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AKTOBE, KAZAKHSTAN, APRIL 25-26, 2019

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The development of models for prediction of preeclampsia in early pregnancy, including the identification of the polymorphism of the gene placental growth factor in ethnic Kazakh women

Sholpan B. Arenova[1]*, Akylbek B. Tussupkaliyev[1]

[1]Department of obstetrics and gynecology №2, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding autor: Sholpan B. Arenova, [1]Department of obstetrics and gynecology №2, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: sholpan.arenova.87@mail.ru

BACKGROUND: The presence of gene polymorphisms plays an important role in the development of preeclampsia. The study of genetic predisposition to preeclampsia allow at the pregravid stage to predict and form a high-risk group for the development of preeclampsia in a timely manner. But so far this prognostic mechanism is under study [Belotserkovtseva L. D. *et al.* 2017]. Despite some advances in studying the molecular mechanisms of PE, it should be noted that the results obtained by different researchers in studying the genetic susceptibility to this disease are often controversial for individual ethnic groups. Thus, it seems extremely relevant to study the structure of hereditary predisposition to preeclampsia taking into account ethnicity and the search for common and ethnospecific genetic markers of this pathology [Vorozhishcheva A. Yu., 2014]. The aim of this study is to develop a model for predicting preeclampsia in early pregnancy, including the determination of polymorphism of the placental growth factor gene in ethnical Kazakh women.
METHODS: Participants in the study are pregnant women. The study will be carried out in three phases over a period of 36 months. The first stage will be the analysis of clinical and anamnestic indicators and gynecological examination data, as well as blood sampling to determine the level of placental growth factor. Then, prior to delivery, a prospective observation is carried out to establish the presence of preeclampsia. The second stage will be to identify the polymorphism of the gene placental growth factor rs1042886. In the III period of labor in all women in labor, blood sampling from the umbilical cord was carried out to determine the polymorphism rs1042886 of the PLGF gene by polymerase chain reaction (PCR) in real time. The third stage will be the development of a model for predicting preeclampsia in early pregnancy, including the determination of polymorphism of the placental growth factor gene (PIGF) which can be used to assess the prognosis of pregnancy outcome in ethnic Kazakh women with preeclampsia, which will identify a group of pregnant women at high risk for preeclampsia.
This study is a fragment of a doctoral dissertation, funded by the West Kazakhstan Marat Ospanov State Medical University.
RESULTS: We expect that the detection of clinical significant indicators of the presence and level of placental growth factor (PIGF) in the first trimester and the presence of polymorphism of the PIGF gene in ethnic Kazakhs, which will develop new methods of early diagnosis of preeclampsia.
CONCLUSIONS: The study will develop effective models for predicting preeclampsia in early pregnancy. And this makes it possible to identify a risk group for the development of preeclampsia and reduces perinatal and maternal morbidity and mortality.

Significant survival rate factors of children with extremely low birth weight

G.Zh. Baigaziyeva*, K.B. Zhubanysheva, M.A. Baimakhanova, M.A. Dzhumadilova, A.A. Sarbas

The Asfendiyarov National Medical University JSC, Department of Children's Diseases No.2, The City Perinatal Center Almaty

*Corresponding author: G.Zh.Baigaziyeva, The Asfendiyarov National Medical University, Department of Children's Diseases No.2, Kazakhstan, Almaty. E-mail: guljan73@mail.ru

BACKGROUND: Data on survival rate of children with Extremely Low Body Weight (ELBW) according to different sources vary from 26% to 55%. In Kazakhstan, the survival rate of all premature infants makes 93.9, but there are no data on survival rate in the category of children only with ELBW.
METHODS: We did a retrospective analysis of the health status of premature infants born with Extremely Low Birth Weight and the analysis of survival rates of newborns born in the City Perinatal Center (CPC) of Almaty born in 2017. The data of official statistical reports, study of such primary medical documentation as "A Childbirth History" were used. The examination results were entered into the Microsoft EXCEL XP table, statistical processing of the material included Software Statistica 6.0.
RESULTS: During the study period in the Almaty CPC 7974 were born, including 124 infants with birth weight from 600 grams to 999 grams that was 1.5% of all live-born children and 14.2 % of all premature infants, the survival rate of ELBW children was 53.2%.

For the purpose of survival rate analysis all children were divided into weight categories: in the 699-gram group the infant survival rate made 0.8%, in the group of 700-899g made 8%, in the group of infants weighting from 900 to 999 g survived – 36.2%. In view to prevent the respiratory distress syndrome (RDS), 46 women in labor (37%) received antenatal corticosteroid therapy. All infants received surfactant replacement therapy, including; 38 infants received a preparation containing Paracant alpha (survival rate made 63%), 75 infants received a preparation containing Bovakant (survival rate 49.3%) and 10 infants received a preparation containing Berakant (survival rate 40%).
The analysis of risk factors for preterm births and types of delivery revealed that by the Cesarean section, the survival rate of ELBW infants was higher and amounted to 50% and among the unfavorable outcome infants the rate made 39%. Among the causes of premature birth, as a rule was the threatening fetal state – 50 cases (40.3%), in 27% caused by severe preeclampsia – 34 cases, the obstetric bleeding associated with placental abruption and presentation made 16 cases (12.9%). Doppler examination of 19 (15.3%) mothers revealed violation of utero-fetal-placental blood flow of 3 degrees. Obstetric history of 75 (60.5%) women was burdened with infertility, miscarriages, and frozen pregnancy. According to pathomorphological studies of 58 deceased ELBW infants, RDS is in the first place – 26 cases (44.8%), intrauterine pneumonia took the second place – 19 cases (32.7%), intrauterine sepsis – 8 cases (13.7%) was in the third place, JANEK – 4 cases (6.7%). Discharged, 66 infants were convalescents of the following pathologies: intrauterine pneumonia in 41 cases (62.1%), RDS – 14 cases (21.2%), sepsis in 3 cases (4.5%). 7 infants were discharged with bronchopulmonary dysplasia (10.6%).
CONCLUSIONS: 1. The survival rate of the ELBW infants is high enough and makes 53.2%, but significant survival rate factors are the birth of infants in the weight category range from 900 to 999 and delivery by the cesarean section. 2. The prophylactic surfactant replacement therapy with surfactant-containing Paracant alpha survival rate of which is 63%, serves as the significant survival factor of infants. 3. The reserve for reducing infant mortality in Kazakhstan present oneself significant coverage of antenatal corticosteroid therapy for women at risk of having a very premature baby.

Single-stage endoscopic treatment of complicated forms of cholelithiasis

Aliya M. Aitbayeva[1,2]*, Bazylbek S. Zhakiyev[1], Kakhaber Kashibadze[3], Arystan A. Bazarbai[2]

[1]Department of Surgical Diseases №2, West Kazakhstan Marat Ospanov state medical university, Aktobe, Kazakhstan; [2]Surgical Department, Emergency Hospital, Aktobe, Kazakhstan; [3]Department of Surgery, Batumi Shota Rustaveli State University, Batumi, Georgia.

*Corresponding author: Aliya M. Aitbaeva, Department of Surgical Diseases №2, West Kazakhstan Marat Ospanov state medical university, Aktobe, Kazakhstan. E-mail: aliya-aitbaeva@mail.ru

BACKGROUND: Stones of the common bile duct occur in 3–33% of patients suffering from gallbladder stones. Accompanying stones of the gallbladder and common bile duct should be treated because of the risk of life-threatening complications such as pancreatitis, obstructive jaundice and cholangitis. There is no consensus regarding the optimal treatment of common bile duct stones associated with stones of the gallbladder. Current evidence shows that single-stage treatment of concomitant choledocholithiasis and cholelithiasis is as effective and safe as two-stage treatment. However, with the development of obstructive jaundice, the solution to this problem remains controversial. The currently preferred method is a two-stage treatment with removal of stones after drainage is recommended for the development of obstructive jaundice of mild to moderate severity associated with choledocholithiasis. However, single-stage treatment has some advantages. The aim of our study was to evaluate the efficacy and safety of a single-stage endoscopic treatment of cholelithiasis complicated by choledocholithiasis and mild severity of obstructive jaundice.
METHODS: A prospective cohort study of patients diagnosed of cholelithiasis complicated by choledocholithiasis and mild severity of obstructive jaundice (according to the classification of V.D. Fedorov *et al.* 2000), who were treated with the single-stage treatment a single-stage treatment - laparoscopic cholecystectomy and intraoperative endoscopic retrograde cholangiopancreatography, endoscopic papillosphincterotomy with endoscopic mechanical lithoextraction of calculi and laparoscopic cholecystectomy, laparoscopic choledocholithotomy, drainage of the common bile duct in hospital surgery clinic of West Kazakhstan Marat Ospanov state medical university for the period from 2014 to 2018.
The primary outcomes were complications, hospital stay, operative time and timing of cholestasis resolution.
RESULTS: The study included 35 patients. All patients underwent laparoscopic cholecystectomy. Intraoperative endoscopic retrograde cholangiopancreatography, endoscopic papillosphincterotomy with endoscopic mechanical lithoextraction of calculi performed in 24 (68.6%), 11 (31.4%) – laparoscopic cholecystectomy, laparoscopic choledocholithotomy, drainage of the common bile duct. Normalization of biochemical parameters characterizing cholestasis (bilirubin, alkaline phosphatase) and cytolysis (AsAT and AlAT) within 3 days after single-stage treatment was observed in 31 patients (88%). Mean operative time was 102.6 ± 34.2 minutes. Mean hospitalization stay was 6.8 ± 1.5 days. Complications directly related to the operation were found in 2 patients (5.7%): acute pancreatitis was observed, accompanied by increased levels of blood amylase and leukocytosis. Comprehensive conservative therapy in these patients had a positive clinical result. Deaths were not recorded.
CONCLUSIONS: This study demonstrated that single-stage endoscopic treatment may be effective and safe for cholelithiasis complicated by choledocholithiasis and mild severity of obstructive jaundice.

Association of the rs2229774 polymorphism with the development of Breast Cancer in Kazakh population: preliminary findings

Nazar K. Seidalin[1]*, Tamara A. Voshchenkova[1], Valery V. Benberin[1], Aibek M. Rakhimbekov[2], Beybit T. Bayzakov[3], Yury A. Starchenko[3]

[1]Department of Science, the Medical Centre Hospital of President's Affairs Administration of the Republic of Kazakhstan, Astana, Kazakhstan; [2]Eurasian Lev Gumilyov National University, Astana, Kazakhstan; [3]Medical Center, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Nazar K. Seidalin, Department of Science, the Medical Centre Hospital of President's Affairs Administration of the Republic of Kazakhstan, Astana, Kazakhstan.
E-mail: nkseidalin@mail.ru

BACKGROUND: The incidence rate of Breast Cancer (BC) grows incrementally worldwide, including the Republic of Kazakhstan, and ranks first among all malignant tumors. To our knowledge, genetic factor is referred to as main of those playing a significant role in the development of BC. To date, a list of polymorphisms associated not only with the risk of developing malignant tumors of the mammary gland, but with the disease course and response to treatment, has been determined, but still there are no convincing data for clinical use of the information obtained.
The present study aimed to compare frequency of the rs2229774 polymorphisms occurrence in healthy women and patients diagnosed with BC.
Research tasks included the DNA extraction and typing for rs2229774 polymorphism in women of Kazakh ethnicity.
METHODS: 192 women corresponding to Inclusion criteria were typed to identify the status of SNP (single nucleotide polymorphism) using the chipping method, of them 96 patients were women diagnosed with the BC (main group) and 96 were clinically healthy (control group).
Relationship revealed between the SNP status and the presence of Breast cancer was statistically processed using the logistic regression model.
RESULTS: The main and control groups were comparable by age. The average statistical timing from the time of diagnosis to the time of inclusion in the study was 4 years, with a median value of observation as 2 years. Clinical staging at the time of diagnosis (according to TNM classification, 7th edition, 2009) in the main group of women was the following: stage I - 21.3%, stage II - 48.2%, stage III - 15.8%, and stage IV - 14.7%, respectively. According to the molecular and immunohistochemical profile of women diseased with BC, the proportion of cases with luminal type A were 66.3%, with the luminal type B were 7.9%, having Her 2 + status 10.5%, and cases with triple negative BC 15.3%, respectively.
We found that in patients having the disease, replacement of the single nucleotide A / G with G / G in the rs2229774 allele at the RARG gene was statistically significant, with the absolute risk (EER) = 0.85, while in healthy women the absolute risk (CER) was 0.09 at the relative risk RR = 9.5. The distribution of $\chi 2$ was 111.6 at $P<0.001$ with enhancing the direct relationship (+0.76). The test's sensitivity and specificity were determined as 0.92 and 0.84, respectively. Thus, statistically significant relationship between the SNP status and a high risk of the Breast cancer developing in the studied population was established.
CONCLUSIONS: Replacement of the nucleotide having a high association with the Breast cancer was detected through the examined groups. According to the research findings, replacing the single nucleotide A / G with G / G in the rs2229774 allele was highly correlated with the absolute risk of the Breast cancer developing.

The study of single nucleotide polymorphisms of genes in patients with Breast Cancer of the Kazakh ethnicity

Nazar K. Seydalin[1] *, Nasrulla A. Shanazarov[1], Amir A. Akhetov[1], Beybit T. Baizakov[2], Yury A. Starchenko[2], Natalia Kiel[3]

[1]Department of Science, the Medical Centre Hospital of President's Affairs Administration of the Republic of Kazakhstan, Astana, Kazakhstan; [2]Medical Center, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [3]Damu Information Technology Center

*Corresponding author: Nazar K. Seidalin, Department of Science, the Medical Centre Hospital of President's Affairs Administration of the Republic of Kazakhstan, Astana, Kazakhstan.
E-mail: nkseidalin@mail.ru

BACKGROUND: Management of the Breast Cancer (BC) is one of the leading challenges in practical oncology. High prevalence of this kind of tumor leads to significant economic costs for the treatment and rehabilitation of this group of diseased. Numerous epidemiological studies have demonstrated the significant role of genetic factors in the BC development. Considerable number of single nucleotide polymorphisms (SNPs) associated as with the risk of developing as with predicting the course of disease were identified by researchers.
The research presented was purposed to study the frequency of single nucleotide polymorphisms (SNPs) in patients diagnosed with Breast cancer in Kazakh population.
METHODS: Identification of 128 SNPs in 96 women having BC (main group) and 96 healthy women (control group) amongst the Kazakh population using the method of chipping was carried out. The results obtained were processed through the logistic regression analysis.
RESULTS: The study resulted in finding a series of polymorphisms, which had the greatest frequency of differences across the studied groups.
The average age of women examined was 55 years, with median value 58 years. The average statistical timing from the time of diagnosis until the inclusion in the study was 4 years, with a median value of observation as 2 years. Clinical staging at the time of diagnosis (according to TNM classification, 7th edition, 2009) in the main group of women was the following: stage I - 21.3%, stage II - 48.2%, stage III - 15.8%, and stage IV - 14.7%, respectively. According to the molecular and immunohistochemical profile of women diseased with BC, the proportion of cases with luminal type A were 66.3%, with the luminal type B were 7.9%, having Her 2 + status 10.5%, and cases with triple negative BC 15.3%, respectively.
Representatives of small allele rs121434592 with the C / C SNP status were strongly associated with a relative risk of BC in the examined sample, RR coefficient was 7.373 (95% CI 4.51;12.03). The significance of C / C SNPs in rs4415084 allele in association between the relative risk's susceptibility loci was 4.512 (95% CI 3.084;6.601) and also had a strong relationship.
CONCLUSIONS: Preliminary findings of a molecular genetic analysis showed that in patients diagnosed with the Breast cancer, statistically significant replacements of single nucleotides were found in the small rs121434592 and rs4415084 alleles with an increased risk of the disease development and direct strong relationship. A high sensitivity and specificity of the test was noted. Thus, nucleo-

tides substitutions in SNPs were associated with a high risk of developing the Breast cancer in population.
Preliminary results suggest the need to continue the research in order to obtain validated data by increasing the number of subjects.

Improving the quality of medical education in increasing the resistance of future doctors to emotional burnout

Kulchimbayeva S.M. *, Khamidullina Z.G., Ahmedjanova G.U., Kaldarbek O.N., Aman A.

Department of obstetrics and gynecology №1, JSC "Astana Medical University", SME on the ERM "Perinatal center №3", Astana, Kazakhstan

*Corresponding author: Sabira M. Kulchimbayeva.
E-mail: s_kulchimbayeva@mail.ru

BACKGROUND: According to the WHO, 45% of all diseases are associated with excessively strong and prolonged psychological tension or stress. The period of study has a significant impact on the formation of personality in students, therefore the problem of emotional burnout in medical staff is a key indicator of medical education. Skills gained in medical institutions is an indicator of readiness for emotional tension in work. This study provides information on the level of professional burnout (PB) among medical staff.
METHODS: The study was conducted in the hospital of the SME on the ERM "Perinatal Center № 3" akimat of Astana in January 2019. A pilot study was conducted by Online questionnaires on specially designed questions in Google forms for 135 medical staff. General questions included passport and contact information, age, work experience, adherence to a healthy lifestyle, and psychological testing. To measure the PB used the method of V.V. Boyko, with a score of 12 results of the symptoms and the phase of its development, WAM test and the Holmes-Ray stress scale. Using the Google forms presented no difficulty in understanding the issues. 100% completed answers to all questions were received.
RESULTS: The study was conducted in 135 medical staff, of which 30% were physicians, 70% of nurses, women (80%) were more than men (20%), while the average age was 43.3 ± 2.2 years, work experience 14.5 ± 3.5 years.The results showed that the majority of physicians are dominated by symptoms of the "exhaustion" phase, 54.5 ± 2.5 points, which manifests itself in emotional detachment (17.1 ± 1.3 points) from patients. Inadequate response (8.1 ± 2.1 points) is also quite pronounced, points ("resistance" phase, 52.5 ± 2.8 points), which manifests itself in an economical display of emotions and inadequate selective emotional response. Analysis of the WAM methodology revealed that in general, the assessment of well-being and mood were good, 53.7 ± 2.6 points and 53.8 ± 3.3 points, respectively, low activity, 30.7 ± 1.7 balls, which, in parallel with the test for the assessment of the SEB, can talk about fatigue, leading to a reduction of professional duties, their simplification. The indicators of this survey showed that 46% of medical workers lead a healthy lifestyle. Detailed analysis showed that 22% of respondents led a hectic lifestyle associated with the presence of bad habits (smoking, alcohol), a wrong lifestyle (eating disorders, rest and work behavior, lack of sports) was detected in 20%, and the correct lifestyle (mainly food) noted 12%.
CONCLUSIONS: The results showed that the emotional burnout syndrome in health care workers was identified in the stage of exhaustion with the leading symptom of emotional withdrawal and the stage of resistance with the prevalence of inadequate response and decreased activity with good health and mood. Lifestyle is associated with disorders in nutrition, sports, recreation, and bad habits, which affects the resources of the body in the fight against occupational stress and accompanies emotional burnout. Improving the quality of curriculum for medical students is a constant problem, for which different approaches are used. Evaluation of PB shows that at the stage of training medical students there should be a tool for the prevention of symptoms of PB at the professional stage.

The potential of using biochip test systems in the differential diagnosis of malignant tumors

Nazar K. Seidalin[1] *, Almagul A. Tuleubaeva[1], Nurzhamal A. Tokhpanova[2], Beybit T. Baizakov[3], Yury A. Starchenko[3]

[1]Department of Science, the Medical Centre Hospital of President's Affairs Administration of the Republic of Kazakhstan, Astana, Kazakhstan; [2]Cytological laboratory, Astana City Oncology Center, Kazakhstan; [3]West-Kazakhstan Marat Ospanov State Medical University

*Corresponding author: Nazar K. Seidalin, Department of Science, the Medical Centre Hospital of President's Affairs Administration of the Republic of Kazakhstan, Astana, Kazakhstan.
E-mail: nkseidalin@mail.ru

BACKGROUND: Differential diagnosis of lymph node lesions in neoplasms of various origins (lymphoma, metastases, inflammation) is based on morphological data and constitutes one of the most difficult sections of morphology and cytology. Such a state of things is arisen due to the high reactivity, morphological similarity of healthy and tumor cells, as well as a variety of histological types of tumors. Currently, immunohistochemical assays of remote lymphatic tissues are conducted to clarify the type of malignant neoplasm. The existing techniques of differential diagnosis for lymph nodes (immunohistochemistry, flow cytofluometry) are time- and cost-consuming, besides require trained morphologists, which makes diagnosis difficult.
The research was aimed to draft a methodology for performing fluorescent immunocytochemical studies using test systems in the format of cellular biochips for differential diagnosis of malignant neoplasms at affection of lymph nodes.
Objectives were to study the biochip-test systems efficiency in the differential diagnosis of malignant tumors at the defeat of the lymph nodes with metastatic, inflammatory and lymphoproliferative process.
METHODS: A biochip is a complex of miniature chemical reaction zones arranged in a specific order and deposited on a solid matrix. Medical biological microchips are designed to carry out "invitro" studies in order to differentiate between malignant and benign epithelial and lymphoid tumors. Biochips manufactured by "Biochip", Russia, were used in the work. For differential diagnos-

tics, antibodies Epcam, CK7, CK20, CD3, CD20, CD30, CD15, CD45 were applyed. The biomaterial was collected through the fine-needle aspiration biopsy of the lymph nodes under ultrasound guidance. Comparative analysis was performed with the results of histological and immunohistochemical studies.
RESULTS: A preliminary comparative analysis of performing fluorescent immunocytochemical assays based on biochip-test systems in 18 patients with suspected lymphoma, metastases in lymphomas or inflammatory processes was carried out. In 7 (38.8%) cases, according to biochip systems data, metastasis of epithelial tumors to the lymph nodes was detected. Positive reactions with Epcam antibodies were detected in 4 cases, with SC7 antibodies in 6 cases and CK20 in 5 cases, respectively. According to the histological and immunohistochemical analysis, the diagnosis was confirmed in all 7 cases of metastasis. In 6 (33.3%) cases, according to biochip test systems data, lymphoma was detected. Positive reactions were obtained with CD3 antibody in 3 cases, with CD20 antibodies in 3 cases, and CD45 antibody in 1 case, respectively. Reactions with CD30 and CD15 antibodies were failed. In all cases, the diagnosis was confirmed morphologically. In 5 cases, according to a fluorescent immunocytochemical study, there were no signs of a malignant tumor, as the inflammation process was revealed, according to the results of histological examination.
CONCLUSIONS: Preliminary results of the biochip-test systems use showed their high accuracy in the differential diagnosis between lymph node lesions in lymphomas, metastases and inflammatory changes.
Further research is needed to study the sensitivity and specificity of the method for proper applying in differential diagnosis.
The study was performed in frames of the scientific project funded by the Ministry of Education and Science of the Republic of Kazakhstan (Grant No. AP05136177).

The features of vegetative status in children with heart connective tissue dysplasia

Gulshat Kulniyazova *, Dolotova L.V., Seipenova A.N., Kuzdenbayeva G.E., Altayeva A.M.

West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Kulniyazova Gulshat Matayevna, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: k_gulshat@mail.ru

BACKGROUND: The most frequent manifestation of heart connective tissue dysplasia (HCTD) among children is mitral valve prolapse (MVP) and abnormally located chords of the left ventricle (ALC LV). Majority of authors allocate the leading role in their symptogenesis to dysfunction of the autonomic nervous system. At the same time, vegetative homeostasis and circulatory system reactions among children with HCTD remain understudied.
The study was aimed to examine the vegetative status of school-age children with some forms of HCTD.
METHODS: 75 school pupils aged 7–18 years with MVP in combination with ALC LV were examined. The control group consisted of 50 healthy students of this age. The initial autonomic tone was determined according to the Wayne table (2002), which includes the results of a survey and registration of indicators by systems; the probability of the predominance of sympathetic (Pc) or parasympathetic manifestations (Pn) was calculated; each symptom is evaluated on a five-point system with the calculation of the average value of points.
RESULTS: Comparison of the total initial vegetative tonus in the subjects revealed a significant predominance of sympathetic tone in children with NCTD: Pc. - 52.2 ± 3.4, in the control group - 43.6 ± 2.8, $t = 2.07$, $P<0.05$; parasympathetic tone prevailed in the control group, Pn - 42.8 ± 2.6 and 48.4 ± 3.3, $t = 1.90$, $P> 0.05$, respectively. The score of symptoms in assessing signs of autonomic dysfunction (subjective and objective) was 193.5. Among those surveyed, more than 15 points for subjective symptoms, children with DSTS made 68.0% compared to controls - 53.0% $\chi2 = 4.101$, $P=0.043$ ($P=0.001$). Moreover, of the maximum number of points which equals 71, children with HCTD had a significantly higher average score compared to the control: 29.7 ± 4.4 and 17.8 ± 3.5 at $t = 2.12$, $P<0.05$, respectively. The frequency of objective symptoms in the subjects (with HCTD) - 72.1, in the control - 58.0, $\chi2 = 20.251$, $P=0.001$. The average number of points for objective symptoms (maximum 89) is 34.6 ± 3.8 and 25.1 ± 2.3 at $t = 2.14$, $P<0.05$, respectively. Objective symptoms of autonomic dysfunction, which amounted to 25 or more points, were also found in the majority of children with HCTD and the vegetative Kerdo index among them corresponded to sympathicotonia. Positive vegetative index (VI) (sympathicotonia) was detected in 70.7% (N.=53) children with HCTD, in the control - 54.0% (N.=27), $\chi2 = 52.515$, $P=0.001$. Negative VI (vagotonia) - 22.7% (N.=17) and 32.0% (N.=16), $\chi2 = 20.161$, $P=0.001$. VIC = 0 (eutonia) - 6.7 (N.=5) and 14.0 (N.=7), $\chi2 = 26.204$, and $P=0.001$, respectively. The severity of HCTD in the subjects and their autonomic dysfunction were in direct correlation and dependence ($r = 0.86$, $P<0.05$).
CONCLUSIONS: Thus, the tense functioning of the sympathetic division of the autonomic nervous system indicates the uneconomic "working mode" of the cardiovascular system, which leads to myocardial fatigue and deterioration of its trophism, dictating the need for correction of its condition until reaching the normal values of the autonomic tone, respondence and ensuring.

Experience of using virtual patients with medical error for undergraduate students in Astana Medical University

Riza G. Nurpeissova[1]*, Aimura S. Syzdykova[2], Kulyash K. Jaxalykova[1], Zhanar K.Bukeyeva[3], Marina K. Zhanaliyeva[4]

[1]Department of Family and Evidence Based Medicine, Astana Medical University, Astana, Kazakhstan; [2]Department of Internship and Employment, Astana Medical University, Astana, Kazakhstan; [3]Department of Academic Affairs and Quality, Astana Medical University, Astana, Kazakhstan; [4]Department of Human Anatomy with Operative Surgery, Astana Medical University, Astana, Kazakhstan

*Corresponding author: Riza G. Nurpeissova, Department of Family and Evidence Based Medicine, Astana Medical University, Astana, Kazakhstan. E-mail: nriza@mail.ru

BACKGROUND: Medical error is an increasingly significant cause of harm to patients. Errors resulting from cognitive mistakes can be reduced through enhanced learning opportunities. Within the framework of the European program Erasmus + JSC "Astana Medical University" (AMU) in 2015 joined the international grant project "Training against medical error - TAME".
The TAME project aims to train medical students to avoid preventable adverse events caused by errors in practice and includes 10 universities from countries: UK, Greece, Czech Republic, Sweden, Vietnam, Ukraine, Kazakhstan. TAME aims to provide research evidence about learning how to avoid the most common medical errors in training of future physicians by the use of virtual patients (VP). Here we report about the students' experience in AMU when interacting with VPs.
METHODS: AMU repurposed and adapted 6 VP cases in pediatrics, authored by St. George's University of London in linear and branched versions). After interacting with the cases, 375 students answered the evaluation questions via a survey. The survey aimed to evaluate personal experience, perceived abilities, mental effort and emotional reactions. 15 interviews and 3 focus-groups clarified the survey findings.
RESULTS: We received 375 responses to the survey out of which 72% were given by female participants. By age categories, 39 questionnaires were received from 20-year-old students, 303 questionnaires from 21-year-old ones and 21 questionnaires from 22-year-old students. The majority of respondents (90.86-95.31%) interacting with cases responded that they felt like real doctors. 85.32% of students believed that the complexity of cases corresponds to their level of knowledge. 96.93% of respondents decided that cases help to improve their diagnostic skills. 96.39% of students believed that after the class they are more prepared for the actual clinical practice. 98.33% of responders considered their participation in the course as a valuable experience. Some of the strengths of the cases reported by the students interacting with the VPs were the teamwork; the potential to explore different diseases of similar symptoms, the authenticity of the patient responsibility, the potential to deal with rare cases, unexpected unfolding of the case. In particular, students noted: "the work of the surgical team", "the abundance of diseases similar to that of the real patient, which subsequently prepares us for work in differential diagnostics", "patient choice and responsibility," "Frequent symptoms, problems with breastfeeding and artificial feeding, which is considered relevant at this time", "work not only with the child, but also with the parents", "until the end of the case I did not suspect what caused the child's injuries." Weak sides of cases, the respondents considered: "insufficient information when sorting patients. After working with the cases the students felt confident with the knowledge acquired. As a matter of fact, they received 42,61 points out of 5 in average.
CONCLUSIONS: Implementation of pediatric VP cases based on 10 medical errors were considered as a valuable experience for the great majority of the students participating in the course. Our work encourages further implementation of VP cases in the context of medical education in Kazakhstan.

Assessment instruments used for virtual patients based on medical error in the frames of TAME project

Aimura S. Syzdykova[1], Riza G. Nurpeissova[2] *, Zhanar K. Bukeyeva[3], Kulyash K. Jaxalykova[2], Marina K. Zhanaliyeva[4]

[1]Department of Internship and Employment, Astana Medical University, Astana, Kazakhstan; [2]Department of Family and Evidence Based Medicine, Astana Medical University, Astana, Kazakhstan; [3]Department of Academic Affairs and Quality, Astana Medical University, Astana, Kazakhstan; [4]Department of Human Anatomy with Operative Surgery, Astana Medical University, Astana, Kazakhstan

*Corresponding author: Riza G. Nurpeissova, Department of Family and Evidence Based Medicine, Astana Medical University, Astana, Kazakhstan. E-mail: nriza@mail.ru

BACKGROUND: Astana Medical University (AMU) in 2015 joined the international grant project "Training against medical error – TAME, co-funded by EU Erasmus + Programme, includes 10 universities from countries: UK, Greece, Czech Republic, Sweden, Vietnam, Ukraine, Kazakhstan, and provides research evidence addressing the most common medical errors in training future physicians using virtual patients (VP).
Virtual Patients (VPs) are "interactive computer simulations of real-life clinical scenarios for the purpose of training, education or assessment". In particular in medical education contexts, VPs are known to facilitate the training of clinical reasoning skills but may also promote critical thinking and decision making, enable active and self-directed learning. Here we report about the results acquired by the assessment instruments developed during the implementation of new clinical cases.
METHODS: 32 students (4 groups) of Year 5 "General Medicine" were selected for conducting tutorials with D - PBL. A schedule was drawn up taking into account the interdisciplinary approach. The correspondence of the case to the discipline of the module "General Medical Practice", 6 clinical cases with different specialties: unit1 – cardiology: "Headache", unit 2 – pulmonology: "Cough", unit 3 – hematology: "Weakness", unit 4 – endocrinology: "Thirst", unit 5 – pediatric: "Difficult breathing", unit 7 – obstetrics and gynecology: "Bleeding" . The tutorials were held from 06.02.2018 to 29.03.2018, 2 times a week, with duration of 3 hours a day. At the end of each clinical case, an online essay was completed, which was developed on the Moodle platform.
Assessment instruments consisted of two parts: an essay for evaluation of clinical cases and multiple choice questions for evaluation students' knowledge. All essay responses were saved in the Moodle program, for each student and group. We were assessing in the following way: we read the answers and using with the help of the evaluator's table chose the criteria and the program counted the score.
RESULTS: Based on the results of the essay assessment, we received the following data: we got more complete answers for those cases that interested students and taught something (Case 1, 2, 4.6 (67-75 points). Caused difficulty in the description Case 3 and case 5 (Cough and Headache). We think this is because these cases they passed easily and some pathology were familiar to them. The highest scores were received from the Case 4 and Case 2, because case 2 called more controversy in the clinic, and

Case 4 was the most interesting among all cases and all students liked this case. The most active were groups 570 and 571. The case with the highest score is case 4 (groups 570 and 571) and the smallest points received case 3. Group 569 on the contrary highly recommended case 2 and 3.
CONCLUSIONS: Interactive electronic scenarios are increasingly recognized by the medical education community as very effective tools for developing reasoning skills. This will lead to a more patient-centric view of medicine, improve the quality of medical treatment and decrease the healthcare costs through development and implementation of innovative teaching strategies in Kazakhstan.

Renin gene polymorphism rs2368564 is associated with the risk of in-stent restenosis in Russian patients with stable coronary artery disease

Kalima B. Bogatyreva[1], Madina M. Azova[1], Zaur Kh. Shugushev[2], Anna V. Aghajanyan[1], Leyla V. Tskhovrebova[1], Amira Ait Aissa[1], Olga B. Gigani[1]

[1]Department of Biology and General Genetics, Institute of Medicine, Peoples' Friendship University of Russia (RUDN University), Moscow, Russia; [2]Department of Cardiovascular Surgery, Institute of Medicine, Peoples' Friendship University of Russia (RUDN University), Moscow, Russia

*Corresponding author: Kalima B. Bogatyreva, Department of Biology and General Genetics, Institute of Medicine, Peoples' Friendship University of Russia (RUDN University), Moscow, Russia. E-mail: kalmia.bogatyreva@mail.ru

BACKGROUND: Percutaneous coronary intervention (PCI) has become an effective and most frequently performed procedure for treatment of obstructive coronary artery disease (CAD). However, one of the major complications of coronary revascularization is the development of in-stent restenosis (ISR) in 5–20% of all initially treated patients. Restenosis is defined as the re-narrowing of the lumen of the treated coronary artery, resulting in renewed symptoms of CAD and the need for repeated intervention. Several studies suggest that neointimal proliferation is the crucial pathophysiological process underlying in-stent restenosis after PCI. According to the recent studies the renin-angiotensin system may influence neointimal hyperplasia. Gene polymorphisms of their components have been described to be associated with the development of ISR. Our study was aimed at investigating the 83G>A renin gene polymorphism (rs2368564) in patients with stable coronary artery disease after balloon angioplasty and stent implantation.
METHODS: One hundred thirteen patients and sixty two healthy individuals participated in the study. All of them were Russians. The patients were divided into two groups - those with significant ISR (N.=53) and those without ISR (N.=60). All patients underwent coronary revascularization with drug-eluting stents (DES) and had subsequent coronary angiography performed in a year after primary PCI. Re-narrowing of the vessel in the stent position place of more than 50% was defined as angiographic restenosis. Criteria for inclusion in the study: age> 45 years, Russians, atherosclerosis according to the coronary angiography, patient consent to the study. Total DNA was extracted from the blood and genotyped using the Real-time PCR. The REN G83A polymorphism was analyzed. The Chi-square test and Fisher's exact test were used to estimate differences between groups.
RESULTS: Comparison of analyzed groups revealed a significant increase in the frequency of minor (AA) homozygotes in patients with in-stent restenosis comparing with patients without ISR and healthy individuals (42% vs. 22% and 8% respectively; $P<0.05$).
CONCLUSIONS: Our study suggests that REN rs2368564 (83G>A) gene polymorphism is associated with in-stent restenosis in Russian patients with stable coronary artery disease following balloon angioplasty and coronary stenting.
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Treatment and prevention of postoperative intestinal paresis in the experiment on the model of complicated development of acute intestinal obstruction

Vitaliy A. Feoktistov *, Talgat Z. Temirbekov, Meirambek S. Askarov, Bakhit A. Begezhanov, Khabibulla B. Bismildin, Sanzhar M. Zhumanbaev

Department of Surgical diseases №1, Karaganda Medical University, Karaganda, Kazakhstan

*Corresponding author: Vitaliy A. Feoktistov, Department of Surgical diseases №1, Karaganda Medical University, Karaganda, Kazakhstan. E-mail: vitalij-bio@mail.ru

BACKGROUND: Among acute diseases of the abdominal cavity, the share of intestinal obstruction accounts for from 7 to 9% of cases. The pathology has a severe course and mortality is directly depended on the duration of the disease and the development of complications.
The purpose of our study: searching for the most optimal method of treatment and prevention of postoperative intestinal paresis in the experiment on the model of complicated development of acute intestinal obstruction among laboratory animals.
METHODS: The objects of the study were Chinchilla rabbits of both sexes with the same weight category in the amount of 32 individuals.
Laboratory animals were divided into 2 equal experimental groups with the aim of modeling acute intestinal obstruction under anesthesia. We applied the imposition of purse suture on the anal sphincter followed by fixing the button and gripping the anterior abdominal wall together with the intestinal wall by the branches of soft clip plastic nozzles for 30 minutes twice in the different areas. For oppression of motor function of the intestine the atropine solution at the dose of 0,5 ml/kg was injected intramuscularly. After 12 hours from the onset of obstruction signs, the 12 animals from each group were released from the previously applied purse sutures the abdominal revision and adhesion dissection were carried out if there were any and also applying lavage**,** sanation and drainage. The final stage of surgical treatment was a catheterization of the mesentery between the two visceral sheets of thin silicone tube with a diameter of 0,2 mm. to 12 individuals every groups, the catheter was brought to the front abdominal wall. In the early and late postoperative period 0,25% of warm

Novocain solution was injected through the catheter at the dose of 1,5 ml/kg.
RESULTS: On the 3rd day 12 individuals of the 1st group were taken for surgical treatment. On 10 out of the 12 cases (83,3%) individuals showed dilatation of the intestine, and signs of widespread fibrinous peritonitis, presence of large intestine perforation is detected in 2 cases (16%); in this case a perforated area was resected with an "end-to-end" primary anastomosis. 12 animals with the sign of obstruction from the 2nd group were operated on 10 out of 12 cases (83,3%) detected intestinal adhesions in 1 case (8,3%) preference the presence of local signs of peritonitis. Out of 12 operated animals of the 1st group 25% died in the early postoperative period within 2 days.
Discharges of fecal masses, the appearance of appetite, auscultation peristaltic noise were found later in 75% of the remaining animals. Of the 2nd group the postoperative period easier 33%, discharge of fecal masses and auscultation peristaltic noise. Out of 8 animals operated without a catheter 62,5% died.
CONCLUSIONS: Thus the use of catheterization of intestinal mesentery with postoperative stimulation with 0,25% of warm Novocain solution allow to improve the recovery of peristaltic movements of the intestine in the postoperative period.

Early recognition and rehabilitation of children with severe-to-profound hearing loss

Gulnara Zh. Kapanova[1] *, Ruslan B. Zhumabayev[1], Galiya B. Zhumabayeva[2], Amangeldy A. Zhangireyev[3], Sundetkali B. Kalmakhanov[1]

[1]Health Policy and Organization Department, Faculty of Medicine and Health Care, Al-Farabi Kazakh National University, Almaty, Kazakhstan; [2]Sport Medicine Department, Kazakh Academy of Sport and Tourism, Almaty, Kazakhstan; [3]Departament of phthisiatry and dermatovenerology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Gulnara Zh. Kapanova, Health Policy and Organization Department, Faculty of Medicine and Health Care, Al-Farabi Kazakh National University, Almaty, Kazakhstan.
E-mail: g.kapanova777@gmail.com

BACKGROUND: According to WHO data, Hearing loss and deafness in children have high medical and social significance. Congenital or early-acquired lack of hearing, even a small decrease in it, entails not only speech, but also intellectual, severe emotional and socio-psychological disorders in the child's development.
Around 466 million people worldwide have disabling hearing loss, and 34 million of these are children. Hearing loss may result from genetic causes, complications at birth, certain infectious diseases, chronic ear infections, the use of particular drugs, exposure to excessive noise, and ageing. Interventions to prevent, identify and address hearing loss are cost-effective and can bring great benefit to individuals comply with WHO data.
People with hearing loss benefit from early identification; use of hearing aids, cochlear implants and other assistive devices; captioning and sign language; and other forms of educational and social support.
The aim of this study was to determine the impact of early diagnosis and detection of severe-to-profound hearing loss in children on quality of life.
METHODS: Manual and computer-assisted literature searching was conducted. After screening of 37 full texts of proper articles (PubMed database), directness of evidence (DoE) and risk of bias (RoB) were assessed for the included articles. Research characteristics and data on our outcomes of concern (speech perception in noise, sound localization, quality of life, and speech and language development) were extracted.
RESULTS: All 37 articles reflect statistically proven and significant positive effect of the early diagnosis of severe-to-profound hearing loss due to early rehabilitation, including both Hearing Aid and Cochlear Implantation. In 18 articles, there are cases with improvement of children social integration, in 10 articles there is a greater effect in speech development (language acquisition and performance). The authors of 9 articles revealed an improvement in self-esteem, and therefore a sense of confidence in society.
CONCLUSIONS: The results show that the time of the diagnosis of severe-to-profound hearing loss is crucial for further development of the children. Early diagnosis of deep hearing loss in children allows using the adequate treatment options. Moreover, early diagnosis and intervention suggest the best chance for speech and language acquisition. Accordingly, early rehabilitation leads to better quality of life in aspects of communication, social relationship and education.

The development of general medical practice in the Republic of Kazakhstan

Togzhan S. Khaidarova *, Gulnara Zh. Kapanova, Sundetkali B. Kalmakhanov, Kayni S. Baigonova

Health Policy and Organization Department, Faculty of Medicine and Health Care, Al-Farabi Kazakh National University, Almaty, Kazakhstan

*Corresponding author: Togzhan S. Khaidarova, Health Policy and Organization Department, Faculty of Medicine and Health Care, Al-Farabi Kazakh National University, Almaty, Kazakhstan.
E-mail: khaidarovat@gmail.com

BACKGROUND: The relevance of the development of primary health care (PHC) for the Republic of Kazakhstan (hereinafter – Kazakhstan) is increasing, as the basis for ensuring the availability of medical care will be the PHC system, represented mainly by General medical practice (GMP).
The aim of this study was to conduct a comparative analysis of the implementation of the GMP in Kazakhstan and in the countries of the Organization for economic cooperation and development (OECD) to develop recommendations for its improvement. Objectives: 1) to analyze the implementation of GMP in Kazakhstan; 2) to study the experience of OECD countries in the development of GMP in the PHC; 3) to develop recommendations for improving the PHP and GMP.
METHODS: Generally accepted methods are used: content analysis of legislative and regulatory documents (LRD), bibliographic - to search by PubMed data on the organization of GMP in the PHC of OECD countries.

RESULTS: Analysis data revealed that the organization of primary health care in Kazakhstan is built according to the local principle, there is a shortage of primary care doctors, high load on the reception in the clinics, the introduction of the GMP did not develop, social workers and psychologists do not work in the GMP team, but at the other branch of the clinic, the focus of the PHC remains a sick man, not the family with its social-psychological and economic problems. All this causes a decrease in the quality and low preventive orientation of primary health care. A review of data from OECD countries revealed that PHC is an effective system for providing integrated assistance to the population, and is built on independent teams of GMP (GMP, as the main link, and other professionals recruited depending on the needs of the population served. This ensures regularity and continuity of medical care at all stages of treatment, and a low level of referral to specialists and hospitals: GMP cope themselves. Only 6% of patients are referred to narrow specialists. GMP takes care of more than 80% of all medical care cases, and more than 80% of patients start and finish treatment with one doctor, the availability of medical care in all OECD countries has reached almost 100% coverage of the basic of PHC program.
CONCLUSIONS: Organization of GMP in the Republic of Kazakhstan and the OECD countries has fundamental differences: the GMP in OECD countries are independent, working under contract with the insurance office, the brigade serves 7,700 people (per GP – 1500). In Kazakhstan, the GMP has no independence (works under an employment contract), and serves more than 2,100 people.

Identification of factors influencing uterine myoma shrinkage after uterine artery embolization

Talshyn M. Ukybassova [1]*, Milan Terzic[1, 2], Balkenzhe Zh. Imankulova[1], Sanja Terzic[2], Fariza O. Shauyen[1]

[1]Department of Obstetrics and Gynecology, Corporate Fund "University Medical Center", National Research Center for Maternal and Child Health, Astana, Kazakhstan; [2]Department of Medicine, Nazarbayev University School of Medicine, Astana, Kazakhstan

*Corresponding author: Talshyn M. Ukybassova, Department of Obstetrics and Gynecology CF "University Medical Center", National Research Center ofMaternal and Child Health, Astana, Kazakhstan. E-mail: talshynu@yandex.ru

BACKGROUND: Uterine artery embolization (UAE) is nowadays well-established uterine preserving and minimally invasive therapy for symptomatic fibroids. The goal of embolization is to occlude the vessels supplying the fibroid leaving the uterine artery patent yet with slow flow, typically near stasis. The angiographic endpoint of near stasis is the sluggish flow in the main UA with a persistent column of contrast through five heartbeats. The mentioned procedure is confirmed to have the following outcomes: fibroid size reduction, uterine size reduction, reduction of bulk symptoms, and elimination of abnormal uterine bleeding. However, factors influencing the outcome of UAE have not been well documented so far.
Aim: to assess factors influencing myoma shrinkage after UAE outcome.
METHODS: This study involved 337 women in reproductive age treated by UAE in our Clinic due to a single symptomatic intramural myoma throughout the period of five years (2012-2016). Unilateral or bilateral UAE was performed in a classical manner with Trisacryl gelatin microspheres or polyvinyl alcohol. A detailed personal, menstrual and past medical history was obtained along with the presenting symptoms and complains. The uterus and myoma diameters and volumes were determined on ultrasonographic scans before and three, six and twelve months after the procedure.
RESULTS: Final good outcome (volume regression ≥50%) was registered for uterus in 97.4% and for myoma in 67,9% of patients. Myoma volume decrease was greater if embolization was bilateral (P=0.016) with Trisacryl gelatin microspheres (P=0.004). Myoma decrease was better in women with fewer pregnancies (P=0.014). Patients age and myoma localization had no influence on UAE outcome. Initial myoma volume did not impact the final uterine volume (P=0.104), but correlated positively with myoma volume on each three months and negatively with myoma reduction rate (P=0.004). The best volume reduction rate was registered for myomas <5cm and the worst for myomas from 5 to 10 cm in diameter (P=0.007). Significant models were obtained for prediction of uterine and myoma volume change after UAE based on patients and myoma characteristics.
CONCLUSIONS: UAE has optimal results if the occlusion is bilateral in women with fewer previous gestations and smaller myoma volumes.

Innovative student educational technologies on the Department of Public health, "Karaganda Medical University" non-commercial joint-stock company

Nailya F. Sayfulina, Saule R. Zhakenova, Karina E. Nukeshtayeva*

Department of Public health, "Karaganda Medical University" non-commercial joint-stock company, Karaganda, Kazakhstan

*Corresponding author: Karina E. Nukeshtayeva, Department of Public Health, "Karaganda Medical University" non-commercial joint-stock company. E-mail: nukeshtaeva@kgmu.kz

BACKGROUND: Thanks to new information and pedagogical technologies of teaching, to methods of transferring knowledge to students, it became possible to change the role of the teacher in the learning process, transform it from "teacher-knowledge holder" to "teacher-leader". Now teacher is an arbitrator who orients students in choosing the right direction, contributing they have creative approaches in the implementation of independent work.
METHODS: Innovative educational technologies include problem lectures, presentations and discussions on topical issues of world and Kazakhstan health care, case study analysis, team-based learning (TBL), use of brainstorming, business and role-playing games, the method of questioning in practical classes, assessment of knowledge on the independent work using the Moodle program.
RESULTS: Analysis of problem cases - a case study and the technology of brainstorming are used at the department of public health in the elective disciplines "Legislative

base of health care of the Republic of Kazakhstan", "HR-management in health care". With this approach, students receive a certain artificially constructed case. This allows students to develop the skills of teambuilding, which expands the possibilities for solving typical problems within the framework of the study subjects. In consequence of group discussion, identifying problems, finding alternatives, choosing actions and a plan for their implementation, students have the opportunity to develop planning and analysis skills. The activity of the teacher when using the case-study method includes two phases. The first phase is a complex extra-curricular creative work to create a case and questions for its analysis, consisting of research, design and methodological parts. The second phase includes the activities of the teacher in the classroom when discussing the case, where he delivers opening and closing remarks, organizes a discussion or presentation, supports business sentiment in the audience, assesses the students' contribution to the analysis of the situation.

The next effective method of innovative education is business and role-playing games that are used in teaching students who have chosen the subject of "HR - Management in Public Health", where the main attention is paid to the practical development of the knowledge and skills that are transmitted. This method is a role-playing game with different, often polar interests of its participants and the need to make any solution at the end or during the game. The teacher needs a lot of preliminary methodical training during the role-playing games, the ability to predict results and image appropriate conclusions.

Another innovative, effective method in medical education is team-based learning. TBL allows you to make the right decisions in the face of uncertainty, taking into account the opinion of each team member, use the experience of research situations, develop action plans and use the theoretical knowledge gained in practice, which encourages them to active lifelong learning. The TBL method contributes to the active involvement of students in the learning process and the development of communication skills involves students' independent work, taking initiative in making decisions, and substantiating their conclusions based on theory.

CONCLUSIONS: Thus, profound importance has preparation for the class not only the student but also the teacher. This approach will give positive results, as it will contribute to the development of the creative potential of the future specialist, the formation of his analytical thinking and leadership qualities in order to be competitive in the modern world.

The role of innovative methods in increasing the performance of students' independent (out-of-class) work in a medical university

Tamara Zh. Batyrova *, Ainur Amanzholkyzy, Dinara S. Kulzhanova, Akmaral M. Akkozhina

Department of Normal Physiology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Tamara Zh. Batyrova, Department of Normal Physiology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Republic of Kazakhstan.
E-mail: batyrova_64@mail.ru

BACKGROUND: To our knowledge, in any higher educational institution the mentor's foreground task is to prepare the students for professional activities in the context of the global spread of information and communication technologies (ICT). Abilities and skills of interaction with ICT resources are formed within the framework of the competence approach, which implies that a graduate should acquire a certain set of professional, social, personal competencies that contribute to the realization of his potential both as an individual and a specialist. To achieve these goals, mentors introduce various forms and methods of teaching and constantly look for new and effective kinds of arranging the students' out-of-class work.

METHODS: Currently, the main tasks of the West Kazakhstan University's faculty members are focused in the formation of a specialist through the self-development, self-education and encouraging innovative activity in students.

As a matter of fact, simple transferring the body of information from the teacher to student evidences the lack of proper arranging of educational process and eventually depreciates the education itself. Any student should be involved in self-development, self-education and be aware of the new innovations in teaching. A student should be able to formulate a problem, to analyze ways to solve it, to find the optimal result and prove its correctness, and this task can be reached through the improving the student's competence in self-education.

One of the main teaching methods potentially resulting in the students' preparedness for achieving certain skills is the independent (out-of-class) work. In the course of their independent working students usually show more extent of involvement and relevant personal abilities. As it has been traced by our faculty members, the reasonably increased proportion of students' out-of-class working facilitates their gradual adaptation to future professional activities and makes possible to smoothly cope with innovative technologies. Reasonable reduction of class work and the growth of independent work's load are aimed developing creative initiative in students, need for self-education and desire to increase their proficiency.

Students spend mostly their extracurricular time for independent working, whereas during the class time this kind of working constitutes active feedback at lectures and practical trainings, which are conducted in the form of "brainstorming", business games, the discussion in small groups, and classes in various formats, such as case-based (takes approximately 10% of the Syllabus in our University), team-based (up to 70%), problem-based (10%) and research-based learning (does not exceed 10%), respectively.

RESULTS: Thus, to reveal a potential impact of increasing the proportion of the independent working, the University's faculty members currently design a kind of a case-control study, where groups of students are being taught in a standard way will serve as controls for those being taught with the controlled increasing of independent working.

CONCLUSIONS: Experimental teaching with the reasonably increased proportion of the students' independent working will highlight potential benefits and pitfalls of modern educational process. Taking into account the

requirements for medical school' students training, out-of-class working should cover specific topics of the sections specified in the state educational standard of higher medical education.

Attitudes and knowledge of Ukrainian nurses students' about Palliative Care

Svitlana O. Yastremska*, Nadiya I. Reha

Department of Clinical Immunology, Allergology and General Patien Care, Institute of Nursing, State Institution of Higher Education "Ivan Horbachevsky Ternopil State Medical University of the Ministry of Health of Ukraine", Ternopol, Ukraine

*Corresponding author: Svitlana O. Yastremska, Department of Clinical Immunology, Allergology and General Patien Care, Institute of Nursing, State Institution of Higher Education "Ivan Horbachevsky Ternopil State Medical University of the Ministry of Health of Ukraine", Ternopol, Ukraine. E-mail: yastremska@tdmu.edu.ua

BACKGROUND: There is no possibility for nursing, as a separate science, to develop without scientific research. The purpose of nursing activity is to care for patients, therefore, these studies, in contrast to the doctors' researches, are aimed to improve the care of patients, to promote early activation of the patients, to enrich nursing practice by improving nursing manipulation. The attitudes and knowledge of Ukrainian nurses' students about Palliative Care affect the quality of care provided to the incurable patients. Although "Palliative Care" was delivered as a one of the subjects of Bachelor of Science in Nursing program in Ternopil State Medical University since 2010, the attitudes of nursing students' toward incurable patients were not investigated.
Purpose: To investigate nursing students' knowledge about palliative care and attitudes towards death and end-of-life care, and explore demographic and academic factors as potential moderators of student knowledge and attitudes.
METHODS: We conducted a descriptive, cross-sectional, questionnaire-based survey. We recruited 2nd, 3rd and 4th year undergraduate nursing students from the Institute of Nursing of Ternopil State Medical University, Ukraine. Participants completed a demographic form, the Palliative Care Quiz for Nursing (PCQN), and the Frommelt Attitudes Towards Care of the Dying (FATCOD) questionnaire.
RESULTS: Data from 298 (response rate = 83.04%) nursing students who returned the questionnaire were analyzed. Mean total PCQN scores revealed low levels of knowledge. Knowledge about pain/symptom management and psychosocial/spiritual care was insufficient. Mean total FATCOD scores indicated positive, liberal and supportive attitudes towards end-of-life care, with 60% of respondents keen to care for a dying person and their family. We noted less positive attitudes mainly in relation to student comfort with the care of a dying person and his/her imminent death. Academic parameters (year of study) and student demographic characteristics (older age) were the most significant moderators of both knowledge and attitudes. Greater knowledge about palliative care was a relatively weak, yet significant, predictor of more liberal attitudes towards care of the dying.
CONCLUSIONS: Our findings suggest that structured courses in palliative care can be a core part of undergraduate nursing education. Specific attention could be given to such areas patient-health professional communication, misconceptions and biases towards death and dying, and comfort in caring for the dying in order to prepare student nurses to psychologically deal with the sensitive and challenging process of death and dying.

An application of artificial intelligence for telerehabilitation of patients with injuries of the lower extremities

Andriy J. Hospodarskyy[1] *, Andriy I. Tsvyakh[2]

[1]Associate professor of Surgical department, I. Horbachevsky Ternopil State Medical University, Ternopil, Ukraine; [2]Chief of Orthopedic department, I. Horbachevsky Ternopil State Medical University, Ternopil, Ukraine

*Corresponding author: Andriy J. Hospodarskyy, Associate professor of Surgical department, I. Horbachevsky Ternopil Medical University, Ternopil, Ukraine. E-mail: hospodarskyy@gmail.com

BACKGROUND: The use of artificial intelligence (AI) has a major role in the implementation of telemedicine technology. The overarching theme of this paper is to discuss implementation of the telemedicine technology with machine learning algorithm for rehabilitation of patients with injuries of the lower extremities. Consecutive patients were recruited over a four-year period.
METHODS: A total of 148 subjects with lower extremity injuries were enrolled in the study. 52 patients from the control group underwent traditional rehabilitation procedures for a 3-week period after injury. A total of 96 subjects were enrolled in the telerehabilitation group for a 3-week study period after injury and were trained with a set of exercises for home use. Home remote monitoring for the 96 test subjects included use of a Prototype device with Axis-sensor, temperature and pulse-oximetry sensors, that were fixed to the injured limb. Software with machine learning was developed in the I. Horbachevskyy Ternopil Medical University and Ternopil National Technical University, Ukraine and permits the monitoring of exercise time, local temperature, the frequency of active movements of the injured limb with algorithm of machine learning. During the execution of home exercises, data from the subjects Prototype were measured and sent to a server through a cellular Internet connection and to the personal smartphone of the treating doctor and displayed as digital data and graphically. Based on the patient's individual condition and machine learning algorithm, the rehabilitation doctor created an individualized rehabilitation plan for each subject, containing an activity plan.
RESULTS: During the telemonitoring, the physician controls the adequacy of execution of each stage of rehabilitation exercises and has the ability to adjust the load in real time depending on the functional state of the limb. The orthopedic surgeon during telerehabilitation took signifi-

cantly less time to consult patients (1.9 minutes, SD:0.5) than the traditional rehabilitation (15.2 minutes, SD:2.7). Patient satisfaction was higher for the telerehabilitation with machine learning algorithm (78.3%, SD:12.6) than for the orthopedic surgeon's traditional rehabilitation (36.7%, SD:7.3).
Subjects reported a higher satisfaction with telerehabilitation with machine learning algorithm than with the traditional orthopedic rehabilitation due to the fact that they spent less time at the hospital and had more time for exercises at home under orthopedic remote monitoring. The telerehabilitation system with machine learning algorithm can be used in complex rehabilitation of patients with injuries of the lower extremities.
CONCLUSIONS: Telemedicine was able to catch up with the trends in using artificial intelligence but there are still some challenges to be solved. The implementation of these researches will be the most important contribution, which is why it is also important to begin researching on how this technology can be made more cost effective so it can be used in rural areas and underdeveloped hospital facilities.

Telerehabilitation of patients with injuries of the elbow joint of the upper extremities

Andriy I. Tsvyakh[1] *, Andriy J. Hospodarskyy[2]

[1]Chief of Orthopedic department, I. Horbachevsky Ternopil State Medical University, Ternopil, Ukraine; [2]Associate professor of Surgical department, I. Horbachevsky Ternopil State Medical University, Ternopil, Ukraine

*Corresponding author: Andriy I. Tsvyakh, Chief of Orthopedic department, I. Horbachevsky Ternopil State Medical University, Ternopil, Ukraine. E-mail: andrytsvyakh@gmail.com

BACKGROUND: The international orthopedic community aims to achieve the best possible outcome for patient care by modifying rehabilitation methods and using telemedicine technology. The theme of this article is to discuss the integration of telemedicine technology in the rehabilitation of patients with injuries of the upper extremities. Currently not sufficiently studied sequential algorithm of movement activity on the injured upper extremity after immobilization, not studied physiological and pathophysiological response during rehabilitation.
METHODS: Consecutive patients were recruited over a 3-year period. A total of 84 subjects with upper extremity elbow joint injuries were enrolled in the study and monitored during 2-weeks period. 48 patients from the control group underwent traditional rehabilitation procedures for a 2-weeks period after completion of immobilization. A total of 36 subjects were enrolled in the telerehabilitation group for a 2-weeks period after completion of immobilization and were trained with a set of exercises for home use. Home remote monitoring for the 36 test subjects included use of a smartphone with gyroscope, G-sensor and magnetometer that was fixed to the injured forearm. Software for smartphone was developed in the I. Horbachevskyy Ternopil Medical University, Ukraine. Software permits the monitoring of exercise time, the frequency of active movements of the injured limb. During the execution of home exercises, data from the sensors on the subject's smartphone were measured and transmitted to a server through a cellular Internet connection with a bandwidth of 2 megabits per second (Mbps) and to the personal smartphone of the treating doctor and displayed as digital data and graphically.
RESULTS: The 1-month rehabilitation period started with the movements in the injured limb. During the telemonitoring, the physician controls the adequacy of execution of each stage of rehabilitation exercises and has the ability to adjust the load in real time depending on the functional state of the limb.
Subjects were also asked if their pain level increased after the first exercise and in the event that it did, they were asked to indicate by how much it increased by picking one of the following three options on the smartphone: 1–4 pain was a bit stronger; 5–7 pain was moderately stronger; and 8–10 pain was much stronger. The algorithm allows increasing the daily load on 1%, if the assessment of pain after exercise was not >7 points on 10-point scale and progressive limb edema was absent. If pain persisted or questions persisted, subjects were invited for a visit to the doctor with correction of the rehabilitation algorithm. The orthopedic surgeon, during telerehabilitation, took significantly less time to consult patients (2.3 min – 0.4) than the traditional rehabilitation (12.6 min – 2.9). Patient satisfaction was higher for the telerehabilitation (83.1% – 14.2) than for the orthopedic surgeon's traditional rehabilitation (33.1% – 8.9).
CONCLUSIONS: The telerehabilitation system and dosed load algorithm can be used in complex rehabilitation of patients with injuries of the upper extremities. This will improve the quality of life in this group of patients and significantly reduce the cost of the rehabilitation period. These results provide preliminary evidence supporting the telerehabilitation model for orthopedic care. We conclude that telerehabilitation should be considered a key component in the long-term management of patients who have upper extremity injuries.

Comparative features of the coefficient of branching of coronary arteries

Nurkanat A.Zhumabay *, Sapargali B.Rakhmanov

Department of Normal and Topographical Anatomy with Operative Surgery, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan;

*Corresponding author: Nurkanat A. Zhumabay, Department of Normal and Topographical Anatomy with Operative Surgery, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail:kano_1986_86@mail.ru

BACKGROUND: We aimed to conduct extensive study that allows to adjust the correction of the coronal canal by creating elastic transformation model. We are going to study the coefficient of branching of coronary arteries depending on the age of comparative features in corrosive drugs.
METHODS: The hearts of 30 male pigs were taken to the investigation work. Experimental animals were divided into 3 groups. Group I: early period 3 to 4 months, group

II: the average period is 11-12 months, group III: the late period-4-5 years. The received preparations were investigated by methods of preparation, injection, corrosion.
RESULTS: In Group I, the value of branched coefficients of posterior descending artery was 4,3±0,03 mm, the right coronary artery -3,7±0,01 mm, which is lower than the values of left coronary artery. Features of left coronary arteries characterized by a clear vision compared to the right. The angle of division of the left anterior descending artery and circumflex artery was 84°, 7,3±0,2 mm for left anterior descending artery and 7,2±0,03 mm for circumflex artery. Types discharge divided by the bifurcation type in the form of large stems.
Compared with Group I, Group II had its own distinguishable features in its branching. The branching ratios was 4.6±0.02 mm in posterior descending artery, on the right marginal artery 4,4±0.1 mm in comparison with the Group I. Value in the second group in the range of 0.3 – 0.7 mm. The separation angle of length is rounded, about 39% of preparations include this type of trifurcation separation, which is absent in the first group. By the coefficient of branching, even though right coronary artery branches is more often, type of 2 and 3 branching id dominant for the left coronary artery and the fact that there are posterior and anterior descending arteries, means that there may be a mixed form of blood supply to the heart. Changes in the curves of the right coronary arteries mean that angiogenesis of the heart is not complete.
In the third study group right coronary artery and posterior descending arteries are clearly distributed, with the highest coefficient of branching of 18.1±0.02 mm. The coefficient of branching of the right coronary artery compared to the second group increased 4.3 times and increased 5.1 times compared with the first group. By the right marginal artery transverses the additional curved inward was made. And the shoulder, which has passed into the posterior interventricular prism, differs from the anterior group, creating a right angle. The branching coefficient was 12.3±0.1 mm for anterior descending artery, which is more than the second group, and from the first group for 1.7 times. Ratio of circumflex artery is 27.0±0.4 mm, for 0.6 mm more compared with the group second and 19.8 mm than first group. The angles of the division are direct and stupid. Mixed type of heart blood supply branching coefficients, mainly dominated by the right type.
CONCLUSIONS: The branched coefficients of the coronary arteries in the middle stage of the study were obvious compared to the early period. In the third group large stems were formed, but some stems in the branches represent their age characteristics. Bifurcation and trifurcation secretions occurring on the coronary arteries represent the degree of their transformation.

Primary Ciliary Dyskinesia (Kartagener Syndrome) – a case report

M. Aliyeva[1] *, S. Akhmetova[1], G. Kachkinbayeva[2], A. Lugovaya[1], M. Mambetalina[2]

[1]West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [2]Nazarbayev intellectual school, Aktobe, Kazakhstan

*Corresponding author: M. Aliyeva, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: malyakosha@mail.ru

BACKGROUND: According to literary sources, more than 50 hereditary syndromes are described, including the reverse arrangement of organs. One of these, Sievert syndrome - Cartagena with a triad of symptoms: reverse arrangement of internal organs, chronic bronchopulmonary process and rhinosinusopathy. According to the world Register of Rare Diseases OMIM, frequency of occurrence of this pathology is 1:50,000 newborns. According to modern concepts, Cartagener syndrome is considered one of the variants of primary ciliary dyskinesia.
CASE REPORT: Patient A., 11 years old, treated in the Children's Clinical Hospital of Aktobe with a diagnosis: "Congenital malformation, community-acquired bronchopneumonia, acute uncomplicated course. Acute rhinopharyngitis. Acute bilateral catarrhal otitis media. Sievert-Cartagener Syndrome". Family heredity was not burdened. A child was born after the 2nd pregnancy (1st was interrupted). Body weight at birth was 3,400 gr and height 52 cm. Pregnancy proceeded with marked gestosis. The child since the first birth up days was directed in the neonatal pathology department with a diagnosis of pneumonia. Throughout the medical record mentions of frequent recurrences of respiratory diseases were found. At the last admission to hospital cough with serous-purulent sputum, shortness of breath (24 per min.), pain in the abdomen, ears, persistent fever (39°C) were observed. An increase in the ESR up to 20 mm/h., leukocytosis up to $11.5x10^9$ were noted in the blood test. On the review of the chest radiograph dextracardia, strengthening of the vascular pattern was noted in the medial zones on both sides. An echocardiographic study revealed an additional chord in the left ventricular cavity. The ejection fraction was 66%. Minimal mitral and small tricuspid regurgitation presented. On computed tomography of the organs of the thoracic and abdominal cavities dextracardia was detected, but the heart was not dilated in diameter. The inferior vena cava fell into the left right atrium. The hepatic vein flowed into the left atrium to the left, isolated from the inferior vena cava. The right lung was located on the left, the left lung was on the right. The abdominal organs were "mirrored", the spleen was lobed. ECG conclusion: sinus arrhythmia with a heart rate of 65-100 in a minute. Ultrasound of the abdominal organs showed the situsvisceruminversus. There were no structural changes by organs, the sizes corresponded to the age. Consultation of the ENT specialist: bilateral catarrhal otitis media. Loss of hearing, first degree.
The reverse position of an organ relatively to its own axis or median plane of the body is the result of an early violation of embryonic rotation or a consequence of a violation of the ovum differentiation. In the early embryonic period, the internal organs are located along the midline of the body. Normally, in the course of their subsequent development, growth and rotation take place to the right, extremely rarely when the situsvisceruminversus is to the left. This clinical case of the abnormal position of the organs of the thoracic and abdominal cavities lead to a chronic inflammatory process that requires high vigilance in the diagnosis and the choice of further treatment tactics.

Five-year survival in patients diagnosed with Breast Cancer in the Aktobe province of western Kazakhstan within 2013-2017

Marzhan A. Aitmagambetova *, Gaziza A. Smagulova, Saule K. Balmagambetova, Yerbolat M. Iztleuov, Nurgul M. Kereyeva, Valery V. Begunov, Dinara A. Zholmukhamedova, Aigul S. Ayazbaeva, Anar B. Tulyaeva

Department of Oncology and Visual Diagnostics, Medical Center of the West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Marzhan A. Aitmagambetova, Department of Oncology and Visual Diagnostics, Medical Center of the West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: inzhumarzhan90@mail.ru

BACKGROUND: According to estimates by the International Agency for Research on Cancer (IARC), BreastSource Globocan as of September 2018, 2.088.849 new cases of Breast Cancer (BC) were registered worldwide, or 11.6 per 100,000 population standardized by age, with a mortality rate of 626.679, or 6.6 per every 100,000. According to the same source, overall 33,949 new cases of malignant neoplasms were diagnosed in Kazakhstan as of September 2018, of which 4,211 (13.4%) were referred as BC. Overall mortality from the malignant neoplasms reached 21,828 in the country, of them 1,727 deaths, or 8.47% occurred due to the mammary glands tumors.
The present study was aimed to present the 5-year survival in patients registered with the diagnosis Breast cancer in the Aktobe province of western Kazakhstan within 2013-2017.
METHODS: This observational study involved data obtained from the Cancer registry of the Medical center where the oncological aid throughout the province is implemented. The number of female population for analysis was obtained from the Aktobe Committee on Statistics as of 01.01.2018. Data presentation: the age of diagnosis was calculated from the day of birth to the time of diagnosis. The stages of Breast cancer were based on the TNM classification of the American Joint Committee (AJCC), 7th edition, 2009. The Pearson's $\chi 2$ test, Kaplan-Meier analysis, Log rank test and Cox regression were used to analyze the survival rates.
RESULTS: The five-year survival in patients diagnosed with BC was studied by age groups through 950 Hospital records. In the age group of 20–39 years, the survival rate was the lowest, 71.6 (95% CI 53.4;89.8). The highest rates were traced in the age group of 60-69 years, 81.7 (95% CI 66.5;96.9), following the age group of 40–49 years, 84.4% (95% CI: 76.8;92.0). Patients aged 50-59 and 70+ years reached almost the same levels of five-year survival, 79.7 (95% CI 73.4;86.0) and 79.6 (95% CI 71.4;87.8), respectively.
When analyzing the 5-year survival rate depending on the histological types, we found that the rates up to 87.3% (95% CI 80.8;98.7) at clinical stages I-II were observed in infiltrative ductal carcinoma, then declining to 62.8% (95% CI 52.9;75.3) at stages III-IV. We could not identify the five-year survival rate in patients with lobular carcinoma due to small number of observations. Among the other BC histological types, the overall rate reached 89.7% (95% CI 80.6;98.7). When considering survival by stages, the highest rate of 95.6 (95% CI 91.1;100.0) was established at stage I, then falling down to 86.3 (95% CI 80.2;92.4) at stage II, and the lowest index 29.1 (95% CI 9.5;48.7) was determined for stage IV.
CONCLUSIONS: The lowest 5-year survival rate in patients aged 20-39 years may evidence underestimation of the health state and low appealability for medical aid until advanced stages of the disease in young individuals. Besides, patients under 39 years old are not referred to group at risk and not covered by the nationwide screening program, staying eventually underdiagnosed.

Initial evaluation of the nationwide screening programs running in the Aktobe province of western Kazakhstan

Saule Balmagambetova*, Olzhas Urazayev, Anar Tulyayeva, Gulmira Nurgaziyeva, Marzhan Aitmagambetova, Nurgul Kereeva, Saganay Dyussembekov, Temirkhan Simbatov, Lyazzat Raikhanova, Togzhan Ali

Department of Oncology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Saule Balmagambetova, Department of Oncology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: sau3567@gmail.com

BACKGROUND: Starting since 2009, a total of three nationwide screening programs have been running in the Republic of Kazakhstan: on Breast cancer (BC), Cervical cancer (CaCx) and Colorectal cancer (CRC). The program on BC implies mandatory mammography in all women aged 40-70 with 2-year interval. At screening for CaCx taking of cervical smears in women aged 30-70 through the liquid-based cytology (the "Cell Scan" preservative fluids, manufactured in South Korea) is provided. Target groups are formed with 4-year interval. The screening on CRC has been implementing in accordance with the guidelines where the test for iFOBT (immune analysis of fecal occult blood) and colonoscopy at positive iFOBT are prescribed for both sexes aged 50-70 with 2-year interval.
METHODS: Data from the Cancer registry within 2009-2018 were analysed to reveal the number of precancerous lesions as well as invasive cancers detected through the screening.
RESULTS: Data on BC screening were available from 2012. A total of 150,400 individuals passed through the mammography (coverage 99.3%) for 7 years. Of them, 6.6% true precancerous lesions were revealed (M3-M4 on BI-RADS) and further steps were undertaken – 55.1% of these cases were undergone biopsy. Total number of probable malignancies (M5) revealed through the mammography was 0.15% out of all covered, whereas M6 (proven malignancy) reached 18% out of all biopsies at suspicious abnormalities. Overall, 0.15% findings out of all 150,400 mammographic images appeared to be invasive cancers, of them St I diagnosed in 18.1%; St II in 71.6% and St III in 10.3%, respectively.
Data on CaCx screening performance were the most complete, through 2009-2018. A total of 237,281 women were undergone to cytological smears taking (coverage 93.7%). True precancerous/preinvasive lesions were revealed in 0.7% out of all screened, of them L-SILs constituted 0.5%,

H-SILs up to 0.18%, and TIS up to 0.02%, respectively. In the meanwhile, total number of invasive cancers reached 0.06%, whereas according to international standards for properly organized screening, this index should not exceed 0.02%.
A total of 340,594 individuals of target groups were screened for CRC precancerous lesions through 2011-2018 (data for 2009-2010 were not available). Of them, 100% were undergone iFOBT assays, and colonoscopy was administered to 0.9%. In 3.0% of cases with suspicious colonoscopy biopsy was performed. Overall, total number of the individuals diagnosed with precancerous lesions did not exceed 0.01% of all screened. In the meanwhile, cases of invasive cancers including advanced stages revealed through the screening program reached 0.2% out of all 340,594 screened.
CONCLUSIONS: Despite the fact that the first decade of any screening program implementation imminently forces an increasing of manifested cancers, current situation concerning detection of precancerous lesions in the Aktobe province of western Kazakhstan evidences yet insufficient potency of all programs running. These findings raise the issue on how to reach more efficiency of the screening measures. Increasing of public awareness of the vital need in regular medical examination remains a key task for health providers.

Primary hyperaldosteronism in a female patient: a case report

Raisa A. Aringazina[1] *, Fatima A. Kanimkulova[2], Akeshan R. Astrakhanov[3], Makhmutsultangali A. Otessin[3]

[1]Department of Internal Diseases №1, West Kazakhstan State Medical University, Aktobe, Kazakhstan; [2]Western Clinic of Atyrau, Atyrau, Kazakhstan; [3]Faculty of General Medicine, West Kazakhstan State Medical University, Aktobe, Kazakhstan

*Corresponding author: Raisa A. Aringazina, Department of Internal Diseases №1, West Kazakhstan State Medical University, Aktobe, Kazakhstan. E-mail: raisa_aringazina@mail.ru

BACKGROUND: The *syndrome of primary hyperaldosteronism* (PHAS) was first described by J. Conn (1955) in connection with the hyperproduction of aldosterone by a tumor of the adrenal cortex, the removal of which led to normalization of blood pressure, metabolic and clinical manifestations. According to the literature sources, the frequency of PHAS among persons with primary hypertension ranges within 0.4 to 15%. Low detectability of PHAS sometimes related to the revaluation of hypokalemia. A modern reliable and affordable method of PHAS diagnosis is determining the ratio of aldosterone concentration to *plasma renin activity* (ARS) in patients with hypertension.
CASE REPORT: A female patient of 38 years old reported the onset of the disease since 2008, when she first noted an increase in blood pressure (BP) to 160-170/100-110 mmHg. For a long time of hypertension she was being administered various kinds of antihypertensive therapy without a positive effect. Since July 2017, her BP began to increase up to 200/120 mmHg. She was administered "Micardis Plus 80" tablets 12.5 mg and "Lercanidipine" 10 mg per a day, but the blood pressure remained unstable. On August 2017, computed tomography (CT) of the abdominal segment was performed, and some change in the left adrenal gland was revealed. On September 2017 the decline in the potassium level (K+=4.6 mmol/l) was identified. By February, 2018 a decrease in potassium levels reached to 3.1-2.8 mmol/l, and "Spironolactone" 25 mg per a day was prescribed. Hormonal examination of the blood was carried out according to recommendation of the Endocrinologist. The plasma aldosterone showed an increased level 891.0 (up to 920.0) pg/ml (Normal level is up to 385), the plasma renin was recorded 0.5 mkME/ml, aldosterone-renin ratio (ARR) reached 1,782 (Normal ratio 12), the level of metanephrine in the urine ranged daily in frames of 8.0-8.36 mkg/s (Normal level is in frames of 320.0 mkg/s), the normetanephrine level of 31.08 mkg/s (the norm is less 390.0 mkg/s).
Taking on account the aforementioned changes in laboratory analyses, on March 2018 a second CT scan with the contrast enhancement was performed. In the left adrenal gland the tumor sized 20*18*17 mm was revealed with the smooth straight contours and somewhat heterogeneous structure, of density up to 4-5 NU. An active accumulation of contrast was observed along with increase in the density to 24 NU while the arterial phase. On a basis of history, clinical examination, laboratory data and CT scan data "Primary hyperaldosteronism. Adenoma of the left adrenal. Symptomatic hypertension" diagnosis was established. On May 25, 2018 laparoscopic adrenalectomy was run. Pathomorphological conclusion as of 28.05.2018: Adrenocorticotropic adenoma. By the 10th day after surgery antihypertensive drugs were canceled due to the blood pressure stabilized. By 6 months after the operative intervention, the concentration of aldosterone, plasma renin, ARS ratio and potassium level came to normal values, and BP reached its normal range of about 110/70 mmHg. To date, the patient does not intake antihypertensive drugs. Medical examination once a year was recommended upon the patient's discharge from the hospital.

Morphological indicators of red bone marrow in people of old age in different climate of geographic conditions of Kyrgyzstan

Abaeva Tamara Suranalievna*, Zhanganaeva Mira Tobokelovna

Department of Normal and Topographic Anatomy, Kyrgyz State Medical Academy.2. International School of Medicine. Bishkek. Kyrgyzstan

*Corresponding author: Abaeva Tamara Suranalievna, Department of Normal and Topographic Anatomy, Kyrgyz State Medical Academy.2. ISM. E-mail: tamarakgma@mail.ru

BACKGROUND: The red bone marrow is the central hematopoietic organ, in which there are self-sustaining stromal and hematopoietic stem cell populations. Reticular tissue forms the bone marrow stroma, in the loops of which the hematopoietic elements are located. Human blood-forming organs belong to the main structures of the body, which perform the function of the formation of new blood cells. They also include red bone marrow and spleen.
The lymphatic system is also one of the parts for which the bone marrow works.

The purpose of this study is to study the structure (state of cell populations) of the red bone marrow in people of old age in Bishkek and Karabalta (living in the uranium tailing site) and at the same time detecting morphological changes in blood.
METHODS: The anatomy of the red bone marrow was studied on 24 corpses: 13 of them were the corpses of Bishkek and 11 corpses of the city of Karabalta, which died in old age from causes not related to immune-deficient states.
Sternal puncture was performed with an IA Kassirsky needle with a safety shield according to the method of M.I. Arinkin.
RESULTS: As a result of myelogram research, it was established that the residents of Bishkek (with a real count of cellular elements per 500 cells) : blasts - 0.3 ± 0.1, band-core - 11.9 ± 2.3, promyelocytes -2.0 ± 0.4, erythroblasts - 0.3 ± 0.08. Pronormoblasts -0,6 ± 0,2. Basophilic normocytes - 3.9 ± 0.5 Granulocyte germ averaged -267. Erythroid sprout - 104. The maturation index of red blood - 0.8 ± 0.04.
In percentage terms, the data obtained show that young cells make up -14.2%, segmented cells -19.0%, lymphocytes -17.4%, erythroblasts-0.2%. Granulocyte germ is equal to 61.2%, erythroid germ -21.4%.
Sternal cell punctate, all sprouts of blood formation are preserved. A slight rejuvenation is noted in the granulocyte sprout. Megakaryocytes in sufficient quantities, the function is complete.
As a result of the study of the above indicators of blood among the residents of Karabalta, it was established that (with a real score for 500 cells) the following were made: blasts - 0.8 ± 0.2, stab-15.2 ± 0.9, promyelocytes -4.1 ± 1.0, erythroblasts 0.7 ± 0.3, pronoroblasts -1.5 ± 0.3, normocytes basophilic 0.6 ± 0.9. Granulocyte sprout averages - 267. Erythroid sprout - 104. The maturation index of red blood is 0.6 ± 0.05.
Blood counts tend to decrease, so the young cells were -11.1%, segmented cells -16.9%, lymphocytes -16.4%, erythroblasts-0.6%. Granulocyte sprout is 52.8%. The erythroid sprout rates are reduced to - 27.3%. The bone marrow neutrophil index is 0.4%, the leuko-erythroblastic ratio is 2.9%. The maturation index of red blood is 0.7%. In granulacytic sprout slight rejuvenation. Megakaryocytes in sufficient quantities, the function is absent, there are few mature platelets.
CONCLUSIONS: The results of the study for Bishkek show that sternal punctate is cellular. All the blood sprouts saved. The megakaryocytes are isolated or absent, the function is sufficient. Studies of bone marrow taken from cadaver material of Karabalta showed a tendency to increase blasts, promiolycytic cells, erythroblasts, stab cells and a decrease in basophilic normal cells, pronormoblasts and red blood maturation index. Megakaryocytes single or absent, no function, mature platelets in small quantities.

Chemical evaluation of electronic cigarettes

Saida K. Mukhanova[1] *, Alma R. Shopabayeva[2], Talgat S. Nurgozhin[2]

[1]School of Pharmacy, Department of Organization and management of pharmacy economics and clinical pharmacy, Kazakh National Medical University named after S.D. Asfendiyarov, Almaty, Kazakhstan; [2]Department of Organization and management of pharmacy economics and clinical pharmacy, Kazakh National Medical University named after S.D. Asfendiyarov, Almaty, Kazakhstan

*Corresponding author: Saida K.Mukhanova, School of Pharmacy, Department of Organization and management of pharmacy economics and clinical pharmacy, Kazakh National Medical University named after S.D. Asfendiyarov, Almaty, Kazakhstan.
E-mail: saida_023_@mail.ru

BACKGROUND: The rapid growth of popularity of electronic cigarettes among the population has led to heated discussions about their benefits and harms, advantages and disadvantages. Electronic cigarettes differ in design, chemical composition and different physical properties of the aerosol produced. However, in most cases, data on the exact chemical composition of electronic cigarettes is missing.
METHODS: A systematic review of the literature in the PubMed electronic database using the following keywords related to the electronic cigarettes and / or their combination (electronic cigarettes, electronic nicotine delivery devices, carcinogenic) was performed. A total of 31 publications were found, of which 20 chemical analyzes of one or a limited number were excluded electronic cigarettes samples, as they were discussed in a review article.
RESULTS: The selected articles analyzed the chemical composition of solvents, cartridges, aerosols, and environmental emissions using electronic cigarettes. The quantitative and qualitative analysis revealed a wide range of chemicals in cartridges, fillers and aerosols of electronic cigarettes, including formaldehyde, acetaldehyde, acrolein, acetone, nitrosamines, cadmium, nickel, lead, arsenic, propylene glycol, glycerin, phenols, polycyclic aromatic hydrocarbons, tobacco alkaloids *et al.* Many substances are also present in tobacco smoke when smoking conventional cigarettes and are known as health hazardous substances whose pathogenic effects have been proven in many clinical studies. Solvents (propylene glycol, glycerin) and humidifiers that mimic the smoke when using electronic cigarettes, when released into the environment are oxidized to form aldehydes, also present in ordinary tobacco smoke. It should be noted that in studies of the chemical composition of electronic cigarettes, different methods of chemical analysis (qualitative and quantitative) and different samples (smoke or aerosol, different methods of extraction of substances) were used.
CONCLUSIONS: The composition of the aerosol produced by electronic cigarettes is extremely variable. It includes numerous toxic and carcinogenic substances that cause respiratory and cardiac disorders. Therefore, additional research is needed based on scientifically based methods for generating aerosols, methods for measuring the physical properties of aerosols, and methods for chemical analysis to standardize methods for analyzing the quality of electronic cigarettes.

Severe combined primary immunodeficiency: a case report

Zhumabek B. Dossimov[1] *, Arystan Zh. Dossimov[2] *, Lyudmila V. Dolotova[1], Nurniyaz B. Bisaliev[1], Svetlana G. Davidovich[1], Bakhtiyar A. Kurmanalin[1]

[1]Department of Pediatrics No.1, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan; [2]Department of General Practice No.2, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan

*Corresponding author: Zhumabek B. Dossimov, Department of General Practice No.2, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan.
E-mail: dossimov_zkgma@mail.ru

BACKGROUND: Primary immunodeficiencies (PID) are orphan, progressive, genetically determined diseases caused by disorders of one or several defense mechanisms of the immune system. The PID problem is important due to the variability of the clinical course. Therefore, since the pathology is often not recognized or the diagnosis is made late, the patients die from infectious, neurological autoimmune disorders and other complications of this disease.
Statistics show that in the Republic of Kazakhstan there should be at least 2000 patients with birth defects of immune system. However, at the end of 2013th year there had been officiallyregistered 17 patients with verified PID diagnoses. Patients with the most severe manifestations of primary immunodeficiency constitute a contingent of patients with combined disorders of the immune system. Combined T and B-cell immunodeficiency-syndromes, characterized by absence or diminished number and / or impaired function of T-lymphocytes and severe disorders of other components of adaptive immunity. Even with normal level of B cells in the peripheral blood, their functional activity is usually suppressed. The most typical and serious combined immunodeficiency is severe combined immunodeficiency (SCID). The overall frequency of SCID is 1: 50,000 newborns).
CASE REPORT: The patient is 5 years old with no significant features in the case history. The normal growth and development from birth up to 3 years of age was observed. Prophylactic vaccinations were received in a timely manner without any complications. Susceptibility of the patient to respiratory infections has increased since starting kindergarten. There were 4 episodes of acute pneumonia, requiring inpatient treatment, several episodes of purulent otitis. Consistently there was thickening of the terminal phalanges and progressive splenomegaly. With the preliminary diagnosis PID the patient was examined in Germany. Blood tests revealed anemia and thrombocytopenia. The immunogramshowed agammaglobulinemia, (complete absence of A, M, G, Eimmunoglobulins), significant reduction in the total count of B-lymphocytes and memory B-cells, CD8 + T-cells and antigen-inexperienced T-lymphocytes. Based on the results of the clinical and immunological examination, the SCID diagnosis was verified. To prevent further life-threatening infections, immunoglobulin replacement therapy (intravenous infusions of Octagam) has been recommended. A bone marrow transplantation for the patient is planned for the future.
The clinical case represents the fact of late diagnosis of PID and determines the needof awarenessof the disease due to the probability and variability of this pathology coursein children.

Clinical case of secondary cerebral vasculitis

Marina A. Grigolashvili, Elmira M. Zhuanysheva*, Natalya A. Evstafyeva, Raushan M. Mustafina

Department of Neurology, Psychiatry and Rehabilitation, Medical University of Karaganda, Karaganda, Kazakhstan

*Corresponding author: Elmira M. Zhuanysheva, Department of Neurology, Psychiatry and Rehabilitation, Medical University of Karaganda, Karaganda, Kazakhstan. E-mail: emi-92@mail.ru

BACKGROUND: Cerebral vasculitis is an inflammatory disease of cerebral vessels, affecting young and employable people. It is a rare disease, which manifests acutely and leads to disability.
The difficulty of cerebrovascular disease diagnostics is due to the extreme lack of information about clinical and laboratory-instrumental research methods. False negative results of diagnostic angiography reached 30-80%. Laboratory signs of inflammatory brain lesions are absent. Clinical manifestations are not specific.
30% of patients weren't confirmed this diagnosis, because cerebral vasculitis could be masking other disorders, such as lymphoma, sarcoidosis, multiple sclerosis, toxoplasmosis.
CASE REPORT: The clinical case of a 35-years-old woman with secondary cerebral vasculitis on the background of systemic lupus erythematosus is presented, who was hospitalized due to memory loss, headache, dizziness, slowness of speech, long subfebrile temperature. According to patient's anamnesis morbi: headache, dizziness, memory loss were for a long time. In July 2017 during the sleeping an epileptic unfolded seizure with opercular automatism developed for 1.5-2 minutes at the first time. She turned to a neurologist, anticonvulsant therapy of valproate was prescribed. After taking the first dose of the drug an allergy developed, followed by rashes and itching, fever. In September 2017 a generalized epileptic seizure with tongue biting was noted for daytime sleeping. Then the ulcers on the lips and mouth mucousa, edema, hyperemia, lymphadenitis, menstrual disorders, dysmenorrhea, and hyperhidrosis appeared. Lamotrigine was recommended.
In November 2017 she was hospitalized at the neurology department for treatment.
In neurological examination severe pyramidal and cerebellar syndromes, conductive sensitivity changes were revealed.
Electroencephalography showed moderately severe disorganization and instability of the brain bioelectric activity with mesencephalic structures irritation, epicomplexes in the occipital region. The MRI of the brain showed encephalopathy.
In January 2018, the patient again was hospitalized. In neurological examination symptoms were without changes. In the hospital differential diagnostic was continued between axonal-demyelinating diseases, isolated cerebral vasculitis and systemic rheumatological diseases.
Considering the absence of inflammatory demyelinating foci on the MRI scans, progression of foci, their increasing in volume, location parallel to the course of the vessels and along the lateral ventricles, forming of diapedesis soaking, vasculitis was exposed. Considering the presence of skin syndrome, neurovasculitis, livedo, Raynaud's syndrome, photosensitization, dysmenorrhea, aphthous stomatitis, cheilitis, trophic disorders, splenomegaly, lymphadenitis, pancytopenia, positive test on ANA-screen for antibodies to double-stranded DNA (Ig G), the diagnosis of DBST was suspected. A positive

result was obtained for AT to SSA / Ro-52 3+, SSA 3 by immunoblotting, the diagnosis of secondary autoimmune vasculitis of cerebral vessels on the background of DBST (Systemic lupus erythematosus) was confirmed to the patient.
The patient received hormonal and immunosuppressive therapies. Inpatient treatment was finished with improvement.
In conclusion, it is worth noting that the onset of this disease in the patient was manifested by an atypical clinical picture, late and long-term laboratory and neurovisualizing diagnostics.
Thus, cerebral vasculitis is a diseases, that is difficult to diagnosing, because does not have specific clinical manifestations. Patients with cerebral vasculitis should be managed in conjunction of neurologists and rheumatologists. Improvement of neuroimaging methods, expansion of biochemical researching will allow to reliable non-invasive diagnose of cerebral vasculitis in the future.

Clinical case of the melas syndrome with concomitant arteriovenous malformation of the brain in a 12-year-old child

Polina S. Semenikhina*, Sholpan K. Omarova, Amirzhan M. Smagulov, Valeriy Y. Lissitsyn

Department of Neurology, Psychiatry and Rehabilitation, Medical University of Karaganda, Karaganda, Kazakhstan

*Corresponding author: Polina S. Semenikhina, Department of Neurology, Psychiatry and Rehabilitation, Medical University of Karaganda, Karaganda, Kazakhstan. E-mail: gianeya13@gmail.com

BACKGROUND: MELAS syndrome (Mitochondrial encephalomyopathy, lactic acidosis and stroke-like episodes) is a progressive neurodegenerative disease, characterized by the aforementioned clinical signs, which could be accompanied by polymorphic symptoms: diabetes, seizures, headaches with vomiting, hearing loss, cardiovascular problems, short stature, endocrinopathies and neuropsychiatric disorders. Stroke-like episodes mostly manifest in children under the age of 15 by recurrent hemiparesis and hemianopia with relatively rapid recovery. Other diagnostic criteria for MELAS include increased lactate levels in blood and cerebrospinal fluid, as well as cortical or subcortical infarctions in the parietal, temporal and occipital lobes on the MRI.
CASE REPORT: the report describes a 12-year-old child with MELAS syndrome and concomitant arteriovenous malformation (AVM) in the right occipital lobe of the brain. Anamnesis morbi: the child was brought to the emergency room with complaints of a sudden episode of blindness in both eyes, lasting 10 minutes, accompanied by weakness in his right arm, which regressed 3 hours later. On referral only slightly clouded consciousness was noted, the child's parents refused hospitalization. Repeated referral 2.5 months later, after a sudden loss of consciousness with short (3-5 minutes) generalized tonic-clonic convulsions. After the child regained consciousness, blindness in both eyes lasted 15 minutes, weakness in his right extremities disappeared ~48 hours later. Further in the department, he had two episodes of generalized convulsions, followed by weakness in his left arm (first time) and in his right limbs (second time) lasting 1-2 hours.
Anamnesis vitae: the child's cognitive development was age appropriate, he is registered with an endocrinologist with nanism. Every 6 months starting from the age of six the child has recurrent episodes of severe headache without obvious reason, accompanied by vomiting; similar episodes are noted in his maternal grandmother, who was never examined.
Laboratory and instrumental tests: MRI of the brain with contrasting revealed multiple (up to four) subcortical foci, probably of ischemic nature, in the occipital and parietal lobes, one of the foci with a zone of perifocal edema (fresh ischemic stroke), and an altered area in the right occipital lobe, similar to AVM. CT angiography confirmed the presence of AVM. 3 hour EEG-monitoring revealed sharp waves and sharp slow waves over the left parietal-occipital region. Acid-base blood test monitoring for 7 days in 85% of cases indicated increased level of lactate (1.5-3 times higher than norm). Psychiatrist examination confirmed normal level of cognitive development.
The main difficulty in the differential diagnosis for this patient appeared because the described areas of ischemia and stroke-like episodes could be associated both with the MELAS and the "steal syndrome" because of the AVM.
The final diagnosis was: MELAS syndrome; AVM in the right occipital lobe; symptomatic epilepsy. As etiotropic therapy of this disease does not yet exist, pathogenetic therapy was prescribed: L-carnitine 1.0 g/day and coenzyme Q10 60 mg/day, and also levetiracetam 250 mg twice dayly as symptomatic anticonvulsant therapy. At an observation 9 month later the child's condition was stable; there were no convulsions or episodes of headache. For the final verification of the diagnosis, the family was recommended to agree to the neurosurgical treatment of AVM, to exclude its effect on the child's condition, and to perform genetic testing for MELAS syndrome, which could provide a more accurate prediction of the outcome for this patient.

Debridement of birth canal in pregnancy before childbirth and its influence on postpartum period

Veronika N. Popova*, Dariya V. Aldeeva, Ainur N. Sagieva

"Medical University of Karaganda", NJSC, Obstetrics and Gynecology Department, Karaganda, Kazakhstan

*Corresponding author: Veronika N. Popova, "Medical University of Karaganda", NJSC, Obstetrics and Gynecology Department, Karaganda. E-mail: veronichka__08@mail.ru

BACKGROUND: Bacterial vaginosis is a serious medical and social problem among women. It is one of the risk factors for pelvic inflammatory diseases, preterm birth, and postpartum septic complications of mother and newborn. Bacterial vaginosis is the most frequent disease among women in reproductive age (30-57.6%). Its pathological process may cause various complications regardless

of stage of pregnancy. The current main task is an early diagnosis and rational etiotropic therapy among pregnant women.
Aim: to rate the effectiveness of debridement of birth canal prior delivery.
METHODS: Amsel criteria will be used for diagnosis:
1. Pathological characteristics of vaginal discharge
2. pH of vaginal discharge >4.5
3. Positive amine odor test
4. "Clue cells" of microscopy

Diagnostic significance is achieved if at least 3 out of 4 criteria will be positive.
Debridement of birth canal in pregnant women of experimental group is performed by using chlorhexidine and povidone-iodine. Effectiveness of therapy is assessed on the basis of clinical data and results of laboratory analysis.
Participants were 80 pregnant women with age of 18-42 on 34-36 weeks of gestation, with clinical features of bacterial vaginosis. Participants were divided to 2 groups: experimental group – 42 women that had debridement, and control group – 38 women with no debridement performed. Age classification: 18-25 – 27 women (33.75%), 26-35 – 38 women (47.5%), 36-42 – 15 women (18.75%).
RESULTS: As main symptoms of bacterial vaginosis white or grey vaginal discharge, unpleasant smell, rash, and pain of sexual intercourse were considered. In experimental group, 24 patients had vaginal discharge, 14 patients had unpleasant smell, 6 patients had rash, and 10 patients had pain. However, in control group, 10 patients complained about white or grey vaginal discharge, 8 patients about unpleasant smell, 2 patients about rash, and 3 patients regarding pain of sexual intercourse. 19 women with bacterial vaginosis had no symptoms, thus were added to control group.
After debridement therapy on the second visit, nobody on experimental group complained regarding previous symptoms. On laboratory analysis, 4 patients had high leukocyte level with cocci flora, and 2 patients elevated pH (>4.5). On control group, nobody complained about previous symptoms, except for rash, the number of complaining became 6. 12 patients had high leukocyte level and cocci flora, and 9 patients had elevated pH (>4.5).
In the end of research, 17 patients were lost to follow-up out of 80. From overall 63, 36 were in experimental group, 27 in control group.
2 groups were compared for postpartum complications with factors such as term delivery, average gestational weeks, endometritis, and perineal suture infiltration. Control and experimental groups had 78% and 90% on percentage of term delivery, 37 and 39 on average gestational weeks, 0 and 1 on endometritis, and 4 and 1 on perineal suture infiltration, respectively. Postpartum complications were higher in control group compared to experimental group, with exception of 1 case of endometritis in experimental group. Newborn state was satisfactory, without infectious and inflammatory signs of skin and mucous membrane diseases.
CONCLUSIONS: Based on results of this research, it was found that early diagnosis and effective debridement of birth canal reduces the risk of postpartum and postoperative complications in pregnant women.

Dysbiotic changes in the oral cavity in recurrent aphthous stomatitis

Togzhan B. Sagimbaeva[1] *, Zhanar G. Tankibaeva[1], Ilya S. Azizov[2]

[1]Dentistry Cathedra, Karaganda State Medical University, Karaganda, Kazakhstan; [2]Laboratory service of Research and Development Establishment of antibacterial chemotherapy, "Smolensk State Medical University", Smolensk, Russia

*Corresponding author: Togzhan B. Sagimbaeva, Karaganda, Kazakhstan. E-mail: toka-love@mail.ru

BACKGROUND: The rising interest to the role of mictobic factors in ethiology and pathogenesis of different mouth's mucous membrane diseases is a subject to strengthening of environmental adversity from one hand and increasing number of cases with chronic stomatitis diseases. These factors cause disorders in organism's symbiotic microbic flora in general and in mouth cavity specifically. Mouth's mucous membrane diseases with it's solution of continuity, local inflammatory reaction and pain form conditions leading to mouth cavity functional disorders and the developing of dysbiosis.
The aim of our research was to determine the frequency of occurrence and the structure of oral dysbiosis in patients with recurrent aphthous stomatitis.
METHODS: A research was carried out to discover the dysbiosis of oral microbiome among 44 patients with recurrent aphthous stomatitis (RAS) and 20 patients who formed the control group. Patients who took antiinfectives and hormonal drugs and also those with partial laminar dentures were excluded from the research.
RESULTS: Summarizing what has been said, the results of carried research indicated that RAS was accompanied by substantial changes in microflora in the form of dysbiosis. The frequency of oral dysbiosis in patients with RAC was 90.9 (95% CI:78,8-96,4)%.
The I-II degree dysbioses dominated in dysbiosis structure with RAS. They were discovered among 60 (95% CI:40-68,3)% of the patients with RAS. The second by frequency of appearance were light changes in microbiocenosis of mouth cavity in the form of dysbiosis shifts. They were discovered among 30 (95% CI:16,3-41,8)% of the patients with RAS. Rate of III degree dysbiosis among the patients with RAS was imperceptible and made up 10 (95% CI:3,5-21,1)% . Presence of IV degree dysbiosis among the patients with RAS wasn't discovered.
The dysbiotic shift (compensated form) in the oral cavity of the patients with RAS was characterized by insignificant changes in the number of a single species of opportunistic microorganism (a slight decrease in the number of nonhemolytic streptococci or coagulase negative staphylococci), while maintaining the normal species composition of the mouth microflora.
I-II degree dysbioses (subcompensated form) of the patients with RAS was characterized by more evident changes in the composition of the mouth microflora: 1-2 opportunistic species, abnormal for this ecotope (colibacillus and/or β - hemolytic streptococcus) on the back of a slight decrease of the titer of lactic acid bacteria.
III degree dysbiosis of the patients with RAS was characterized by dominant discovery of opportunistic axenic cultures, abnormal for this ecotope (β - hemolytic strep-

tococcus, colibacillus) and a slight increase of the titer of Candida fungi with drastic decrease or absolute absence of lactic acid bacteria.
Clinical research studies showed that dysbiotic shifts, in experimental subjects' mouth cavities were accompanied by various symptoms and signs – from singular cases, anabrosis that didn't disturb patient much, to the to multiple, deep, severely painful inflammatory-destructive affection elements, sometimes accompanied by ulcerative-necrotic stomatitis and general health problems.
CONCLUSIONS: A high frequency of oral dysbacteriosis in patients with RAS was established.
In the structure of dysbioses among the patients with RAS the I and II degree dysbioses were dominating, wich was characterized by more evident changes in the composition of the mouth microflora: 1-2 opportunistic species, abnormal for this ecotope (colibacillus and/or β - hemolytic streptococcus) on the back of a slight decrease of the titer of lactic acid bacteria.

Use of low dose MSCT in diagnostics of acute pancreatitis and its complications

Madina A. Ermekova[1] *, Makash T. Aliyakparov[1], Kairat T. Shakeyev[2]

[1]Department of Oncology and Radiology, Karaganda Medical University, Karaganda, Kazakhstan; [2]Department of Surgical Conditions №1, Karaganda Medical University, Karaganda, Kazakhstan

*Corresponding author: Madina A. Ermekova, Department of Oncology and Radiology, Karaganda Medical University, Karaganda, Kazakhstan. E-mail: er-madina@yandex.ru

BACKGROUND: According to the Atlanta classification (Classification of acute pancreatitis-2012: revision of the Atlanta classification and definitions by international consensus), acute pancreatitis is 'an inflammatory process of the pancreas with variable involvement of regional tissues and remote organs, accompanied by increased level of pancreatic enzymes in blood and/or urine'.
Per recommendations of ESGE, it is proposed to perform contrast-enhanced CT at early stages of disease for establishing a diagnosis; within the first week of disease (72 hours after onset of symptoms) for determining a therapeutic approach; from 2nd to 4th week for assessment of dynamics of patient's condition and for prevention of potential complications; and during week 4 for planning further approach in patient management and to control treatment. However, one of the restrictions of frequent use of CT is high radiation dose.
Recently the new trend in CT is using the low dose protocols (E. Matkevich *et al.*, 2017).
Study goal: Determine capabilities of low dose MSCT in imaging of the pancreas for diagnosing acute pancreatitis and its complications.
METHODS: Study covered 38 patients with diagnosed pancreatitis confirmed by pain syndrome, changes in lab tests, imaging of characteristic changes on CT with intravenous contrast enhancement within the 1st week from disease onset.
Low dose CT examination was done with intravenous contrast enhancement using Siemens AS 64. All patients were divided into 2 groups depending on protocol. Modified protocols 100kV, 120 kV/50mAs were used. Post processing was done per standard reconstruction algorithms.
RESULTS: were analyzed with assessment of image definition, presence of 'noise' on tomograms, potential for identification of pathological changes, potential for dynamic monitoring as compared with previous examination performed using standard protocol.
The following changes were assessed:
— Change in size of the pancreas,
— Change in density of the pancreas' tissue,
— Blurring of contours,
— Presence of focal changes,
— Change and inhomogeneity of the pancreas' structure,
— Degree of infiltration of parapancreatic tissues,
— Degree of exudation into free abdominal cavity, changes of vessels in the abdominal cavity.
Discussion:
— When reviewing obtained images, we did not discover significant differences (better imaging and lower noise) between the examinations performed per modified protocols 100kV, 120 kV/50mAs.
— When using the modified protocols, radiation dose decreased by 25-29% against the standard CT.
— Low dose examination images were considered diagnostic for assessment of change in size of the pancreas, change in tissue density, imaging of blurring contours, presence of focal changes and identification of fluid masses exceeding 0.5cm; for assessment of degree of infiltration of parapancreatic tissues, degree of exudation into free abdominal cavity, changes of vessels in the abdominal cavity.
— Low dose examination images were considered non-diagnostic for assessment of change and inhomogeneity of the pancreas' structure caused by image graininess, and for assessment of presence of focal changes and identification of fluid masses under 0.5cm in diameter.
— When comparing low dose examination images with the results of standard protocol scans, dynamic monitoring of patients' condition and assessment of treatment results were possible in 100% of cases (all observed patients).
CONCLUSIONS: Obtained results enable drawing conclusions on applicability of this method as one to be used when reduced dose is required, for dynamic monitoring of condition of the pancreas and for assessment of treatment results.

Use of MSCT for assesment of vascular changes in patients with pancreatitis and pancreonecrosis

Madina A. Ermekova[1]*, Makash T. Aliyakparov[1], Kairat T. Shakeyev[2]

[1]Department of Oncology and Radiology, Karaganda Medical University, Karaganda, Kazakhstan; [2]Department of Surgical Conditions №1, Karaganda Medical University, Karaganda, Kazakhstan

*Corresponding author: Madina A. Ermekova, Department of Oncology and Radiology, Karaganda Medical University, Karaganda, Kazakhstan. E-mail: er-madina@yandex.ru

BACKGROUND: Recently the urgency of the issue of hemodynamic compromises and vascular complications

of pancreatitis has become distinct. Hemodynamic compromises in the context of acute pancreatitis is a credible criterion for assessment of the process' severity; these can provide sufficient information for prediction of risk of pancreonecrosis.
Objectives of this work was evaluation of significance of vascular changes identified during abdominal CT of patients with pancreatitis and pancreonecrosis.
METHODS: At the 1st stage we carried out look back study of case records of 120 patients diagnosed with acute pancreatitis and pancreonecrosis who underwent treatment at the surgery departments of the City Hospital No.1 and Regional Medical Center in Karaganda. From the case records, we determined severity and pattern of disease progression. Indications of vascular changes in patients were analyzed using the reports of CT examinations.
At the second stage, 48 patients were monitored: 28 males and 20 females diagnosed with pancreatitis with pain syndrome, changes in lab tests and characteristic evidences on CT scans. 30 (64%) of these patients were diagnosed with acute pancreatitis, 14(29%) – with chronic pancreatitis, and 3 persons (6%) – with pancreonecrosis. All patients, within the first two days of admission, had received CT examination with bolus contrast enhancement using Philips Brilliance 64 and Siemens AS 64. The Balthazar score was used for tomographic evaluation of condition, according to which 20 persons (41%) were acknowledged to have severity degree B, 25 patients (52%) – C and 3 persons (9%) - D-E.
To determine vascular changes, diameter of large arteries and veins was assessed, presence of clots, atherosclerotic changes, aneurysms and vascular anastomoses.
RESULTS: During the look back study of examination records we established that assessment of hemodynamic changes in patients with this pathology was not part of the study objectives and was not done consistently for all patients. Identified vascular abnormalities were recorded in medical reports as two options: atherosclerotic changes of abdominal aorta and other vessels and signs of portal hypertension. However, despite the lack of mandatory assessment of vascular abnormalities, these changes were noted in 1/3 of all patients with pancreatitis.
According to the performed studies, 27 (56%) patients had dilation of stem of the portal vein, 20 (43%) had dilation of the splenic vein. Dilation of stomach and esophagus veins was identified in 9 (18%) cases. It was found that 14 (30%) monitored persons had splenorenal anastomoses, 15 (31%) had arterial sclerotic disease. In 8 (17%) cases no abnormal condition of vessels was identified.
We noted a direct relation between severity of pancreatitis, as determined using the Balthazar score, and presence of vascular changes. The changes were identified in patients with severity index B in 21 (44%) cases; patients with severity index C had vascular changes identified in 30 (62%) cases, and patients with severity index D-E had it in all 3 cases.
CONCLUSIONS: In case of pancreatitis, reaction of vessels to the pathological process is most often manifested in a change of diameter of large vessels, emergence of anastomoses, clotting of vessels.
— It is necessary to further study and assess capabilities of CT with bolus contrast enhancement in identification of vascular changes, which will provide more data on severity of pancreatitis and risk of complications.

A pilot study of secondary school biology and physical education curriculum impact on improving health literacy of Kazakh students

Alma U. Utaubayeva[1], Alikhan Kalybayev[1], Yeltay Rakhmanov[2, 3], Assel Baymuratova[3], Daniya B. Smagulova[3] *

[1]Makhmabet Otemysuly West-Kazakhstan State University, Oral, Kazakhstan; [2]Department of Department of Life, Health and Environmental Sciences, University of L'Aquila, L'Aquila, Italy; [3]West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.

*Corresponding autor: Daniya B. Smagulova, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. Email: daniya_1993@mail.ru

BACKGROUND: Kazakh health care (HC) and education systems are going through systematic transition period. Any reforms should be made on demand-based request. Elaboration of school curriculum based on public health necessities creates mutual beneficial synergetic collaboration between HC and secondary school (SS) teachers. HC personnel could learn from SS teachers pedagogical, didactic skills and vice-versa - current trends of public health which are paramount information for problem-based learning lessons. SS biology is considered as primary source to improve health literacy and school physical education (PE) programs are effective health promotion tool for SS students. In this regard, we had purpose to study SS students' knowledge acquired from biology and PE disciplines and their ability to use these skills in improving personal health.
METHODS: This was prospective, longitudinal study with an Intervention Group (IG) (120 students) and Control Group (CG) (120 students) aged 15-17 SS students living in Aral Sea region of Kazakhstan. Both groups were followed regular school curriculum and academic progress were the same. IG group had additional twenty (20) hours lesson on healthy eating, fitness, how to manage study-leisure time and common public health problems. 2 months after intervention, students underwent Adapted European Health Literacy Survey Questionnaire (HLS-EU-Q). Statistics were performed using SPSS Statistics 21 (SPSS Inc., Chicago, IL, USA) with a significance level set to $p \leq 0.05$. Descriptive statistics and a three-way ANOVA, along with Tukey's HSD post hoc test, were employed.
RESULTS: The general health literacy was a mean of 32,63. In CG - 37,1% , IG - 50,2% of respondents were reported as "adequate". In CG - 5,3%, IG - 24,56% students demonstrated "excellent" health literacy. Comparing with IG (25,24), in CG - 57,6% of respondents had a health literacy score in the "problematic" range. Individual domains were "problematic" levels of health literacy: healthcare CG (42,87), IG (24,3), disease prevention CG (38,52); IG (15.1) and health promotion CG (37.7), IG (26,93).
CONCLUSIONS: Health literacy among students who had standard education curriculum is insufficient. Health literacy and Health Promotion should be integral part of SS curriculum. There is need for comprehensive research and for discussion platform to integrate HC and SS teachers to elaborate demand-based school curriculum.

Evaluation of the quality of life in patients with chronic heart failure in the post-hospital phase

Gulnara L. Kurmanalina*, Bekbolat K. Zholdin, Zhanat A. Timirbaev

Department of Cardiology, Department of Internal Diseases No.2, Medical Center, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan

*Corresponding author: Gulnara L. Kurmanalina, Department of Internal Diseases No.2, Medical Center, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan. E-mail: gulnara.kurmanalina@mail.ru

BACKGROUND: Chronic heart failure is one of the most common, severe and unfavorable complications of diseases of the cardiovascular system, the frequency of which has increased in recent years.
WHO experts consider it very important to develop quality of life research, which includes determination methods, evaluation criteria and being a key index when using different methods of patient management, when deciding on treatment and prevention methods in light of their effectiveness and cost. that the quality of life is an important, independent indicator of the patient's condition, and his dynamics in the course of treatment at the post-hospital stage may be no less than usually estimated clinical parameters.
OBJECTIVE: To study the indicators of quality of life in patients with varying degrees of chronic heart failure in the post-hospital phase with the help of a specialized questionnaire.
METHODS: The study was conducted in the conditions of the cardiology department of the Medical Center of the West Kazakhstan State Medical University. In assessing the quality of life, the Minnesota Quality of Life Questionnaire for patients with chronic heart failure was used. The study included 20 patients who were hospitalized in the cardiology department of the Medical Center of the West Kazakhstan State Medical University from November 29, 2018 to January 10, 2019, who were interviewed 1 month after discharge from the hospital, including 9 (45 %) men and 11 (55%) women, aged 53 to 87 years, with an average age of 68.4 ± 1.8 years. Assessment of the severity of CHF was conducted according to NYHA: the number of patients with FC I was 5 (25%) people, with FCII 7 (35%) people, with FCIII 8 (40%) people. According to the classification N.D. Strazhesko - V.Kh. Vasilenko patients with stage I CHF were 2 people (10%), with stage IIA - 7 people (35%), with stage IIB - 8 people (40%), with stage III - 3 people (15 %).
RESULTS: When analyzing the results of the survey, it was found that the average value of QOL in patients with CHF was 50.42 points. Gender differences in QOL of patients with CHF were determined: for men, the average value of QOL was 59.3 points, for women, 38.1 points. According to the Minnesota questionnaire, a tendency was identified for a significant decrease in the quality of life in patients with more severe CHF. The impact of functional class of severity of chronic heart failure on the quality of life: I FC - 22.9 points; II FC - 39.5 points; III FC - 59.1 points.
CONCLUSIONS: The functional class of gravity is directly proportional to the quality of life indicators at the post-hospital stage. Gender differences in the quality of life in patients with chronic heart failure were revealed: QOL in women is higher tha n in men. The Minnesota Quality of Life Questionnaire for Patients with Chronic Heart Failure reflects the dynamics of the patient's condition, is convenient and available for use at any stage of the management of patients with CHF. Evaluation of the quality of life in the practice of a cardiologist allows to increase the effectiveness of therapeutic and preventive measures among patients with chronic heart failure.

Evidence-based nutritional and physical activity recommendations for patients with iron-deficiency anemia

Akmaral M. Baspakova[1, 2] *, Ainur N. Zinaliyeva[1, 3], Anara Zh. Abitova[1, 2], Zhanat B. Ashimova[1, 2], Aigerim A. Umbetova[1, 2], Dilyara S. Taskaliyeva[1, 4], Yeltay Rakhmanov[1, 5]

[1]Research Group of the Project "Adapted nutritional and physical activity programs for youth with iron deficiency anaemia living in Aral Sea region of the Republic of Kazakhstan". [2]Department of Management of Scientific and Innovative Activities, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [3]Department of hygienic disciplines with professional diseases, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [4]Department of Pathological Anatomy and Forensic Medicine, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [5]Department of Department of Life, Health and Environmental Sciences, University of L'Aquila, L'Aquila, Italy;

*Corresponding author: Akmaral M. Baspakova, Marat Ospanov West Kazakhstan State Medical University, Aktobe, Kazakhstan. E-mail: baspakova@zkgmu.kz

BACKGROUND: Iron deficiency anemia (IDA) is the most predominant pathology among population. Sports doctors, Primary Care physicians and Health Promoters quite often encounter with such cases and should provide appropriate preventive, therapeutic, adaptive recommendations. The aim of this review is to summarize existing evidence-based nutritional andphysical activity recommendations for patients with IDA.
METHODS: A comprehensive search of Cochrane library, PubMed, Medline, Embase, the database of American College of Sports Medicine, World Health Organization, Food and Agricultural Organization of the United Nations was undertaken for publications in English for the period 1988–2018. We used the following words to identify relevant articles to study: iron, iron deficiency, iron deficiency anemia, diet, nutritional recommendations, dietary supplements for iron deficiency anemia, physical activities, oxidative stress, antioxidant supplements, meta-analysis, evidence-based recommendations.
RESULTS: Total 1422 randomized controlled trials and systematic reviews were found and 137 manuscripts wereconsidered for further study. Iron supplementation and food fortification are recommended to improve haemoglobin status of anemic patients and their efficacy depends on the prevalence of this pathology. Oral iron supplements could be integrated with other vitamins (e.g. ascorbic acid) but it increases the frequency of side-effects and thus the risk of poor compliance.
Vigorous-intensity physical activities lead to worsening condition of anemic individuals and cause increased iron demand, elevated iron loss and iron absorption failure due to hepcidin bursts.Therefore, it is recommended to pre-

scribe low-, moderate-intensity physical activities. The study results stated that moderate exercises favorably impact on antioxidant system. However, in case of antioxidant supplementation, there are adequate evidences for the blockage of natural antioxidant discharge.
CONCLUSIONS: In iron-deficiency endemic regions, iron supplementation and fortification should be considered as priority agenda items, but additional vitamin and mineral supplementation should be administered with caution. Physical activities should be precisely tailored to every individual with anemia by considering transition conditions from aerobic to anaerobic metabolism, the hydration status, tissue oxygenation and the antioxidant release.

Sustainable Development Goals in I. Horbachevsky Ternopil State Medical University

Larisa Ya. Fedoniuk[1] *, Ganna S. Saturska[2]

[1]Department of Medical Biology, I. Horbachevsky Ternopil State Medical University, Ternopil, Ukraine; [2]Department of Social Medicine, Organization and Economics of Health with Medical Statistics, Ternopil, Ukraine

*Corresponding author: Larisa Ya. Fedoniuk, Department of Medical Biology, I. Horbachevsky Ternopil State Medical University, Ternopil, Ukraine. E-mail: fedonyuk22larisa@gmail.com

BACKGROUND: Principle I of the Rio Declaration on Environment and Development states that "Human beings are at the center of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature". The goals of sustainable development cannot be achieved when there is a high prevalence of debilitating illnesses, and population health cannot be maintained without ecologically sustainable development.
METHODS: In 2019-2020 I. Horbachevsky Ternopil State Medical University (TSMU) will launch new master programme for students of specialty "Public Health" (1-year students, 3 credits, 90 hours). It is supposed to include into curriculum a new subject "Sustainable Development", which should contain a brief factual overview, which is intended to inform students on key health trends in the contest of Sustainable Development.
RESULTS: According to the 2030 Agenda for Sustainable Development, which calls on countries to begin efforts to achieve the 17 SDGs over the next 15 years, the goals address the needs of people in both developed and developing countries, emphasizing that no one should be left behind. Broad and ambitious in scope, the Agenda addresses the three dimensions of sustainable development: social, economic and environmental, as well as important aspects related to peace, justice and effective institutions. We will focus our attention on three of them as they all related to health issues.
One from the 17 goals of Sustainable Development is good health and well-being. Therefore, based on the TSMU mission: training highly skilled specialists for the healthcare system of Ukraine and abroad through the provision of educational services of the proper quality, observance of high standards in teaching, scientific and professional activity; developing fundamental and applied sciences in the field of medicine and pharmacy; providing of the high-tech science-intensive medical care and developing new diagnostic and therapeutic technologies for the needs of the Ukrainian health care system. Therefore, TDMU is fully capable of realizing the goal of Sustainable Development "Ensuring a healthy lifestyle and well-being of people of all ages."
The Department of Medical Biology, Department of Social Medicine, Organization and Economics of Health with Medical Statistics, and other departments of the TSMU are intended to translate into reality the program and the goals of sustainable development, primarily due to the availability of environmental issues in the work programs, in which the concepts and goals of sustainable development can be studied, as well as practically.
However, the subject of educational and work programs, approved by the standard of education for higher educational institutions of medical care, does not envisage the study of sustainable development as a separate course or discipline, therefore, our task is to introduce environmental and social components into the contents of the discipline.
CONCLUSIONS: Close cooperation with universities have the opportunity to provide educational services, where teachers receive special skills and effective teaching methods for theoretical material on the foundations of sustainable development. It is envisaged to develop and implement a discipline "Sustainable Development" in the educational process at the TSMU.

The presence of department of vascular neurosurgery may reduce the mortality rate of hemorrhagic stroke

Yevgeniy S. Zhukov[1] *, Ermek K. Dyussembekov[2], **Altyn M. Aringazina**[3], Aizhan M. Raushanova[4], Zhenisbek A. Assylbekov[5]

[1] Department of Vascular neurosurgery, City Clinical Hospital №7, Almaty, Kazakhstan; [2]Head of the Department of Neurosurgery of Kazakh Medical University of Continuing Education, Almaty, Kazakhstan; [3]Head of the Department of Population Health and Social Sciences of the KSPH Almaty, Kazakhstan; [4]Kazakhstan School of Public Health, KMU Almaty, Kazakhstan; [5]School of Science and Technology, Nazarbayev University, Astana, Kazakhstan

*Corresponding author: Yevgeniy S. Zhukov, Department of Vascular neurosurgery, City Clinical Hospital №7, Almaty, Kazakhstan. E-mail: zhukov_yevgeniy@mail.ru

BACKGROUND: Hemorrhagic stroke is the leading cause of morbidity and mortality in Kazakhstan. The incidence of acute cerebrovascular accident has 250-370 cases per year on 100 thousand of the population in Kazakhstan, and 25,2% are hemorrhagic stroke. The rate of mortality from stroke is one of the highest in the world, which is 183-240 per 100 thousand of the population. The issues of early diagnosis of stroke, the choice of treatment method, as well as the selection of patients for surgical treatment do not lose their relevance today.We would like to study whether the presence of the Department of vascular neurosurgery will have an impact on the mortality rate.
METHODS: This study analyzes the mortality rate of hemorrhagic stroke prior and after the presence of Department of vascular neurosurgery, including both conservative

treatment and surgical interventions. All cases of hemorrhagic stroke have been collected for 5 years (2013-2017) at City Clinical Hospital №7 in Almaty city. The impact on mortality rates by the presence of Department of vascular neurosurgery is analyzed by using chi-squareand Pearson's X2 goodness-of-fit test.
RESULTS: The total number of patients was 1496 for 2013-2017. 1306 patients (87,30%) were treated conservatively and 190 patients (12.70%) were subjected to surgical interventions. This study showed that the presence of Department of vascular neurosurgery reduced the mortality rates from 34,19% to 27,10%.
CONCLUSIONS: For the full provision of medical care to patients with hemorrhagic stroke is necessary to have a specialized department. The analysis showed that with the opening of the Department of vascular neurosurgery, the overall mortality, as well as mortality after surgery, to patients with hemorrhagic stroke, decreased significantly (at significance level of 0,1). Based on this, the importance of improving the organization of neurosurgical care for patients with hemorrhagic stroke is obvious.The presence of Department of vascular neurosurgery may associated with a better mortality rate for hospitals that treat hemorrhagic stroke.

From traditional to digital: labor market requirements and educational expectations

Bibinur K. Sydykova*

Department of Public Health and Evidence-Based Medicine, Semey Medical University, Semey, Kazakhstan

*Corresponding author: Bibinur K. Sydykova , Department of Public Health and Evidence-Based Medicine, Semey Medical University, Semey, Kazakhstan. E-mail: bibinursk@gmail.com

BACKGROUND: In the context of higher education, ICTs are being introduced in the form of virtual learning environments (Sims, Vidgen, & Powell, 2008), augmented reality and virtual reality. Many universities are opening massively online courses (MOOCs) and video conferencing systems that offer multimodal training that goes beyond time and space. However, the introduction of ICT did not benefit all. Presumably, the terms barriers and discontinuities are related to digital exclusion and refer to the same factors scheme. However, there is a lack of evidence and knowledge regarding digital exclusion in its context. Thus, the research question is this: what concepts and interpretations make up the terms "digital isolation" and "digital gap" in the context of higher education?
The purpose of this document is to review the relationship between education, the digital environment and the labor market. Our focus will be on the European Union's strategy to minimize the gap between supply and demand for the labor market for workers with developed digital competencies. We will also examine how important computer literacy is and how the educational process can be updated to meet the expectations of a growing and ever-changing digital environment.
METHODS: methods for collecting and analyzing data are presented. Secondly, individual articles are classified and analyzed by country of empirical research. Third, the factors analyze the basic concepts of the "digital gap" and "digital exclusion." Procedia - Social and Behavioral Sciences 228 (2016) 614 - 621 Available online at www.sciencedirect.com
RESULTS: The results of the study of the multiple regression model show that the relationship between employee shares in the ICT sector in Romania significantly depends on 5 other factors, and therefore we accept H1 hypothesis as SignF <0.05. In addition, the multiple R is positive and very close to the value "1", which shows the real connection therefore between the factors it can be concluded that the relationship between them is high. Based on the Correlation Matrix, we can also add the fact that between variables is a positive relationship, as all terms in the matrix are positive, which means that all of them change in the same way.
CONCLUSIONS: Strengths CE implies the digitization of all spheres of human activity. The digital economy is a virtual environment that complements our reality. The next technological revolution will be connected with Neuronet technologies and a significant increase in labor productivity. An important advantage of CE is the reduction of such economic scourges as bureaucracy and, always going with it, corruption
Weaknesses Knowing that the entrance to these foreign technologies, albeit adapted for our realities, creates additional information technology dependence. The robotization of production and services significantly increases the unemployment rate.
Opportunities The main advantage of CE is a significant increase in labor productivity (the value created by one person rises sharply).ease (for power) of centralized management, taxation and control. Global automation and standardization of all business processes: production, education, medical, social, etc.
Threats The penetration of foreign IT-technologies into all aspects of life and activity significantly limits our sovereignty and increases its vulnerability. There are real threats to national cybersecurity: finance, transport and energy infrastructure, economic management, social "engineering" and modeling.

Suggested Protokol of Ain Shams And West Kazakhstan Universities for Management of Delayed-Interval Delivery of the second twin: Case Report

Ibrahim A. Abdelazim[1, 2]*, Svetlana Shikanova[3]

[1]Department of Obstetrics and Gynecology, Ain Shams University Cairo, Egypt; [2]Department of Obstetrics and Gynecology, Ahmadi Hospital, Kuwait Oil Company (KOC), Kuwait; [3]Department of Obstetrics and Gynecology No.1, West Kazakhstan State Medical University named after Marat Ospanov, Aktobe, Kazakhstan

*Corresponding author: Ibrahim A. Abdelazim.
E-mail: dr.ibrahimanwar@gmail.com

BACKGROUND: The incidence of multiple gestations increased after the assisted reproductive techniques (ARTs).

Preterm labor (PTL) and preterm premature rupture of fetal membranes (PPRFM) are the commonest complications of multiple gestations.
Traditionally; if one fetus delivered preterm in twin pregnancies, the situation managed by delivery of the second fetus.
Recently, there are reported cases of delayed-interval delivery (DID) of the second twin, with good outcome without established protocol for management of such cases.
Farghali *et al.*, 2017; stated that in-spite of increasing incidence of multiple pregnancies and PTL, there is no available established protocol for management of DID.
In addition; Cozzolino *et al.*, 2015; concluded that although no protocol for DID currently exists, an excellent outcome for the second twin is possible if managed in tertiary centers.
This report represents Abdelazim and Shikanova suggested protocol for management of DID of the remaining second twin.
CASE REPORT: A 29-years old woman, P2 (previous two cesarean deliveries), twin pregnancy after assisted reproduction techniques (ARTs), presented with preterm premature rupture of fetal membranes (PPRFM) and delivered a fresh still birth (FSB 430 grams) first twin at 22+3 weeks` gestation.
The parents agreed and signed written consent for Abdelazim and Shikanova suggested protocol for management of DID of the remaining second twin.
The Abdelazim and Shikanova suggested protocol for management of DID of the remaining second twin include;
1. ligation of the umbilical cord as high as possible in the cervix under complete aseptic conditions using vaginal washes with 0.5% chlorhexidine and the placenta left inside the uterus.
2. Combined systemic antibiotics (IV ampicillin for 2 days, followed by oral amoxicillin for 5 days with erythromycin for 10 days) and discharged home.
3. Follow up every 3 days using; infection, consumptive coagulopathy parameters and wellbeing of the second fetus every 3 days through the conservative treatment till 34 weeks.
4. Fetal wellbeing of the remaining second twin evaluated by; fetal movements count, fetal heart rate record and/or cardio-tocography (CTG) every 3 days and trans-abdominal ultrasound weekly for amniotic fluid volume, umbilical artery Doppler and fetal growth.
5. No tocolysis given for the studied woman through the suggested protocol for management of DID and/or after delivery of the first fetus. Tocolysis can be only used for 48 hours, if the uterine contractions developed after 24 weeks in combination with dexamethasone for lung maturity and Mg Sulphate for neuro-protection of the second remaining twin at 24 gestational weeks.
She delivered by cesarean section (CS) at 34 weeks (11 weeks^{+4days} of conservative treatment), baby boy 1.68 Kg (1.25 Kg weight difference from the first FSB fetus), received surfactant 10 min. after delivery, admitted to neonatal intensive care unit (NICU) for 12 days on ventilator support and discharged at 2.2 kg in good general condition.
No maternal complications recorded during the DID of the remaining second twin.
CONCLUSION: The birth weight and the survival rate increased after Abdelazim and Shikanova suggested protocol for management of DID of the remaining second twin without any maternal risks or complications.
DID should be done in tertiary centers after informing the parents about the possible risks of keeping the live second twin in the hostile intrauterine environment.

The outcomes of the Vaginal Birth after Cesarean section during the second birth order in West Kazakhstan

Kanshaiym Z. Sakiyeva[1]*, Ibrahim Abdelazim[2, 3], A. Alanwar[2, 3], Gulmira A. Zhurabekova[4], Svetlana Y. Shikanova[1], Gulmira Mukhambetalieva[1], Nazgul Izgalieva[1]

[1]Department of Obstetrics and Gynecology No.1, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [2]Department of Obstetrics and Gynecology, Ain Shams University Cairo, Egypt; [3]Department of Obstetrics and Gynecology, Ahmadi Hospital, Kuwait Oil Company (KOC), Kuwait; [4]Department of Normal and Topographical Anatomy, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Kanshaiym Z. Sakiyeva, Department of Obstetrics and Gynecology No.1, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: sakieva_k@mail.ru

BACKGROUND: As it is known, at Vaginal Birth after Cesarean section (VBAC) woman has a shorter hospital stay after a VBAC than after a repeat Cesarean section (C-section). Vaginal deliveries have lower rates of bleeding, infection, blood clotting in one or more of the deep veins in the body (deep vein thrombosis), and injury to abdominal organs, such as the bladder or bowel. Research on women who attempt a trial of labor after cesarean (TOLAC) shows that about 60-80 percent have a successful vaginal delivery. Nonetheless, VBAC is not right for everyone. Certain factors, such as a high-risk uterine scar, can lower the likelihood of VBAC and make the option inappropriate.
The present study was aimed to detect the outcomes of the vaginal birth after C-section (VBAC) during the second birth order in the Aktobe province of western Kazakhstan. Search for articles by this author.
METHODS: Eight hundred and thirty-two (832) women eligible for trial of VBAC were included in this study. Women signed the consent of VBAC were evaluated thoroughly to collect the following data: maternal age, body mass index (BMI), height, gestational age at admission, indication of the previous cesarean section, estimated fetal weight, engagement of the fetal head, condition of the membranes and cervical dilatation. Data collected after delivery included: duration from active phase of labor, mode of delivery, fetal and neonatal outcomes. Non-parametric operational tests were used due to a priori missing a normal distribution. The Pearson's $\chi 2$ test for frequencies comparison was performed. To identify the relationship between the studied values the Spearman's correlation analysis was applied. Logistic regression analysis with Odds ratio calculation was applied to estimate likelihood for VBAC outcomes. SPSS Statistics.v.20 software (IBM, Armonk, NY, USA) was applied for calcula-

tions. For all tests a two-side type I error of P≤0.05 or less at 95% CI was assumed statistically significant.
RESULTS: Logistic regression analysis and Odds ratio showed that at BMI ≤25 Kg/m2 (OR 1.7; P 0.0004), women's height ≥150 cm (OR 1.7; P 0.002), gestational age ≤40 weeks (OR 2.3; P 0.0001) and inter-delivery interval ≥2 years (OR 1.6; P 0.008) significantly associated with successful VBAC. In addition, <2/5 of the fetal head palpable abdominally, station <-2 (OR 1.7; P 0.0009), cervical dilatation ≥4 cm (OR 1.7; P 0.003) and duration of active phase of labor ≤7 hours (OR 1.6; P 0.01) significantly associated with successful VBAC.
CONCLUSIONS: VBAC is safe in properly selected cases. BMI ≤25 kg/m2, gestational age ≤40 weeks, inter-delivery interval ≥2 years and fetal head <-2 station increase the success of VBAC. Prolonged active phase of labor >7 hours and the need for labor augmentation decrease the chance of VBAC success.
Overall, the vaginal birth after cesarean section (VBAC) increases the chance of subsequent vaginal deliveries and reduces the repeat cesarean section rate with subsequent post-operative morbidity.

Prevalence of internet addiction and its association with mood and sleep disorders among young adults in Astana, Kazakhstan

Akbota S. Tolegenova[1] *, Aigulsim K. Izekenova[2], Manshuk A. Ramazanova[3], Byron Crape[4], Raushan Alibekova[5], Akerke R. Abzaliyeva[6]

[1]Department of Epidemiology with a course of HIV infection, Asfendiyarov Kazakh National Medical University, Almaty, Kazakhstan; [2]Department of Epidemiology with a course of HIV infection, Asfendiyarov Kazakh National Medical University, Almaty, Kazakhstan; [3]Department Public Health, Asfendiyarov Kazakh National Medical University, Almaty, Kazakhstan; [4]Department of Medicine, Nazarbayev University, Astana, Kazakhstan; [5]Department of Medicine, Nazarbayev University, Astana, Kazakhstan; [6]Medical college of Almaty "DIMED", Almaty, Kazakhstan

*Corresponding author: Akbota S. Tolegenova, Department of Epidemiology with a course of HIV infection, Asfendiyarov Kazakh National Medical University, Almaty, Kazakhstan.
E-mail: atolegenova@nu.edu.kz

BACKGROUND: In recent years, the Internet has become the most essential tool in both studying and entertainment, by giving the fast and easy access to all the information for students. However, uncontrolled excessive use of internet negatively influences a person's life, leading him to "Internet addiction" (IA) or "Problematic Internet use". Despite the fact, that more than half of Kazakhstani population (55.8 %), which is approximately 10 million, uses internet on a daily base, there is a lack of studies on internet addiction in Kazakhstan. Therefore, our study aims were: (1) to estimate the prevalence of IA among university and college students; (2) to explore the association of IA with various factors, related to socio-demographics, family relationships, mood and sleep disorders, self-esteem, physical and social activities, and academic performance of the students.
METHODS: The cross-sectional study sample comprised 400 students of Astana city. Students completed a structured questionnaire comprised of a Young's 20-item internet addiction scale, Depression Anxiety Stress Scales (DASS 21), Insomnia severity index scale, and questions about socio-demographic characteristics. Univariate, bivariate and multivariate analysis were used to analyze the obtained data.
RESULTS: It was found out, that the prevalence of pathological IA among students is 19.75%. This rate is higher than the rate of entire Asian countries, which was 7.1%, and West and North Europe countries 2.6% (Uddin *et al.*, 2016). The prevalence rate was significantly different between males and females (P value = 0.000); males had higher prevalence (65.82%) than females (34.18%). Furthermore, multivariate logistic regression demonstrated that depression, anxiety and stress (DAS) are statistically significant predictors of potential internet addiction. In addition, the odds ratios of DAS were more than one, which means that more the level of DAS more the person becomes addicted (P value < 0.05).
CONCLUSIONS: These study findings have revealed a high prevalence of internet addiction among students. Association of internet addiction with mood disorders underlies the need for improving mental health services for adolescents.

New trends and challenges in ageing of population and the life expectancy after retirement: A comparative country-based analysis

Aigulsum K. Izekenova[1]*, Akbota S. Tolegenova[1], Assel K. Izekenova[2], Elmira T. Abdraimova[3], Sanam M. Zikriyarova[1], Maira A. Zhunissova[4], Ainur B. Kumar[5]

[1]Department of Epidemiology and HIV, Asfendiyarov Kazakh National Medical University, Almaty, Kazakhstan; [2]Eurasian Technological University, Almaty, Kazakhstan; [3]City Polyclinic №20, Almaty, Kazakhstan; [4]City Polyclinic №11, Almaty, Kazakhstan; [5]Department of Integrated Economics and Healthcare Management Systems, Asfendiyarov Kazakh National Medical University, Almaty, Kazakhstan

*Corresponding author: Aigulsum K. Izekenova, Department of Epidemiology and HIV, Kazakh National Medical University, Almaty, Kazakhstan. E-mail: izekenova.a@kaznmu.kz

BACKGROUND: With the growing problem of population ageing, there is a big need to rethink this trend and use tools that turns it from a burden to a benefit for the state. In1950 the elderly (persons aged 60 years and older) were 8 per cent of the world population, in 2000 is already 10 per cent, and in 2050, according to UN projections the proportion will reach 21 per cent. There are also new challenges in the form of a gender imbalance in the ageing population.
AIM: This research on Kazakhstan provides demographic analysis from 1989 to 2018 and presents the main features of population ageing through comparative analysis.
METHODS: The research based on previous study made in 2012 and was continued by the same main authors in order to expand the time period until 2018 and to include other countries in the review. Authors used information-analytical, content-analysis, mathematical treatment and comparative analysis of statistical data on demographic status in the Republic of Kazakhstan and other countries

of the world such as UK, USA, Turkey, Russia, China and India over the 1989-2018.
RESULTS: Age dependency ratio of the Russian Federation – more than 1.7 times, in the USA – up to 1.9 times the dependency ratio of Chinese population – more than 2.2 times and the UK has dependency ratio higher than 2.5 times of similar indicators in Kazakhstan in 2018. The India shows negative results and coefficient is 1.2 times less. Gender gap in population ageing is clearly visible in the following countries: Russian Federation, China, India, Turkey and Kazakhstan.
CONCLUSIONS: Life expectancy of the elderly population KZ after 65 years in 2018 was only 14.2 years, which is 7-10 years inferior to European and U.S. indices. With the inclusion of new countries in the analysis, the authors came to the conclusion that in non-western countries life expectancy after retirement is less than in Western countries, therefore, non-Western countries have time to adapt their national systems. It is necessary to conduct such a state program that will expand the opportunities of the employment market and the field of health care, as well as other areas where you can get mature, experienced and healthy-minded customers. And focusing on this stratum of the population, we should not forget about the gender aspects that take place according to the results of our analysis.

Antibacterial efficiency of antibiotic-impregnated bone allografts in an *in-vitro* study

Berik E. Tuleubaev[1], Dina A. Saginova[1], Amina A. Koshanova[1] *, Saule B. Akhmetova[2], Azim M. Saginov[1]

[1]Department of Surgical Disease №2, Karaganda Medical University, Karaganda, Kazakhstan; [2]Department of Microbiology, Karaganda Medical University, Karaganda, Kazakhstan

*Corresponding author: Amina A. Koshanova, Department of Surgical Disease №2, Karaganda Medical University, Karaganda, Kazakhstan. E-mail: koshanova87@mail.ru

BACKGROUND: Recently, bone allografts have become more widely used in traumatology and orthopedics. In traumatology and orthopedics, bone allografts are used to fill in bone cavities, for example, in chronic osteomyelitis or bone tissue tumors. Treatment of patients with chronic osteomyelitis remains a challenge for modern traumatology and orthopedics. In the treatment of chronic osteomyelitis, bone allografts are used as carriers of antibiotics. Knowledge of the microbiological relationship helps in choosing a rational starting treatment, which is later corrected by analyzing each individual clinical situation and obtaining the results of culture studies. Bone allografts in modern medicine are becoming increasingly popular as a useful bone-plastic material, and sometimes an indispensable tool for the surgeon to remove bone defects. Microbial contamination of postoperative wounds is the main reason for the surgeons' refusal to use bone allografts. In view of the foregoing, it became necessary to create a bone allograft of domestic origin, which would have an antimicrobial effect.
The aim was determine the efficiency of antibiotic-impregnated bone allografts against most frequent post-operation infection agents *St. aureus*, *P. aeruginosa* and *S. epidermidis* in vitro study.
METHODS: The femoral heads were used after hip arthroplasty (approved by the Regional Bioethics Committee). All femoral heads were used after thermal disinfection by processing in the Marburg Bone Banking system. The bone allografts were impregnated by soaking with 2% solution of gentamicin before or after sterilization in the "Lobator-sd2-system". The effects of solid and perforated femoral heads were compared against *St. aureus*, *P. aeruginosa* and *S. epidermidis*. Bacterial suspensions were prepared in sterile circumstances. Bone allografts 1x1 cm in size were placed in a Petri dish and poured a bacterial suspension prepared in advance under sterile conditions. Then incubated in a thermostat at 37 ° C and a relative humidity of 100% for 24 hours. The result was evaluated every 24 hours for 10 days by measuring the zone of inhibition. All results were statistically analyzed using the Mann-Whitney test. A P value less than 0.05 was considered significant.
RESULTS: All tested, impregnated bone allografts with antibiotics retained their antibacterial properties, but in samples impregnated with antibiotics during heat treatment, they were less. Analysis of results demonstrated that the concentrations of gentamycin eluted from the bone allografts were above the minimal inhibitory concentration for long period.
CONCLUSIONS: Antibiotic-implanted bone allografts from living donors, prepared by soaking in antibiotics before or after thermal disinfection in Lobator-sd2-system, have significant properties for the main postoperative pathogens of chronic osteomyelitis. The use of perforation in bone allografts was increased spreading and elution antibiotic of these allografts.

Uric acid level and its relationship with the components of the metabolic syndrome in adult population of the Aktobe province (Western Kazakhstan)

Raikul N. Kosmuratova*, Khatimya I. Kudabaeva, Yerlan Sh. Bazargaliyev

West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Raikul N. Kosmuratova, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: kosmuratova.raikul@mail.ru

BACKGROUND: The problem of obesity in the modern world is becoming increasingly urgent and is beginning to pose a social threat to people's lives. This problem is relevant regardless of social and professional affiliation, area of residence, age and sex. Elevated serum uric acid (UA) is a factor in atherogenesis and predictors of cardiovascular disease. However, the role of uric acid as an independent risk factor is still being questioned, and there are no evidence-based recommendations for the treatment of asymptomatic hyperuricemia.
The study was aimed to assess the interrelations of the components of metabolic syndrome with asymptomatic hyperuricemia among the adult population of the Aktobe province.
METHODS: A cross-sectional study of the adult popula-

tion of the Aktobe province was conducted. The study involved 197 adults, of which 65.9% were women and 34.1% were men. The exclusion criteria were: patients with severe chronic diseases (cardiac, hepatic, renal failure), diseases of the joints, patients suffering from diabetes or having a history of an increase in blood glucose. Inclusion criteria were: age (18-80 years) and their voluntary consent. Research methods: anthropometry; questioning; laboratory research of blood serum. Uric acid was determined by the enzymatic (uricase) method.
RESULTS: The median UA in the sample was 242.5 μmol/L. The frequency of GU among the adult population of the Aktobe province (within the studied sample) reached 12.66%.
Analysis of the data showed that in the total sample, hyperuricemia among the male population (8.6%) was detected twice as often as compared to women (4.06%). The median UA in women was 227.0 μmol/L, for men - 331.0 μmol/L ($P \leq 0.0001$).
The analysis of the relationship of GU with other factors affecting the risk of cardiovascular diseases, such as body weight, insulin resistance and lipid profile was carried out. We identified the most significant correlation between the level of UA and the waist/hip coefficient. Insulin resistance, being one of the important components of the metabolic syndrome, has an important influence on the development of cardiovascular risk. The level of UA is statistically significantly higher with an insulin resistance index of NOMA more than 3.2. The obtained data confirm the close connection of GU with insulin resistance.
To study the relationship of the UA level with body weight, sex, lipid profile, a multiple regression analysis was performed, where UA was an independent indicator. Relationship analysis showed that the most significant contribution to the increase in UA was made by the male gender ($\beta = 0.510$; $P=0.000$), the waist / hip index ($\beta = 0.428$; $P=0.000$), triglyceride levels ($\beta = 0.414$; $P=0.000$), total cholesterol ($\beta = 0.314$; $P=0.00002$); low density lipoproteins ($\beta = 0.311$; $P=0.00003$). The effect of high-density lipoproteins on the level of UA was not detected.
CONCLUSIONS: Prevalence of asymptomatic GU among the adult population of the Aktobe region (within the sample under study) is 12.66%. The elevated level of UA in the blood serum of adults has a close relationship with cardiovascular risk factors: male; dyslipidemia (OX, TG, LDL); overweight, waist / hip index; insulin resistance.

Social marketing: the future of reproductive culture in Kazakhstan

Sabira M. Kulchimbayeva*, Zaituna G. Khamidullina, Gainyl U. Ahmedjanova

*Department of obstetrics and gynecology №1, JSC "Astana Medical University", **MUS on REJ "Perinatal center №3", Astana, Kazakhstan***

*Corresponding author: Sabira M. Kulchimbayeva.
E-mail: s_kulchimbayeva@mail.ru

BACKGROUND: The Department of obstetrics and gynecology №1 of JSC "Medical University of Astana" at the clinical base of MUS on REJ "Perinatal center № 3", with the support of the Health Department, for the period 2017-2018, in order to improve the literacy of pregnant women on psychological and physical readiness for childbirth to reduce the frequency of obstetric and perinatal pathology, 7 charity events were carried out.
The promotion of protection maternal and child health, where the main component is to change the behavior of pregnant women in conception, bearing and childbirth on the basis of evidence-based developments in the field of effective perinatal technologies of natural childbirth, proper nutrition, active lifestyle, contributes to the development of reproductive culture of future mothers, refers to the form of social marketing.
METHODS: The key concept of the charity Events was the methods stated in the Lamaze system (2012), on the following topics:
— Belly painting for pregnant women "I and my child" (June 30, 2017)
— "Mom and baby: 3 steps to the meeting" (17 September 2017)
— "Christmas Sunday brunch" (23 Dec 2017)
— "Karaoke childbirth " (March 6, 2018)
— "6 practices of natural childbirth: 20 years of experience" (03 July 2018)
— "Children flowers of the life" (15 November 2018)
— "Santa Claus at the hospital" (27 December 2018)
The total coverage of pregnant women was 2000 pregnant women who were trained to properly relax, breathing exercises, the using of analgesic massage, a free choice of birth positions, affirmations (positive settings) and visualizations in childbirth. All events were covered by the national channel "QAZAQSTAN", the morning program" Tansholpan", as an involved television channel, to promote the implementation of the President of the Republic of Kazakhstan N. A. Nazarbayev about the priorities of social policy in the " Protection of motherhood and childhood." In all activities, were involved 5th year students of the faculty of General Medicine, according to the new educational technology "Improvement of professional and communication skills of the bachelor through the introduction of art therapeutic techniques in the school of preparation for childbirth."
RESULTS: A large-scale event for the development of reproductive culture, the rules of natural conception, bearing and birth of a child, affected on indicators of quality in care for childbirth, which according to the main indicators of perinatal and maternal mortality in 3 times was lower in MUS on REJ "Perinatal center № 3" in comparison with other Perinatal centers in Astana, for the analyzed period.
CONCLUSIONS: Active involvement of traditional mass media and modern social media resources and networks, allows to informing and educate the population in carrying out preventive measures on the joint responsibility of the population for their own health, to expand the possibilities of treatment and monitoring in multi-profile and specialized medical institutions of the obstetric care system for the management of complications of pregnancy, childbirth, newborn. The students acted as leading trainers, learning the rules of behavior in childbirth, thereby increasing the efficiency of digestibility of the material, the development of professional skills and advice, the increasing interest in the subject of obstetrics and gynecology.

A centralized automated controlling system of treatment compliance – "Medreminder"

Serikzhan B. Sydykov*, Alma R. Shopabayeva, Kairat S. Zhakipbekov

School of Pharmacy, Asfendiyarov Kazakh National Medical University, Almaty, the Republic of Kazakhstan

*Corresponding author: Serikzhan B. Sydykov, School of Pharmacy, Asfendiyarov Kazakh National Medical University, Almaty, the Republic of Kazakhstan. E-mail: bc_sydykov@mail.ru

BACKGROUND: "Medreminder" - is a mobile app (app) based on Android and iOS operating systems. The functions, inform the attending physician about the patient's health and adverse effects on the medicine. "Medreminder" also allows keeping record and controlling patients receiving medications prescribed by the attending physician. This abstract will provide information on improving patient treatment compliance using app.
METHODS: The market of mobile operational systems, which are more frequently used in Kazakhstan, was carefully researched to choose the platform of programming language. The Android operational system takes 74,37% of the market share, iOS- 22,73% and others- 2,9%[1]. So, the mobile application "MedReminder" was developed for those mobile devices with Android and iOS operational systems.
RESULTS: The selection criteria of the patients was a verified diagnosis, the availability of all laboratory and instrumental results, receiving medical therapy at least a month before the study and informed consent for the study. The research included the observation of two groups of patients:
1. The first group of 25 patients who were using the mobile application.
2. The second control group of 20 patients who were not using the application.
All patients were specially surveyed and questioned; moreover, careful consideration was given to all the data from clinical-laboratory and instrumental research.
During the survey, the following data, not related to the disease, was collected: gender, age, marital status, residence, education, occupation and experience in long-term use of medicines in case of chronic diseases in anamnesis. Every participant of the research was assigned to have a unique two-digit number, which matched the patient's serial number in the centre. All the patients included in the research were registered in the research centre, the registered data included a serial number of a patient, the date of inclusion in the study and other information. The observation period lasted for 3 months.
Both groups of patients filled in the questionnaire during the appointments, including Morisky-Green test [2]. It includes 4 questions:
1. Have you ever forgotten to take your medication? ("Yes"-0 points, "No"-1 point)
2. Are you sometimes careless about the time when to take medicines? ("Yes"-0 points, "No"-1 point)
3. Do you miss taking medicines if you are feeling well? ("Yes"-0 points, "No"-1 point)
4. If you are feeling unwell or worse after you have taken medicines, do you miss the following medication? ("Yes"-0 points, "No"-1 point).
Results of test in the research group and control group at first visit: 1,8 and 1,9 points. After 3 months of using an app, treatment compliance in the study group increased to 3.9 and in the control group to 2.9 points. It was noted that on the background of the treatment there was a significant increase in compliance in both of the groups. However, in the research group there was a more dramatic change in the answers.
CONCLUSIONS: The analysis of the results and doctor's interviews showed that during the study, patients who used the application became more careful about following the regime for medications intakes, doctor's prescriptions and sending information about health, which allows making such a conclusion about formation of compliance to treatment and an increase in patient's responsibility.

Method of elimination of neoureter fistula

Meirambek S. Askarov [1], Yertay Y. Yerbolganov [1]*, Zhanat K. Yelubayev [1], Argyn N. Bidaibayev [2], Yekhlas A. Akmoldayev [2]

[1]Department of surgical diseases №1, "Karaganda Medical University" non-commercial joint-stock company, Karaganda, Kazakhstan; [2] Department of surgical diseases, Regional Children's Clinical Hospital, Karaganda, Kazakhstan

*Corresponding author: Yertay Y. Yerbolganov, Department of surgical diseases №1, "Karaganda Medical University" non-commercial joint-stock company, Karaganda, Kazakhstan. E-mail: Erbolganov@kgmu.kz

BACKGROUND: traditional methods of neoureter fistula closure include: the necessity to mobilize the fistula on all of its circumference, intersecting and stitching it, and also closure of operational defect by displacing the free skin flap. Traditional methods are combined by the difficulty of performing this operation and the damage it causes, also by the difficulty of using the intra-operational magnifying optical devices. The objective of referred work is to develop more physiological, effective and less deforming elimination method of neoureter fistulae in children, operated due to hypospadias.
METHODS: male children of different age with neoureter fistulae are taken for this research. According to the method of surgical procedures of elimination of neoureter fistulae the children are divided randomly into two groups: group №1- patients who had undergone traditional closure of fistula (N.=15), group №2- patients who had undergone closure of fistulae by ligation of the fistula at its origin (N.=27). Our suggested method is carried in the following way: placing the urinary catheter with its size adjusted to child age (0.7-0.8 cm), making the incision 1 cm of length from the external orifice of fistula, mobilizing the fistula on its circumference, carrying the ligature through the obtained tunnel and tying it tightly at the origin of the fistula. The operation is finished by suturing the skin on the incision site.
RESULTS: during the research of elimination of neo ureter fistula at children effectiveness results of the 1st group of children the post-operative scars were in the shape of letters "V", "L", "Z" and their length was from 1.5 to 2 cm. The urinary bladder catheterisation was done for 5 to 7 days. During the post operational period new fistulae were

formed in 3 children (20%). The mean time each child spent at the hospital was 8 days. In comparison, after the elimination of fistulae by the 2nd method (ligation of the fistula at its origin) the post-operational scar was linear, 1 cm in length, the catheter was removed on 4-5th day after the operation, only at 1 child (3.7%) newly formed fistula was present. All the children were discharged from the hospital on 5th-7th day.
CONCLUSIONS: the use of the method of neoureter fistulae closure by ligation of the fistula at its origin makes it possible to eliminate the urinary fistulae of neoureter at children operated due to hypospadias. Introduction of ligation method at the elimination of neo ureter fistulas at children will make it possible to decrease the frequency of newly formed fistulas and improve the clinical and esthetical effect.

A case study on implementation of Italian Adaptive and Preventive Sport into Kazakh Practice

Yeltay Rakhmanov[1, 2], Samat S. Kumuspayev[1], Gulmira A. Zhurabekova[1]*

[1]Department of Department of Life, Health and Environmental Sciences, University of L'Aquila, L'Aquila, Italy; [2]West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.

*Corresponding author: Gulmira A. Zhurabekova, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. Email: gzhurabekova@gmail.com

BACKGROUND: Italian Society of Hygiene, Preventive Medicine and Public Health has defined Adapted Physical Activities (APA) as "Biotechnology for Health", because of their effect as a "super-drug" or better as a "super-prophylaxis" measures that could be applied in all phases of prevention. can effectively apply to all prevention phases with a very high impact in opposing sedentary lifestyles and promoting social health, globally. APA may include sport activities, without the purpose of achieving recognition in competition, but rather to gain health within prevention programs [Romano-Spica *et al.* 2015]. Graduates of Master of Science in Adapted and Preventive Sport could deliver APA services for preventive, rehabilitative and treatment purposes in collaboration with Healthcare system. In this connection, we aimed to share experience of researchers who observed Italian Adaptive and Preventive Sport experience.
CASE REPORT: This article was written based on observations of scientists who conducted research at the University of L' Aquila, under Kazakh-Italian academic exchange program "Development of Preventive and Adapted Sport in Kazakhstan from medical, pedagogical, social and legal perspectives". This project was funded by the Bolashak International Scholarship and Erasmus Mundus TOSCA Scholarship (Transfer of Skills, Knowledge and Ideas to Central Asia). Master's Program in "Preventive and Adapted Sport Sciences", didactic and scientific database, Italian National Prevention Plan for 2010-2018 were analyzed and this Plan's realization in Abruzzo region was observed. The possibilities of development of Adapted and Preventive Sport, its integration with preventive, rehabilitative methods and harmonization with Kazakh educational, social, health care system were forecasted, elective disciplines for future medical and sport professionals who will be involved in Adapted and Preventive Sport were implemented, collaboration agreements were signed. Since isolated regions and ecologically unfavorable areas of Kazakhstan are under close scrutiny, group members drafted pilot project on "Preventive and Adapted Sport Programs focused on Aral Sea environmental disasters' area".
The widely practice of Preventive and Adapted Sport will optimize prevention and rehabilitation actions of modern Kazakh Health Care System. Special attention for implementation of this project in Aral Sea region might attract attention of young scientists, donor organizations and internationally recognized researchers working on prevention, community-based rehabilitation and environmental health. This model could be easily disseminated across the country and neighboring Central Asian Republics.

Miller-fisher syndrome with atypical onset

Marina A. Grigolashvili, Raushan M. Mustafina*, Ekaterina D. Kim, Elmira M. Zhuanysheva

Department of Neurology, Psychiatry and Rehabilitation, Medical University of Karaganda, Karaganda, Kazakhstan

*Corresponding author: Raushan M. Mustafina, Department of Neurology, Psychiatry and Rehabilitation, Medical University of Karaganda, Karaganda, Kazakhstan. E-mail: m.raushan07@mail.ru

BACKGROUND: Miller-Fisher syndrome (MFS) is the clinical variant of acute inflammatory demyelinating polyradiculoneuropathy with autoimmune genesis and belonging to an atypical form of Guillain-Barre syndrome (GBS). MFS is a rare disease: incidence 1-2% of all acute inflammatory demyelinating polyneuropathies in Europe and the USA, but higher in Asia and in Japan - up to 25%. Patients' age varies from 13 to 78 years, adults get sick more often, than children.
70% of patients had preceding bacterial or viral infections, such as Cytomegalovirus, Epstein-Barr virus, Campylobacter jejuni, Mycoplasma pneumoniae, Haemophilus influenzae, Varicella zoster. In 80% of cases, the initial symptom was diplopia; myalgia, paresthesia on the face, ataxia, vertigo occur less often. About 30% of patients had facial palsy, weakness of oropharyngeal muscles was present in 26%, sensitivity changes – 24%, pelvic disorders – in 16-26%, severe pain syndrome (more in children).
CSF albuminocytological dissociation is detected in MFS, 80-90% of patients had GQ1b-IgG antibodies in both CSF and serum.
Considering the rarity of this disease, difficulties of establishing the diagnosis can be possible due to overlap-syndromes when clinical, serological, instrumental signs are present together for 2, or in rare cases more syndromes.
CASE REPORT: A 63-years-old woman was hospitalized due to acutely developing left-sided facial weakness, lacrimation and difficulty in eating and speech disturbance. These symptoms appeared the day before hospitalization. Shortly before she suffered an acute respiratory infection, which was accompanied by cough, sore throat, runny nose

and didn't receive treatment. The patient was exposed to hypothermia at work repeatedly in the presence of a respiratory infection.
In neurological examination ptosis and peripheral facial palsy on the left side were revealed.
While the patient was in the hospital, pain, right-sided peripheral facial palsy, ptosis on the right side, areflexia in the limbs, mixed ataxia, dysphonia appeared, palatal reflexes decreased, also symptoms of the trigeminal nerve lesion developed on both sides, such as weakness of the masticatory muscles, pain in all exit points of trigeminal nerve branches. For this reason, a lumbar puncture was performed, in the CSF: slightly elevated protein, leukocytosis, positive Pandy's reaction. Blood culture revealed Staphylococcus haemolyticus. Immunoblotting revealed Anti-GQ1b IgG antibodies elevation in CSF and blood.
Electroneuromyography of the cranial nerves showed slowing of motor fibers conduction with demyelination phenomena of the facial, trigeminal nerves.
The MRI of the brain showed multiple subcortical and periventricular vascular foci, also in the area of the basal ganglia, brainstem.
In the process of differential diagnosis, the patient received glucocorticoid therapy, then transferred to a course of plasmapheresis №5; anticonvulsant therapy for analgetic effect, anticholinesterase, antibacterial, nonsteroidal anti-inflammatory, neuroprotective therapies, physiotherapy treatment.
Patient's condition was improving: pain on the right side of her face decreased, the range of movements of the facial muscles increased during therapy. Repetitive control of qualitative and quantitative analysis of serum anti-GQ1b IgG antibodies is planned for further treatment tactics determination.
The described clinical case is considered peculiar, because the disease began with left-sided peripheral facial palsy, ptosis, pain on the face, also had non-specific symptoms of other cranial (trigeminal, facial, glossopharyngeal, vagus) nerves lesions besides the classic MFS triad. When verifying this diagnosis doctors should be wary about clinical variants of MFS and GBS, MFS and Bickerstaff brainstem encephalitis overlap-syndromes.

Integrational and motivational aspects in teaching "Pediatric Hematology" in the postgraduate medical education system

Zhumabek B. Dossimov[1] *, Arystan Zh. Dossimov[2], SvetlanaV. Kim[1], Gulzhan A.Tulegenova[1], Anargul T. Kaliyeva[1], Zhanay N. Kenbeylov[1]

[1]Department of pediatric diseases No.2, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [2]Department of general medical practice No.2, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Zhumabek B. Dossimov, Department of pediatric diseases No.2, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
Email: dossimov_zkgma@mail.ru

BACKGROUND: The relevance of teaching the module "Pediatric Hematology" is determined by the fact that pediatric hematology is a multidisciplinary problem located at the intersection of fundamental and clinical disciplines. In this regard, the final learning outcomes will depend on the success of introducing knowledge integration technology into the learning process and increasing students' motivational activity, the main result of which would be integrated knowledge and developed skills along with the need for self-education.
The study currently designed by faculty members is aimed to increase the motivational activity and provide the integration of knowledge in the process of the "Pediatric Hematology" module implementation.
METHODS: In the process of experimental implementing the new Curriculum of the "Pediatric Hematology" module, technologies for integrating knowledge and increasing the motivational activity of interns / residents in accordance with the concept of continuous professional development have been introduced. As known, the motivational activity is formed through the constant use of various training methods (Small group methodology, Team-based learning, Problem-based learning) and all listed methods of teaching are involved in a new Curriculum. To assess the initial level of knowledge and determine the content of the integration technology at the initial stages of studies, the knowledge basic tests using is prescribed in small groups.
RESULTS: During the teaching modern scheme of blood formation the latest amendments are going to be analyzed, as well as the latest immunologic achievements in functional purpose of mature peripheral blood cells. The obtained information is fixed on the myelogram data interpretation model. Commonly, the obvious integrated potential is an ability to interpret peripheral blood tests. This fact is especially obvious during interpreting blood tests in children with Anemia of various origins, when the nosological identity of the anemic syndrome and the functional state of the bone marrow are specified according to the results of the integration of information on hemoglobin level, reticulocyte count and color index. When interpreting other indicators of peripheral blood, students' attention is focused on determining not the relative, but the absolute count of various leukocytes types. It is equally important to integrate the knowledge on the problem of the physiology and pathology of hemostasis, to form the skills in interpreting coagulograms.
At the stage of implementation of the specific problems of pediatric hematology, as an element of integration the syndromic (clinical and laboratory) principle of determining the thematic structure of classes is applied. Training based on the syndromic approach determines the need to integrate students' knowledge in the process of preparing for classes on a wide range of problems of physiology and pathology of the blood system and related disciplines. Active teaching methods are used in almost every lesson and above all in the process of solving issues in clinical situations. The homework procedure which involves the preparation of presentations on specific topics with subsequent active discussion in class, has an undoubted motivational effect on students.
CONCLUSIONS: Thus, the use of various methodological approaches increasing integration motivational potential during the classes, is a prerequisite for achieving educational goals in the "Pediatric Hematology"module.

Navigation control in neurosurgery for brain tumor

Nurtas I. Tursynov*, Ermat M. Sanayev, Samat Zh. Aumazhitov, Rakhym Zh. Mergenbay, Ruslan A. Khautiyev

Department of Neurosurgery and Neurology, Non-profit JSC Medical University of Karaganda, Karaganda, Kazakhstan

*Corresponding author: Nurtas I. Tursynov, Head of Neurosurgery Department, Non-profit JSC Medical University of Karaganda, Karaganda, Kazakhstan. E-mail: tursynov@kgmu.kz

BACKGROUND: Determination of the effectiveness of neuronavigation control methods in the spread of the tumor process in the brain.
METHODS: In the last 3 years 258 patients with brain tumors undergone operation at the center of neurosurgery and neurology, emergency and planned neurosurgery departments, at multipurpose center name after H. Z. Makazhanov. The patients' age ranged from 31 to 79 years, among them: 170 men, 88 women. Despite a modern equipment in operating theaters and improved tactics of surgical treatment, the problem of improving approaches to the surgical treatment of patients with brain tumors is still one of the top priorities in neurosurgery. The best result of surgical treatment is achieved when there is an accurate access to the main "target" - a tumor, which is provided by the navigation control system. This method involves accurate verification of the boundaries, the size of regional edema, the degree of vascularization of the neoplasm and differentiation of the feeding arteries. An ultrasound system was used at the stage of choosing the trajectory of a surgical attack, assessing the structure and degree of blood supply, as well as controlling the radical removal of the tumor and the quality of hemostasis. In the first 48 hours after the operation, all patients underwent a control CT scan. Differentiated application of modern neuroimaging methods allowed combining preoperative planning of surgical access, selection of a starting point and trajectory of a surgical attack, determination of the degree of radical removal of the neoplasm, and quality of hemostasis.
RESULTS: According to the tumor localization, patients could be identified as follows: convexital hemispheric tumors - 58 (22.5%); intracerebral hemispheric - 132 (51.1%); interhemispheric - 52 (20.2%); intracerebral cerebellar - 16 (6.2%). By morphological structure: shell tumors –110 (42.6%); neoplasms of the glial series - 135 (52.3%); vascular tumors - 13 (5.1%).
CONCLUSIONS: 1. The use of "Medtronic" neuronavigation systems significantly simplifies the planning of surgery, increases its radical nature, optimizes surgical approaches (dimensions and localization of the trephination window), and minimizes the risk of damage to the main functionally significant areas and brain vessels. 2. The use of methods of intraoperative neuronavigation increases the radical nature of the removal of brain tumors. 3. The use of intraoperative navigation in surgery of brain tumors reduces intraoperative blood loss, the duration of stay in the neuroreanimation department, the total duration of inpatient treatment, and postoperative mortality. 4. When using intraoperative navigation, the immediate postoperative period proceeds with a smaller number of complications, and the dynamics of neurological manifestations is more favorable. 5. Comprehensive application of the methods of intraoperative navigation allows to avoid errors that occur during brain displacement at the time of operation. The neuronavigation system is an effective tool for planning neurosurgical operations and their intraoperative support. The use of ultrasound navigation is effective in assisting intraoperative orientation and radicalization assessment, especially when removing glial tumors that do not have clear boundaries and are localized in functionally significant areas of the brain.

Dental morbidity of the population of the former military polygon "Emba-5"

Nurgul Zh. Zholdassova[1] *, Kozy M.Kibatayev[2], Azamat I. Kaikan[1], Albina M. Nurtileuova[1], Dana N. Tulepbergenova[1], Murat B.Sarsenbaev[1], Amangali A.Koptleuov[1]

[1]Department of therapeutical dentistry and prosthetics; [2]Scientific and Practical Center, West Kazakhstan Marat Ospanov state medical university, Aktobe, Republic of Kazakhstan

*Corresponding author: Nurgul Zh. Zholdassova, Department of therapeutical dentistry and prosthetics.
Email – n.zholdasova@mail.ru

BACKGROUND: The factors contributing to the development of major dental diseases also include climatic and geographical features of the area, harmful factors of production. the sharp deterioration of the environment and depletion of natural resources have led to the fact that at present it is difficult to find an area that is not subject to varying degrees of man-made impact, and today in the Republic of Kazakhstan there are more than 22 cities and industrial centers, where there is an unfavorable environmental situation. One of them is the military testing ground Emba-5, located on the territory of Aktobe region. During the existence of the test site were tested anti-aircraft missile systems, air defense, operational and tactical missiles of short range, as well as military exercises with the use of new weapons.
Purpose. To study the dental morbidity of the population of the Mugalzhar district of Aktobe region (the territory of the former military test site "Emba-5").
METHODS: Analysis of data on the incidence of dental diseases according to the Central district hospital for 2016-2018.
RESULTS: In 2016, the number of visits to dentists was 3863, which is 583.1 per 10 thousand population. Among them, the urban population was 3358 people (86.9%), including children under 14 years old – 2522 (65.3%); rural – 505 (13.1%), of them, children – 304 (60%). By disease factors: received treatment with caries 1455 (37.7%), with pulpitis – 1003 (26%), with periodontitis – 311 (8.1%) and with oral mucosa disease – 199 (5.2%). In 2017 the number of visits to dentists and dentists made 3317, which is 500.7 on 10 thousand population. Their urban population was 2580 people (77.8%), including children under 14 years old – 979 (37.9%); rural – 737 patients (22.2%), of them, children – 630 (85.5%). Total received treatment: with caries 1591 (48%), with pulpitis – 814 (24,5%), with periodontitis – 346 (11,3%), with the disease of the oral mucosa – 154 (4,6%) patients. In 2018, the total number of visits to dentists and dentists amounted to

1862 patients, which is 276.5 per 10 thousand population, of which the urban population was 1538 people (82.6%), including children under 14 years inclusive-942 (61.3%); rural population – 324 (17.4%), of them, children – 199 (66.4%). According to the forms of diseases: received treatment: 950 patients with caries (51%), with pulpitis – 540 (29%), with periodontitis – 209 (11.2%), with oral mucosa disease – 212 people (11.4%).
CONCLUSIONS: The total number of visits by patients to the dental office in 2018 decreased by 2.1 times compared to 2016. At the same time, the percentage of children under 14 years of age with dental diseases tends to increase, especially among children from rural areas. Among the forms of diseases dominated by caries, which tends to increase. A moderate increase is noted in other nosological forms (pulpitis, periodontitis, diseases of the oral mucosa).

Modern aspects of the anatomy tuition

Nurgulim S. Akhmad, Saltanat T. Dosaeva, Dinara S. Baygamisova, Tasbulat M. Dosaev*

Department of Anatomy, Asfendiyarov Kazakh National Medical Univesity, Almaty, Kazakhstan

*Corresponding authors: Tasbulat M. Dosaev, Department of Anatomy, Asfendiyarov Kazakh National Medical Univesity, Almaty, Kazakhstan. E-mail: tdosaev@inbox.ru

BACKGROUND: Nowadays a traditional method of anatomy tuition, using cadaverous materials, faces serious restrictions in many countries due to legal, confessional and ethical reasons.
METHODS: We compensate deficiency of corpse material using animal biomaterials. So when studying the heart, students dissect the bovine heart and study in detail the valvular apparatus of the heart, coronary vessels, and the conduction system of the heart. The teacher demonstrates features of comparative anatomy of the heart of humans and animals. Then students create from polymer clay a model of heart, forming chambers, valves, and large vessels.
After studying the larynx natural preparations students create a model of the larynx from plexiglas with movable joints between the cartilages.
In 3 halls of the Anatomy Department there located the Anatomical Museum with more than 1000 exhibits of anatomical preparations, specially made for educational purposes.
The Museum, equipped with a variety of exhibits, is intended to improve studying of the subject and understanding the essence of the human body structure.
The Museum contains unique preparations such as mummies, preparations of the brain, bones of the skull, skeletons of various species of vertebrates and mammals for comparative anatomy. Preparations are made using various techniques (mummification, enlightenment, corrosion, etc.). Corrosive preparations of internal organs such as polychrome infusion of blood vessels of the kidney and heart are also represented in the Museum.
For profiling of anatomy teaching of future pediatricians preparations of human embryos and fetuses are exhibited. Features of the skeletal system (primary points of ossification, fontanels), structural features of the internal child organs the are shown.
There are preparations with abnormalities such as hydrocephalus of oval hole and arterial duct in the heart, splitting of the hard and soft palate, congenital hernia, acephalia, hydrophilia, Siamese twins, atresia of the extremities, horseshoe-shaped kidney, modified wing valve, ectopic pregnancy , bovine heart.
During off-hours students study individually or in a team using bone and wet preparations, do research work and make reports for anatomical circles and meetings.
As a solution to overcome the tuition crisis mentioned above the following technologies are considered further.
We have created flip charts, structured as per organ systems and 3D slides for ActiveBoard and ActiveInspire aimed for first year students, who face massive data volume and complicated Latin terminology from the very beginning.
RESULTS: The tuition process is also organized both individually or in a group setting using brainstorming techniques to facilitate the learning process.
Also the interactivity of tuition process allows students to try either tutor or student roles.
CONCLUSIONS: Thus, modern anatomy tuition process consists of both traditional (using biomaterial) and digital educational methods. Implementation of the interactive tuition materials significantly improves learning process under lack of cadaverous materials.

Our experience in buried penis treatment

Meirambek S. Askarov, Yertay Y. Yerbolganov*, Amanzhol B. Mardenov, Khabibulla B. Bismildin, Indira T. Zhakupova

Department of surgical diseases №1, "Karaganda Medical University" non-commercial joint-stock company, Karaganda, Kazakhstan

*Corresponding author: Yertay Y. Yerbolganov, Department of surgical diseases №1, "Karaganda Medical University" non-commercial joint-stock company, Karaganda, Kazakhstan.
E-mail: Erbolganov@kgmu.kz

BACKGROUND: Buried Penis (BP) is an anomaly, first described by Keyes in 1919. Many conditions such as: concealed penis, inconspicuous, hidden megaprepuci, trapped penis are included in that terminology. There are many methods of the concealed penis elimination in children and adults. We have begun to apply the operation recommended by the European Association of Urology (EAU) in our clinic in 2010. We have faced the problem of skin deficiency for covering the truncus (shaft) of the penis after its mobilization in the course of this operation. In addition to operation recommended by EAU, we suggest use of pedicle flap of foreskin inner layer in condition of plastic material deficiency. The purpose of our study is to propose a method of operative treatment and to share our achieved results.
METHODS: for the period of two years (between from 2015 to 2018) 8 boys at age of 8 months up to 5 year are operated in the Department of Pediatric surgery with Urology, using plastic correction of the penis foreskin due to a BP. We propose our interesting method, which is

worked out of our experience. The method consists of an inner preputial vascularized graft as a plastic material. The operation is performed as follows: a curved skin incision is made along the border between the skin of penile shaft and the skin of the scrotum, directing towards the top of the scrotum; the incision is deepened with a needle coagulator through the dartos fascia to the deep fascia of the penis; the skin is separated from the penis along the entire circumference to its base. The preputial sac is opened by incision along the ventral surface along the ventral suture to the orifice, after which the head of the penis is pulled out and taken on the traction suture; the inner layer of the foreskin is dissected below the head by 6–8 mm along the entire circumference parallel to the coronal sulcus. Before the dorsal flap is separated from the subcutaneous fat, the flap is fitted (we make an assessment of sufficiency of the skin of the foreskin to close the shaft of the penis). In all cases there was a shortage of skin to cover the ventral surface of the penis; in some cases the skin lacked only 60% to cover the shaft of the penis. This problem prompted the invention of this method, that is, the use of a pedicle skin graft from the inner later of the foreskin to completely close the shaft of the penis. To achieve this goal, a rectangular flap is cut out of the inner sheet of the foreskin and moved to the ventral surface of the shaft of the penis. Transposition of the scrotum is eliminated by stitching the corners of the original incision. The edges of the skin are stitched with interrupted sutures. There are different attitude towards the penis with lack of local tissues. A practical algorithm is proposed, based on the different types of BP.
RESULTS: All 8 patients have splendid postoperative improvement and satisfactory functional results.
CONCLUSIONS: the proposed modified prepuce operation is a safe and effective method of BP correction. This method is quite a simple and effective procedure with good outcome.

Problems of education in the nursing

Ayganim A. Bolatbekova*, Auez R. Aitmagambetov, Dusen B. Kulov, Rustam R. Aitmagambetov

Department of Public Health, Karaganda Medical University, Karaganda, Republic of Kazakhstan

*Corresponding author: Ayganim A. Bolatbekova, Department of Public Health, Karaganda Medical University, Karaganda, Republic of Kazakhstan. E-mail: bolatbekova1992@gmail.com

BACKGROUND: all over the world, nursing specialists are currently being trained not only at the level of basic technical and professional education, but also at the bachelor's, master's and doctoral studies in nursing.
Objective: to identify the main problems of education in the nursing based on the literature review.
METHODS: 32 publications were found and selected in the search databases of the highest attestation commission and in the databases of the Russian Science Citation Index. Criteria for the inclusion of publications in the review: full-text articles in English and Russian, a summary of reports. As well as 11 regulatory documents.
RESULTS: In 2007 the standard of the Higher Education of Nursing was introduced in Kazakhstan and the training at the faculties of higher nursing education in medical universities. At the present time, preparing nurses with higher education is carried out by bachelor program (4 years).
From the beginning of training for these programs, the total number of bachelors of Nursing from 2011 to 2015 amounted to 1,194 specialists. In accordance with the level of qualification, no more than 30.5% of graduates are employed. A significant part of the graduates are forced to work in lower positions (district nurses, nurses, etc.).
Since 2014 in Kazakhstan the preparation of bachelors of nursing is implemented in two main programs - academic and applied bachelor.
Nowadays in Kazakhstan there are the following levels of nursing training: Junior nurse; Nurse; Applied Bachelor of Nursing; Academic Bachelor of Nursing; magistracy
In the republic 63 medical colleges, 28 of which are public and 35 are private prepare nursing staff. At the same time, 24 colleges are under the jurisdiction of local executive authorities, 1 - at the State Medical University, 1 - at the republican level.
Also the project is being implemented for the development of an applied baccalaureate educational program in a
CONCLUSIONS: In Kazakhstan the main problem is that doctors train nurses; in practice a similar problem: nurses are subordinate to doctors, and not to the senior / main nurse.
Another problem is the lack of clinical practice in the education of nurses.
Despite the availability of all levels of nursing education, the level of science development in nursing is low. Scientific and technical programs with research in nursing are not created. In the "Comprehensive nursing development plan in the Republic of Kazakhstan until 2020", that only two papers were published in Scopus journals by Kazakhstan nursing researchers for the period from 1996 to 2012.

A review on current changes in the timing of pubertal development and incomplete forms of early puberty

Giovanni Farello[1] *, Carla Altieri[1], Maristella Cutini[1], Alberto Verrotti[2]

[1]Pediatric Unit, Department of Health, Life and Environmental Sciences, University of L'Aquila Italy; [2]Department of Biotechnological and Applied Clinical Sciences, University of L'Aquila Italy

*Corresponding author: Giovanni Farello, Pediatric Unit, Department of Health, Life and Environmental Sciences, University of L'Aquila Italy. E-mail: giovanni.farello@cc.univaq.it

BACKGROUND: Puberty is a sensitive period of life characterized by the appearance of secondary sex characteristics which leads to a complete sexual maturation.
It physiologically starts between the age of 8 and 13 years in girls and 9 and 14 years in boys.
Familiar or genetic hereditariness and neuroendocrine factors are some of the determiners of the onset of puberty which is also influenced by general health, nutrition, exercise and environmental chemicals
It is still unclear what is the real connection between early puberty and obesity in girls but some hypothesis who can

support it are the role of leptin in the activation of GnRH neuron secretion and the presence of an exaggerated secretion of insulin.
In the last two decades different studies has showed as the start of puberty has moved up to younger ages by 12-18 months and some of the hypothesis trying to explain this change include the role of nutritional status and growth but also the influence of extrinsic factors such as the exposure to the endocrine -disrupting chemicals (EDCs).
PREMATURE PUBARCHE / ADRENARCHE
Premature pubarche is a form of incomplete puberty characterized by the presence of pubic hair in girls under 8 years of age and in boys under the 9 years of age. With an incidence of 3%, this form of puberty seems to be particularly frequent in the Mediterranean area.
The causes of premature pubarche/adrenarche has not been clarified yet; one of the theories could be a precocious maturation of the reticularis zone of the adrenal glands with a peak in the levels of androgens similar to the levels usually reached at the onset of puberty.
PREMATURE THELARCHE
Premature thelarche is defined by the unilateral or bilateral isolated breast development without the development of other sexual characteristics before 8 years of age. Skeletal maturation is linear, with a good correlation between bone and biological age.
Some of the possible causes of premature thelarche include increased FSH (but not LH) secretion, excessive dietary intake of estrogens such as phyto-estrogens and increased breast sensitivity to circulating estrogens, obesity and the role of endocrine disrupting chemicals (EDCs).
PREMATURE MENARCHE
Premature menarche is defined as a menstrual-like vaginal bleeding in girls under the age of 9 years old without the presence of other signs of pubertal development. The main cause of this condition is still unknown, but it seems to be associated with a hypersensitivity of the endometrium to very low levels of estrogens.
EARLY PUBERTY
Early puberty is defined by the presence of clinical and auxological signs of pubertal development between the age of 8 and 10 years, or between the age of 7.5 and 8.5 years old or between the age of 8 and 9 years old. This condition may also be related to the secular trend in pubertal timing anticipation.
CONCLUSIONS: In the last decades we witnessed a stable anticipation of the first steps of pubertal development even though the age of menarche has remained unchanged. Therefore, it is essential to carefully discriminate patients with signs of precocity in the pubertal timing from the actual and swiftly progressive forms of precocious puberty.

Robot help-assistant "Pill-helper"

Marat K.Iztleuov, Aigul U. Turganbaeva, Makhabbat B. Shurenova, Sanimgul S.Sambayeva*, Asem A. Temirbayeva

Department of Natural Science disciplines, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Sanimgul S. Sambayeva, Department of Natural Science disciplines, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mal: s.sanim_kz@mail.ru

BACKGROUND: The sphere of robotics in Kazakhstan is on the way of development and need of innovation. Advanced designs in medical robotics of native production will create conditions for development of robotics in Kazakhstan. And also, will bring medical service to new level. The purpose of the research is development of a prototype of the robot assistant.
OBJECTIVITIES:
1. To design a 3D model of future robot in program 3DMaxStudio
2. Design of a 3D model of the robot
3. Creation of the program for control of the robot on the Android platform
   - an algorithm for the program
   - creation of own program using the Arduino Uno programming environment
   - Testing of a finished stock

METHODS: The program 3DmaxStudio is for creation the 3D model of a robot prototype. Methodical guide for working with the program ArduinoUno for the details of the robot is assembled. Details were printed using a 3D printer. Algorithm and program code for the robot operation program.
RESULTS: The 3D model of the Pill-Helper robot is created on the basis of the 3DmaxStudio program, which made it possible to create a real model of the robot. On the basis of 3D model, work with the program is carried out, assembly of motor mechanisms for work with cells for drugs, for moving it in space were done. Algorithmization and software code for the operation of the robot are produced. The latter allowed controlling the operation of the robot, as well as its functions, i.e. set in motion its functional parts, the mechanisms for opening and closing cells, adjust and prescribe new schedules for taking medicines, manage all its functions. Testing of the robot showed his service ability. This robot is a prototype of the robot assistant. The model of the robot proves that important components of the robot, algorithms of the program for his work can be reproduced also in our country. Advantages of use of the robot: conditions of activity of patients improve and safety of work of medical personnel increases; costs of carrying out the procedures performed by nurses' decrease; the overall performance of medical personnel increases, the load with routine procedures decreases.
CONCLUSIONS: As a result, the prototype of the robot help-assistant Pill-helper is obtained.

Introduction of automated tables for calculation of metabolic disorders in educational process of discipline "Basics of General Medical Practice"

Semyon S. Bobyrev*, Maiya S. Serikova, Karlygash A. Alihanova, Bauyrzhan K. Omarkulov, Samat B. Aitbek, Nadezhda A. Zhukova

Department of General Medical Practice №1, Karaganda Medical University, Karaganda, Kazakhstan

*Corresponding author: Semyon S. Bobyrev, Department of General Medical Practice №1, Karaganda Medical University, Karaganda, Kazakhstan. E-mail: bobyrevsemyon@gmail.com

BACKGROUND: to teach students in medical educational institutions to calculate body mass index (BMI), to reveal the presence of metabolic syndrome and risks of comorbidities by using automated tables.

METHODS: we developed program/automated table (certificate of entry into the state register of rights to copyright-protected items №462, dated 9th November, 2019), which are intended to be used by medical workers, researchers, individuals who study in medical educational institutions, other individuals, and those without special medical education. This developed program able to calculate BMI, automatically define presence of metabolic syndrome, interpret BMI results also analytically predict risks of comorbidities during additional input of definite data. The automated table based on software, Microsoft Excel. As a basis we took: current formula of BMI calculation (mass of body in kg/height in meters ^2), interpreting results of BMI, diagnostic criteria of metabolic syndrome (IDF 2016) also classification of risk of comorbidities, which developed under recommendations of world health organization (WHO, 1997). Program consist of 3 lists: "Fill out forms", "Calculation sheet" and "Menu" which included in the Excel as one book. Fill out form is the major list for users, which responsible for data input and display current results. Calculation sheet is major list functional list, which responsible for all mathematical calculations. "Menu" is supporting dropdown list with additional information displayed in fill out list for users. For more convenient use and to avoid editing of functional and supportive data of program, "Calculation sheet" and "Menu" is hidden from user and protected by password. The program equipped with understandable interface, easy to use for any users.
RESULTS: the program described above was introduced into practical healthcare in polyclinics of the Central region of the Republic of Kazakhstan. Positive feedback was received from the staff of medical institutions on the effectiveness of this program, as well as supporting documentary evidence were received as a response for introducing automated tables at the outpatient admission of patients. Considering the positive recommendations of public health, we decided to implement an automated table for calculating body mass index, presence of metabolic syndrome and the risks of comorbidities in the educational process within course of "Basics of General Medical Practice". That allowed to improve the quality of education by developing knowledge of the metabolic syndrome's diagnostic criteria, general classifications of obesity, skills of the obtained results interpretation and application of anthropometric survey skills in practice.
CONCLUSIONS: the use of automated tables in the educational process of discipline "Basics of General Medical Practice" allowed to form professional competencies among students, during the work with patients with disorders of carbohydrate and lipid metabolism, as well as at working on the early identification of risk factors and development of comorbidities.

Successful management of severe preeclampsia major complications: case report

Svetlana Shikanova[1], Ibrahim A. Abdelazim[2, 3] *, Bakyt Karimova[1], Mukhit Sarsembayev[1], Gulmira Mukhambetalieva[1], Mariya Bekzhanova[1]

[1]Department of Obstetrics and Gynecology No.1, West Kazakhstan State Medical University named after Marat Ospanov, Aktobe, Kazakhstan; [2]Department of Obstetrics and Gynecology, Ain Shams University Cairo, Egypt; [3]Department of Obstetrics and Gynecology, Ahmadi Hospital, Kuwait Oil Company (KOC), Kuwait

*Corresponding author: Ibrahim A. Abdelazim, Department of Obstetrics and Gynecology, Ain Shams University Cairo, Egypt.
E-mail: dribrahimamwar@gmail.com

BACKGROUND: Maternal hemorrhage, hypertension and sepsis are the three leading causes of maternal deaths. The hypertensive disorders with pregnancy are common in low and middle-income countries.
Severe preeclampsia (PET) has considerable adverse maternal and fetal outcome especially in low-resource countries.
CASE REPORT: A 21-years old pregnant woman, admitted to Shalkar Medical Center as prim-gravida, severe preeclampsia and intrauterine fetal death (IUFD) at 32 weeks` gestation due to abruptio-placentae and delivered by cesarean section (CS).
Intraoperatively; the placenta was totally separated with Couvelaire uterus with atonic PPH managed according to the hospital protocol.
She was transferred by the air ambulance to West Kazakhstan University (WKU) maternal intensive care unit (ICU), as severe preeclampsia (PET) complicated by IUFD due to accidental hemorrhage (abruptio-placentae) and renal failure (anuria due to acute tubular necrosis (ATN)).
On admission to WKU-ICU; she was anemic (hemoglobin 7.8 gms/dl), with generalized edema, anuria, 160/110 mmHg blood pressure, 21x1000/mm3 platelet count (thrombocytopenia), with normal coagulation profile, normal bilirubin and normal liver function tests (HELLP syndrome excluded).
Markers of infections showed elevated total leucocyte count (15.000/mm3), while, the other markers of maternal infection and sepsis (C-reactive protein (CRP) and procalcitonin) were normal (maternal sepsis excluded).
She was managed by multi-disciplinary team approach (nephrologist, radiologist and neurologist beside the obstetrician) with clear management plan including;
1. Correction of anemia.
2. Correction of the thrombocytopenia.
3. Control of the blood pressure to maintain the blood pressure <160/100 mmHg.
4. Renal dialysis based on the renal function tests, serum potassium level and fluid overload signs.
5. Human albumin to correct hypoalbuminemia.
6. Laboratory investigations according to the hospital protocol.

The studied woman developed two attacks of tonic colonic convulsions (Eclampsia) on the 5th day postpartum 12 hours apart.
After the second attack of convulsion, brain computerized tomography (CT) showed; right partial lobe intracranial hemorrhage (ICH) of 1.35 Cm^3 volume.
The thrombocytopenia, anemia, ICH and the postpartum eclampsia were added to the final diagnosis of the studied woman.
The renal failure was transient due to acute tubular necrosis managed by 5 sessions of dialysis and resolved on the 10th postpartum day with normal urine output and normal renal function tests.
The ICH size decreased by the follow-up brain CT and resolved on the 16th postpartum day and she was dis-

charged from the hospital on the 20th postpartum day in good general condition for follow up in the outpatient`s department.
CONCLUSIONS: This case report represents severe preeclampsia major complications managed successfully by multi-disciplinary team approach to highlight the importance of the clear management plan to avoid the morbidity and the adverse outcome of the severe preeclampsia. We are in need for an international and national program to increase the awareness of the population towards the serious morbidity and adverse outcome associated with the hypertensive disorders with pregnancy.

Analysis of the survival and mortality in low-birth weight newborns in a comparative aspect

Svetlana Shikanova*, Gulmira Mukhambetalieva, Nazgul Izgalieva

Department of Obstetrics and Gynecology No.1, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Svetlana Shikanova, Department of Obstetrics and Gynecology No.1, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: shik.sv@mail.ru

BACKGROUND: The use of scientific practices in nursing children with extremely low (ELBW) and very low birth weight (VLBW) at birth has significantly reduced mortality and morbidity.
METHODS: We carried out a comparative analysis within a retrospective study of the survival and mortality of children born with ELBW and VLBW with a difference in 8 years: 74 cases for 2018 and 105 cases of birth of similar children for 2011. All births took place in the Regional Tertiary Care Center of Aktobe. Statistical processing was performed using the software STATISTICA.v.10. Nonparametric operational tests were used due to a priori missing a normal distribution. For all tests a two-side type I error of $P \leq 0.05$ at 95% CI was assumed statistically significant.
RESULTS: The proportion of children born with ELBW and VLBW in 2018 was 1.1% (74) of the total number of births (6534), while in 2011 it was equal to 1.4% (105 out of 7295). Among all cases of birth with low weight in 2018, 20.3% were children with ELBW and 79.7% were children with VLBW, compared to 29% and 71% in 2011, respectively. Of them, various pathologies at birth were the following: Respiratory Distress Syndrome (SDR) was found in 81% vs. 86% of cases, perinatal pathology of the central nervous system (intraventricular hemorrhage (IVH) and hypoxic-ischemic encephalopathy) in 18.9% vs. 25%, Lung Atelectasis in 4% vs. 5%, Bronchopulmonary Dysplasia (BPD) in 2.7% vs. 3.7%, in respect to a corresponding year. Necrotizing enterocolitis, fetal hepatitis, occlusive hydrocephalus and acute nephritis were found in 1.3% and 1.2% of cases, respectively.
The study showed that the mortality rate in children born in 2018 with extra small bowel movements and intestinal neoplasms was 35%, compared to 26% in 2011. Of them, 53.3% of children were born with ELBW and 30.5% with VLBW, respectively, and the mortality rates resulted in 38.7% and 17.5%, respectively. Among the major causes of mortality IVH is to the forefront - 38.6% and 32% of cases, in respect to a corresponding year, while intrauterine infections (IUI) ranked 2nd, 30.8% and 28%, respectively. In the list of main causes of mortality are also congenital malformations (CDF) recorded: 11.5% vs. 20%, lung atelectasis 7.7% vs. 8%, sepsis 3.8% vs. 8% and neonatal asphyxia 3,8% vs. 4%, in respect to a corresponding year. Besides, accompanying SDR was found in close to 100% of lethal outcomes.
Thus, the number of children born with ELBW and VLBW as being 1.1% by 2018, slightly declined comparing to 1.4% in 2011. Among the causes for perinatal mortality SDR yet ranked first, then IVH, IUI and CDF, respectively. Survival and mortality of children with ELBW and VLBW is an important component of the medical and demographic situation in the region. Provided close to 100% survival rate will be achieved for children with neonatal neoplasia of low intensity, the infant mortality rate should be significantly reduced.
Among the causes for perinatal mortality SDR yet ranked first, then IVH, IUI and CDF, respectively.
CONCLUSIONS: The findings suggest the need to improve the measures of antenatal prevention of preterm birth and surfactant maturing therapy, intensive care for newborns and comprehensive measures of medical rehabilitation for surviving children.

Simulation training in ophthalmology

Y.A. Shusterov, L.L. Sergeevna*, G.P. Arinova, B.S. Akhmadyarov, K.N. Tabriz

Department of Ophthalmology and Otorhinolaryngology, Karaganda Medical University, Karaganda, Kazakhstan

*Corresponding author: Lee Larisa Sergeevna, Candidate of Medical Sciences Department of Ophthalmology and Otorhinolaryngology, NSS "MUK". Email: li@kgmu.kz

BACKGROUND: The training of highly qualified medical personnel is one of the priority tasks for the development of the national health of the Republic of Kazakhstan. On the 7th year of the specialty "General Medicine" in order to optimized the educational process for the formation of clinical thinking among students we have introduced a new course of objective structured clinical examinations (OSCE)-"Virtual Patient" applying a special computer program (case). This program allows students to diagnose ophthalmopathology and assist patients with the results of their actions. The multiplicity of options for the diagnosis and treatment of a clinical case also allows for erroneous options. This allows you to increase the safety of the educational process for patients, to improve the level of professional skill of future doctors. The use of the concept of a virtual patient not only contributes to increasing the objectivity of their assessment, but also motivates to a deeper analytical approach in the study of the discipline.
METHODS: To accomplish our aim a have educated "Virtual Patient" case for the discipline "Ophthalmology" discipline using the OpenLabyrinth platform as OSCE station based on the Practical Skills Center of the Medical University of Karaganda (Certificate of State Registration of Copyright No. 1048 of 22 May 2017). The basis of the case has founded on the goals and objectives of the study

of the discipline "Ophthalmology" by students of the specialty "General Medicine". The role of clinical disciplines consists of educating students in collecting and analyzing information about the patient's health, a professional algorithm for solving practical problems of diagnosis, treatment of patients and prevention of diseases; professional behavioral skills and medical records management.
An algorithm has created for making decisions on case materials with the only correct branch. At the next stage, depending on the decision made by the student, alternative branches have built. Both in the main and alternative branches, the student has offered the results of ophthalmological, laboratory, instrumental research methods and recommendations for making the next decision. The following competencies and skills have evaluated demonstration of clinical skills, demonstration of practical skills, presentation of information to the examiner, skills of interpretation of laboratory and instrumental data, organization/efficiency.
RESULTS: According to the results of the survey, the majority of students noted that the use of a new algorithmized station "Virtual Patient" motivates them to clinical thinking to solve the problem, because it uses an interactive method with visualization of each step and the choice of options for a particular solution to the problem. Thus, 66% of respondents agree that the OSCE station brings practical benefits, 12% disagree and 22% found it difficult to answer.
CONCLUSIONS: Using the virtual patient in the learning process, shifting the focus on the student with the ability to make mistakes, correct the sequence of actions in the process of diagnosis, patient management tactics, brings the students closer to the real situation, increases the effectiveness of training, motivates them to further self-education. Computer technologies evaluate the actions of students without the presence of the patient. All this contributes to reducing the number of medical errors, improving the quality of medical care and the level of professional training of future specialists - ophthalmologists.

Spatial-temporal gait characteristics of persons with different somatotypes

Larisa A. Udochkina[1] *, Olga I. Vorontcova[2]

[1]Department of Anatomy, Astrakhan State Medical University, Astrakhan, Russia; [2]Center of three-dimensional study biomechanics of human movements, Astrakhan State University, Astrakhan, Russia

*Corresponding author: Larisa A. Udochkina, Department of Anatomy, Astrakhan State Medical University, Astrakhan, Russia.
E-mail: udochkin-lk@mail.ru

BACKGROUND: Clinical gait analysis using motion analysis systems is used to diagnose the state of the human musculoskeletal system. A large amount of research has been devoted to the analysis of biomechanics of walking, but the question of studying the peculiarities of the gait of people belonging to different somatotype groups is not yet sufficiently studied. The aim of the work is to determine the spatial-temporal parameters of walking healthy men aged 16-21 years with different somatotypes.
METHODS: The work was performed at Astrakhan State University using the Vicon motion capture system. One hundred forty healthy male subjects aged 16-21 years who did not complain of the musculoskeletal system problem at the time of the study were examined. Of these, sixty-two people were randomly selected and divided into three groups according to their somatotype. Somatotyping was carried out according to the method of Heath B.H. and Carter J.E.L., with the release of endomorphic, mesomorphic and ectomorphic body type. The distribution of the studied group according to somatotypes was carried out as follows: out of the total number of studied endomorphs were eight people (12.9%), mesomorphs were fifty people (80.06%), and ectomorphs were four people (6.5%). The results of the analysis gait cycle parameters were compared with similar data of persons of the same age, examined without taking into account the somatotype (comparison group). Processing of the obtained material was performed using Microsoft Excel. The degree of accuracy of the study is determined by the probability of an accurate forecast less than or equal to 0.95%; significance level $P \leq 0.05$; Student's *t*-test used $t = 2$.
RESULTS: The following length of the lower extremities was recorded: 0.98 ± 0.2 m in the group of ectomorphs, 0.95 ± 0.2 m in the group of endomorphs, 0.86 ± 2 m in the group of mesomorphs. Analysis of the obtained data showed that the values characterizing the spatial-temporal parameters of gait of ectomorphs and endomorphs are different from the results of the comparison group. The main differences affected the following parameters: gait speed, base of step, step time and double support. Endomorphs have a gait speed decrease of 0.09 m/s, an increase in the base of a step by 0.04 m., a step time by 0.03 s. and double support at 0.04 s.
Ectomorphs showed an increase in gait speed of 0.04 m/s, step time by 0.02 s, double support by 0.04 s and stride length by 0.08 m. The spatial-temporal characteristics of mesomorphs did not differ much from the indicators of the comparison group.
CONCLUSIONS: Spatial-temporal parameters of gait depend on their somatotype. In persons with an endomorphic body type, these differences are more pronounced and differences in persons with an ectomorphic body type are less pronounced. The revealed differences in the spatial-temporal characteristics are due, among other things, to differences in the ratio of the lengths of the segments of their lower limbs, which in turn proves the influence of anthropometric differences between individuals belonging to different somatotype groups on the gait pattern change. When creating reference bases of gait biomechanical parameters of people different gender and age, it is necessary to take into account their belonging to different somatotype groups.
The work was performed within the framework of the fulfillment of the State task No. 12.9588.2017 / 7.8.

Sports and Exercise Medicine electives for Kazakh Higher Education Curriculum

Yeltay Rakhmanov[1, 2], Yerbol Zh. Bekmukhambetov[1], Sapargali B. Rakhmanov[1], Gulmira A. Zhurabekova[1], Akmaral M. Baspakova[1], Guido Macchiarelli[2] *

[1]Marat Ospanov West-Kazakhstan State Medical University, Aqtobe, Kazakhstan; [2]Department of Life, Health and Environmental Sciences, University of L'Aquila, L'Aquila, Italy

*Corresponding author: Guido Macchiarelli, Department of Life,

Health and Environmental Sciences, University of L'Aquila, L'Aquila, Italy. E-mail: gmacchiarelli@univaq.it

BACKGROUND: The purpose of this review was to analyze International, National Health Care (HC) and Higher Education (HE) System to propose the appropriate model for teaching and service delivery in Sports and Exercise Medicine (SEM).
METHODS: PRISMA statement by Moher *et al.* (Preferred reporting items for systematic reviews and metaanalyses) was used to design this review. Materials published in English, Italian, Kazakh, Polish and Russian languages were considered into study. Data were extracted from the electronic databases: EMBASE, MEDLINE via PubMed, PLEIADI, SciELO and publications of the Ministry of Health, Ministry of Science & Education of the Republic of Kazakhstan.
RESULTS: In Aqtobe Oblysy, 27% of patients have had addressed to primary care (PC) physicians due to musculoskeletal problems, 68% of SEM interventions are available in hospitals, mostly in urban areas and out of pocket expenses for SEM are still higher. In Kazakhstan, there is lack of highly qualified specialists in PC to provide advice on SEM and prescribe physical activity as part of treatment. In isolated, rural areas, SEM services are offered by vocational school graduated-nurses. In industrialized countries, these problems are solved by organizing dedicated courses on SEM for medical under-, postgraduates, empowering community health workers, not-for-profit organizations and capacity-building programs for allied health professionals. In the curriculum of Kazakh undergraduates of "General Medicine", "Public Health", "Nursing" the allocation percentage for Physical education (PE) is 5-7% as compulsory, elective and extracurricular activities. But methodological approaches are different than their western colleagues.
CONCLUSIONS: SEM curriculum should be structured by considering the needs of local community to integrate SEM into Kazakh HC. There is need for more quota of reserved places for residency students in Sports Medicine. Elective discipline for PC personnel are essential to fill knowledge and experience gap in SEM. SEM elective program should be elaborated by multidisciplinary team, which unites not only clinicians (Sports, Rehabilitation Medicine, Physiotherapy, Anatomy, Orthopedics, Emergency Care, Cardiology, Endocrinology, Laboratory Diagnostics Specialists, Pharmacologists, Geneticists, Dieticians, Physiologists, Psychologists) and also allied health professionals such as Public Health Specialists, Medical Sociologists, PE Teachers, Statisticians, Non-Profit Organization Managers etc. Problem-based teaching, peer to peer learning are recommended as PE teaching methods for medical students that give opportunity to acquire new skills and generate knowledge with further implications for health promotion, prevention, treatment and rehabilitation practice.

Surgery of cerebral aneurysms

Nurtas I. Tursynov*, Ermat M. Sanayev, Samat Zh. Aumazhitov, Rakhym Zh. Mergenbay, Ruslan A. Khautiyev

Department of Neurosurgery and Neurology, Non-profit JSC Medical University of Karaganda, Karaganda, Kazakhstan

* Corresponding author: Nurtas I. Tursynov, Non-profit JSC Medical University of Karaganda, Karaganda, Kazakhstan. E-mail: tursynov@kgmu.kz

BACKGROUND: To determine the results of surgical treatment of patients with cerebral aneurysms.
METHODS: In 2013, on the recommendation of Neurosurgical Department of the Multipurpose Center of the Karaganda, the Neurosurgical Centre was established. One of the tasks of the centre is to select patients with cerebral aneurysms for surgical treatment. The majority of patients come on an emergency basis from outpatient clinics, district and regional hospitals. On the day of hospitalization MRI, CTA and CAG are performed.
In the last 3 years, under conditions of the Neurosurgery center, 238 patients underwent surgery with aneurysms out of which 138 patients (59%) (group A patients) were treated with microsurgical clipping and 96 (41%) (group B patients) were treated with endovascular embolization. The age of patients ranged between 22 and 84 years. There were 81 men and 153 women.
The most suitable surgical treatment was carried out taking into account the anatomical accessibility, the ratio of the diameter of the aneurysm dome and its neck, and the presence of special tools.
RESULTS: In most cases, patients had one aneurysm. Multiple aneurysms were revealed in 17 patients (12.3%) of group A and in 7 patients (8.3%) of group B.
They operated on a total of 208 aneurysms of the anterior segment arterial circle (88.9%) and 26 aneurysms of the posterior segment (11.1%). The most frequent aneurysms of the ICA - 84 cases (35.9 percent) and aneurysms of the ACA – 79 cases (33.8%). The structure of operated aneurysms differed in both the groups.
In group A, the aneurysms of ACA (42%) and MCA (37%) prevailed, and in group B, aneurysm of the ICA (55%) were more prominent. Only 3 patients of group A, were operated for aneurysms of the vertebrobasilar basin, and only 9 patients of group B were operated for aneurysms of MCA (7%).
Aneurysms of medium size (from 5 to 15 mm) made up 71% of their total number. The number of large and giant aneurysms in group A was 19, in patients of group B - 27 cases (28.1%) were reported. Small aneurysms were commonly found in patients of group B - in 14 cases (10.0%). The majority of patients in both groups were operated for ruptured aneurysms (127 and 65 patients, respectively).
In group A, patients of Hunt-Hess grade 2 and 3 prevailed (64%), whereas in group B, patients of Hunt-Hess grade 2 (48%). In group A, patients of Hunt-Hess grade 4 and 5 are more commonly operated.
CONCLUSIONS: Microsurgical intervention provides a significantly greater radicalism off aneurysms from the bloodstream, as compared with the embolization of aneurysms microspirals. However, the frequency of effective shutdown aneurysms from the bloodstream is identical. All patients after intravascular interventions require long-term dynamic monitoring for early diagnosis and correction of disease recurrence. Embolization is most effective in aneurysms of the anterior cerebral and internal carotid arteries of small size with a narrow neck. The radicality of microsurgical clipping is not determined by the localiza-

tion and size of aneurysms. The decision of choosing the optimal method of surgical intervention for an aneurysm in the acute period of hemorrhage should be carried out taking into account the clinical condition of the patient, the form and severity of SAH, the anatomical factors of aneurysm, the presence of SAH complications, and the risk of open and intravascular surgical interventions.

Our experience of using the virtual simulator "Lapsim" in the training of interns-surgeons

Bazylbek S. Zhakiev, Uteugali G. Karsakbaev, Aset A. Elemesov, Bulat A. Kurmanbaev*, Botagoz P. Mukhamedgalieva, Nadiyar M. Musin

West Kazakhstan State Medical University named after Marat Ospanov Chair of Surgical Diseases №2 with Urology Republic of Kazakhstan, Aktobe city

Corresponding author: Bulat. A. Kurmanbaev, West Kazakhstan State Medical University named after Marat Ospanov Chair of Surgical Diseases №2 with Urology Republic of Kazakhstan, Aktobe city. E-mail: kurmanbaevbulat@gmail.com

BACKGROUND: Recently, in medical schools there is a priority for the implementation of innovative educational technologies in educational process. Therefore, one of the important problems of modern medical education is the training of specialists with a good level of laparoscopic techniques to ensure the widespread introduction of minimally invasive technologies into clinical practice.
The results of numerous studies confirm the high efficiency of teaching for basic laparoscopic skills on training simulators. It has been proven that the skills acquired by novice endosurgeons during such training sessions are successfully transferred and reproduced in actual conditions. The purpose of study was to evaluate the possibilities of using a virtual simulator in the system of training ofendosurgical skills for interns-surgeons.
METHODS: For the acquisition of endosurgical skills by interns-surgeons, we have a cycle on endoscopic surgery in the form of an elective discipline – 90 hours. Practical class is held at the department, and the self-work of a student with teacher (SWST) and self-work of a student (SWS)– at the center for practical skills (CPS) of the WKSMU named after M.Ospanov, which has the basic equipment for training of laparoscopic skills: a set of necessary tools and consumables, a computer simulator virtual simulator "Lapsim". Therefore, the department made guidelines for teaching of clinical skills in the clinical training center on the topic "Practical skills of working on the virtual Lapsim simulator", where interns should demonstrate practical skills on capturing, positioning and orienting the object in space using the spectacular clamp on the Lapsim virtual simulator.
RESULTS: The virtual computer simulator "Lapsim" provides the surgeon with the choice of several levels of training – from basic movements to complexly coordinated skills:
— Navigation camcorder
— Navigation tools
— Movement coordination
— Capture of the object
— Rise and capture (combination of 2 tasks)
— Crossing the cloth
— Exercise on the evaluation of coordination of movements is performed on a laparoscopic simulator 3D-med.
— Exercise on the evaluation of bimanual manipulations of eye-hand coordination and 3-dimensional orientation in a 2-dimensional image (performed on 3-D laparoscopic simulator).
The exercise is evaluated by a computer, so the simulator can be used for independent objective testing of the level of practical training.
The main advantages of the virtual simulator "LapSim": the duration and mode of training may not be limited in time; there is the possibility of repeating the exercise to an acceptable qualitative and quantitative assessment set automatically by the computer. In addition, there are no ongoing financial costs and ethical issues compared with animal laboratory education.
CONCLUSIONS: Our experience of using the virtual laparoscopic simulator "LAPSIM" in the program of postgraduate education and the acquisition of endosurgical skills by intern-surgeons shows the feasibility of its use in combination with other teaching aids.

The choice of method of surgical treatment of glial brain tumors

Nurtas I. Tursynov*, Ermat M. Sanayev, Samat Zh. Aumazhitov, Rakhym Zh. Mergenbay, Ruslan A. Khautiyev

Department of Neurosurgery and Neurology, Non-profit JSC Medical University of Karaganda, Karaganda, Kazakhstan

*Corresponding author: Nurtas I. Tursynov, Non-profit JSC Medical University of Karaganda, Karaganda, Kazakhstan.
E-mail: tursynov@kgmu.kz

BACKGROUND: To determine the results of surgical treatment of patients of patients with brain tumors.
METHODS: An analysis of the results of surgical treatment of 396 patients with glial brain tumors who were hospitalized from 2016 to 2018 was carried out in a multidisciplinary canter of the city of Karaganda. The age of patients ranged from 28 to 80 years, among them: men 125 (31,8%), women 254 (64,4%), children 15 (3,8%). The most important stage in the treatment of glial tumors is surgical treatment. When conducting operations, it is necessary to use modern technologies that recluse the trauma of surgical intervention, prevent neurological deficit, and improve the quality of life of patients. The decision in favor of active surgical tactics should be made with a pronounced mass-effect, compression and dislocation of the brain.
RESULTS: Localization of the frontal lobe – 98 (26,1%), temporal lobe – 72 (19,1%), parietal lobe – 90 (23,9%), occipital – 5 (1,3%), combination – 111 (29,6%). Radical operations were performed in 346 (92,1%) cases, in 30 (7,9%) cases palliative operations. All patients underwent surgery in the from of osteoplastic or decompressive trepanation. On the localization of the hemisphere were involved in 291 (73,8%) cases, of which the right-sided process – 132 (45,4%), left-sided – 159 (54,6%), where the frontal lobe consisted to – 69 (23,8%), the temporal

lobe – 51 (17,5%), parietal lobe – 32 (10,9%), occipital – 6 (2,1%), combination – 133 (45,7%). In 2 cases there was a lesion of the frontal lobe with germination in the corpus callosum. It is speaks other localizations, neoplasms in the subcortical ganglion were found in 1 (0,5%) case, intraventricular – 13 (3,2%), tumors of the optic nerve and chiasm – 2 (0,5%), brain stem – 3 (0,7%), hemisphere of the cerebellum 27 (6,8%), pineal region 3 (0,7%), transparent septum – 1 (0,2%), combined cerebellar lesion and IV ventricle 49 (12,4%).
Histological examination in 164 (41,6%) cases anaplastic astrocytoma was verified, in 69 (17,5%) – fibrillary astrocytoma, in 21 (5,3%) – fibrillar-protoplasmic astrocytoma, in 4 (1,0%) – protoplasmic astrocytoma, in 43 (10,9%) – oligoastrocytoma, in 6 (1,5%) – polycytic astrocytoma, in 7 (1,7%) – oligodendrogliomas, in 77 (19,5%) – glioblastomas. If we take the prevalence by age group, the astrocytoma is more common in men 186 (47,2%), in women 66 (16,7%), in children 19 (4,8%); glioblastoma in men 32 (6,7%), in women 22 (4,6%); choroid papilloma in men 3 (0,6%), in women 1 (0,2%); ependymoma in men 3 (0,6%), in women 3 (0,6%), in children 6 (1,2%); medullablastoma in men 15 (3,1%), in women 6 (1,25%), in children 44 (9,2%).
CONCLUSIONS: 1. The choice of surgical treatment method is determined by the localization of the tumor, the phase of the clinical course of the disease, the general condition of the patient, the histological structure of the tumor. 2. When comparing the outcomes of various surgical interventions, it is also necessary to take into account the initial state of the bout before the operation. This will, to a significant degree, make it possible to more reliably judge the effectiveness of that more or other method of operation. 3. In patients with glial brain tumors that were in the phase of gross clinical decompensation, the use of the palliative surgery method as the first stage of removal of the cystic part of terms of improving postoperative outcomes.

The effectiveness of the TBL method

Marat K. Iztleuov, Sanimgul S. Sambayeva*, Aigul U. Turganbaeva, Asem A. Temirbayeva, Makhabbat B. Shurenova

Department of Natural Science disciplines, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Sanimgul S. Sambayeva, Department of Natural Science disciplines, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mal: s.sanim_kz@mail.ru

BACKGROUND: Team-based learning (TBL) involves not only a deep understanding of the subject, but also a careful selection of techniques and methods in the planning of the lesson, aimed at the formation of creative thinking, communication skills and responsibility for their learning. Team learning expands opportunities for teaching, evaluating and monitoring students' knowledge, skills and abilities. The aim of this research is the evaluation of the effectiveness of the TBL training method compared to the traditional method.
METHODS: The main methods of research: the study and analysis of scientific literature; pedagogical experiment designed to identify the effectiveness of team-based learning in the class, the Student's *t*-test for comparative analysis. Teaching methods were used in the 2nd year students of the faculty of "General medicine" in practical classes in the discipline of biostatistics on the topics: "Parametric methods for testing hypotheses", "Correlation analysis". In the control group (N.=85) the lesson was provided with the traditional method of training, in the experimental group (N.=78) using the TBL method.
The Department has developed a General technique of providing classes using the method of team-based learning and assessment of students' knowledge. Application of the TBL method consisted of the following stages: Introduction: lesson topic, goals and objectives, application and evaluation system of the method (5 minutes), individual testing on a computer (10 minutes-15%), team building, team testing (10 minutes-10%), analysis of tests (5 minutes), team work: presentations on the topic (20 minutes-30%), solving situational problems at the computer (15 minutes), discussion of the tasks of each team (15 minutes-30%), final individual test (10 minutes -15%), feedback, checkup, the results of classes (10 minutes).
RESULTS: The average assessment of students' knowledge on the topic: "Parametric methods for testing hypotheses" in groups with the traditional method of training (N.=85) was 80.1% (standard deviation [SD]-3.30), in groups with the method TBL (N.=78) 87.6 (SD-5.05), *t*-test 6.91, p=0.0012. Topic "Correlation analysis" these figures amounted to 82.4% (SD-4.51) and 89.2 (SD-3.32), *t*-test 4.91, p=0.0021. The output of the power is P 0.91.
On the basis of a questionnaire to identify the opinions of students about the method of TBL on a 5 point scale of "not like" (1 point) to "like very much" (5 points) of the 78 respondents the following results were obtained: 1 point – 0, 2 points - 4 (5,1%), 3 points - 9 (11,5%), 4 points – 42 (53,84%), 5 points – 23 (29.4%) of the student.
CONCLUSIONS: The introduction of innovative teaching methods in the educational process is currently an integral part of the improvement of higher education. Our study showed that the application of the TBL method at the classes improves the performance of students learning material, which in turn determines the qualification of the future specialist.

The frequency of refractive errors in schoolchildren of different age with different levels of school load

Neilya A. Aldasheva[1], Irina S. Stepanova[1], Ainagul S. Mukazhanova[1, 2]*

[1] Kazakh Eye Research Institute, Almaty, Kazakhstan; [2] Department of Biomedical Statistics and Evidence-Based Medicine, Faculty of medicine and health care, Al-Farabi Kazakh National University, Almaty, Kazakhstan

*Corresponding author: Ainagul S. Mukazhanova, Kazakh Eye Research Institute, Almaty, Kazakhstan; Department of Biomedical Statistics and Evidence-Based Medicine, Faculty of medicine and health care, Al-Farabi Kazakh National University, Almaty, Kazakhstan. E-mail: ainagul.e@gmail.com

BACKGROUND: In the overall nosological structure of vision impairment in school-age children, myopia

occupies a leading position, accounting for 34.9% of all causes of blindness and low vision. According to a number of authors, the intensification of information support for the educational process, accompanied by additional visual loads, eventually leads to a significant increase in the prevalence of myopia in schoolchildren. According to homeland researchers, the overall the increase from the first to the eleventh grades is from 1.7 to 5.2 times [Bikbov M.M. *et al.*, 2009; Schiller S.I., 2012; Teleuova T.S. *et al.*, 2013].

The present study is aimed to briefly analyze the frequency and structure of refraction errors among school children of different age, different set of school subjects and with different level of academic performance.

METHODS: This cross-sectional study involved students of a comprehensive school, a gymnasium and a specialized boarding school for gifted children in sports located in Almaty, a large megapolis of Kazakhstan. A total of 350 students from the 1st, 5th and 9th grades were examined. Ophthalmic examination included visometry, skiascopy and ophthalmoscopy in each participant.

RESULTS: We established that the frequency of refractive errors in the gymnasium school exceeded the same indicators in the comprehensive school 1.8 times, and in specialized sports school up to 2.4 times, respectively. In the first grades of the gymnasium, the refractive errors were observed almost 1.6 times, in the 5-th grades 1.2 times, and in the 9th grades 3.8 times higher than in the comprehensive school. The main reason for the decline in vision in all schools was myopia, accounting for 51.3% through all the students examined in a comprehensive school, 23.2% in a sports school, and 61.5% in gymnasium, respectively. Among the pupils of the 9th grade of the gymnasium, moderate myopia was observed 2.2 times higher than in the sports school students, moreover, myopia of high degree was detected only among the pupils of the gymnasium (5.5%). In the structure of refractive errors the spasm of accommodation ranked 2nd, reaching 23.1% averagely, and the frequency of this pathology did not differ significantly across the schools with different visual load: 22.7% in the general education school, 23.4% in the sports school, and 23.5% in the gymnasium, respectively.

CONCLUSIONS: Overall, myopia is recognized the main reason for the decline in vision among schoolchildren, regardless the levels of their school loading. In the structure of refractive abnormalities reasons, the proportion of myopia reached 66.7%, while the spasm of accommodation was 25.85%, and hyperopia 5.44%, respectively.

Cognitive Impairment in Patients with Type 2 Diabetes Mellitus

Marina A. Grigolashvili[1], Liya N. Takenova[1] *, Larisa E. Khomenko[2]

[1]Department of Neurology, Psychiatry and Rehabilitation, Medical University of Karaganda, Karaganda, Kazakhstan; [2]Department of Internal Medicine №2, Medical University of Karaganda, Karaganda, Kazakhstan

*Corresponding author: Liya N. Takenova, Department of Neurology, Psychiatry and Rehabilitation, Medical University of Karaganda, Karaganda, Kazakhstan. E-mail: liya_takenova@mail.ru

BACKGROUND: According to the WHO definition, diabetes mellitus is a group of metabolic conditions characterized by increased blood glucose levels.

Diabetes mellitus is one of the main factors affecting the early development and rapid progression of atherosclerosis of small, medium, and large bore arteries, and nerve fiber disorders. The main mechanisms of formation of brain neurons disorders in diabetes are determined by hyperglycemia leading to microangiopathy and the development of dyscirculatory encephalopathy (DEP). DEP is included in the concept of Chronic Cerebral Ischemia, a slowly progressive brain dysfunction resulting from diffuse and/or fine-focal brain tissue damage under conditions of a long-term insufficiency of the cerebral blood supply.

At present, insulin is proven to be directly involved in glucose metabolism in the structures of the central nervous system. Insulin receptors are widely represented on the brain neuron membranes, whereupon, the highest concentration of insulin receptors are localized in the hippocampus.

OBJECTIVE: assessment of the degree of cognitive impairment in patients with type 2 diabetes mellitus and its dependence on insulin therapy.

METHODS: The object of the research is 101 patients with type 2 diabetes mellitus (N.=101) hospitalized at the endocrinology department.

Criteria for inclusion in the research

— the definite diagnosis of type 2 diabetes mellitus
— the course of the disease for more than a year.
— Criteria for exclusion:
— age under 39,
— severe concomitant conditions or recrudescence of chronic ones, the presence of which may affect the results of the research, IHD (> FC III), heart failure (> level II), myocardial infarction, and stroke in history, the presence of chronic kidney disease 5 (GFR as per CKD-EPI is less than 15 ml/min /1.73m2), hepatic insufficiency, viral hepatitis, and pregnancy.

RESULTS: Patients were divided into 2 groups: Insulin-dependent (ID) and non-insulin-dependent (NID). The average age of patients included in the research was 60.7, the minimum age was 39, and the maximum age was 87. 50 persons of these patients were females (50.5%), 50 ware males (49.5%). Assessment of cognitive impairment was carried out using Mini-Cog and MMSE tests. Statistical processing was carried out by the Biostat software.

It was found that 89 patients suffered from cognitive impairment. Severe cognitive impairment was identified in 5 patients from the ID group, i.e. 4.9%. Moderate cognitive impairment was identified in 12 patients from the ID group (12.2%) and in 4 patients from the NID group (3.96%). Mild cognitive impairment was identified in 16 patients from the ID group (15.8%) and in 9 patients from the NID group (8.9%).

No cognitive impairment was identified in 12 patients with type 2 diabetes mellitus.

Therefore, in the ID group, cognitive impairment was identified in 33 patients of 51, i.e. 64.7%, while in 13 patients of 50 in the NID group (39%). When analyzing the experience of insulin therapy, it was found that 13 patients have been taken insulin for more than 10 years; 24 patients, for 5 to 10 years; and 5 patients, for less than 5 years.

CONCLUSIONS: In patients from the NID group, the degree of cognitive impairment is less pronounced compared to those in the ID group, and the longer the duration of insulin therapy the higher the degree of cognitive impairment ($P<0.05$).

Training of the student on the program of the doctor of health service at the enterprise

Serik A. Ibrayev[1] *, Zharylkassyn Zhengisbek[1], Saule R. Zhakenova[2]

[1]Scientific-research sanitary-hygienic laboratory; [2]Department of Public Health; Non-Profit Joint Stock Company Karaganda Medical University, Karaganda, Kazakhstan

*Corresponding author: Serik A. Ibrayev, Scientific-research sanitary-hygienic laboratory, Karaganda Medical University, Karaganda, Kazakhstan. E-mail: ibraev_kgmu@mail.ru

BACKGROUND: In the Republic of Kazakhstan there is no legalized shop medical service for workers, so many heads of large firms and far-sighted private entrepreneurs came to the conclusion that in some of the most dangerous industries it would be useful to go further and create their own medical service for industrial workers.
The incentive for this is a humane consideration: concern for the creation of a medical service in the workplace. The management of this service is carried out by a specialist doctor in the field of industrial medicine, working full-time or part-time, to help him a nurse is allocated.
METHODS: Its business relationship with an entrepreneur can be in the nature of consultation or joint cooperation (advisor) sometimes it is a relationship of a staff member (working at a rate or 0.5).
Inculcation of doctor's skills in industrial medicine begins at the department and is prolonged in the sanitary-hygienic laboratory, using an innovative method of training TBL, using situational tasks, instilling communication skills and the basics of professional ethics. At the same time, the program of laboratory classes should cover:
a. Monitoring at the enterprise of all factors capable of harming the health of workers, and the performance in this area of advisory functions in the administration of the enterprise and the workers.
b. Study or participation in the study of work, both from the point of view of hygiene, and from the physiological and psychological points of view
c. Monitoring the implementation of measures to prevent accidents and occupational diseases, monitoring of PPE and their use.
d. If possible, participation in medical checkup for employment, as well as periodic and annual inspections at work.
e. Monitoring or participation in first aid equipment and facilities.
f. Inculcation of skills of training of the personnel of the enterprise in the field of occupational health.
g. Participation in the preparation of reports on the health of workers and employees of the enterprise.
RESULTS: Thus, the innovative method of training TBL allows you to study a sufficient amount of preventive measures. In many cases, monitoring and examination may require the assistance of specialists: radiologists, ophthalmologists, otolaryngologists, dermatologists, gynecologists, etc., as well as specialists in safety, chemists, industrial psychologists, social workers and others, the workers of social security and other, i.e. the student should instill communicative skills – work in a team. This also applies to the following components of communication: the ability to establish contact with other services of the enterprise (Occupational Safety Department, Social Welfare, Occupational Safety), or participate in activities aimed at ensuring occupational safety, health and welfare of each worker.
The doctor must have the skills to analyze the situation: that is instilled in him through participation in a set of databases on working conditions and morbidity with temporary disability: a) effectively analyze the results of preliminary and periodic medical examinations, increase their diagnostic significance; b) the detection of the disease in the early stages; c)the identification of dangerous and adverse health conditions or social tensions in the enterprise; d) the implementation of preventive measures to correct the situation.
CONCLUSIONS: Thus, we believe that it is possible to train specialists with sufficient knowledge and practical skills, using an innovative method of training such as TBL with all its forms of training.

Training specialists and methods of assessment in conditions internationalization and academic autonomy

Meirambek S. Askarov[1], Khabibulla B. Bismildin[1, 2] *, Talgat Z. Temirbekov[1], Vitaliy A. Feoktistov[1], Marat A. Rakhmanov[3]

[1]Department of Surgical Diseases No.1, non-commercial joint-stock company Karaganda Medical University, Karaganda, Kazakhstan; [2]LLP Medical Advisory Center "General Practitioner - Consultant - Expert" in Karaganda, Kazakhstan; [3]Department of Pediatric Surgery, Joint-Stock Company "Kazakh Medical University of Continuing Education", Almaty, Kazakhstan

*Corresponding author: Khabibulla Bukeevich Bismildin, Department of Surgical Diseases No.1. Karaganda Medical University, Karaganda, Kazakhstan. E-mail: Bismildin@kgmu.kz

BACKGROUND: Internationalization and an open market will place high demands on the training of competent specialists in the autonomy of universities.
The aim: is to study the results of the applied methods of knowledge assessment under various learning models and justify them as possible resources for improving competence.
Tasks of research: to assess the knowledge of medical students, including foreigners (Russia, Tajikistan, India - academic mobility) by analyzing students' individual work (SIW), students' independent work with a teacher (SIWT), students' educational research work (SERW), students` research (SR) with succession in all courses.
Training models: – traditional and competency models. – Model with the use of intellectual property objects of departments. – Model using the "know-how" of a business partner with the skills of scientific competence.
METHODS: 1. Evaluation of testing (paper, computer, "portfolio") of students. 2. Assessment of the integrated competence of teachers of the department in conjunction with the concept of the pedagogical process, built by an individual teacher. 3. Evaluation of the skills and knowledge of students and teachers with a qualimetric.

RESULTS: It was found that 89.2% of SIW/SIWT remained without transformation into scientific work (reports, publications), which indicated their insufficient level and the authors' lack of desire to publish them.
Considering that these works were carried out under the supervision of a teacher, their output data made it possible to judge about the need to increase innovative activity (educators and trainees) with the tools of successful practices.
The analysis of the concept of teaching built by teachers showed the difference in results and orientation: – implementation of educational programs – 103 (39.6%); – motivation for knowledge – 52 (20.4%); – compliance with modern innovative requirements – 105 (40%).
At the same time, the potential by nature (the potential for survival) was found – 49 (18.8%) and there were identified those wishing to use the innovative environment – 105 (40%) and 90 (34.6%) who wanted to have a startup.
The use of incentives, both intellectual property of departments, and the know-how of a business partner, in the form of "health franchise", are considered as investment methods in their intellect, and educators and educators in investors of their "Health, Education, Well-being.
The basis for their inclusion was the commercialization and profit from their intellect, where 70% wanted to raise capital for their startup ideas (21-8.1%), of which 54% wanted in partnership with the business, and 46% from the university.
Qualimetric evaluation showed a denouement of old technologies (trend), and 40% of students' understanding of modern realities, of which 18.8% did not know how to implement it, confirmed the need to change the educational technology
CONCLUSIONS: The analysis of knowledge assessment methods showed that the formation of competence occurs within the training programs, however, in order for it to correspond to innovativeness, it is necessary to change the orientation of trainees as an innovator teacher and thereby respond to them and university expectations.

Treatment of Basal Cell Skin Cancer by photodynamic therapy

Nasrulla Shanazarov[1, 2], Takhir Tashpulatov[2], Nazar Seidalin[1] *, Dinara Turzhanova[2], Aibek Rakhimbekov[1]

[1]Department of Science, the Medical Centre of the President's Affairs Administration Hospital, Astana, Kazakhstan; [2]The "Astana Medical University", Astana, Kazakhstan

*Corresponding author: Nazar Seidalin, Department of Science, the Medical Centre Hospital of President's Affairs Administration of the Republic of Kazakhstan, Astana, Kazakhstan.
E-mail: nkseidalin@mail.ru

BACKGROUND: The Basal Cell Skin Carcinoma (BCSC) exceeds 50% of all malignant neoplasms of the skin and rates in more than 1,500 new cases annually. In 42-88% of cases its foci have a size of up to 2 cm, while in 57.9% tumors 2-5 cm and even up to 9.6 may emerge. Localization on the scalp and neck constitutes 98.3% of BCSC cases. Surgical removal and radiation therapy are classic methods of the skin cancers treatment. Currently, as a method the most corresponding to specific requirements of therapeutic, functional and cosmetic efficacy the photodynamic therapy (PDT) is recognized. PDT is a method of local activation of a photosensitizer selectively accumulated in a tumor, by a visible red light which in presence of oxygen contained in the tissues leads to the development of photochemical reactions eventually resulting in the destruction of tumor cells. Indications of PDT at BCSC are the following: the presence of tumors in "uncomfortable" sites on the face, a high risk of complications during therapy in elderly and somatically burdened patients, the rejection of other treatments, as well as in the form of palliative care.
The study was aimed to initially analyze the short- and long-term efficiency of PDT in patients with primary and recurrent BCSC.
METHODS: Within November 2016 to December 2018, 17 patients with BCSC were treated at "Center of Photodynamic Therapy" and in the Medical Centre of the President's Hospital. The "Photolon" was used as a photosensitizer in dosage of 100 mg. Red light exposure was performed through the laser devices "Lakhta-Milon" and "Latus-Fara", manufactured in Russia.
RESULTS: The average age of patients was 60.5 (33-79) years, of them there were 8 men and 9 women. Localization of the tumor was the following: the scalp – 6 (35.2%), face skin – 8 (47%), parotid region – 2 (11.7%), and two more sites in 1 patient (5.8%), respectively. At the time of admission 5 (29.4%) patients had St I, 3 (8.8%) had St II, and 9 patients (51.9%) experienced a recurrent disease upon previous therapy. Of them, two patients undergone cryodestruction after the third recurrence before PDT, two patients undergone radiotherapy after the fourth episode of recurrence, and five patients had combined therapy (surgical treatment + radiotherapy) after 3 episodes of the disease recurrence.
A total of 34 PDT sessions were run. One PDT session was performed in 8 patients (47%); two sessions took place in 4 patients (23.5%), three were carried out in 3 individuals (17.6%), and 4 (5.8%) and 5 sessions (5.8%) were run in 1 patient. The mean follow-up time after PDT was 14 months. Complete clinical response was achieved in twelve patients (70.5%). Stabilization of the process was reached in three patients (17.6%) after the two sessions of PDT. In two patients with recurrent tumors, continued growth of the tumor was observed (11.7%). No side effects and adverse events were identified.
CONCLUSIONS: Overall, photodynamic therapy is an effective, non-invasive method for a group of patients with malignant tumors of the skin and mucous, where conventional methods were being exhausted. Complete tumor resorption can be achieved through a single or stepwise effect without the side effects, with maximum preservation of the surrounding tissues viability and good cosmetic and therapeutic results.

Trends in diabetes prevalence and incidence in Kazakhstan

Nurzhibek Beisembinova[1]*, Lyazzat Kosherbayeva[1,2], Aigul Balmukhanova[1], Nurgul Alekenova[3]

[1]Asfendiyarov National Medical University, Almaty, Kazakhstan; [2]Al – Farabi Kazakh National University, Kazakhstan; [3]West Kazakhstan Marat Ospanov State Medical University

*Corresponding author: Nurzhibek Beisembinova, Asfendiyarov National Medical University, Almaty, Kazakhstan.
E-mail: silkway88@hotmail.com

BACKGROUND: The National Register reports annual increase in the number of diabetes, which inevitably leads to an increase in the frequency of diabetic retinopathy (DR). Early detection and treatment can reduce the risk of complications and will have a positive economic effect on the cost of state services. Despite of it, about 5% of diabetes worldwide is undiagnosed and 30% have never performed a retinal examination. This necessitates to measure trends in diabetes and DR.
METHODS: To analyze the incidence situation, data from annual statistical compilations were used, as well as statistical materials from the Republican e-health center. Trends in diabetes of different types (1,2 and other) and DR incidence and prevalence rates in the last 6 years (2013-2018) are described and results are compared: by gender (male and female) and residence(urban/rural).
RESULTS: Over the past 6 years, the incidence of type 2 diabetes has increased from 146.8 per 100,000 in 2013 to 189.3 in 2018 and accounts for the main share (85% in 2018) of the incidence from all types of diabetes. The prevalence of type 2 diabetes also increased from 1,486.2 in 2013 to 1,885.8 in 2018. According to gender comparisons of type 2 diabetes, women exceed on average 1.6 times the number of men, in terms of incidence 225.4 against 154.2 and the prevalence 2386.8 against 1385.1.
Despite the lowest rates compared to type 1 and 2 diabetes, there was a significant increase in incidence of other types of diabetes in 2018, amounting to 12.4 per 100,000, against 3.4 in 2013, and a doubling prevalence from 13.5 to 31.1 with a predominance of women. However, in 2015 there was an extreme decline in number of detection of this type of diabetes. Also, significant gender differences in incidence have not been established, but in 2018, the incidence of women was higher than men, 15.1 and 9.8, respectively.
A slight increase in incidence of type 1 diabetes was noted, ranging from 8.8 (in 2013) to 11.3 (in 2018). The risks of male morbidity in this type of diabetes was slightly higher than female, for example, for 2018, it was 11.8 and 11.0, respectively. Nevertheless, the prevalence analysis showed a growing trend in the number of people living with this type of diabetes from 118.4 in 2013 to 182.3 in 2018, where the number of women prevailed, but in 2013 and 2017 the prevalence among the male population was higher.
In 2018, the number of patients with diabetic retinopathy in Kazakhstan was 13,558, with 2006 new cases. The DR prevalence remains relatively growing, where female indicators were almost twice as high as male e.g. by 2018 women prevalence was 96.6 (incidence 14.0), whereas their counterparts amounted to 51.2 (incidence 8.1).
The prevalence and incidence rates for types 1 and 2 diabetes among urban population were on average 1.5 times higher (in the case of DR the difference is 2 times) in contrast to rural population.
CONCLUSIONS: Trends in diabetes prevalence do not show declines, which could mean that patients with diabetes live longer due to increased awareness and available healthcare technologies, which were presumably more often used in urban areas than in rural areas. Women were more likely to suffer from type 2 diabetes and DR than men, whereas the number of men was higher with type 1 and other types of diabetes.

Clinic of neurological manifestations under conditions of environmentally disadvantaged West Kazakhstan areas

Aigul P. Utepkalieva*, Gulnar B. Kabdrakhmanova

Department of Neurology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Aigul P. Utepkalieva, Department of Neurology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. Email: aiguler72@mail.ru

BACKGROUND: The West Kazakhstan is known by its large Oil and Gas producing facilities, where an increased level of different pathologies was found in workers exposed to the chemical agents. The purpose of this research is to outline the neurological manifestations and the state of the vegetative nervous system in individuals living in the Oil and Gas producing areas of the western Kazakhstan.
METHODS: This case-control study included 282 participants 18-50 aged, living in sites of Aksay and Berezovka located in Burlinsky District, as well as in the city of regional importance Uralsk. The main group (N 171) consisted of persons living near the Oil and Gas facilities located in Aksay and Berezovka. The control group (N 111) included clinically healthy individuals living in the city of Uralsk, which is referred to relatively prosperous sites regarding to the environmental pollution as being remoted from industrial facilities. The average age in the main group was 38.3±9.3, and 34.3±9.8 years in the control group. The neurological status of the patients was studied according to commonly accepted protocol with an assessment of the state of cranial innervation, motor, reflex, sensitive spheres, cerebellar and extrapyramidal systems, higher cognitive functions, as well as the state of the autonomic nervous system. Evaluation of the vegetative status included an assessment of the vegetative tonus and the vegetative support of activity, as well as calculation of the vegetative Cerdo index (VI).
RESULTS: The following subgroups were identified in the main group: presence of autonomic dystonia syndrome (40.9%), astheno-neurotic syndrome (26.3%), syndrome of focal microsymptomatics (18.1%), motor impairments (4.1%), cognitive disorders (5.2%) and vertebrogenic syndrome (22.8%). In the control group, the severity of astheno-neurotic syndrome was lower 3.2 times, focal microsymptomatics 2.2, movement disorders 4.5 and vertebral disorders 2.3 times, respectively. Cognitive disorders were identified only in the main group. Vegetative dystonia syndrome was detected in the main and control groups in 40.9% and 9.9%, respectively. Calculation of the Cerdo VI in the main group resulted in a predominance of sympathetic influence (61.4%) with a positive value. Parasympathicotonia was observed in 38.6% of cases. In the control group, sympathicotonia

was detected in 63.1% of cases, while parasympathicotonia in 36.9%, respectively. Excess vegetative provision of activity was found in 22.8% and 16.2% of cases in the main and control groups, respectively. The lack of vegetative support of activity was observed in 16.4% and 4.5% of cases in the main and control groups, respectively. Such changes in the vegetative support of activity appear to be the result of a violation of the adaptation mechanisms of the body. Overall, a combination of 2-6 syndromes of the nervous system lesions was observed throughout the main group, which may be associated with the damage of nervous system by a prolonged exposure with a complex of harmful substances formed during the processing of Oil and Gas, good solubility of neurotoxic substances in fats and lipids of the nervous tissue, and the ability to penetrate the hematoencephalic and hematologic barriers.
CONCLUSIONS: Thus, the toxic effects of adverse environmental factors on the nervous system resulted in forms of different syndromes were observed in persons exposed to Oil and Gas processing' products. The initial findings of the research can serve as a basis to develop a set of measures aimed to prevent the nervous system disorders.

Improving the adherence to drug therapy after myocardial infarction: research protocol

Damira G. Zhamankulova[1], Lazzat M. Zhamaliyeva[1] *, Mukhit N. Turebayev[2]

[1]Center for Family Medicine and Primary Care Research; [2]Department of General Medical Practices of internship, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan.

*Corresponding author: Lazzat M. Zhamaliyeva, Centre for Family Medicine and Primary Care Research, Aktobe, Kazakhstan.
E-mail: lzhamalieva@zkgmu.kz

BACKGROUND: Non-adherence to medical treatment in patients after myocardial infarction (MI) is the main cause of cardiovascular morbidity and mortality. Full adherence to therapy reduces the risk of cardiovascular events in patients with atherosclerosis by half (Bansilal S, 2016). It is known that not all methods used to increase the adherence are effective (Reese PP, 2015; Volpp KG, 2017). The aim of this project is to develop, implement and evaluate a training course for volunteer students to improve patient adherence to treatment.
METHODS: The project participants are students of the medical university who agreed to undergo additional training and work with patients. This project will be carried out in two phases within 24 months. At the first stage, a training program will be developed for students to comprehensively increase adherence in patients after MI to medication and training will be conducted. The intervention (training) will be developed taking into account known factors affecting treatment adherence: factors related to the patient, socio-economic factors, factors affecting health and the system, factors related to therapy, and factors related to the condition.
At the second stage, a randomized controlled trial will be conducted: in the main group, trained volunteer students will initiate and maintain the required behaviour of patients on the background of standard outpatient care, in the control group - standard outpatient care without intervention. The intervention components will include training, patient information materials, delivery of free medication prescriptions; visits to patients, calls and reminder messages; coordination with specialists by students (psychiatrist for patients with depressive disorders, cardiologist for correction of treatment). Evaluation of the results will be carried out after 3, 6, 9 and 12 months. We will study cardiovascular events and death rates in both groups. Additional outcomes will be behavioural, clinical variables, training evaluation. The effectiveness of the intervention will be analysed using linear mixed models for each outcome studied.
This project is funded by the West Kazakhstan Marat Ospanov State Medical University (order number №12/4-1-17/133), received the approval of the local bioethical commission (protocol №1 from 29.01.2018) and approved at a meeting of the Academic Council of the West Kazakhstan Marat Ospanov State Medical University (protocol №2/1-54 from 31.10.2018).
RESULTS: We expect that in the intervention group the number of cardiovascular events and deaths rates will decrease, and patient behaviour, quality of life, intermediate clinical indicators of patients will improve in comparison to the control group. We expect successful mastering of the training program by students, their satisfaction with the training and work in the project.
CONCLUSIONS: We expect that this project will develop an effective set of tools and activities based on the analysis of patient behaviour and healthcare system, aimed at improving patient medication adherence and reducing cardiovascular morbidity and mortality.

Optimization of therapy for acute stenotic laryngitis in children

Galina D. Zhumagaliyeva*, Balslu T. Saparova, Svetlana K. Shalekenova, Zhanara S. Umarova

Department of Infectious Diseases and Children's Infections, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Galina D. Zhumagaliyeva, Department of Infectious Diseases and Children's Infections, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: galdau@mail.ru

BACKGROUND: Acute stenotic laryngotracheitis of infectious etiology (ASLT) in children still remains relevant. Mortality in ASLT vary from 0.4 to 5%. In the 2000s, the main therapy was the administration of a glucocorticoid - Prednisolone along with spasmolytics and maintaining a moist microclimate in hospital settings. In relation with the introduction of an integrated management strategy for children's diseases since 2008, Prednisolone began to be administered to sick children at the prehospital stage at the ambulance level. Since 2017, nebulizer inhalation with Budesonide + Dexametoson if necessary, has been introduced.
The study was aimed to evaluate the clinical effective-

ness of therapy for ASLT in children by different years depending on the drugs used: in 2002 (Prednisolone in the Intensive Care unit + Euphyllin), in 2013 (introduction of Prednisolone in the prehospital phase), and 2017 (nebulizer inhalation with Budesonide + Dexametoson).
METHODS: Baseline data from the statistical reports of the Regional Hospital of Infectious Diseases of Aktobe and the medical records of sick children aged from 11 months to 3 years with the 2nd degree of ASLT admitted to the Hospital in 2007 (45 patients), 2012 (48 patients) and 2017 (32 children) were used and analyzed in this retrospective study. The degree of stenosis was determined by the Westley scale.
RESULTS: Analysis by in-patient department annual reports showed that the proportion of sick children with ASLT decreased threefold: in 2002 - (18.97%), in 2013 - (9.35%), and by 2017 - (6.31%). In 2002, the majority of patients (63%) admitted to the 2nd day of the disease with severe form: having the 2nd degree of stenosis - 58%, 3rd degree - 27%, which was complicated by obstructive syndrome in 29% of patients. Emergency care was carried out only in the Intensive Care unit. Besides, one lethal outcome was recorded. Owing to the use of Prednisolone for ASLT at the prehospital stage at the ambulance level, the number of patients admitted with the 2nd degree of stenosis has been decreasing from year to year. Since that time, severe stenosis of the 3rd degree have occurred sporadically, and accompanying symptoms quickly regressed. So, in 2013, the cases with ASLT with the 3rd degree of stenosis were not recorded, while the 2nd degree was presented in 49% of cases. In patients admitted in 2013, compared to the clinical manifestations of patients admitted in 2002, dyspnea regressed in 1.47 days ($P \leq 0.05$), hoarseness in 2.7 days ($P \leq 0{,}0009$), cough duration decreased ($P \leq 0.001$), as well as fever ($P \leq 0.003$) and the number of bed-days ($P \leq 0.005$). Nebulizer inhalation with Budesonide in the prehospital phase has not always administered. So, out of 32 cases, topical glucocorticoid was administered to 12 (37.5%) children due to temporary absence of Budesonide in the emergency pharmacy. In all 12 patients, the ASLT clinic regressed during the first days after Budesonide intake. Currently, the number of patients with ASLT with the 2nd degree of stenosis is prone to reduce.
CONCLUSIONS: Over the past 15 years, positive results have been achieved due to the optimization of emergency care for children with ASLT. Nebulizer inhalation with Budesonide + Dexametoson if necessary is the most effective treatment for children with ASLT.

The efficiency of antibiotic therapy with due consideration of the antibiotic resistance of Shigella pathogens in the Aktobe region

Galina D. Zhumagaliyeva*, Aigerim B. Baiguliyeva, Gulzhanat N. Nurlanova

West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Galina D. Zhumagaliyeva, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. Email: galdau@mail.ru

BACKGROUND: Shigellosis is an infectious disease caused by various serotypes of pathogenic enterobacteria of the Shigella genus, occurs with severe symptoms of intoxication and diarrhea. Sometimes in the absence of medical care may be complicated by dehydration, subsequently contribute to the formation of chronic pathology. Objective of study is to determine the prevalence of clinical strains of Shigella pathogens in patients with shigellosis who were hospitalized in the regional clinical infectious diseases hospital of Aktobe city, as well as the effectiveness of antibiotic therapy with regard to resistance often used antibiotics.
METHODS: The materials were provided by statistical data on infectious morbidity (form No. 1), research journals of the bacteriological laboratory of the regional infectious diseases hospital in Aktobe, and medical records of patients, who admitted to the regional clinical infectious diseases hospital in Aktobe within 2012-2017.
RESULTS: The highest increase in the incidence of shigellosis was recorded in 2000 (92.8 per 100 thousand population), then there was a decrease to 52.7 per 100 thousand population in 2003. Despite the increase in the rate in 2004 (69.2), in next years it gradually decreased and the incidence was at the level of 35.5 - 27.2 in 2010. In 2014-2017, the indicator was marked at the level of 6.34-6.0 per 100 thousand population. The microbial landscape of acute dysentery is represented mainly by two types of pathogens. If in 2006 Shigella Flexner - 82.9% and Shigella Sonne –17.0%, in 2014: Shigella Flexner -71.1% and Shigella Sonne - 28.8%. Along with microbiological monitoring of circulating Shigella pathogens in the Aktobe region, we analyzed the spectrum of sensitivity and resistance to a wide range of antibiotics of Shigella Flexner and Shigella Sonne serovars, received from patients who were in an infectious diseases hospital in 2012-2017. As a result of the analysis of the antibiogram to Shigella Flexner serovar: in 2017 sensitive to ceftriaxone (91.5%), gentamicin (55.9%), ceftazidime (100%), cefazolin (83.3%), amikacin (80%) ,cefepine (100%). As a result of an analysis of the antibiotic on Shigella Sonne serovar: in 2012, it is sensitive to ceftriaxone (100%), ceftazidime (80%), 2014 to cefaclor (66.6%), amikacin (66.6%), cefazolin (66.6 %), In 2015, cefepime (100%). In 2016-2017 defined sensitivity to ceftazidime and cefepime (100%). 2012-2017 in the analysis of children under 7 years of age (form No. 003/y) who had particular sensitivity, the effectiveness of treatment with antibiotics cef III, cef IV, ceftriaxone, gentamicin was determined, while there were no complications and hospital stay was reduced (bed-days).
CONCLUSIONS: The variety of antibiotic resistance of Shigella Flexner and Shigella Sonne serovars in different years indicates annual and species variability. The presence of third-generation cephalosporin-resistant clones suggests that these strains produce extended-spectrum beta-lactamase, which may result in ineffective therapy. Therefore, it is necessary to constantly monitor the antibiogram in order to get the effective etiotropic therapy for patients with shigellosis. Currently, in the hospital due to the course of the disease and indicators of complications, a group of antibiotics of the 2nd generation of cephalosporins and aminoglycosides is prescribed and the effectiveness of treatment is being determined.

Relationship of mineral densityand biochemical markers of bone tissue in adolescents of Aktobecity

Ainur Amanzholkyzy*, Roza E. Nurgaliyeva, Dinara S. Kulzhanova, Aiman T. Kaldybaeva, Tamara Zh. Batyrova, Farida K. Balmaganbetova

Department of Normal Physiology West Kazakhstan Marat Ospanov State Medical University, Aktobe Republic of Kazakhstan

*Correspondening author: AinurAmanzholkyzy, Department of Normal Physiology West Kazakhstan Marat Ospanov State Medical University, Aktobe Republic of Kazakhstan.
E-mail: a.ainur.82@mail.ru

BACKGROUND: Among the many skeletal and extraskeletal risk factors for fractures and bone diseases, bone mineral density (BMD) has a paramount importance. In a normally developing growing organism, bone remodeling processes are characterized by the predominance of bone formation over resorption, which continues until the peak of bone mass is reached.Analysis of the literature data shows that the decrease in BMD in children is not uncommon, moreover, osteopenic syndrome is currently significant in the field of pediatric and adolescent traumatology and orthopedics.Activities aimed at early diagnosis and identification of risk groups contribute to improving the health and quality of life of the child population.
Purpose: to study the mutual influence of mineral density and individual biochemical markers of bone tissue in adolescents of Aktobe city.
METHODS: The study was conducted in the framework of the grant financing of the research project of the MES of the Republic of Kazakhstan, on the basis of Clinical Diagnostic Center of West Kazakhstan Marat Ospanov State Medical University. There were examined 106 healthy children aged from 13 to 17 years of Aktobe city.Using the device osteodensitometry SONOST-3000 (South Korea) assessed the state of BMD.The device is based on measuring the speed of ultrasound in the heel bone. In children, the Z-score was determined, which was evaluated on the recommendation of L.A. Shcheplyagin. Values of index Z-score to -2 SD were considered as normal, below -2 SD - as a reduced BMD.Biochemical markers were determined in the biological substrates of the examined children - in the urine and in the blood serum. The analysis of the values of biomarkers and their correlations with low and normal BMD, as well as the correlation of biological markers with the boundary state of BMD was carried out.
RESULTS: According to the results of the densitometric study, taking into account the Z-Score criterion, the examined adolescents were divided into two groups: in 54% of the examined adolescents was found reduced BMD, in 46%- normal BMD.Evaluation of the level of vitamin 25 (OH) D in the serum of examined both groups, in the specified sequence within 21.0 ± 6.6 and 20.5 ± 6.5 ng/ml without significant differences, indicating moderate deficiency.The PTH level, respectively: 2.8 ± 1.1 and 3.1 ± 1.1 pmol/l, which does not indicate a significant difference (P>0.2). The deoxypyridinoline (DPID) biomarker was significantly different between the groups with reduced and normal BMD: 12.5 ± 5.3 and 10.4 ± 5.1.1 nmol/l (P<0.05).
Revealed a correlation relationship between the levels of the studied biomarkers and the state of BMD in the selected sequence: for 25 (OH) vitamin D r = 0.1; r = -0.06; for PTH, uniquely BMD in both groups, r = –0.2; for DPID r = -0,08; r = -0.3, but not significant. However, a reliable correlation was obtained between indicators of PTH and DPID with the boundary state of BMD r = -0.2; r = -0,3; (P<0.05).
CONCLUSIONS: The state of BMD is largely due to the humoral biomarker of PTH, but without significant participation of 25 (OH) vitamin D and DPID. The results indicate the need for further research on other biological markers and humoral mechanisms of bone tissue remodeling.

Individual treatment regimens for extensively drug-resistant tuberculosis

Altyn S. Almagambetova*, Galya N. Tanzharykova, Rosa A. Algieva, Bakytzhan S. Baisalbayev

Department of Phthisiology and Dermatovenereology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan

*Corresponding author: Altyn S. Almagambetova, Department of Phthisiology and Dermatovenereology, West Kazakhstan State Medical University, Actobe, Republic of Kazakhstan.
E-mail: altyn_130863@majl.ru

BACKGROUND: Despite the fact that in recent years in Kazakhstan there has been a significant decrease in the incidence of tuberculosis, it still remains a serious threat to the health of multidrug-resistant and extensively drug-resistant tuberculosis (MDR-TB and XDR-TB). The success rates of treatment of drug-resistant forms of tuberculosis remain unsatisfactory, and the long-term use of anti-tuberculosis drugs (PTP) in the standard regimen is accompanied by adverse reactions, high treatment costs and low motivation of patients. For more effective treatment of patients with XDR-TB, individual regimens have been used with the use of new (bedaquiline and delamanid) and repurposed (linezolid, clofazimine and carbapenems) fifth-line PTP drugs.
OBJECTIVE: to study the results of the effectiveness of new individual treatment regimens for patients with extensively drug-resistant tuberculosis in comparison with standard regimens.
METHODS: The study included 44 patients with XDR-TB tuberculosis who received chemotherapy on an individual basis using new anti-TB drugs in the Pulmonary Department of the Regional Tuberculosis Dispensary in Aktobe. A comparative analysis was conducted with a control group of patients with XDR-TB who received the standard treatment regimen. Assessment of the patient's condition consisted of a clinical examination, audiometry, and assessment of visual acuity on the Ishihara colour test. Bacteriological (smear microscopy, culture, GeneXpert MTV/RIF, drug-susceptibility test (DST) for first-line and second-line drugs) and laboratory tests (ECG, complete blood count, serum electrolytes, liver function tests, glycated hemoglobin, thyroid-stimulating hormone) were performed.
RESULTS: 37 (84%) participants of the study were male and 7 (16%) female. The bulk of the patients were of working age (20-49 years). The average age was 42 years.

According to clinical forms, infiltrative form prevailed in 21 (47.7%) patients and fibro-cavernous form – in 18 (40.9%) patients. Mycobacterium tuberculosis (MBT) was detected in the sputum using bacterioscopy in 33 (75%) patients, while all the patients had a positive MBT result using the bacteriological method. Drug resistance to first-line and second-line PTP drugs was observed in 37 (85%) patients. Individual treatment regimens were compiled depending on the results of DST, not less than 5-6 PTPs with the inclusion of a new PTP - bedaquiline and repurposed - linezolid and clofazimina. One of the main indicators of the effectiveness of new treatment regimens for patients with XDR-TB is sputum smear conversion. Of the 33 patients, sputum conversion by the bacterioscopic method after 1 month occurred in 20 (60.6%) patients, after 2 months - in 6 more (18.2%) and after 3 months in 2 (6.1%) patients, i.e. 90.9% of patients had negative sputum microscopy results by the end of 6 months of treatment. Sputum conversion occurred in 30 patients after 1 month (68.2%), and after 3 months, negative results were observed in 86.4% of patients.
CONCLUSIONS: The use of new PTP may increase the effectiveness of treatment of XDR-TB, reduce the length of hospital stay for such patients.

Pharmacoeconomic evaluation of the early postoperative period after cataract phacoemulsification

Sholpan D. Jamantaeva* [1], Galina V. Veklenko[2], Lidiya Zh. Mardanova[1, 2], Aigul Z. Musina[2]

[1]"Daru Zharygy" Clinic, Aktobe, the Republic of Kazakhstan; [2]Department of Internal Medicine Propedeutics and Clinical Pharmacology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan

*Corresponding author: Sholpan D. Jamantaeva, "Daru Zharygy" Clinic, Aktobe, the Republic of Kazakhstan.
E-mail: sholpan277@mail.ru

BACKGROUND: In connection with the health care reform in Kazakhstan and the introduction of compulsory social health insurance (CSHI) from January 1, 2018, it is extremely necessary to make a revision of present treatment methods and pharmacoeconomic (PE) studies, also including of ophthalmology.
The main vision problems have the fifth rank among all human diseases. Cataract is one of the reasons for the weak vision of the population after 50. About 19 thousand cataract removal surgeries are performed annually in Kazakhstan as a part of the guaranteed free health care (GFHC). Cataract phacoemulsification surgery with the implantation of an elastic posterior chamber intraocular lens (IOL) is recognized as the standard method for the cataracts treatment. The development of ophthalmic surgery and medical technologies improves the technique of phacoemulsification surgery however the physical injury of the eye during the operation is being the main reason of postoperative non-infectious exudative-inflammatory reaction (EIR). The guaranteed free health care (GFHC) for patients with cataracts in Kazakhstan includes four inpatient bed days with cataract phacoemulsification and medicine treatment after surgery.
METHODS: This study examined the patients without acute ophthalmologic and general pathology at the age of 55-85 years. Sixty people (eyes) were operated by cataract phacoemulsification method with IOL implantation. The standard technique of this method includes the using Oertli Faros phaco machine with observance of all principles of asepsis and antisepsis. Pre and postoperative period of patients was carried out according to the "Cataract" protocol using Levofloxacin 0.5% eye drops (1 drop 4 times a day) and Dexamethasone 0.1% (1 drop 3 times a day), as well as Gentamicin 40 mg 0, 2 ml subconjunctivally at the end of the surgery for 3 days (1 time per day) in the postoperative period. The effectiveness of prevention EIR was carried out according to the point sistem of N.V. Pasechnikova (2005). Pharmacoeconomic calculations were performed using the "cost-effectiveness" method.
RESULTS: Thirteen patients (21,6%) had an EIR of 1–3 rates after 2-3 days. The anti-inflammatory therapy we held in patients with EIR was continued, which increased the bed-days to 5-7 days. Considering the economic position of the problem, direct and indirect costs per patient increased by more than 10% of the total sums of guaranteed health support, and the period of hospital staying increased from 1 to 3 extra bed – days.
CONCLUSIONS: The pharmacoeconomic calculation of anti-inflammatory therapy according to the present "Cataract" record was not effective enough. Some other alternative methods for the prevention of EIR (the introduction of the antibacterial drug Cefuroxime 0.1 ml into the anterior chamber at the end of cataract phacoemulsification surgery) and further studies of this problem will be conducted from the position of effectiveness and economy.

Studying the efficiency of motivating interview during the treatment of patients with cardiovascular diseases

Tanbetova Ziyash*, Kashkinbayeva Alima

West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Tanbetova Ziyash, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: zhuldyz63@mail.ru

BACKGROUND: The rising prevalence of cardiovascular diseases constitutes a major burden for patients and healthcare systems and is predicted to increase in the upcoming decades. Improving the self-management skills of patients is a strategy to steer against this burden. This could lead to the higher quality of patients' lives and lower healthcare costs. Motivating interview is one of the methods for enhancing the self-management of patients and can be delivered as individual motivating training. The effects of individual motivating interview are promising, but its effectiveness is still not extensively studied with respect to the treatment of patients with heart diseases. Economic evaluations and studies examining the transferability of effects to different healthcare systems are still rare. Aim of this study is to evaluate individual motivating interview for patients with cardiovascular diseases.

METHODS: The study is a prospective randomized controlled study comparing the effects of individual motivating interviewing on the healthy lifestyle issue (weight loss, healthy nutrition, physical activity, ceasing smoking) with typical practice of doctor in Primary Health Care (PHC). Data are collected at the baseline and after 6 and 12 months. Patients included to the study have one of the following diseases: ischemic heart disease (IHD), arterial hypertension (AH). The motivating interview intervention is carried out by trained assistants of PHC. The frequency and the topics of the motivating interview are manual-based but tailored to the patients' needs and medical condition, following the concepts of motivational interviewing, shared decision-making. Shared decision-making is patient's conscious decision towards the behavior change. 120 patients with IDH and AH will be enrolled and randomized into intervention and control groups.
RESULTS: Primary results include the following: results communicated by patients, such as behavior change and life quality change, and clinical changes to be evaluated by surveys. Additional results include economic evaluation, such as using medical services, and costs and index of rehospitalization. Statistical analysis comprises of two principles: 'intention to treat' and 'how to treat'. Study will be completed by May 2020.
CONCLUSIONS: This study will provide evidence regarding clinical effects of motivational interviewing. Besides, this study will demonstrate that patient behavior changes can lead to the increase of disease self-control and patient life quality, which in turn will help to address the growing burden of cardiovascular diseases. Key principle of successful behavior of the patient with cardiovascular diseases is a change of risk factors that significantly influence on the general mortality and morbidity rates.

Medical effectiveness and outcomes of the treatment of patients after pacemaker implantation

Aizhan B. Almukhanova[1], Alyona D. Peremitina[1] *, Magripa K. Bapaeva[2], Bekzhan A. Rysmendiyev[3]

[1]Department of Internal medicine №2, JSC "National medical university", Almaty, Kazakhstan; [2]Kazakhstan's Medical University "KSPH"; [3]City Cardiac Center, Almaty, Kazakhstan

*Corresponding author: Alyona D. Peremitina, Department of Internal medicine №2, JSC "National medical university", Almaty, Kazakhstan. E-mail: alena_peremitina@mail.ru

BACKGROUND: A study of medical social characteristics of patients who had been implanted a pacemaker, and medical effectiveness of the procedure.
METHODS: Statistical, analytical, and descriptive methods were used in this research.
RESULTS: From 2013 to 2017 there were 597 pacemaker implantations at the City Cardiac Center in Almaty. There were 507 patients who were citizens of Almaty (84.9%), the rest 90 patients (15.1%) were citizens of other regions of the Republic of Kazakhstan and other countries. 594 patients (99.5%) were the citizens of the Republic of Kazakhstan, the rest 3 patients (0.5%) were the citizens of other countries. Among the patients who received treatment (pacemaker implantation) females dominated (57.5%); the percentage of males came only to 42.2%. The maximum age among operated patients was 94, the average age was 70.2±12.9. The average age of females was 72.1±11.8, where the average age of males was 67.7±13.8. In general, most patients were delivered to the hospital by the ambulance (59.8%). In other cases, patients came to the City Cardiac Center on their own (12.6%), were referred by medical counseling organizations – 12.4%, by primary health care – 9.2%, by other hospitals – 5.7%, other cases – 0.2%. Among the reasons to implant a pacemaker the top triggers were different types of heart arrhythmia (second-degree atrioventricular block, third-degree atrioventricular block, sick sinus syndrome (SSS), atrial fibrillation and atrial flutter) – 54.3%, the second top triggers were angina and myocardial infarction - 44.9%. Other heart conditions were the triggers for pacemaker implantation only in 0.8% cases. On average, a number of bed-days spent in the hospital were equal to 10.11±3.43; the maximum number of hospital bed-days was 36, the minimum number of bed-days was 3; a number of reanimation bed-days on average was equal to 2.17±1.88; the maximum number of reanimation bed-days was 13, the minimum number was 0. A positive trend (a recovery and an improvement) had been observed in 99.2% of cases after pacemaker implantation, a negative trend (death) had been observed in 0.8% of cases after pacemaker implantation. A patient observation since 2013 displayed the five-year survival rate resulted in 74.8%. The one-year and the three-year survival rates came to 89.0% and 85.0% correspondingly. The average survival time after the pacemaker implantation is equal to 60,56±1,89 months.
CONCLUSIONS: In comparison with the results of a similar research in the Russian Federation, where according to Ponomarenko V.B., Zhdanov A.M., and Shestakov V.A. the one year, the three-year, and the five-year survival rates came to 72.0%, 50.0%, 31.0% correspondingly and in comparison with the research results in European Union countries (Erica O.), where the one year, the three-year, and the five-year survival rates came to 93.0%, 81.0%, 69.0% correspondingly, we can come to a conclusion that the survival rates after the pacemaker implantation in the Republic of Kazakhstan (based on the example of pacemaker implantations at the City Cardiac Center in Almaty) comply with similar outcomes of European and Russian research projects.

"Lecture together" as an example of integration of basic and clinical disciplines in the medical university

Ljudmila N. Vlassova, Galina V. Veklenko*, Aigul B. Ramankulova, Kairgaly Gh. Akhmetov

West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Galina V. Veklenko, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Republic of Kazakhstan. E-mail: veklenko@zkgmu.kz

BACKGROUND: The study process at the university is a combination of classroom and extracurricular activities, whilst the proportion of the latter is increasing steadily.

The traditional course of lectures still has not lost its methodological, educational and upbringing significance and remains systematic. Lectures with a decrease in the total number of hours and semantic load on them, should meet the expectations in the development of independent thinking of students.
METHODS: Integrated "Lectures together" is a good example of the interaction of two professional teachers, interacting on problem-organized material, both among themselves and with the audience. Technology assumes the decisive role of clinical discipline. All questions of the topic are considered in the context of explaining the main clinical situations from the point of view of basic disciplines: why such a clinical picture develops, what is its morphological substrate, what are possible outcomes and complications. The direct content of the issues under consideration is determined by the topics, objectives of the lecture, as well as the disciplines that are involved in this. A feature of the lecture is the presentation of the material "not in turn" one after another, "in order" by each teacher, but in the context of the logic of the presentation of the material.
RESULTS: The key moment of such a lecture is feedback during the lecture and after its completion. During the lecture, students are periodically asked a question about the disassembled lecture fragment. To assess the quality of lectures, questionnaires were developed, which included questions to evaluate the impact of this technique on the quality of mastering the material presented, availability of presentation, the relationship between the lecturers and the audience, presentability, audio and video accompaniment. The survey was conducted at the end of each lecture. The results show that 92% of students evaluate the method of reading "Lectures together" positively and suggest its introduction into other disciplines. From 6 to 8% of students annually express doubts about the expediency of such an approach, explaining this by the difficulties of perceiving information from two lecturers simultaneously. Perhaps this is due to the fact that a certain number of students may not be ready for such perception of the material due to the general lack of preparedness in one of the disciplines or related disciplines, or due to individual characteristics of perception.
CONCLUSIONS: The methods used create the conditions for the natural integration of disciplines horizontally and vertically and are applicable at various stages of training. The lecture requires constant attention and active participation of the listener, as systematically appeals to the topics covered and the topics of related disciplines. With this method of presenting lecture material, the meaning and place of the basic discipline in the system of acquiring clinical knowledge and skills becomes more clear, and eventually, in the system of training the doctor.

Skin microbiocenosis in women having Breast Cancer in Aktobe

Gulaim E. Taskozhina[1] *, Azhar N. Zheksenova[1], Ayman T. Kaldybayeva[2], Ainur Amanzholkyzy[2], Gulbanu D. Mukyshova[1]

[1]Department of Pathological Physiology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [2]Department of Normal Physiology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.

*Corresponding author: Gulaim E. Taskozhina, Department of Pathological Physiology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: tge77@mail.ru

BACKGROUND: According to the World Health Organization (WHO) estimates, Breast Cancer (BC) is the most common malignant neoplasm among women worldwide and accounts for 16% of all cancer cases in women. Breast cancer in Kazakhstan ranks first in mortality across the overall oncological structure and accounts for 11.6%. When ranking by pathology in the Aktobe region, the highest rates were registered for Breast cancer among women. In immune compromised patients, as cancer patients are related to them, bacterial and fungal infections along with microbial colonization increase. Thus, the skin microflora in cancer pathology is of practical significance.
The research is aimed to study the skin microflora in patients having BC aged 37-65 years old: to evaluate general state of microflora and reveal the most featured microorganisms living in the skin of BC patients.
METHODS: A total of 103 women were enrolled in the study, 73 of them presented the main group and 30 served as controls. The studied women from the main group were treated in the Chemotherapy Department of the University's Medical Centre, and controls were clinically healthy and selected out of the Hospital. A microbiological study was carried out, and the qualitative composition of the skin microflora was determined by N. N. Klemparsky method (by means of bacteriological laboratory). Smears from the forearm and affected mammary gland skin were taken for analysis.
RESULTS: Overall pattern evidences that the opportunistic microorganisms were not presented in the skin of the mammary gland in 35% of women from the main group, and in 39% in the forearm skin. The opportunistic microorganisms Staphylococcus Epidermidis and St Enterobacter were the same in both biotopes of the skin, 32% and 7% respectively. Staphylococcus Aureus was presented in 26% of cases in the skin of the mammary gland and in 23% in the skin of forearm. When comparing the biotopes of the mammary gland skin by the two groups, main and control, opportunistic microorganisms were not been cultured in 35% of women, whereas from the forearm they were presented by 1.5 times higher in the study group vs. controls (45% vs. 30%). In the skin of the mammary gland, the incidence of St. Epidermidis was 28% vs. 42% in the skin of forearm. St Enterobacter was presented in 6% in smears from affected skin of the mammary gland and in 10% of smears from the skin in healthy women, i.e. 1.5 times higher in the control group. St. Aureus, on the contrary, was presented 2 times higher in the study group (30% vs. 15%), in the skin of affected gland. In the skin of the forearm, the occurrence of St. Epidermidis (30% and 35%), St. Aureus (24% and 20%) had no significant differences, whereas St Enterobacter (2% and 15%) was 7 times higher in the control group.
CONCLUSIONS: A preliminary evaluation of microflora of the breast and forearm skin in patients having Breast cancer was presented. Different frequency in occurrence along with a tendency to reduce St. Enterobacter and other opportunitic microorganisms in the study group was

revealed. In the meanwhile, pathogenic flora (St. Aureus) was actively presented in the skin of affected gland in BC patients.

Role of surgical treatment in differential diagnostics of spondylitis

A.S.Dosbayev[1], E.N. Iliyasov[2], D.S. Dilmagambetov[1], K.T. Dzhaysheva[1]

[1]West-Kazakhstan State Medical University named after M.Ospanov, Aktobe city, Kazakstan; [2]Aqtobe Regional Tuberculosis Dispensary, Aktobe city, Kazakstan.

*Corresponding author: Dosbayev Askar Sultanovih, West-Kazakhstan State Medical University named after M.Ospanov, 030019 Aktobe city, Maresyeva street, 68, E-mail: adosbaev@mail.ru

BACKGROUND: Spondylitis, specific vertebra inflammations, was always a particular issue of tuberculosis of bones and joints. The disease attracts the attention of researchers and physicians due to the disease severity and the difficulty of diagnosis and treatment. It should be added that tuberculous spondylitis occur more often and take first place among all other sites of tuberculosis of bones and joints.
CASE REPORT: A patient, 18 years old, was admitted to the Aqtobe Regional Tuberculosis Dispensary with diagnosis: TB spondylitis C1-C2, destructive form with pre-and intravertebral abscess with spinal cord compression at this level, complicated by the upper and lower right-hand hemiparesis. BC (-) neg, I category, "new case". Complaints: pain in the cervical vertebrae, limitations of movements in the upper and lower right limbs, their cramps and spastic pains, asthenia, poor appetite, sweating, five kilos weight loss. From anamnesis: sick for the two last years, when the patient for the first time felt pain in the cervical vertebrae. The patient got massage from a chiropractor. At the end of May 2011 the pain intensified. In a month there appeared above mentioned complaints. The patient was examined in Mangystau Regional Hospital, where MRI of the cervical vertebrae was done. Diagnosis: TB spondylitis C1-C2, destructive form with pre-and intravertebral abscess with spinal cord compression at this level, complicated by the upper and lower right-hand hemiparesis. BC (-) neg, I category , "new case". Treatment: DOTS I category. Condition of the patient was improved during treatment, symptoms of spinal cord compression were decreased, hemiparesis had replaced hemiplegia. In September 2011 the patient was transferred to the Aqtobe Regional Tubergulosis Dispensary. The following surgery was performed: dissection and inspection of prevertebral cellular spaces at the C1-C2 level, biopsy of lesion and decompression of the spinal cord at this level were performed. During surgery it was found out that abscess detected at the MRI is in fact tremelloid tumor. Histopathological diagnosis: myxoma. The diagnosis of tuberculous spondylitis was excluded. Tissue specimen was revised in Kazakh Scientific Institute of Oncology and Radiology, and the diagnosis "myxoma" was confirmed. For further treatment the patient was transferred to the above mentioned Scientific Institute. At the dismissal from the hospital the condition is satisfactory, in the early postoperative period there was a good positive trend, strength and range of motion in the right upper and lower extremities were increased.
CONCLUSIONS: This clinical case demonstrates the role of surgical treatment in the differential diagnosis of tuberculous spondylitis. With the steady growth of atypical forms of tuberculosis, as well as tuberculous spondylitis, the surgical guide comes to the front in differential diagnosis, which allows to get a surgical material and confirm the diagnosis by histological or bacteriological methods. This is the fulfillment of the tasks of a phthisiologist-osteologist – the earliest detection of tuberculous spondylitis.

Social aspects in developing the health and well-being of children and adolescents in Western Kazakhstan

Dariya T. Doskabulova

West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Dariya T. Doskabulova, West Kazakhstan Marat Ospanov State Medical University.
E-mail: doctor_medicine@mail.ru

BACKGROUND: Developing of children and adolescents' health is influenced by many risk factors, including non-medical determinants (lifestyle, environmental, socio-economic and domestic factors and living conditions), which significantly affect the development of diseases, reduce the physical and mental development of children and adolescents, increase the burden on public health services. The goal is to study the health and well-being of children and adolescents of school age in a social context and the impact of social determinants on their health as they mature.
METHODS: The study is based on the World Health Organization (WHO) methodology for creating coherent systems for the epidemiological surveillance of the behavior of schoolchildren in relation to health - Health behaviour in school-aged children (HBSC). The study was conducted on a basis of secondary schools in the cities of Western Kazakhstan. The object of the study is schoolchildren 5th, 7th, 9th and 11th grades. The cluster method of sampling schools was used for the study. Selection of schools to be studied using a random sample was determined as follows: schools that can be included in the surveillance system are taken as the basis of the sample. The sample size for the calculation of the required number of observations was determined by the 10% (n) of schoolchildren of target age groups (official statistics). The number of children and adolescents of 11,13,15,17 years in the cities of Western Kazakhstan was the following: Aktobe - 19,107, Aktau - 10,292, Atyrau - 10,948 and Uralsk - 17,596. Study design was cross-sectional. Statistical data were processed using Statistica.v.10 software.
RESULTS: While studying the schoolchildren behavior in the cities of Western Kazakhstan, the following summarized conclusions were made: the majority of children had a good understanding of their appearance (body

image 69.5%); when describing their health, schoolchildren rated it quite high as "excellent" and "good" (health complaints 88.2%), while by the age of 17, adolescents have chronic diseases of 21.2% in all age groups among boys and male adolescents. Eating behavior does not fully comply with the rules of healthy eating, as they eat breakfast less often than on weekends, and as they grow older, the ratio of children who eat sweets every day increases (71.9%). Physical activity and sedentary lifestyle, family and peers – 66.5% evidences low prevalence of physical activity. Every day they are physically active at the age of 11 years old, as they grow older, the level of physical activity decreases, the prevalence of sedentary behavior, watching TV and playing computer games increases with age (64.9%). As they grow up, schoolchildren have a diminished perception of their own academic success as good (school environment 67.0%). Sexual behavior of 4.6% means that sexual behavior of young people is not safe and they are not aware of the prevention of unwanted pregnancy and sexually transmitted infections. Use of alcohol, tobacco: the schoolchildren of the studied age groups do not drink alcohol (deny 91.1%). Socio-economic environment 64.6% means that financial well-being they themselves assess as "quite high", as 56% indicated having their own room and 61% a car in the family.
CONCLUSIONS: The degree in developing the health and well-being of children and adolescents of school age was determined. These data may allow developing specific means and technologies to improve the atmosphere both in the family and at school, aimed the harmonious development of the individual.

Feedback as an effective mechanism for the development of students' communication skills

R.E. Yegemberdiyeva[1] *, M.A. Bashbayeva[2], K.B. Darzhanova[3], K.K. Ermenova[4], M.S. Zhailybayev[3], T.S. Mukashev[3]

[1]Department of Histology West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [2]Center for Continuing Professional Development West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [3]Department of Normal and Topographic Anatomy with Operative Surgery West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [4]Department of Foreign Languages West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: R.E. Yegemberdiyeva, Department of Histology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: egemberdieva17@mail.ru

BACKGROUND: This study presents material on the development of students' communication skills through interactive teaching methods by using feedback. By the end of the lesson students were able to demonstrate their ability to give specific feedback.
METHODS: The study was conducted with students of 1st course of the Faculty of Dentistry in practical classes on the topic "Cartilage tissue" in the discipline "Histology". Students worked in small groups of 7 in each. Each team received a task: to solve a case problem. Conditions of the problem: The patient suffered an injury to the temporomandibular joint. A task list is accompanied by a number of questions and it is necessary to find correct and reasonable answers. For example: What cells is a part of cartilage tissue? What is the composition of the intercellular substance? What are the signs of hyaline and elastic cartilage? Age-related changes in the cartilage. Regeneration possibilities of the cartilage tissue. When the task is done each team presents its work and gives their feedback. For developing communication skills of the 1st course students Pendleton rules were used.
RESULTS: In order to achieve the goal of the study, a practical lesson was conducted using the small group method. Two groups of 7 students were formed. Each group received a task: to solve a case problem. In the process of working in a team, students receive information about their achievements through feedback, and also learn what they should work on. The teacher watches the students giving feedback. In the case of deviations from the rules, he necessarily draws their attention to this.
Students begin their performance with the words "I think that..." and note the positive in the actions of the other team and only after that calls what he thinks he should do in other way. When evaluating the work of a team, the task of the student is: to speak exactly and in a well-argued manner. The teams listen to the speaker without interrupting calmly, then thank him for the provided feedback and only after that, they get the opportunity to agree with the opinion of the opponent or to object, i.e. they also give feedback.
The duration of practical lesson is 4 hours. By the end of the lesson students confidently demonstrate communication skills through feedback following the rules of Pendleton.
CONCLUSIONS: First-year students do not know how to give feedback; they do not have enough communication skills, so we set out to develop these abilities during practical lessons using the small group method. The results of this study showed that students easily acquire feedback skills and, by the end of the lesson, were able to demonstrate communication skills through feedback.

The expression levels of the generalized anxiety disorder and psychological profiles of the people living in oil and gas regions

Ainur N. Zinaliyeva[1] *, Muslima A. Bashbayeva[2], Akmaral M. Baspakova[3], Altinay K. Zhumagambetova[4]

[1]Department of Hygienic Disciplines with Occupational Diseases, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan; [2]Center for Continuous Professional Development, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan; [3]Department of Management of Scientific and Innovative Activities, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan; [4]Department of Microbiology, Virology and Immunology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan

*Corresponding author: Ainur N. Zinaliyeva, Department of Hygienic Disciplines with Occupational Diseases, Aktobe, the Republic of Kazakhstan. E-mail: zinalieva_ainur74@mail.ru

BACKGROUND: The results of the GAD-7 questionnaire for determining the expression of generalized anxiety dis-

order in people of the oil and gas region and psychological profiles identified on the basis of data analysis were presented in this study. The analysis indicated different levels of generalized anxiety disorder, that is in 97.2% of the respondents - minimal, moderate and medium, and in 2.8% people - high level. The mental health condition of the population was represented by two psychological profiles: psychasthenic and anxiety-depressive, highlighted on the basis of the predominance of the mental component of anxiety.
METHODS: A self-reported questionnaire for screening and severity measuring of generalized anxiety disorder (GAD) was used as a data. The respondent is asked to choose an answer that more closely matches his state of health and mood. It allows to reveal negative mental condition (irritability, anxiety, fear, waiting for smth terrible) as well as to get data on the level of anxiety. The sample included adult population of the West Kazakhstan region aged 18-50: including 246 people from oil and gas region Karachaganak – Aksay city; 188 people from Berezovka village and 248 people from the control area Uralsk city. The study was conducted in vivo without any intervention in this process. The work was organized in accordance with the study protocol with departure to the place of residence of the respondents. Statistical Package for the Social Sciences version 25 for Windows was used for statistical processing of the results.
RESULTS: GAD – 7 item scale was used in study, it allowed to measure differentially and detect the presence of generalized anxiety disorder including normal anxiety reaction and distressed state. Among all respondents, minimal level of anxiety in oil and gas regions were made up 75,5%, in control area 78,5%; moderate level of the anxiety in oil and gas regions were 16,5%; in control area 14,9%; middle level 2,0%. The results of the GAD-7 scale indicated that in most of the indicators – minimum, moderate, medium – the anxiety level of the population of the oil and gas region is lower by 3%, 1.6%, 0.6%, respectively, than in the control area, and in terms of high - 0.8% higher than in the control. The mental health of the population living in oil and gas regions were represented by two psychological profiles: psychasthenic and anxiety-depressive.
CONCLUSIONS: In our study we made an attempt to detect the presence of the generalized anxiety disorder in population of studied regions. Results of the data obtained showed that the people of oil and gas regions are subject to anxiety, reaching up to high, it is statistically significant and differed in terms of anxiety ($P<0.01$). Results identified levels of anxiety allowed to determine psychological profiles of population living in oil and gas regions.

Erythrocytes osmotic resistance under influence of copper-zinc pyrite ore

Klara R. Ziyakaeva*, Aliya F. Kayumova, Valentina G. Shamratova, Minzilya Y. Fazlyakhmetova, Irina R. Gabdulkhakova, Olga S. Kiseleva, Galina S. Tupinevich, Oksana V. Camokhodova

Department of Normal Physiology, Bashkir State Medical University, Ufa, Russia

*Corresponding author: Klara R. Ziyakaeva, Department of Normal Physiology, Bashkir State Medical University, Ufa, Russia.
E-mail: claraz@ufanet.ru

BACKGROUND: In the southern Urals, on the territory of the Republic of Bashkortostan there is located one of the largest enterprises of mining - Uchalinsky Mining Plant, where is mined 70% of zinc and 30% of copper. In recent years ore mining is conducted mainly underground. The miners constantly have to contact with the polymetallic dust of copper-zinc pyrite ores, there is changed a functional state of organism , reduced its adaptive capacity, as a result is increased a risk of professional and common diseases. The rate of osmotic resistance of erythrocytes reflects the functional state of the erythrocytes in adapting to various stress conditions. The purpose of the study is to explore osmotic resistance of erythrocytes (OR RBC) of peripheral blood in vivo by prolonged exposure of copper-zinc pyrite ore on rats.
METHODS: Experiments were carried out on 70 white outbred male rats weighing 180± 43,37 g. Experimental group (N.=50) daily for four months daily was fed with ore powder added to bread, at the rate 600 mg/kg body weight. Blood sampling was carried out from the tail vein on the 10-th, 30-th, 60-th, 90-th, 120-th day of experiment. OR RBC was determined by the method of Waugh and Asherman (1938) in Vasilevskaya (1955) and Cohen (1958) modification by defining the optical density solutions hemoglobin, resulting in the destruction of RBC in hypotension solutions of sodium chloride (NaCl). The degree of hemolysis of erythrocytes was assessed in the spectrophotometer N5400 at 540 nm wave-length. There were determined three different populations of erythrocytes: 1) old cells with low resistant, 10% damages cells (d10); 2) erythrocytes with middle resistance, 50% damaged cells (d50); and 3) young erythrocytes with high resistance, 90% (d90) damaged erythrocytes. Statistical data processing was carried out in the program StatSoft Statistica 10. For each indicator was calculated mean and standard error of the mean. As a criterion for assessing the validity of the distinction between experienced and intact animals was used non-parametric criterion validity Mann-Whitney U test. Differences were considered at $P<0.05$.
RESULTS: There was the most difference between treatment group from control group to the 30th-day of experiment in population of middle osmotic resistance cells (d50) at 0.4% NaCl, in the treatment group was 52.32±11.51% damaged cells, and in the control group only 38.76 ± 1.35%. On the 120-th day was observed a population of old cells (d10) in 0.5% NaCl. Hemolysis of d50 erythrocytes was in 0.44% NaCl, in the control group d50 population of erythrocytes in 0.3% NaCl solution. On the 120th-day of in vivo experiment d90 (90.15±2.5%) population of young erythrocytes with high resistance was damaged in 0.2% NaCl, whereas in the control group only 72.87±7.32% erythrocytes were destroyed.
CONCLUSIONS: On the basis of the obtained results it is possible to determine the negative influence of copper-zinc pyrite ore during long treatment. The greatest effect of the toxic effects of copper-zinc pyrite was observed on 120-th day when hemolysis was in all populations of RBC.

The variant anatomy of Hepatic and Renal arteries

Lyubov Ivanova[1] *, Rustem Abubakirov[2], Myltykbay Rysmakhanov[3]

[1]Department of General and Topographic Anatomy, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [2]Department of Radiology, the Aktobe Medical Center, Aktobe, Kazakhstan; [2]Department of Surgery and Transplantation, the Aktobe Medical Center, Aktobe, Kazakhstan

*Corresponding author: Lyubov Ivanova, Department of General and Topographic Anatomy, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: lubochka_kz@mail.ru

BACKGROUND: In the up-to-date scientific literature interest to the variant anatomy interest to the variant anatomy of the arterial tree of the abdominal aorta, particularly of the hepatic and renal arteries, does not tend to reduce. The findings of anatomical studies of the circulatory system continue to confirm the classic researches in typical anatomy and variability of the human body. Studying the variant anatomy of the arterial trunks of the upper part of the abdominal cavity and retroperitoneal space still remains relevant, as more and more new forms are revealed, which is of practical importance in hepatobiliary surgery, surgical urology and in liver and kidney transplantation to prevent complications.
The present study was aimed to reveal the variants of the hepatic and renal arteries anatomy.
METHODS: This retrospective research was based on 500 CT scans with contrasted hepatic and renal arteries in patients aged 20–85, male and female, who were examined in the Department of Radiology in the Aktobe Medical Center within 2016-2018. The study was performed into the arterial phase to reveal the variants of origin and topographic-anatomical features of the hepatic and renal arteries using the computed tomographer "General Electric, 2013, Optima 660".
RESULTS: The data obtained revealed the presence of isolated variations of the hepatic arteries, when the right hepatic artery began from the splenic artery, the gastroduodenal artery, the superior mesenteric artery, as well as from the main trunk of the abdominal aorta. The left hepatic artery was detected as a branch of the left gastric artery, the common hepatic artery in the absence of its own hepatic artery. There were also combined variants where the left hepatic artery departed from the left gastric artery, and the right hepatic artery departed from the superior mesenteric artery or from the gastroduodenal artery, or from the abdominal aorta. Replacements and presence of additional branches, both in right and left hepatic arteries were noted. Studying the variability in renal arteries, we found numerous variations of the kidney arteries, both in right and left ones. The number of arteries reached 2-9, and the course of running them to the organ gate differed in arcuate, decussating and early branching: one variant constituted an origin of four arteries running from the abdominal aorta to the right kidney, and eventually in the gate area there were nine arteries revealed. Another variant presented four arteries going to different sections of the right kidney which originated from the abdominal aorta twice and one branch each from the superior mesenteric artery and the right common iliac artery.
CONCLUSIONS: Findings showed that anatomical variants of the hepatic and renal arteries structure occurred in 17.2% and 10.0%, respectively, thus confirming the multivariate structure and topography of the mentioned arteries, their insimilarity comparing to previously described data, the presence of single and combined variations, as well as the multiple and replacement arteries. Thus, the blood supply of the liver and kidneys has pronounced individual variability, knowledge and consideration of which will allow carry out revision of tubular formations of the operated area accurately, adjust the tactics of surgical interventions and produce a safe transplant, contributing to the correct imposition of arterial anastomoses to prevent ischemic manifestations.

Comparative assessment of the development of complications in patients with essential arterial hypertension and obesity

Tilekshi N. Zhumabayeva*, Dina O. Shamshayeva, Aniya N. Seipenova, Dina S.Dyusupova.

Department of General Practice №1, West-Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding Author: Tilekshi N. Zhumabayeva, Department of General Practice №1, Aktobe, Kazakhstan.
E-mail: zhumabayeva_tn@mail.ru

BACKGROUND: Despite the presence of various groups of antihypertensive agents, the development of this pathology in Kazakhstan not decreases. In cardiology the question of mortality decrement and development of complications in cases of essential arterial hypertension remains operative; the risk factors elimination is necessary. One of the factors is obesity. Research objective: to assess the incidence of complications in patients with essential stage 2 hypertension and obesity.
METHODS: There were 26 patients under observation for 8 months with essential arterial hypertension (EAH) stage 2 with a normal body mass index (BMI) and obesity (BMI 31.0-32.0), which were divided into 2 groups of 13 patients each. All patients before and after the observation study: a coagulogram, lipid profile, K, Ca, Na, Mg, blood glucose, complete blood count (OAK), electrocardiography (ECG), echocardiography (EchoCG), 24-hour blood pressure monitoring (Smad).In 13 patients of the 1st group, six of them had an increase in total cholesterol (TC) to 7 mmol/l, in three low-density lipoproteins (LDL) up to 3.3 mmol/l, an increase in triglycerides (TG) was observed in 7 patients from 1, 9 to 2.5 mmol/l. The glycemic profile is within 4.4–5.1 mmol/l in all patients. All patients of the 2nd group showed an increase in TC from 6.9 to 8.0 mmol/l, LDL 3.2–4.4 mmol/l, TG 2.3–3.9 mmol/l. Glycemia concentration was within 6.0 -7.1 mmol/l.In patients of the first group, 4 had an overweight (25.1-25.8). In the second group, BMI was 31.0-32.0. Before starting the observation, patients were interviewed about proper nutrition, weight loss (for whom the BMI exceeds 24.9), to eliminate bad habits (smoking, drinking alcohol); keep the daily regimen and sports: swimming, walking before bedtime. To start checking the daily blood pressure after waking up and before bedtime, weekly weighing, regular intake of antihypertensive drugs (all patients took concor, perindopril, indap).

RESULTS: In patients of the first group, hypertensive (HHC) type 1 developed in 3 patients (23.0%), who associated a sharp increase in blood pressure with weather changes, in 2 patients with stress without hemodynamic disturbances (15.3%), stroke developed in 1 patient due to the lack of antihypertensive drugs (7.6%). OX in three patients decreased to 5.9 mmol/l, in two to 6.0 mmol/l, and in one patient without dynamics. LDL: in one patient decreased to 1.9, in two it was 2.8 mmol/l. TG: in two patients it was 1.8, in the remaining patients -2.1 mmol/l. The decrease in weight in the first group was observed in two to 24.7 (30.7%), in two -25.0 (30.7%). In the second group, OX decreased to 6.0 in four patients in three to 7.2 and in the rest to 7.7 mmol/l. In six patients, LDL was reduced to 3.0, and in the remaining 4.1 mmol/l. TG amounted to between 2.0 and 3.0. Serum glucose remained in the range of 6.0–6.7 mmol/l. Decrease in weight to 29.2 was noted in five patients (38.5%). Against the background of the constant use of antihypertensive drugs in the 2nd group, type 1 GC developed in 2 (15.3%), stroke in 4 (30.8%), and 5 type 2 HC (38.4).
CONCLUSIONS: our observation showed frequent and severe complications in hypertensive patients with obesity compared with a normal body mass index, as well as an improvement in the lipid and glycemic profile.

Features of the morphological structure of the middle layer of the myocardium of the right and left ventricle of the heart in the age aspect

Kaliev Abdiraman R.[1], Temirova Gulnara A.[2] *

[1]Department of pathological anatomy and forensic medicine, West Kazakhstan Marat Ospanov State Medical University, Aktobe, The Republic of Kazakhstan; [2]Histology department, West Kazakhstan Marat Ospanov State Medical University, Aktobe, The Republic of Kazakhstan

*Corresponding author: Temirova Gulnara Ayaganovna, acting associate professor of Histology department, West Kazakhstan Marat Ospanov State Medical University, Aktobe, The Republic of Kazakhstan. E-mail: gulnara_acnara@mail.ru

BACKGROUND: Cardiovascular diseases claim (CVDC) the lives of 16.7 million people per year, which is 29.2% of the total mortality of the population of the Earth, mainly due to myocardial infarction.
The structure and function of the left ventricle of the heart is most studied. The structure, function of the right ventricle of the heart plays a central role in the clinical outcome of various CVDC. The established morphological parameters of the heart for our region are absent.
METHODS: Study of the morphological structure of the myocardium of the heart. Study design - transverse, selective. Autopsy material of cardiac myocardium was obtained from autopsies of persons killed without cardiac pathology (Aktobe branch "Center of forensic medicine" MJ RK). The age group consisted of women and men aged 20–60 years. Organometric measurements of the heart were carried out according to the method of G.G. Avtandilov. Statistical processing of the results was carried out according to the program (STATISTICA10).
RESULTS:The average heart mass at the age of 20-40 years old was 267.5, at 41-60 years=380 grams. The mass of the heart in the 1st and 2nd group corresponded to the norm and did not differ from the control. In our study, the thickness of the right ventricle in the 1st and 2nd groups did not differ from the control, whereas the left ventricle was 1.4 times larger.The relative area of the parenchyma, stroma and vessels in the myocardium at the age of 20-40 years was detected within the normal range for the right ventricle. The area of the left ventricular parenchyma in the middle and inner layer is more than 80%, due to the proportion of cardiomyocytes. The area of the vessels in the middle layer of the right ventricle is 3.6 times smaller than the area of the vessels of the left. In women, an increase in the thickness of the left ventricle is associated with an increase in the area of cardiomyocytes, but the area of the vessels of the middle layer of the right ventricular myocardium is 2.3 times smaller than the area of the vessels in the corresponding layer of the left. Stromal-parenchymal myocardial index (SPI) characterizes the ratio of parenchyma and stroma layer by layer. An increase in the parenchyma leads to a decrease in JFS, and an increase in stroma leads to an increase in this index. The decrease in JVI on average by 1.4 times was noted in the myocardium of the middle layer of the left ventricle of the 1st group and the inner layer of the left ventricle of the 2nd group, which indicates an increase in the parenchyma. Nuclear-cytoplasmic index of cardiomyocytes was 1: 20 (1:6).
CONCLUSIONS: Left ventricular hypertrophy was detected in both groups: in the 1st group due to the middle layer and the inner layer in the 2nd. Criterial morphological features of the Western Kazakhstan for the diagnosis of early changes in the myocardium of the heart to choose a trophic index for 20 years.

The results of researches in assessing the rehabilitation of children with cerebral palsy using Ashfort, Bartel and MACS scales

Alima R. Kashkinbayeva *, Yuliya A. Zame, Yerkin Sh. Shaikhimov, Gulbakit K. Koshmaganbetova

Center for Continuing Professional Development, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan

*Corresponding author: Alima R. Kashkinbayeva, Center for Continuing Professional Development, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan. E-mail: alima_kashkinbaeva@mail.ru

BACKGROUND: We can consider that one of the most dangerous pathologies of our time is cerebral palsy. For patients suffering from cerebral palsy, it is very important to adapting in life of society, developing skills, and adapting to social conditions. The programs developed for the rehabilitation, are createaccording to the diverse effects on the child, implying medication, psychological, physiotherapy, social and personal effects. Rehabilitation programs to children with CP should be appropriate for the age and functional status of patients. The results of studies in assessing the rehabilitation of children suffering from cerebral palsy,were conducted at the rehabilitation department of the Children's Hospital of the Aktobe Medical Center by using Ashfort, Barthel and MACS scales.
OBJECTIVES: to evaluate the effectiveness of reha-

bilitation of children suffering from cerebral palsy, who received physiotherapy, remedial gymnastics and massage using Ashfort, Barthel and MACS scales (assessment before and after rehabilitation)
METHODS: 52 patients suffering from cerebral palsy who were undergoing rehabilitation treatment in the neurological department in the Children's Hospital of the Aktobe Medical Center were involved in the research. Before and after rehabilitation the Ashworth, Bartel, MACS scaleswere used for theevaluation of the effectiveness. During the study, period rehabilitation, physiotherapeutic procedures, therapeutic exercises, and massage were performed for children with cerebral palsy.
RESULTS: As a result of research, 52 children with cerebral palsy which assessing daily life, after rehabilitation according to the Bartelscales index showed an increase from 99 points (95% CI 86-113) to 105 points (95% CI 91-119), scores on other scales, there was a decrease in the index on the MACS scale from 2.34 (95% CI 2.08-2.06) to 2.23 (95% CI 1.96-2.49), on the Ashfort scale from 2.94 (95% CI 2.77-3.1) to 2.17 (95% CI 2.17-2.01). Also, we evaluated the types of cerebral palsy, and when assessing daily life on the Barthel scale in children with dyskinetic form after rehabilitation, there was an increase from 85 points (95% CI 66-103) to 89 points (95% CI 80-107), children with the spastic form 105 points (95% CI 87-122) before rehabilitation up to 112 points (95% CI 93-129) after rehabilitation; on the MACS scale, there was a decrease from 2.28 points (95% CI 1.8-2.76) to 2.21 (95% CI 1.6-2.72) in children with the dyskinetic form, and in children with spastic form from 2.36 (95% CI 2.04-2.6) to 2.23 (95% CI 1.9-2.5);on the Ashfort scale, children with a dyskinetic form after rehabilitation also showed a decrease in rates from 2.64 (95% CI 2.35-2.9) to 2.35 (95% CI 2.07-2.64), in children with spastic form from 3.05 (95% DI3.05-2.85) to 2.1 (95% DI-2.1-1.92).
CONCLUSIONS: The most effective, after the use of physiotherapy, massage and physical therapy, was rehabilitation in children with spastic paralysis. Children with a dyskinetic form of cerebral palsy had lower rates of treatment effectiveness, in compare with the children with the spastic form. The results of the effectiveness of rehabilitation on the scales were insignificant, which requires a certain approach in the treatment of children with cerebral palsy.

Evaluation of thyroid status in the adult population living near the Karachaganak field (Western Kazakhstan)

Khatimya I. Kudabayeva *, Yerlan Sh. Bazargaliyev, Aigul K. Turdalina, Saniya F. Zelentsova

Department of Internal Medicine No.1, West Kazakhstan State Medical University named after Marat Ospanov, Aktobe, Kazakhstan

*Corresponding author: Khatimya I. Kudabayeva West Kazakhstan State Medical University named after Marat Ospanov, Aktobe, Kazakhstan. E-mail: Hatima_aktobe@mail.ru

BACKGROUND: Currently, the influence and intensity of environmental factors on human health is b ecoming more pronounced, which in turn affect the life expectancy of the population. Objective of the study: Assessment of thyroid status in the adult population living near the Karachaganak field (Kazakhstan).
METHODS: A one-time cross-sectional study of the population living near the Karachaganak field (the city of Aksai, the village of Berezovka) and the population of the city of Uralsk (control group) was carried out. The study included 682 adults aged 18–50 years, of whom 434 were in the oil and gas bearing area (NG), 248 adults of the city of Uralsk (KG) were examined as a control group. The exclusion criteria were patients with severe chronic diseases (cardiac, hepatic, renal failure) and thyroid disease (thyroid gland) in history. Inclusion criteria were: age (18-80 years) and their voluntary consent.
RESULTS: Determination of thyroid-stimulating hormone (TSH) and free thyroxine (T4) is one of the leading markers in assessing the thyroid hormone status. The level of free T4 in the region was 15.44 ± 3.83 pmol / l, including in NG - 15.38 ± 4.06 pmol / l; in the CG - 15.54 ± 3.40 pmol / l (z = 0.986; P-0.32). TSH content in the region - 3.72 ± 8.78 mU / l; in NG - 3.73 ± 8.62 mU / l; in the CG - 3.70 ± 9.08 mU / l. AT-TPO: in the region - 55,19 ± 114,08 U / ml; in NG - 53.74 ± 119.53 U / ml; in the CG - 57.74 ± 103.93 U / ml. The content of thyroid-stimulating hormone (z = -1.089; P-0.27) and free thyroxin (z = 0.986; P-0.32) in the control group and the control group did not reveal any significant differences. The difference between groups was revealed according to the content of antibodies to TPO (z = 9.603; P-0.00), which was higher than in persons living in the city of Uralsk.
No less important is the study of the frequency of newly diagnosed subclinical hypothyroidism in persons living in NG areas. An increase in TSH levels of more than 4.2 mU/l indicates a lack of thyroid function. The frequency of subclinical hypothyroidism in the surveyed areas was as follows: in NG -14.11%; in CG – 10.12%. No significant difference in prevalence of newly diagnosed hypothyroidism in the groups was found.
When assessing thyroid status, the frequency of hyperthyroid subclinical dysfunction, which is diagnosed at a TSH level of less than 0.27 mU / L, is also assessed. In our study, a reduced level of TSH was detected in 0.53 - 1.61% of cases, and there were no differences in indicators depending on the place of residence. In NG, the suppressed level of TSH was detected in 1.15% of adults, in the CG - in 1.61%.
CONCLUSIONS: Assessment of thyroid status in adults near the Karachagan field showed that living in the region of oil and gas production increases the risk of autoimmune thyroid damage. The functional activity of the thyroid gland, according to a study of thyroid homeostasis, tended to decrease in oil and gas regions.

Internalization in medical education

Sergei Z. Chukov[1], Abdiraman R. Kaliev[2], Ljudmila N. Vlassova[2], Maral E. Ongarova[2], Aigul B. Ramankulova[2] *

[1]Department of pathology anatomy Stavropol state medical University, Stavropol, Russian Federation; [2]Department of pathology anatomy West Kazakhstan Marat Ospanov State Medical University, Aktobe, Republic of Kazakhstan

*Corresponding author: Aigul B. Ramankulova, Department of pathology anatomy West Kazakhstan Marat Ospanov State Medical University, Aktobe, Republic of Kazakhstan.
E-mail: ramankulova1977@mail.ru

BACKGROUND: In the modern world in all spheres of life of any country, there is an active process of internationalization, which involves the exchange of knowledge between students from different countries. Education is no exception. The start of the active internationalization of education was done at the Bologna process. Internationalization of education is the process by which the goals, functions and organization of educational services acquire an international dimension.
CASE REPORT: The concept of internationalization in higher education in international practice traditionally includes two aspects:" internal "internationalization [internationalization at home] and "external" internationalization or education abroad, cross-country education, cross-border education". Today, these processes are becoming an integral part of the life of universities. And most importantly, such processes really contribute to the development of the University, increase its competitiveness in the domestic and foreign market of educational services and research. An acute problem of this system is the problem of the language barrier. The language barrier prevents us from a qualitative transmission of knowledge. Many foreign students have poor language skills of the host country, which consequently affects the perception of knowledge. The most difficult process is the transfer of knowledge to foreign students, if the training takes place in the language of the country in which the institution is located. To solve this problem, it is necessary that both the teacher and the students from the other countries have knowledge of one common selected international language, since it is obvious that the process of internationalization will not be effective without an international language. To do this, it is necessary to provide certain conditions for learning this language. It is necessary to make the State support for training of teachers of language. The WKSMU, throughout all its existence, successfully performs the training personnel for the practical health of Kazakhstan. The educational environment of the University is a modern multi-level system of continuous training of specialists with higher medical education. The staff of the Department of pathological anatomy of WKSMU was also involved in the process of internationalization of education. In this report, we want to share the experience of cooperation in the framework of the academic mobility program "visiting Professor". The University management invited the professor of Stavropol state medical University (Russian Federation), to participate in the educational process at the Department of pathological anatomy. Within two weeks, the educational events were held, including lectures in Russian and English languages, practical classes both in groups of Russian-speaking and English-speaking students, classes with practical pathologists in the format of "master class". Two languages, Russian and English, were chosen for the purpose of internationalization of education, based on their role as languages of international communication, spoken by both students and visiting teachers.
CONCLUSIONS: Thus, the first steps on the implementation of internationalization in the process of teaching pathological anatomy and in the scientific sphere were carried out. Such an approach at the University-wide level, as well as at the country-wide level, can create a significant potential for the economic future not only of a single country, but also of the whole world, as it opens up new horizons in professional education.

Opisthorchiasis in the Aktobe province masked by clinic of hepatitis – a case series

Aigerim N. Iskakova*, Meyrambek S. Kurmangazin, Aigul A. Amanzhanova, Maken Zh. Kurgambekova, Akezhan R. Astarkhanov

West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Aigerim N. Iskakova, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: PhD1013@mail.ru

BACKGROUND: Currently, it is known about 300 human helminth infections and about 50 types of protozoa invasions that cause human's diseases. According to the World Health Organization (WHO), it has been estimated that 1/4 of the world's population is infected with intestinal parasites. At the present time Opisthorchiasis remains a socially significant problem in Kazakhstan by reason of its wide distribution and the development of such severe consequences of the disease and the development of immunodeficiency states. The greatest distribution is registered in the Ob, Irtysh, Irgiz, Turgai, Nura and Ishim River regions. The largest nidus of opisthorchiasis, existing in Aktobe region, is Irgiz. More than 90% of the total fishery is fish from that Irgiz nidus. For successful opistarchosis eradication, it is important to identify the prevalence of invasion in the territory of the Republic of Kazakhstan. Annually opistarchosis is registered among the population of the country, so in 2014 there were 18 cases, or 3.12 per 100,000; in 2015 there were 29 cases, (5.1); and 19 cases took place in 2016 (3.3). Mostly opisthorchosis affects the organs of the hepatobiliary system and the gastrointestinal tract, namely the stomach, duodenum, pancreas and liver, and in 90 per cent of the cases the main affected organ is the liver.
CASE REPORT: On November 2018 7 patients were diagnosed with acute opisthorchiasis and admitted to the Aktobe Regional Hospital of Infectious Diseases. Verification of the diagnosis "Acute opisthorchiasis" was established on a basis of diagnostic criteria in accordance with the clinical protocol "Diagnosis and treatment of adult Opisthorchiasis". Having analyzed their case histories, we found that all the patients were employees of the same local school in the same district (the Irgiz nidus of Opisthorchiasis). The average age of the patients was ranged from 24 to 60 years. The patients were admitted to the Aktobe Regional Clinical Hospital of Infectious Diseases from the infectious diseases' consulting room of the Aitekebi district hospital. When referring to the hospital, the following provisional diagnoses were made: Viral hepatitis B, viral hepatitis A, chronic cholecystitis, pancreatitis, ARVI (acute viral respiratory infection). In the Aktobe Hospital HAV enzyme-linked immunoassay

was made, and the result was negative. The conclusion of presence of acute Opisthorchiasis was made on a basis of the characteristic epidemiological history: hand-made raw fish salad consumption (Heh-salad). The fish had been purchased on the fish market. The average incubation stage of the patients was 7–9 days. All the patients had a moderate clinical course with an acute onset of the disease. The average bed-day was 21 days. The generalized symptoms at admission to the hospital for all patients were: common weakness 85%, fever 100%, nausea 100%, vomiting 85%, icteric staining of the skin 85%, epigastric pain 71%, joint pain 28%, dark urine 100 %, loss of appetite 100%. Their CBC (complete blood count) showed leukocytosis, an increase in ESR (erythrocyte sedimentation rate) and eosinophilia, according to their biochemical analysis it was identified bilirubinemia, AlaT (alanine transaminase) in the range - 0.35, AsT (aspartate amino transferase) in the range - 0.29. In other words, 85.7% of the patients with Opisthorchiasis had a hepatitis clinical manifestations. All the patients were discharged from the hospital in a satisfactory condition.

Principles and directions of the Human resources strategy formation in West Kazakhstan Marat Ospanov State Medical University

Dinara Nuranova[1], Kairat Kurmangaliyev[2] *

[1]Department of administrative and personnel work, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [2]Department of strategic development and quality management, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Kairat Kurmangaliyev, Department of strategic development and quality management, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: kairat_121@mail.ru

BACKGROUND: Issues of personnel policy of the West Kazakhstan Marat Ospanov State Medical University is one of the important conditions for improving its competitiveness and entry into the world educational rankings. As a strategic direction, personnel policy should be based on a system of reasonable priorities and values.
The paper was aimed to substantiate the basic principles and directions of the University's development program regarding the human resources.
METHODS: Analysis of state of the main activities of the University over the past 3 years, SWOT-analysis of the current activities of the University, identified key problems and their causes, a list of measures to overcome them were involved to be analyzed. The assessment of innovative potential of the team and prognosis of tendencies in change was carried out.
RESULTS: The main directions and prospects of development of the University included: improving the quality of academic process, internationalization of education, international cooperation, academic mobility of students and faculty members, improving the efficiency of medical research, a qualitatively high level of publication activity. It is established that an important resource for the implementation of the strategic goals set by the University is the personnel potential and mechanisms of its development: improving the quality of the teaching staff, optimizing the personnel structure, the formation of an effective personnel reserve. The quantitative composition of the University staff, its age and qualification structures were analyzed. The analysis of the development of employees, motivational mechanisms, wages. Through a questionnaire survey among the staff and faculty members of the University the main problems were identified, along with organizational issues that are taken into account in the development of personnel strategy.
In accordance with the analysis, the main activities and tasks in the management of personnel potential of the University are the following: creation of an optimal organizational structure of personnel management, the maintenance of conditions and incentives for the effective work of employees, providing opportunities for training, career development, the creation of an effective personnel reserve. The key indicators of the tasks are defined.
CONCLUSIONS: It appears to be impossible to achieve the strategic goals set by the University without high human resources, its renewal and accompanying development at all stages. Therefore, in the development strategy of the University a separate direction is necessary to allocate the program of the human resources development. It is also necessary to take into account that the personnel structure is a resource which needs to be developed constantly, by investing considerable investments.

Correlations between the gyri of brain hemispheres' frontal lobe, genu and rostrum of corpus callosum

Maigul Sarsenova*, Mukhtar Zhaylybaev, Assima Sapargaliyeva

Department of Normal and Topographic anatomy, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.

*Corresponding author: Maigul Sarsenova, Department of Normal and Topographic anatomy with operative surgery, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: maygul1@mail.ru

BACKGROUND: The variability of the hemispheres of the brain, studying the range of their changes is one of the actual problem of neuromorphology. The corpus callosum is an important anatomical structure of the white matter, uniting the brain hemispheres through numerous commissural fibers. Knowing that the nerve fibers from the pyramidal cells of the frontal and orbital lobes of the hemispheres pass through the genu and the rostrum of the corpus callosum, it is important to note the relationship between their external and internal structure.
METHODS: The reserch was aimed to study a total of 25 preparations made of brain which belonged to humans aged 18-45 years and were requested in the forensic morgue. Morphometric analysis of the corpus callosum was performed to find significant differences or similarities in size and establish definite consistent patterns, if any.
RESULTS: During the study of the external structure of the frontal and orbital gyri, the genu and rostrum of the corpus callosum, their variability and similarities were revealed. Overall, in most of the preparations (22 out of 25) the curvatures of both hemispheres were pronounced,

enlarged and high without significant differences. In contrast to the right hemispheres, the central gyri of the left hemispheres were divided into upper and lower parts. In the right hemispheres the portal part was separated from the lower frontal triangle, and in the lower part of the left hemispheres was connected by anastomoses. The frontal gyri of the two hemispheres were relatively wide and varied insignificantly. The corpus callosum in all 25 cases had a thick, distinct angle of rotation (110.6 ± 0.02°), there were no straight lines. The rostrum was located on the front of the genu, its thickness through all the preparations varied insignificantly, 0.2±0.001 cm, as well as its length, 0.3 ± 0.02 cm. Both hemispheres had simple, vertical and thick orbital gyri. The stem part of the corpus callosum was distinguished by its special appearance and size throughout all the preparations. The size of the front part of the body was large, with a thickness of about one third of the body, the thickness of the trunks of this part was slightly thinner than the genu, the front part of the corpus callosum had a length of about 2.1±0.1 cm. The front and rear central gyri were well developed.

The results of the study show that the frontal and orbital gyri were well developed in all the preparations, in which the genu and rostrum of the corpus callosum were also developed, and in the weakly developed form of the genu and rostrum, the frontal and orbital convolutions were correspondingly thin.

CONCLUSIONS: There is a direct correlation between the layer and the structural configuration of the corpus callosum. The external form of the convolutions is well developed, with a developed genu of the corpus callosum. Both hemispheres have simple, vertical and thick orbital gyrus. Overall, the corpus callosum is associated with the size and shape of the rostrum and the degree of configuration of the orbital convolutions.

Results of simultaneous surgery in cancer patients

Azamat B. Zharylgapov*, Arip K. Koyshybaev, Olzhas N. Urazaev, Saule K. Balmagambetova, Aslan A. Amankosov, Erbol M. Dustanov, Meiramgul G. Igibaeva, Anar S. Zhasulanova

Department of Oncology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Azamat B. Zharylgapov, Department of Oncology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. Email: aza_89med@mail.ru

BACKGROUND: Simultaneous operations are surgical interventions that aimed correction of damages in two or more organs caused by independent diseases, within one-stage single approach. Hence, the simultaneous surgical correction can eliminate the risk of repeated interventions and possible complications, save the patient's psyche and reduce a total cost of treatment, taking on account the re-examination expences. A combination of diseases may be etiopathogenetically interrelated. If so, then the simultaneous intervention becomes mandatory. The issue of indications for simultaneous operations in oncological patients is very complex due to several reasons: the presence of primary severe oncological pathology, the presence of severe homeostasis disorders, and the thought that synchronic one-stage approach can presumably complicate any surgical intervention. Besides, when complications occur during the oncological operation due to the long-term period of uncorrected surgical pathology, most of them may wrongly identified as the progression of the main malignant process. For these reasons, the questions of indications, rational access, volume and sequence of surgical steps are not yet highlighted properly.

The study was aimed to analyze the results of simultaneous operations on the abdominal organs, to justify or to object their therapeutic reasonability.

METHODS: The study was designed in a case-control manner. We retrospectively reviewed the data from medical records of patients who undergone simultaneous operations on the abdominal organs performed in the Aktobe Oncology Center within the period 2012-2017 due to the presence of malignant tumors with concomitant surgical pathology. Patients from the Department of Surgery who underwent surgical operations and matched by age served as controls to those having cancer. Both groups of patients were compared regarding the following parameters: total duration of surgery, presence of complications, blood loss, lasting of postoperative period, outcomes of the surgery. Non-parametric operational tests were used due to a priori missing a normal distribution. To analyze the quantitative variables in two independent samples the Mann-Whitney (U) test and the Pearson's $\chi 2$ test for frequencies comparison were performed. SPSS Statistics.v.20 software (IBM, Armonk, NY, USA) was applied for calculations. For all tests a two-side type I error of $P \leq 0.05$ or less at 95% CI was assumed statistically significant.

RESULTS: A total of 52 patients' medical records (of them 13 men and 39 women) aged 51.5±5.3 (40.0-77.0, M 62.0), who underwent simultaneous operations were being analyzed. Blood loss during the one-stage intervention was 290±40 vs. 250±50 in controls ($\chi 2$ 4.3, P 0.08). The total average duration of the operation resulted in 181.2±14.7 minutes (150-210, M 194.0), while 154±13.3 in controls ($\chi 2$ 3.3, P 0.12). Postoperative bed-days after simultaneous surgery amounted to 21.2±4.9 days (15-46, M 24.0) vs. 15±6.9 in controls ($\chi 2$ 7.3, P 0.06). Three patients suffered from minor complications in the early postoperative period. Intraoperative complications and lethal outcomes were not recorded across the all clinical observations.

CONCLUSIONS: Overall, the simultaneous operations in cancer patients do not significantly affect the operation timing and do not increase the blood loss. Moreover, the indices of postoperative complications and mortality upon simultaneous operations do not differ from those of the standard surgery. The reasonability of practiced approach may be entirely justified by the fact of disposal the patient's two or more pathologies requiring surgical correction which was run while a single intervention.

Recklinghausen's disease and pregnancy

Tatyana S. Slobodchikova*, Irina E. Alekseevna

Department of Obstetrics and Gynecology, Perinatology, Non-profit joint-stock company "Medical University of Karaganda" Kazakhstan, Karaganda

*Corresponding author: Tatyana S. Slobodchikova, Department of Obstetrics and Gynecology, Perinatology, Kazakhstan, Karaganda.
E-mail: super-elvie@mail.ru

BACKGROUND: Recklinghausen's disease (neurofibromatosis) is a hereditary disease that belongs to ectomesodermal dysplasia with lesions of the skin, eyes, nervous system and internal organs. The population incidence of Recklinghausen's disease is 1:3000-1: 4000. The earliest symptom is pigment spots. For number of years, pigment spots remain the only sign of the disease. Then tumors start to develop from nerve trunks and their smallest branches - neurofibromas. Neurofibromas typically begin to occur in pubertal period, increasing with age and during pregnancy. (Thomas p. Habif Skin diseases. Diagnosis and treatment: Moscow, MED Press-inform, 2006). It is important to note that initial manifestations of the disease are identified in many cases during the first pregnancy, which worsens the course of neurofibromatosis. (K. Nisvander, A. Evans Obstetrics translation from English by N.Timoshin Moscow 1999). Currently, the disease is not curable. Specialized treatment is not developed. Individual tumors located in internal organs, Central nervous system and posing threat to life are removed with surgery (Skin and venereal diseases. Guide for doctors in 4 volumes. Ed. by K. Y. Skripkin, M.: Medicine 2010 GRD, 3).
CASE REPORT: A 24-year-old pregnant woman has identified periodic appearance of pigment spots of different sizes on her body since childhood, number of freckles and size increased with age. Round shaped, soft, painless, pigmented and increasing in size lumps have started to appear on back since 14 years old.
New tumor-like formations gradually began to appear on upper and lower limbs, which was reason for visiting doctor. Oncologists identified and confirmed diagnosis of Recklinghausen's disease. The patient is registered for regular medical check-ups. She visits oncologist once in 3 months. This pregnancy is the first, planned; pregnant woman is informed about possible complication of neurofibromatosis. Patient was registered at the period of 7-8 weeks. Genetic screening of fetus for Recklinghausen's disease was not performed. Neurofibroma increased in size and new tumors appeared during pregnancy term. Pregnant woman came to maternity hospital at 35th week with complaints of periodic drawing pains in lower abdomen.
Milky coffee color spots round and oval shape with clear outlines of different diameters from 1 to 2 cm were identified on face (cheeks, forehead areas) and neck of the patient.
Multiple subcutaneous soft, painless, pigmented lumps up to 2 cm in diameter are identified on front abdominal wall, on back, upper and lower limbs. There are round-shape neurofibromas, soft and painless at palpation up to 3 cm in diameter on the back, there are also several single neurofibromas up to 4 cm in diameter on the anterior abdominal wall and in chest area. Obstetric status: position of the fetus is longitudinal, fetal head lies above entrance to small pelvis. Fetal heartbeat is 144 beats per minute. There are no pathological secretions from genital tract. Fetal USG: according to photometry, fetus corresponds to term of 35 weeks. Diagnosis: Pregnancy 35 weeks. False labor. Recklinghausen's disease. Pregnant woman was under dynamic observation at Department for pregnant women before childbirth. At the 38th week of pregnancy had a spontaneous vaginal delivery of live boy 2700-45 cm, with Apgar score 8-9. Newborn baby has no apparent malformations. Delivery and postpartum period had no complications. According to the literature, the pregnancy of the patients with Recklinghausen's disease is often complicated by arterial hypertension, spontaneous abortion and antenatal fetal death. Tumors have tendency to turn into malignant during pregnancy.

Experience of endovideosurgery technique introduction in oncological patients of the Aktobe Medical Center

Aslan E. Ergaliyev[1] *, Nurlan N. Kozhin[1], Irina V. Gordysheva[1], Saganay T. Duysembekov[2], Valeriy V. Begunov[2], Temirkhan K. Simbatov[2], Nurbolat T. Medeubayev[2].

[1]Department of Surgery, Medical Center, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [2]Department of Oncology, Medical Center, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Aslan E. Ergaliyev, Department of Surgery, Medical Center, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: aslan_ergaliev@inbox.ru

BACKGROUND: To date, efficiency and safety of endovideosurgery at treatment of many surgical diseases of a chest and abdominal cavity is indisputable. In oncological practice this type of surgery is particularly relevant and widely discussed at the same time, as one of the oncologic criteria of treatment is radical performance with obligatory removal of the regional groups of lymph nodes where innidiation might occur or already occurred. Currently in our Center clinical material is being accumulated for the purpose of studying the short- and the long-term outcomes of treatment, confirmation of oncological validity and reasonability such operations not breaking the principles of ablastics. The paper is aimed to present the first findings on how this low-invasive type of surgery was applied at treatment of oncological patients.
METHODS: This ongoing study has been running since April, 2014 till present (January, 2019) in the University's Medical Center and to the present 282 patients aged 27-71 years old were undergone endovideosurgical approach due to various malignant neoplasms. At the same time a group of patients undergone laparotomy is enrolled to serve as controls to those from experimental group. To date, we retrospectively reviewed the data from medical records of patients regarding the following parameters: total duration of surgery, presence of complications, presence of bleeding, lasting of postoperative period, outcomes of the surgery. Non-parametric operational tests will be used due to probable missing a normal distribution. To analyze the quantitative variables in two independent samples the Mann-Whitney (U) test and the Pearson's $\chi 2$ test for frequencies comparison will be performed. SPSS Statistics.v.20 software (IBM, Armonk, NY, USA) is applied for calculations. For all tests a two-side type I

error of P≤0.05 or less at 95% CI is assumed statistically significant.
RESULTS: Results. Of a total 282 patients diagnostic laparoscopy with a biopsy was made to 65 patients, a hysterectomy was performed in 57 cases (of them 28 were subjected to expanded hysterectomy with a pelvic-ileal lymphodissection), a simultaneous hysterectomy with a cholecystectomy in 4 patients, ovariocystectomy was performed in 21 cases, the delayed pelvic-ileal lymphodissection in 1, a sigmoidectomy with one-stage imposing of a hardware anastomosis in 8, a sigmoidectomy with an extracorporal manual anastomosis in 8, a sigmoidectomy with an intracorporal manual anastomosis was performed in 1 case, a videoassisted right-hand hemicolectomy to 5 patients, a synchronous belly and perineal extirpation of a rectum in 9, a distal resection of a stomach by Bilrot-2 in case was performed, a gastrectomy with a lymphodissection in volume of D2 – 10 with imposing of a nutritious gastrostomy in 18 cases, a nephrectomy in 12, a renal resection in 5, a diagnostic thoracoscopy in 29 cases, a segmentary pneumonectomy in 5 cases, a lung echinokokkectomy was performed to 7 patients. Post- or intraoperative lethality was not recorded. Complications were recorded in 3 cases (1.06%) after surgery for tumors of a colon, in a form of suppuration of operational wound.
CONCLUSIONS: To date, all performed interventions were successful and gave an experience to widen a range of endovideosurgical surgeries in cancer patients.

Condition of the endometrium and the anti-Muller hormone in tubal-peritoneal infertility

Nazira K. Kamzayeva[1] *, Talshyn M. Ukybassova[1], Aizada Marat[2], Balkenzhe Zh. Imankulova[1]*

[1]Department of Obstetrics and Gynecology, Corporate Fund "University Medical Center" National Research Center for Maternal and Child Health, Astana Kazakhstan; [2]Department of Obstetrics and Gynecology №1, Astana Medical University JSC, Astana, Kazakhstan

*Corresponding author: Nazira K. Kamzayeva, Department of Obstetrics and Gynecology, CF "University Medical Center", National Research Center of Maternal and Child Health, Astana, Kazakhstan. E-mail: nasira-kk@mail.ru

BACKGROUND: The blood level of anti-Muller hormone (AMH) considered as indicator of the reproductive potential of the ovaries and can be used in reproductive disorders with a prognostic purpose, to choose treatment management.
OBJECTIVE: to determine the relationship between the condition of the endometrium and AMH levels in women with tubal-peritoneal infertility (TPI).
METHODS: medical histories of 35 patients with TPI. The average age of the patients is 30.2±2.1 years. The level of AMH was determined; performed hysteroscopy, endometrial biopsy and histological examination.
RESULTS: focal glandular hyperplasia, uterine cavity adhesions, chronic endometritis were detected in 65.7 %(23) of patients with TPI. AMH levels in patients with endometrial pathology in TPI ranged from 0.82 ng/ml to 2.53 ng/ml, averaging 1.83±0.5 ng/ml; 6 (17.2%) patients had low (less than 1.0 ng/ml), 25 (71.4%) – medium (1.0-2.5 ng/ml) and 4 (11.4%) – high (above 2.5 ng/ml) AMH levels. In patients with low AMH duration of infertility was 8.1±0.1 years, age 33.1±0.1 years. In all patients whom performed hysteroscopy, the combined pathology of the endometrium diagnosed endometrial hyperplasia and chronic endometritis, confirmed by histological examination. The AMH level of 1.94±0.01 ng/ml was diagnosed in 25 (71%) of patients with TPI. Duration of infertility in this subgroup was 6.76±0.1 years, age-32.5±0.1 years. Hysteroscopy diagnosed endometrial pathology in 15 women, including focal glandular endometrial hyperplasia in 9 cases, chronic endometritis in 6 cases, including 2 intrauterine adhesions. In 10 cases endometrial pathology was not found. AMH level above 2.5 ng/ml was diagnosed in 4 (11.4%) patients, duration of infertility in these patients was 2.8 years, average age - 29±0.1 years. Among these patients, endometrial pathology was found only in 2 cases (8.7%), 1 case endometrial hyperplasia and 1 - chronic endometritis.
CONCLUSIONS: Thus, our study demonstrated that low ovarian reserve in TPI patients related by endometrial pathologies as hyperplasia, chronic endometritis and uterine cavity adhesions. The endometrial pathology develops in 100% of patients with a low level of ovarian reserve, and including 34.8% hyperplasia, 65.2% - chronic endometritis. The algorithm of examination and treatment of patients with TPI should be included measurement of AMH level, hysteroscopy, biopsy and treatment of the revealed pathology of the endometrium.

Directions of activity of departments of physical education and ways to improve their implementation

Botagariyev Tulegen Amirzhanovich[1] *, Zhetimekov Yerkin Tleshovich[2], Kubiyeva Svetlana Sarsenbayevna[3], Gabdullin Aibek Bokembayevich[4], Pak Tamara Vladimirovna[5]

[1]Department of Physical Culture and Sport, K.Zhubanov Aktobe Regional State University, Aktobe, Kazakhstan; [2]Department of Physical Education, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [3]Department of Physical Culture and Sport, K.Zhubanov Aktobe Regional State University, Aktobe, Kazakhstan; [4]Department of Physical Culture and Sport, K.Zhubanov Aktobe Regional State University, Aktobe, Kazakhstan; [5]Department of Physical Education, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Botagariyev Tulegen Amirzhanovich, Department of Physical Culture and Sport, K.Zhubanov Aktobe Regional State University, Aktobe, Kazakhstan.
E-mail Botagariev_1959@mail.ru

BACKGROUND: Purpose of the research. Determine main activities of the Department of physical education of medical University and ways for improving their implementation.
OBJECTIVES: 1. Reveal theoretical aspects of the problem in improving the process of physical education of medical students. 2. Study main activities of the Department of physical education of medical University. 3. Determine the level of physical preparedness, health of first-year University students. 4. Develop ways for optimizing the physical education of medical students.

METHODS: Analysis of literature, method of analysis of documentary materials, G. Apanasenko's method, control tests on physical preparedness, methods of mathematical statistics (arithmetic average, standard deviation, reliability of differences).
RESULTS: Following technologies of improving physical education of students were highlighted: technology of sports and health orientation; pedagogical technology of physical education; experimental method of additional training in physical culture with professional and applied orientation.
Following activities of the Department of physical education were highlighted: imposition of a new state educational standard in 2012; implementation of monitoring of health, physical development and physical preparedness of University students in the system of educational institutions; improvement of the system of physical and sports activities for students; improvement of the system of mass sports and sports of higher achievements.
First-year students have demonstrated relatively better results in three tests: standing long jump (speed-power quality) – 234,2 cm (B-, good); tilt down (flexibility) – 11,0 cm (B-, good); flexion and extension of arms in the prone position (strength) – 34,0 (B+, good).
According to the body mass index of Quetelet, level of health of 31.3 % of students was classified as below the average, 68.7% had the average level of health. A relatively better trend was observed in the values of the life index. 24.1% of students have an average level, 30.2% - above average and 21.2%- high level of health. As for the strength index, in 64.1 % of students it corresponds to a low level, and 30.3 % - below the average level of health. Ways of optimization in physical education for students of medical University were developed.
CONCLUSIONS:
1. Theoretical aspects of the problem are:
— the use of sport and health oriented technologies to improve physical education of students, pedagogical technologies, methods of additional physical training of professional-applied orientation of professional pedagogical preparation of medical students;
— the results of the level of physical preparedness, physical development, health of students are lower than those for past years.
2. Directions of activity of the Department of physical education were determined.
3. Results of physical preparedness, physical development, functional readiness, health of students were defined. In the health level, low and below average values were indicated on the weight index and the strength index.
4. Ways of optimization in physical education for medical students were developed.

Effect of early second level rehabilitation on the quality of life in patients with coronary heart disease after coronary artery bypass graftings

A.B. Almukhanova[1], Y. Zelenskaya[2]*, A. M. Pivtsova[3]

[1]JSC "National medical university" PhD, associate Professor of internal diseases Department №2, The Republic of Kazakhstan, Almaty; [2]JSC "National medical university" intern of surgical diseases Department, The Republic of Kazakhstan, Almaty; [3]JSC "National medical university" intern of inernal diseases №2 Department, The Republic of Kazakhstan, Almaty

*Corresponding author: Y. Zelenskaya, JSC "National medical university" intern of surgical diseases Department, The Republic of Kazakhstan, Almaty. E-mail: katya_zel1@mail.ru

BACKGROUND: Due to the WHO, 17.9 million people die each year from CVDs, an estimated 31% of all deaths worldwide. Medical and social portrait of a patient with ACS who underwent CABG is as follows: a man (77.6%), age group 50 - 69 years (75.9%), a resident of the city (71.6%). New methodological solutions which are introduced every year contributes to increased use of high-tech interventions in patients with coronary heart disease. Despite this, the quality of life in patients after treatment increases insignificant.
One of the components of the economic damage, is subjective profesional disability, due to which, majority of patients of working age do not return to work.
METHODS: The following activities were carried out with all patients of the experimental group: psychoprophylactic conversation, instruction on exercise therapy, which included breathing exercises and physical exercises in the postoperative period.
The basis of the complex exercise therapy was taken by a set of exercises on Aronov. The quality of life was assessed using the EuroQoL questionnaire. Also we used a six-minute walk test.
RESULTS: There are 30 patients took part in the study. Patients were randomly divided into 2 groups. At discharge, the weight of the experimental group patients was significantly less (P=0.02) than that of the control group patients. Similarly, in the experimental group, patients with a heavier functional class of heart failure (NYHA) moved to lighter functional classes, while patients from the control group on the contrary - had a deterioration and moved to a heavier NYHA functional class of heart failure. Also, statistically significant results were at the self-care indicator in the first day after patients were discharged from the intensive care unit to the wards(P=0.049). Patients of the experimental group on the day of discharge reliably(P=0.02) were more optimistic about their ability to engage in their daily activities: the usual daily activities are not difficult for 33.3% of patients of the experimental group and for 5.9% of patients of the control group. Answer "I am not able to engage in my usual daily activities" was chosen by 13.3% and 29.4% of patients of the experimental and control groups, respectively.
Unlike patients in the control groups, patients in the experimental group assessed their mobility a month after the operation as "not experiencing difficulties when walking"(78.6%) or as "experiencing minor difficulties when walking"(21.4%), while patients in the control group assessed their mobility as "not experiencing difficulties when walking"(40%) or as "experiencing minor difficulties when walking"(33.3%), "experiencing moderate difficulties when walking"(20%). and "I have great difficulty walking" (6.7%). There was no answer "I can not walking" in any group.
CONCLUSIONS: The early cardiorehabilitation at the stationary level is cost-effective, as for therapeutic exercises

do not require specialized equipment or devices, but these techniques have a significant impact on the quality of life of patients in the early and late postoperative period. The topic requires further detailed study with the inclusion of more patients.

Quality of life in women in postmenopause depending on urogenital disorders

Bibigul Karimsakova*, Nurgul Abenova, Gulnar Sahipova, Akbayan Imanbayeva

Department of General Practice №1, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Bibigul Karimsakova, Department of General Practice №1, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: kbk57@mail.ru

BACKGROUND: Today throughout the world an increase in number of women of advanced and senior age is observed. With the increase of life expectancy frequency of urogenital disorders in women increases. Urogenital disorders are a complex of symptoms having a considerable impact on quality of life in women of certain age.
The research is aimed to estimate quality of life in women in a postmenopause depending on intensity of urogenital disorders, the vaginal pH-index and expression of atrophic changes in vagina.
METHODS: This open-controllable research was run on a basis of PHC setting №6 in Aktobe within 2016-2018. A total of 64 women aged about 60 randomized by age, postmenopause durations, presence of urogenital disorders were enrolled and allocated into 2 groups: group 1 of 32 women with a postmenopause duration 10 years and group 2 of 32 women with a postmenopause lasting 15 years. There was the only exclusion criterion - presence of bleeding irrespactive to its nature. The severity of a climacteric syndrome was estimated on Kupperman's scale modified by E.V. Uvarova (1983). The gynecologic examination, cytology smear, endovaginal ultrasonography, colposcopy, determination of vaginal pH level were provided to all participants. The intensity of urogenital disorders was estimated by litmus paper by a scale of D. Barlow from 1 to 5 points: 1 point – the minimum violations which are not influencing everyday life; 2 points – the discomfort which is periodically influencing everyday life; 3 points – moderate violations; 4 points – the expressed violations; 5 points – extremely expressed violations influencing everyday life.
RESULTS: Proportion of women faced urogenital disorders was 56.25% (N.=18) in the group 1 and 84.4% (N.=27) in the group 2. In the group 1 21.9% recorded the first signs of urogenital disorders in a kind of vaginal dryness at premenopausal age, whereas the proportion of women from the group 2 experienced the same symptoms was 25%. With increase in duration of the postmenopause, atrophic changes were emerged in a kind of itch, burning, a cystalgia, a pollakiuria, a nocturia, incontinence of urine and changes in the pH of the vagina. The pH of the vagina increased in women of the group 1 with postmenopause length of 10 years from 3.9 to 5.0. The same indexes in the group 2 (15 years) varied from 5.5 to 7.5. The intensity of urogenital disorders according to D. Barlow scale was as follows: 1 point (9.3%) was traced in women with a postmenopause lasting of 10 years. In women with a postmenopause of 10 and 15 years 2 points were revealed in 9.3% and in 12.5%, respectively; 3 points in 15.62% and 18.75% of women, respectively; 4 points in 28.12% and 25%, and 5 points were detected in 37.5% and 43.7%, respectively. Generally, the urogenital disorders intensity was higher in group 2, with a postmenopause of 15 years, compared to group 1 ($\chi 2$ 17.86, $p<0.001$). At colposcopic examination in women with a long postmenopause >10 years a significant epithelium atrophy was observed. Almost every second patient had a vaginal mucosa easily injured and dystrophic changes of the vulva along with thinning of the epidermis.
CONCLUSIONS: The quality of life in women decreases with increase in duration of a menopause and growth of urogenital disorders intensity.

Tetanus in Aktobe: description of a clinical case

Aigerim N. Iskakova*, Meyrambek S. Kurmangazin, Maken Zh. Kurgambekova, Akezhan R. Astarkhanov, Makhmutsultangali A. Otesin

Department of Infectious Diseases, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan

*Corresponding author: Aigerim N. Iskakova, Department of Infectious Diseases, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan.
E-mail: PhD1013@mail.ru

BACKGROUND: Tetanus is an acute disease caused by a toxin produced by Clostridium tetanii. The disease can affect people of any age and the mortality rate is high. Immunization has reduced the number of cases, although there have been sporadic cases in developing countries.
CASE REPORT: The patient, 56, received complaints of difficulty in opening his mouth, difficulty in swallowing, pain in the muscles, increased heart rate, sweating. For the current day there were 2 convulsive seizures. 22.07.2018 - at about 15:00 due to severe sweating, difficulty in opening his mouth an ambulance was called and the patient was taken to the Central district hospital, due to the severity of the disease admitted to the intensive care department. A neurologist's consultation was obtained. Diagnosis: acute inflammation of the Central nervous system is not detected, it is necessary to conduct a differential diagnosis with tetanus. Consultation of infectious disease: recommended tetanus toxoid and transfer to Regional Infectious Disease Hospital (RIDH) after neurologist's consultation. At 10.00 am the patient was urgently taken to RIDH. During the flight there was 1 tonic-clonic spasm. Epidemiological history: the patient had no contact with patients with infectious diseases. According to the patient, 1 week ago, when cleaning the yard, an iron shovel injured the right sole. General condition: very severe due to severe symptoms of intoxication and neurological symptoms. The patient is conscious, weak, is in a forced position, there is a trism of masticatory muscles, difficulty opening the mouth; dysphagia; persistent tonic spasm of the muscles of the neck, back, limbs, spasm of the abdominal muscles, chest pain, limbs, convulsions during examination, temperature 37 C. The patient's condition is severe. At the level of memory spoor,

GCS score of 11. Opens eyes to loud voice and quickly falls asleep. Pupils are narrowed in the same volume, photoreaction is kept.Because of the violation of hemostasis appeared hemorrhagic rash. Tremor in limbs. Hard breathing in the lungs, dry and wet wheezing. 30.07.2018 - emergency-20. Temperature -37,0 °C, AD 140 / 95 mm. Hg.V., pulse -84. CBC: hemoglobin-148r/l, red blood cells-4,1x10^{12} l, white blood cells-10,2x10^{12} l, neutrophiles t/I-6%, ESR-38mm/hour. 30.07.2018 - 15:00 PM. The condition is unchanged. Body temperature 37 °C, HR-22, Pulse-72, SpO2-97%, BHA: hypoproteinemia-58 g/l, hypoalbuminemia-31.1 g/l, creatinine-252.8 mmol/l, residual nitrogen-44.1 µcat / l. 4.08.2018 - 9:00h. The patient's condition is very severe due to intoxication and acute renal failure. Hemodynamics is unstable.Temperature of 36.6 ° C. Pulse -74. AD -80 / 45 mm Hg.art. from the probe is allocated a dark brown liquid. The eyes do not react to light. The skin is pale green, peripheral cyanosis of the fingers. Hands and feet cool, swollen. There was no urination. 10: 00h. Blood pressure 40/20 mm Hg. The pulse is not revealed, the heart sounds are not correct. The skin is pale gray, cool. Developed acute heart insufficiency. 11: 31 am. Cardiac arrest during mechanical ventilation. Resuscitation measures were carried out within 30 minutes. Treatment without any results. Biological death has been reported. Diagnosis: traumatic tetanus, acute course. General primary form. A very severe degree. Cause of death: multiple organ insufficiency (acute respiratory insufficiency, acute cardiac insufficiency, acute renal insufficiency) DIC. Brain edema. Pulmonary edema. Complication: bilateral pneumonia.

Assessment of uterine artery embolization effeciency in management of patients with submucous leiomyoma

Talshyn M. Ukybassova [1] *, Balkenzhe Zh. Imankulova[1], Milan Terzic[2], Aizada Marat[1], Fariza O. Shauyen[1]

[1]Department of Obstetrics and Gynecology, Corporate Fund "University Medical Center" National Research Center for Maternal and Child Health Astana, Kazakhstan; [2]Department of Medicine, Nazarbayev University School of Medicine, Astana, Kazakhstan

*Corresponding author: Talshyn M. Ukybassova, Department of Obstetrics and Gynecology CF "University Medical Center", National Research Center of Maternal and Child Health Astana, 010000, Kazakhstan. E-mail: talshynu@yandex.ru

BACKGROUND: Uterine myoma is a benign tumor, with the frequency increasing with age, present in approximately 30-40% of women. One or a combination of several symptoms and signs, including severe menstrual bleeding, anemia, infertility and miscarriage, manifest the disease. Currently, FIGO classification is used to determine treatment management for submucous myoma. As there is an evidence in literature that UAE is effective in managing major problems related to myoma, the Republic of Kazakhstan has been actively using a minimally invasive method of treatment of fibroids - uterine artery embolization (UAE).
AIM: To evaluate the effectiveness of UAE in treatment of submucous uterine fibroids.
METHODS: Prospective cohort study was carried out in 58 patients throughout a period of 5 years with submucous fibroids confirmed by magnetic resonance imaging (MRI) and ultrasound. We used FIGO classification for determination of the myoma type. We assessed complaints, clinical symptoms, blood lab test, and menstrual blood volume. Post procedural pain syndrome was evaluated using VAS from 1 to 10. The follow-up period was 5.5 years.
RESULTS: The mean age of the patient was 35.3±2.0 years. Type 0 was diagnosed in 18 (31.0%), type 1 in 20 (34.5%) and type 2 in 20 (34.5%) patients. The size of fibroids ranged from 4.5 to 12 cm. Regarding clinical presentation: 62% had heavy menstrual bleeding, 22.4% had infertility, 5.17% miscarriage, and 10.3% had pain symptom. Anemia was confirmed in 100% of patients. The average length of hospital stay after UAE was 2.5±0.7 days. Postembolic pain syndrome was observed in 49 (87.5%) women with an average score of 6.5±0.5 points and was more significant in patients with the second type of node – 7.6±0.2 points ($P<0.05$), less in patients with type 0 – 4.3±0.2 points ($P<0.01$). In 10 patients with myoma type 0 fibroid was expulsed from the womb 5.6 months after the procedure, and in 4 patients during the period of 1-3 months. Two of the mentioned 14 patients had spontaneous pregnancies and term vaginal delivery. In 3 patients myomectomy was performed after UAE, and 4 patients refused to undergo resectoscopy and continue to the follow-up. In 19 patients with 1st type of fibroid, menstrual bleeding and pain syndrome disappeared after UAE. Imaging methods showed "migration" of nodes in 42% of them (moved to type 2), while amenorrhea occurred in 10.5% aged between 49- 51. In 20 patients with 2nd type of myoma, uterine bleeding and pain stopped, "migration" of nodules was observed in 45%, pregnancy occurred in 1 case, and secondary amenorrhea was observed in 5% at the age of 45.
CONCLUSIONS: Clinical complaints of patients with submucous myoma were significantly improved following the UAE procedure. Therefore, this approach was confirmed to be efficient and reliable for patients with this type of myoma.

Challenges in diagnosis of Colorectal cancer precancerous lesions and in the disease course monitoring in western Kazakhstan

Sajad A. Bhat*, Saule Balmagambetova, Arip Koyshybaev, Zhanna Gumarova, Anar Tulyaeva, Ainel Urazova, Arzhan Taumova

Research group of the Project "Comparative analysis and clinical evaluation of predictive values of Serum Biomarkers CEA/CA19-9 used for the disease course monitoring in patients with Colorectal carcinoma", West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Sajad A. Bhat, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: sajadskystar@yahoo.com

BACKGROUND: The nationwide screening on Colorectal cancer (CRC) has been implementing in Kazakhstan since 2009, in accordance with the guidelines where the test for iFOBT (immune analysis of fecal occult blood) and colonoscopy at positive iFOBT were prescribed for both sexes aged 50-70 with 2-year interval.
Besides, a few tests were developed to monitor the course of disease. Of them, tumor markers CEA and CA 19-9

have emerged as imperative diagnostic tool as they easily detect CRC associated antigen. These tumor markers allow changes to be detected earlier, and hence, contribute much for timely prediction of the patient's state worsening.
The study was aimed to undertake an initial analysis on two directions: to evaluate the CRC screening running for the first decade of its implementation, and to get an idea on how the tumor markers CEA and CA 19-9 were being used by oncologists of the Aktobe Oncology Center in their daily practice.
METHODS: Data from the Cancer registry within 2009-2018 were analysed to reveal the number of precancerous lesions found through the screening. Besides, medical records within 5 years, 2014-2018 were checked to extract data on how the markers CEA and Ca 19-9 applied to monitor changes in the patients' state.
RESULTS: A total of 340,594 individuals were screened for CRC precancerous lesions through 2011-2018 (data for 2009-2010 were not available). Of them, 100% were undergone iFOBT assays, and colonoscopy was administered to 0.9%. In 3.0% of cases with equivocal colonoscopy biopsy was performed. Eventually, total number of the individuals diagnosed with precancerous lesions did not exceed 0.01% of all screened. In the meanwhile, cases of invasive cancers, including advanced stages, revealed through the screening program reached 0.2% out of 340,594 screened.
Of a total 579 CRC patients treated in the Oncological Center within 2014-2018 only 15 individuals (2.6%, aged M 66.0, 44.0-77.0 by 25/75 quartile) were tested for CEA and CA 19-9 markers to evaluate a course of the disease. A majority of individuals (N 9) were women, 10 of them presented the stage III, with the following tumor sites: colon 40%, rectosigmoid junction 40%, and rectum 20%, respectively. Out of 15, only 2 patients presented significant growth in CA 19-9, while CEA was increased in 5 cases, the maximum up to 28.3, i.e. 5-6 times. It is worth noting that the most featured dynamics of CA 19-9 was observed in female patient with CRC St III of rectosigmoid junction, aged 59, of Slavic ethnicity: growth up to 1,198 at admission then declined to 458,0 after 3 courses of neoadjuvant chemotherapy and surgery.
CONCLUSIONS: Current situation concerning detection of CRC precancerous lesions in the Aktobe province of western Kazakhstan evidences low efficiency of the screening program within the first decade of its implementation. To date, tactics of local oncologists towards monitoring the patients treated regarding CRC cannot be recognized sufficient as they apply well-known and quite specific for Colorectal cancer tumor markers such as CEA and CA 19-9 in negligible scale. Both approaches, to CRC screening and monitoring of the patients should be properly analysed and reasonably changed.

Colorectal cancer key indices in western Kazakhstan through the last decade, 2009-2018

Saule Balmagambetova*, Sajad A. Bhat, Zhanna Gumarova, Arip Koyshybaev, Anar Tulyaeva, Ainel Urazova, Arzhan Taumova

West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Saule Balmagambetova, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: sau3567@gmail.com

BACKGROUND: According to reports of the cancer experts from International Agency for Research on Cancer (IARC), there are estimated 17.0 million new cancer cases by 2018. In both sexes combined, Colorectal cancer (CRC) ranks fourth with the incidence of 6.1% and mortality of 9.2%.
The study was aimed to present the key indices for CRC in the industrial and environmentally disadvantaged Aktobe province of western Kazakhstan through the last decade (2009-2018). Objectives of the research are specifying the five-year survival rates and rough incidence with its trends in all age groups of both sexes, including places of residence, stages and tumor sites and thus, to define the nearest prognosis.
METHODS: Rough incidence rates (per 100,000) and annual percent changes (APC), as well as the five-year survival rates were estimated for each age group at diagnosis (20–39, 40-49, 50-59, 60-69, 70+ years), by ethnicities, sex, places of residence, and the disease stages and anatomic subsites. Incidence trends were determined by the least squares method of regression analysis, the five-year survival rates and averaged survival time both for men and women were estimated through the Kaplan-Maier analysis. The prognostic index for 2019-2020 was obtained by the method of moving averages. For all tests a two-side type I error of $P<0.05$ at 95% CI was assumed statistically significant.
RESULTS: Overall, individuals diagnosed with CRC (N 1,128) were mostly Kazakhs (59.2%), living in urban area (64.9%), of 60-69 years and older (59.2%), registered mostly at Stage II (61%) and with the tumor locating either at descending colon (C18.5-C18.7, 28.7%), or at rectum (C20, 35.3%). Within 2009-2018 Colorectal cancer (CRC) rates increased from 14.74±1.68 to 23.19±1.97, with APC 4.69%, $P<0.05$. The most significant growth was traced in men compared to women: from 13.33 in 2009 up to 28.39 in 2018, APC 6.64% vs. 2.64%, P 0.003. Trends by ethnicities were the following: in Kazakhs APC reached 8.7%, with the averaged rough incidence of 11.8±1.44 (95% CI 8.99;14.61), whereas representatives of Slavic diasporas showed decline in the incidence for the last decade: APC -4.3%, $P<0.05$. Declining in rates was also observed in urban population compared to rural: APC -3.3% vs. 17.6%. Diagnosed with CRC aged 60-69 made 31% of all cases, with the rough incidence rate 6.48±1.06 (95% CI 4.39;8.57) and the largest APC through the all age groups of 9.37%, $P<0.001$. Patients registered at stage II made 61% of all observations, but overall trend evidenced growth in the groups of Stage I – APC 28.91%, and Stage IV – APC 11.75% respectively, $P<0.05$. 17.3% of all cases were located in rectosigmoid junction (C19, by ICD-10), and rates for that site showed significant growth within last decade, APC 6.26. Overall five-year survival rate for combined stages was 71% (95% CI 65.5;76.5), and almost not varied in men and women: 70.8% (95% CI 64.7;76.9) vs. 71.2% (95% CI 61.8;80.6). Averaged survival time for men and women also did not vary: 44.7±1.48, or 3.72 years (95% CI 41.8;47.6) vs. 46.1±1.49 (95% CI 41.8;47.6).

The expected incidence rate in 2020 reached 25.94 (95% CI 24.43;27.46).
CONCLUSIONS: Significant growth in CRC incidence was recorded through the most populated Aktobe province of western Kazakhstan. These findings call for proper analysis of the introduced in 2009 the CRC nationwide screening program's efficiency.

Management of information technologies in the preparation of pharmaceutical personnel

Kairat Zhakipbekov, Kurmangozhayeva Assen*, Kumisbek Tolkyn, Kayupova Farida, Elmira Serikbayeva

Department of Organization, Management and Economics of Pharmacy and Clinical Pharmacy, Asfendiyarov Kazakh National Medical University

*Corresponding author: Kurmangozhayeva Assen, Department of Organization, Management and Economics of Pharmacy and Clinical Pharmacy, KazNMU, Almaty, Kazakhstan.
E-mail: assen_k95@bk.ru

BACKGROUND: Information technology in education is currently a prerequisite for the transition of society to the information civilization. Modern New Information Technologies create an environment of computer and telecommunication support for organization and management in various fields of activity, including pharmaceutical education.
In the practical field of pharmacy, they often began to use software tools that reflect a certain subject area, in one way or another the technology of its study is implemented. For the preparation of a highly qualified, competitive specialist, it becomes necessary to train them with these software tools.
METHODS: The databases offered by various service companies of the Republic of Kazakhstan: Online - a database service for monitoring the price of medicines and medical products to ensure the integration of practice and education as a teaching tool in teaching. Online help pharmacy service of Kazakhstan.
RESULTS: When using the above-mentioned databases, students, undergraduates, doctoral students will receive regularly updated pharmaceutical information from one source:
1. Official: data on state registration of drugs, IMN. The source of information is the State Register of Medicinal Products; instructions on the medical use of drugs.
2. Market: data of regular monitoring of wholesale and retail prices for drugs, medical devices; current, minimum, maximum, average wholesale and retail prices for drugs, medical devices in the regions and the republic as a whole; automated reports on price dynamics for thousands of drug, medical device items that have state registration and are in circulation in the pharmaceutical market in the Republic of Kazakhstan for the requested the researcher period; a sample of the price offers of the subjects of the pharmaceutical market on drugs, medical devices by brand name, international non-proprietary name, composition, manufacturer company, country, ATC, wholesale computer Niyama, pharmacies, etc.
The sources of information will be the State Register of Medicinal Products, Medical Devices; marginal prices for drugs, medical devices in the framework of the guaranteed volume of free medical care; orders of the authorized body; marginal wholesale, retail prices for medicines in the framework of the upcoming reform on state regulation of prices for medicines; price lists of the subjects of the pharmaceutical market.
There is also a sample of round-the-clock, social pharmacies, as well as pharmacies where there is a prescription-production department, ordering/ delivery, sales by controlled drugs.
The "Online Reference Pharmacy of Kazakhstan", the main purpose of which is to provide the population with information on the availability and affordability of drugs, medical devices by choosing at the lowest price.
CONCLUSIONS: The use of databases as a textbook will help students, undergraduates and doctoral students to get: 1. additional knowledge of the future profession; 2. practical skills of working with information databases of drugs, medical devices, developed on the basis of the latest IT - technologies; 3. to promote the development of analytical thinking.
The use of the above databases will strengthen the knowledge, skills of pharmaceutical faculties of medical universities of the Republic of Kazakhstan taught in the departments of organization and economics of pharmacy in such basic and specialized disciplines as: organization of pharmaceutical business, management and economics of pharmacy, information technologies in pharmacy, pharmacoeconomics, marketing and management in pharmacy.

Psychological condition of the adult population in Oil and Gas areas of the Aktobe region

Ulday Akhmetova *, Saule Bermagambetova

West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.

*Corresponding author: Ulday Akhmetova, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: uldai.87@mail.ru

BACKGROUND: The exploitation of natural resources leads not only to their depletion, but also to the pollution of the human environment. For this reason, the problem of sustainable development, focused on preserving the ecological balance on the planet and thus living conditions for a person, includes the problem of studying the influence of environmental properties on the human psyche, his mental and psychological health. There are a number of regions on the territory of Kazakhstan, which, by their geographical indicators and profile of their economic activity, are initially characterized by increased pollution of the natural and anthropogenic environment. These regions, in particular, include the Aktobe region, where the oil and gas industry ranks first in the economy. Studying pollution problems in ecologically unfavorable regions, one usually studies the somatic health of the population. But it also important to focus on the psychological state of the population living in these regions. According to the prognosis of the World Health Organization (WHO), by 2020 depression

will take the first place in the world among all diseases, overtaking today's leaders - infectious and cardiovascular diseases. According to the Republican e-health center, by 2018 in the Aktobe region, the primary incidence of mental disorders, which structure includes a depressive episode, increased 1.3 times.
The aim of the study was to assess the psychological state of population living in the oil and gas region, and one of which indicators is depression (according to the International Classification of Diseases - F-32, depressive episode).
METHODS: The PHQ-9 questionnaire was used to identify symptoms of depression, which reveals the presence and frequency of depressive symptoms that the respondent has encountered in the last two weeks and is rated on a 4-point Likert scale from 0 (not at all) to 3 (almost every day). PHQ-9 scores range from 0 to 27, and recommended the following severity thresholds: minimal depression (<5), mild depression (5–9), moderate depression (10–14), severe depression (15–19), severe depression (> 19).
The survey was run in accordance with the study protocol implied a one-time cross-sectional study. Persons living near the Zhanazhol oil field aged 18-50 years old were interviewed: in the village of Shengelshy - 39 persons, in Saga - 48, in Kenkiyak - 155, in Sarkol -144, a total of 384 persons. The control group consisted of residents of the Khobda district, 384 persons.
RESULTS: As being the study ongoing, to date, in oil and gas areas a total of 88 individuals suffered mild depression (23%) were revealed, while the weak depression was traced in 77%. In the control group, 3 persons showed mild depression (1%), while the minimum depression was observed in 99%.
CONCLUSIONS: Mild depression among residents of the Oil and Gas producing sites was more often detected than in residents of the environmentally favorable control area (Hobda district). The study is continued.

Features of adaptation of newborns of mothers living in the oil-and-gas region

Balash Tusupkaliyev*, Akmaral Zhumalina, Bekzada Zhilkibaeva, Lyudmila Bolyakov

Department of Children's Diseases and Perinatology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.

*Corresponding author: Balash Tusupkaliev, Department of Children's Diseases and Perinatology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: tusupkaliev44@mail.ru

BACKGROUND: Environmental pollution by ecologically dangerous components and wasted oils constitutes a problem of global scale. Pollution level when exploiting oil and gas resources has a direct connection with ecological situation. According to many scientists specialized in environmental problems caused by the oil and gas facilities, this issue ranks first in a row of the major challenges calling for deep and comprehensive study. The greatest damage is caused by oil and gas refineries emitting their waste into the atmospheric air. In this relation, the area of the Zhanazhol oil refining complex is of particular importance. At the same time very few scientific papers on studying the negative influence of the oil processing enterprises emissions on the organism during the prenatal period.
The research is aimed to study features of adaptation of the newborns born in mothers living in the oil-and-gas region in the early neonatal period, to estimate conditions of newborns at the birth according to primary physical data and some laboratory indicators.
METHODS: 100 newborns born in 37-40 weeks of gestation in mothers living in the settlement of Kenkiyak located near Zhanazhol oil refinery were enrolled into the main group and 50 newborns born in mothers living in large village Kobda where there is no oil and gas production entered into the group of comparison. Statistical processing was carried out using Statistica.v.10 software.
RESULTS: Assessment of newborns immediately after the birth by Apgar scale showed that in 35% of children from the main group asphyxia of moderate and severe degree took place (Apgar scores 5 and less), or by 1.7 times higher compared to children from the control group (21%, $P<0.05$). In the main group proportion of children with body weight lower than 3000.0 g was 27% vs. 15% in the control group (1.8 times less, $p<0.01$). In 18% of children of the main group congenital hypotrophy was revealed by Ketle-1 index vs. 7% in the control group ($p<0,05$). In children from the studied group 8% of cases with prolonged physiological loss of weight, and in 15% of children late restore of initial body weight was noted compared to control group. Among children of the studied group in 15% of cases bilirubin exceeded 200 mmol/l, while in group of comparison only 1 case was revealed.
CONCLUSIONS: The newborns born in mothers living in the oil-and-gas region have a number of features indicating low level of their adaptation to extrauterine life, such as presence of symptoms of asphyxia, congenital hypotrophy, prolonged duration of physiological weight loss and higher level of bilirubin in blood serum.

"Standardized patient" is an effective method of medical personnel training

Balash Tusupkaliev*, Akmaral Zhumalina, Zhanat Kuttumuratova, Lyudmila Voloshina

Department of Children's Diseases №1 and Perinatology, West Kazakhstan Marat Ocpanov Medical University, Aktobe, Kazakhstan

*Corresponding author: Balash Tusupkaliev, Department of Children's Diseases №1 with Perinatology, West Kazakhstan Marat Ocpanov Medical University, Aktobe, Kazakhstan
E-mail: tusupkaliev44@mail.ru

BACKGROUND: The main objective of higher education medical institution is training students according to requirements of modern medical science with subsequent assessment of their knowledge and skills. Simulation training is one of the components of profound vocational interactive education based on using the corresponding module to train each student personally according to professional standards in the specialty. New educational technologies constitute a new approach in instilling skills and provide training with application of models and phantoms, for

instance, the technique "Standardized patient". It is worth noting that the new techniques in professional training assume cardinal changes in the system of students and graduates competence assessment. In Kazakhstan since 2006 training of medical personnel according to international standards is implemented, as nowadays it is impossible to maintain a good level of education by previous methods.
METHODS: The metod for teaching skills and competences "Standardized patient" (SP) was adjusted to purposes of training in different levels: for students, graduates and postgraduates. For teaching through this technique collecting of data in available sources was performed and methodical recommendations were developed by faculty members for each corresponding level: for bachelors, graduates and postgraduates.
RESULTS: According to our recommendatrions, the training using the technique "Standardized patient" implies the following main conditions: independent acquisition of professional skills and abilities by each student during the interaction with the SP; for checking of results, i.e. level of performance in each skill, the feedback with participation of experts is provided. The term "standardized" replaced the initial term "feigned" to emphasize that the condition of the patient stays essentially identical during interaction with each student. In general, use of SP allows for control the clinical content of training and to provide timely availability of patients according to the schedule. Before starting a process of the SP technique using in class, our methodical recommendations prescribe to create a group of well prepared persons whose work will constitute a part of educational process. After the first presentation of SP, the next part of a class implies answers to any questions related to specific clinical case and connect SP with other educational components of a case, for example, control cards and the feedback process. The third and fourth parts of a class are intended for repeated runs of a clinical case until SP represents the patient in an appropriate and plausible way. Viewing of audio / video allows SP to confirm by (A/B) records the progress in reproduction of a clinical case. The possibility of reproduction A/B records at meetings of SP/students makes this technique very effective. Teachers can look through these records according to their own schedule, and students can look through the records at their own meetings in a private order to consider and estimate the actions.
CONCLUSIONS: The final purpose of training using SP is reaching the highest level of preparedness to face real clinical situations. Students while training using SP in classes, have to receive immediate and constructive estimates at all levels of training, and well prepared SP provides a constructive assessment.

Markers of bone remodeling in children and teenagers with various physical development living in the Oil-and-Gas region

Akmaral Zhumalina*, Balash Tusupkaliev, Lyudmila Voloshina, Zhanat Kuttymuratova, Guldana Begenova

West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.

*Corresponding author: Akmaral Zhumalina, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: zumalina@mail.ru

BACKGROUND: High rates of gas production, growth of its chemical processing volumes turned the enterprises of the Gas industry into powerful sources of environmental pollution that poses a threat to population health and promotes growth of incidence and formation of ecologically caused pathological states at children and teenagers.
The purpose of present research was complex assessment of serum markers of synthesis and resorption of bone tissue in children and teenagers with various physical development living in the oil-and-gas region.
METHODS: In total 519 children and teenagers aged 8–17 years, of them 349 school students (the main group) living in the oil-and-gas region and 170 children and teenagers from the Kobda region (control group) living in the area of rather ecological wellbeing were examined. Physical development was estimated in absolute values of length, besides body weight and the harmony of physical development were defined. Determination of levels in markers of bone metabolism β-CrossLaps, P1NP and an ostecalcin in blood serum was performed. Statistical processing of data obtained was carried out using Statistica 6.0 (USA, Statsoft) software.
RESULTS: Assessment of physical development resulted in the following: normal harmonious development was revealed in 13.8% of teenagers of the main group, while in 56.2% (n-196) disharmonious physical development was determined. The research of mineral density of a bone tissue (densitometry) in 472 teenagers – 303 participants of the main group and 169 from the control group was performed. Children aged 11-15 from the oil-and-gas areas showed a serumal level P1NP 516.071± 35.79 ng/ml, aged 16-18 264.36±22.256 ng/ml, while 541.38± 34.216 ng/ml in children of the control group. It is worth noting that the group of children aged 16-18 had a significant decrease compared to the group of 11-15 years old ($P<0.005$). In the main group of children a weakening of resorptive processes in bone tissue was revealed, characterized by a decrease in the level of β—Cross Lapsin blood serum compared to control group (0.88±0.800 ng / l and 1,46± 0,684 ng / l, respectively), $p<0,005$. Indicator P1NP/b-Crosslaps was almost twice lower in children of the main group ($p = 0,039$). Concentration of osteocalcin in blood of children from the oil-and-gas region compared to control group was reduced ($P<0.05$), especially in group aged 16-18 years.
CONCLUSIONS: Summarizing the research findings, normal harmonious development was recorded in 13.8% of examined teenagers in the main group, while in 56.2% disharmonious physical development was revealed. Decrease in a mineralization of bone tissue was revealed in a half of children and particularly in children with disharmonious development.
Decrease in concentration of the ostecalcin and the index characterizing a ratio of processes P1NP/b-Crosslaps, bone remodeling almost twice in children of the main group indicates rather prevalence of resorptive processes over synthetic ones in bone tissue, particularly in group aged 16-18 with disharmonious development. This data need to be considered when determining a risk degree in development of osteoporosis in children and teenagers.

Assessment of micronutrients composition in the Kazakh population diet

Raushan Sh. Tuleuova*, Lazzat M. Zhamaliyeva

Center for Family Medicine and Primary Care Research, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Raushan Sh. Tuleuova, Center for Family Medicine and Primary Care Research, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: raushan_t88@mail.ru

BACKGROUND: To our knowledge, a healthy diet is provided not only with a sufficient amount of fats, carbohydrates, proteins and energy, but also with an adequate consumption of minerals and vitamins, which as being essential nutrients presented in small quantities are necessary for the sustaining of vital functions in any organism. People should be able to get all the nutrients they need by following a varied and balanced diet. In the meanwhile, studies evaluating the consumption of trace elements among adult Kazakh population have not been conducted yet.
The present study is aimed to assess the micronutrient composition in the diet of the Kazakh population compared to the WHO recommendations.
METHODS: The cross sectional study involved randomly selected 300 individuals on a basis of informed consent. To assess food habits, we used Food Frequency Questionnaire (FFQ) KZ, adapted and validated for the local population from the original FFQ. Micronutrients intake from food was calculated using the software FETA for "Windows" program, which contained a comprehensive database of food and 50 nutrients, while taking into account the loss of vitamins during cooking. Statistical analyses were conducted using Statistica.v.10 (Statsoft Inc., USA).
RESULTS: Of a total 300 participants, N 138 were men and N 162 were women. The mean age was 44±15.3 years. A deficiency in the diet was observed in such minerals as alpha-carotene (299 g/day at a rate of 1000 g/day), iron (15.6 g/day at a rate of 30 g/day), folic acid (314 g/day at a rate of 400-1000 g/day), magnesium (367 g/day at a rate of 800 g/day), potassium (3,790 g/day at a rate of 2000 g/day), and vitamin C (67.2 g/day at a rate of 150 g/day). A high content of chlorides, sodium and selenium in the diet were also detected (5,560 g/day at a rate of up to 2,000 g/day, 123 g/day at a rate of 70 g/day and 4,300 g/day at a rate of 2,000 g/day, respectively).
CONCLUSIONS: According to the study results, the micronutrient composition of the Kazakh population's diet showed significant deviations from the recommended norms, and therefore, the nutrition adjustment is to be introduced. Overall, these data allow for developing necessary recommendations for the diet correction.

What is the evidence base for psychological support interventions for patients with a cardiovascular disease and how are these interventions applicable to Kazakhstan?

Kerbez N. Kimatova[1] *, Bayan K. Kenzhegalieva[1], Gaziza A. Smagulova[2], Lazzat M. Zhamaliyeva[1]

[1]Center for Family Medicine and Primary Care Research, [2]Department of Propedeutics of Internal Medicine, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan

*Corresponding author: Kerbez N. Kimatova, Center for Family Medicine and Primary Care Research, Aktobe, the Republic of Kazakhstan. E-mail: kibi1992@mail.ru

BACKGROUND: According to the literature cardiovascular disease (CVD) and depression are the most common causes of disability in high- income countries and expected to become so for countries of all levels by 2030. The economic indicators relating to CVD and depression reveal rising medical costs, increased health service utilization and lost productivity. Also, CVD and depression have a profound impact to the overall quality of life (QoL), especially to the patients after myocardial infarction and with heart failure. Depressed patients with CVD have worse outcome than those patients who are not depressed. In Kazakhstan there are about 2 million people suffering from cardiovascular diseases, who constitute 12% of the economically active population. But data on effective practices of psychosocial care in Kazakhstan and other middle-income countries are limited.
The aim of study is to conduct a literature review assessing the evidence on effective psychological interventions aimed at improving main cardiovascular outcomes among adult patients diagnosed with CVD worldwide; to assess the availability of psychological support services in Kazakhstan and examine potential for adopting effective interventions in a Kazakhstani context.
METHODS: Literature review articles were selected from four databases: Ovid Embase, PubMed, PsychINFO, Cochrane library. Morbidity, mortality, QoL, anxiety and depression were identified as primary and secondary outcomes. Grey literature and website resources were searched to find literature on Kazakhstan. Inclusion criteria were developed. Contradictions were resolved by discussion between reviewers.
RESULTS: Through the database search, 1163 records were identified. After the removal of duplicates and exclusion of articles after title and abstract screening, 316 articles remained for full-text skimming. After exclusion of papers identified as not eligible (N.=299), 17 publications were included. Available evidence suggests that not all known psychosocial factors are statistically and clinically significantly related to CVD. But the outcomes after myocardial infarction may be partially dependent on psychosocial factors, and psychological interventions can significantly improve QoL of general CVD patients and decrease depression and anxiety levels. Therefore, psychosocial factors can be part of comprehensive measures to reduce cardiovascular morbidity and mortality.
CONCLUSIONS: It was identified that the literature available on psychological interventions in Kazakhstan is limited. In order to evaluate the efficacy of available psychological support services in Kazakhstan, conducting more researches is warranted. Expansion of research in this area needs to be prioritized; there are opportunities for innovation that can improve the quality of medical care. This review can be used to inform health care providers about the risk factors for morbidity and mortality from cardiovascular diseases, recommending medical organizations to more carefully consider psychosocial stress as a dangerous factor in cardiovascular diseases and mortality.

The morphofunctional state of lungs under exposure to Sodium Tetraborate

A. Akhayeva[1] *, T. Umbetov[1], N. Shevlyuk[2], R. Yegemberdiyeva[1]

[1]West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [2]Orenburg State Medical University, Orenburg, Russia

*Corresponding author: A. Akhayeva, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: gistolog89@mail.ru

BACKGROUND: The Aktobe region is a natural and anthropogenic chromium and boron province. Boron compounds presented in the body in small concentrations are involved in various physiological processes. In high concentrations, boron compounds have a toxic effect on various organs of humans and animals. The aim of study is to examine the morphofunctional state of the lungs when exposed to sodium tetraborate.
METHODS: The object of the study was 60 white outbred male rats. Experimental animals were intraperitoneally injected with 1 ml of sodium tetraborate solution at a rate of 150 mg / kg (1/30 LD50). Control animals were injected intraperitoneally with 1 ml of normal saline daily. The lungs were fixed in 10% neutral formalin. The study of lung structures was carried out after standard histological processing and staining with hematoxylin and eosin according to van Gieson. In gistological preparations of the lungs, morphometry of the structures of the lungs was performed.
RESULTS: In animals removed from the experiment a week later, the morphological picture of the lungs was characterized by the presence of a vascular reaction: the walls of the vessels were thickened, in the capillaries, arterioles and venules there was a stagnation of the blood formed elements, the destruction of the blood vessel and the formation of blood cells from the vessels was noted. Disturbances on the part of the microcirculatory vessels continue to persist over longer periods of exposure to sodium tetraborate, and destructive phenomena increase with increasing time of exposure to sodium tetraborate. In all periods of observation leukocyte infiltration is noted in the wall of the bronchi, the interstitium of the organ, in the walls and in the lumen of the alveoli. In the walls of the small and medium bronchi, against the background of moderate edema, focal destruction of the multi-row ciliated epithelium is detected, and the height of the epithelial layer is reduced compared with control animals. Attention is drawn to the increase in the number of goblet cells in the epithelium of the bronchi of medium and small caliber. The proportion of goblet cells at the end of the experiment was 33.4 ± 3.6% (in the control, 11.4 ± 2.0%).
In the epithelium of the bronchi focal areas of its complete destruction are noted. With an increase in the duration of exposure to sodium tetraborate, a decrease in the proportion of ciliated cells is observed. In ciliated cells against the background of a decrease in the height of the epithelial layer of the multi-row ciliated epithelium, a decrease in the height of the cilia is observed. So, in intact animals, the height of cilia of ciliated cells was 5.1 ± 0.4 μm, after 1 week of sodium tetraborate - 3.3 ± 0.4 μm, after 2 weeks - 2.8 ±, 3 μm, after 3 weeks - 2.5 ± 0.3 microns, and in a month - 2.4 ± 0, 4 microns. These changes were most noticeable in the long periods of the experiment.
CONCLUSIONS: Thus, the effect of sodium tetraborate on the human's body causes morphological changes in the structures and vessels of the lungs. The described changes reflect the adaptive capacity of the lung structures, as evidenced by a decrease in destructive changes after cessation of exposure to sodium tetraborate.

Parenteral and enteral therapy in oncological patients in early postoperative period

Sherzad K. Davanov[1] *, Yana L. Poluektova[2], Nikita S. Vorotyntsev[3], Sergey S. Degembaev[4]

[1]Karaganda State Medical University, Department of Resuscitation, Anesthesiology and Emergency Care, Master, PhD, Karaganda, Kazakhstan; [2] Karaganda State Medical University, Department of Oncology and Radiotherapy, Master of Medicine, Assistant Professor, Karaganda, Kazakhstan; [3]Karaganda State Medical University, Department of Resuscitation, Anesthesiology and Emergency Medical Aid Karaganda, Kazakhstan; [4]Karaganda State Medical University, Department of Resuscitation, Anesthesiology and Emergency Medical Aid Karaganda, Kazakhstan

*Corresponding author: Sherzad K. Davanov, Karaganda State Medical University, Department of Resuscitation, Anesthesiology and Emergency Care, Master, PhD, Karaganda, Kazakhstan.
Email: Sherzad85@mail.ru

BACKGROUND: In modern medicine, the treatment malignant tumors of the hepatopancreatobiliary zone is one of the most pressing problems. Cancer of the liver and extrahepatic bile ducts are considered the most severe, which are accompanied by persistent obstruction of the main bile ducts with the subsequent development of obstructive jaundice, the treatment of which still remains debatable. The violation of the nutritional status has a significant impact on the outcome and prognosis of the disease, forcedly increases the duration and cost of treatment, increases the mortality rate and the number of complications.
PURPOSE: Improving the nutritional status of cancer patients after surgery on the liver and biliary ducts through a comparative analysis of the effectiveness of various methods of parenteral nutrition and early enteral nutrition.
OBJECTIVES: To conduct a comparative assessment of the clinical condition of patients according to the SGA (Subjective Global Assessment) and NRI (Nutritional Risk Index) algorithm of severity prior to surgery on the liver and biliary ducts and during various methods of nutritional support in the early postoperative period. To analyze the dynamics of protein and carbohydrate metabolism in the early postoperative period in cancer patients with various methods of nutritional nutrition.
METHODS: A prospective analysis of the results of treatment of 120 patients with neoplasms of the hepatopancreatobiliary zone in the postoperative period. At the first stage, the clinical state of the patient will be assessed according to the SGA and NRI algorithm of severity before the operation, later on - 3, 8, 15 days after the operation. The definition of nutritional status indicators is assumed by body mass index, basal metabolic rate, laboratory immune status indicators, neutrophil phagocytic activity level, total protein, carbohydrates, serum albumin, acid-base status.
A comparative assessment of the nutritional insufficiency

of using parenteral nutrition and early enteral nutrition techniques in a complex of therapeutic measures after operations in the hepatopancreatobiliary zone is assumed. The research is planned as analysis of the duration of postoperative gastrostasis, the beginning of intestinal motility, the appearance of stool, the resumption of self enteral nutrition, return to a normal diet.
RESULTS: The algorithm of parenteral nutrition and early enteral nutrition developed and tested in work will improve the results of treatment of patients with the pathology of the hepatopancreatobiliary system, and will reduce the duration of inpatient surgical treatment, reduce the time needed to restore the functional activity of the gastrointestinal tract.
CONCLUSIONS: It is planned to include a set of nutritional support measures after surgery on the liver and biliary tract, which is an important part of the treatment in the postoperative period, which helps reduce oxidative stress and normalize the function of the body's immune system.

Factors influencing breastfeeding infants in the Aktobe province of western Kazakhstan

Gaukhar S. Dilmagambetova*, Akmaral M. Altayeva, Eleonora B. Nurbaulina, Mukhit N. Turebayev, Marzhan K. Nazarbayeva

Department of General Practice, West Kazakhstan Marat Ospanov Medical State University, Aktobe, Kazakhstan

*Corresponding author: Gaukhar S. Dilmagambetova, Department of General Practice, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: g.dilmagambetova@zkgmu.kz

BACKGROUND: It is commonly known that the breast milk is extremely useful for infants, as being the source of beneficial nutrients. Breastfeeding provides the health and survival of children. The primary healthcare (PHC) institutions in Kazakhstan actively promote the benefits of breastfeeding to mothers as the best source of nutrition for infants.
The present study is aimed to outline the influence of socio-economic factors on preference in infants feeding in the Aktobe province of western Kazakhstan.
METHODS: 150 women 19-32 aged, registered in the Aktobe PHC setting №4 were interviewed through the specially developed questionnaire validated by the Cronbach's α. Information about the age of women, their education, family income, parity, outcomes of childbirth, as well as different complications after the childbirth was analyzed. The influence of these factors on the mothers' further preference in newborns feeding was studied. Non-parametric operational tests were used due to a priori missing a normal distribution. To analyze the quantitative variables in two independent samples the Mann-Whitney (U) test and the Pearson's $\chi 2$ test for frequencies comparison were performed. To identify the relationship between the studied values the Spearman's correlation analysis was applied. SPSS Statistics 20 software (IBM, Armonk, NY, USA) was applied for calculations. For all tests a two-side type I error of $P \leq 0.05$ or less at 95% CI was assumed statistically significant.
RESULTS: The survey of 150 women showed that the breastfeeding took place in 99 cases (66%), and the artificial feeding of infants in 51 cases (34%), respectively. The parity data in women surveyed distributed as follows: 42 women (28%) had one birth in the history, 72 women (48%) had two births, 33 respondents (22%) had three births and 3 women (2%) had four births, respectively. We established that the more number of childbirths presented in a history of respondents, the more they preferred the breastfeeding (the Mann-Whitney's U 776.5, P 0.02). Of interviewed, 94 women had births per via naturalis, and 56 women undergone a cesarean section. Despite the nature of childbirth, in most of cases, the breastfeeding was preferred ($\chi 2$ 103.3, P 0.0001), and only 2% of all births were accompanied with an artificial feeding in each of groups. In 127 cases out of 150, women did not face postpartum complications; their children were further fed naturally (22% versus 8% in children who had artificial feeding). In 33 cases (22%) a history of postpartum complications in women took place, subsequently resulted in artificial feeding of infants ($\chi 2$ 7.91, $P \leq 0.02$), and only 5 out of those 33 practiced breastfeeding (P 0.24). The social factors such as the level of education in mothers, presence or absence of a legal marriage, a family income did not have a significant impact on the feeding of infants.
CONCLUSIONS: Thus, we established that the number of successful births disrespective to the nature of the delivery, and presence of postpartum complications in a woman's history turned to be the factors the most significantly influencing the feeding of infants. A direct relationship between the number and the course of childbirths and feeding preferences was detected. In the presence of any postpartum complications, the artificial feeding looked more preferrable.

Using the method of the "Standardized Patient" for training General Practitioners in internship

Gulzhakhan R. Zhakieva*, Aigul Sh. Sartayeva, Nuriya Z. Ibragimova, Irina V. Ismailova, Zoya B. Moldasheva

Department of General Medical Practice No.2, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Gulzhakhan R. Zhakieva, Department of General Medical Practice №2, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: gulzhahanzhakieva@mail.ru

BACKGROUND: Modernization of higher education system in Kazakhstan requires the solution of priority tasks, of which the most important is improving the quality of education. The effectiveness of the teaching process in a medical school is determined by the high level of professional competence and the possessing of communicative skills in future physicians. The unavailability of real patients for students and the possible difficulties in communicating with them lead to a low rate in proficiency of practical skills. Currently, the implementation of innovative educational technologies has the key significance for medical education system. An innovative method "standardized patient" contributes to the formation of clinical thinking and the ability to communicate with patients under real conditions.

The study is aimed to evaluate the effectiveness of the "Standardized Patient" method in the process of training in General Practitioner interns.
METHODS: The method "Standardized Patient" has been using by the faculty members of the Department of General medical practice №2 for several years in the educational process. Clinical scenarios were developed to evaluate the interns' skills to diagnose and manage patients in various clinical situations under the condition of primary health care (PHC). The educational process includes a patient (an intern volunteer) who is able to simulate a clinical case according to a given clinical scenario, as well as the "doctor" and experts-curators. During the learning process, a discussion on the intern`s chosen tactics, his/her ability to collect and analyze the patient complaints and history, to perform clinical examination and diagnosis, including differential diangnosis, take place between the experts-curators. The whole process of teaching by this technique is documented, and allows for an unprejudised assessing the interns' knowledge and skills. Experts-curators assess the future physician's abilities and practical skills while his/her working with the patient, focusing on using the basic communication skills and the sequence of the actions which are close to real conditions. The evaluation sheets are designed, in which the stages of the examination are provided: admission of an outpatient and using of communication skills.
RESULTS: According to data on filling in the feedback questionnaires: the interns were experiencing difficulties during the collection of complaints and the patients history using communication skills (30%), during the patient examination (25%), diagnosis and treatment (35%). The majority of the interns (76%) upon passing this training method recorded a positive attitude when further communicating with patients in PHC settings.
CONCLUSIONS: Thus, the implementation of the "Standardized Patient" method in the educational process is a priority task for clinical departments, as contributes to the improvement of practical skills and really increases the level of professional competence in interns of a medical school.

The effect of air quality on respiratory morbidity among adult citizens

Dinara T. Ibrasheva*, Saule K. Bermagambetova

Department of Hygienic Disciplines with Occupational Diseases, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan

*Corresponding author: Dinara T. Ibrasheva, Department of Hygienic Disciplines with Occupational Diseases, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan. E-mail: ibrashevadinara@mail.ru

BACKGROUND: According to literature sources, air pollution is considered as an integral indicator of respiratory morbidity among adult citizens. High level of air pollution adversely affects public health, which is evidence of increased morbidity and mortality, especially in those areas where the concentration of polluting chemicals, such as hydrogen sulfide, sulfur dioxide, ozone, chromium formaldehyde, nitrogen dioxide, exceeds the maximum permissible concentration. Respiratory organs are primarily exposed to adverse effect of all substances that pollute the air. High incidence of respiratory diseases is one of the factors of environmental pollution. The pathology of the respiratory organs in 40-60% of cases occurs due to unfavorable environmental situation.
The purpose of this research was to study the annual dynamics of air pollution and its contribution to respiratory diseases of adult citizens living in different districts of Aktobe city.
METHODS: Newsletters served as the source materials on the environmental condition of the Republic of Kazakhstan. Kazhydromet, issue from 2014-2018 and data on the composition of atmospheric air in Aktobe from 2014-2018, obtained at the National Center of Examination affiliate of the RSE for Aktobe region. We have studied the data from two automated posts, i.e. post No. 3, which is located near the Municipal Polyclinic (MP) No. 1, and post No. 6, located near the MP No. 2. The study of the incidence of respiratory organs was made based on the statistical data and the data from electronic database of ERDP (Electronic Register of Dispensary Patients) of the MP №1, which is located in Mareseva Street, Building 1 "B" (industrial zone), and the MP №2 in Takhaui Akhtanova Street, Building 50 (control region) in Aktobe.
The retrospective analysis was conducted to study the effect of air quality on the respiratory morbidity of 18-100 years old citizens in MP No. 1 and MP No. 2 in the last 5 years.
RESULTS: The analysis of air quality and respiratory morbidity of Aktobe citizens revealed correlations between the quality of atmospheric air (hydrogen sulfide emissions (r=0.7), nitrogen dioxide (r=0.57), sulfur dioxide (r=0.51), carbon monoxide (r=0.73), ozone (r=0.82), chromium (r=0.59), formaldehyde (r=0.89)) and the level of respiratory morbidity of Aktobe adult citizens.
It should also be noted that the level of air pollution near the post No. 3 was significantly higher than the post No. 6, where the qualitative composition of the atmospheric air corresponded to the maximum permissible concentrations. The incidence of respiratory organs of MP No. 1 patients was 427.37 for 2018 year, while with patients of the MP No. 2, this rate was 293.35.
CONCLUSIONS: The analysis of average concentration of chemical substances in the atmospheric air showed that the control area of Aktobe is characterized by a more favorable environmental situation, hence the respiratory morbidity among adults is 1.5 times less than among residents of the industrial zone, where higher concentration of chemicals in the air was recorded.

Efficiency of using the simulation method for the heart auscultation skills' teaching in students of medical school: issues of the research designing

Kairat B. Kurmangaliyev, Gulbakit K. Koshmaganbetova*, Saule S. Kurmangaliyeva, Luidmila N. Vlasova

West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Gulbakit K. Koshmaganbetova, Center for Continuing Professional Development, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: gulbakit66@mail.ru

BACKGROUND: Despite years of experience in using cardiology simulators in medical education, numerous studies have documented poor cardiological examination skills among trainees and clinicians using cardiac simulators. In general, outcomes of the research on utility and efficiency of technologies modeling cardiac auscultation are scattered, inconsistent and vary widely in methodological rigor and focus.
To develop the study based on our own findings, the University faculty members from the Department of the strategic development and quality management, the Center of continuing professional education and the Department on academic affairs performed searching the relevant papers from the Pubmed database on the topic. The present passage from the study currently designing is aimed to briefly summarize the existing body of evidence in medical education devoted to the question: "Does the use of the heart simulator improve the students' auscultation skills?"
METHODS: Search for original articles and reviews in the online database PubMed (MEDLINE) was carried out with the following Inclusion criteria: articles published in English and related to cardiac stimulation in medical education in undergraduate students over the past 10 years.
RESULTS: The review included 20 studies met the inclusion criteria, with a total of 2676 participants. Various types of simulations for learning auscultation of the heart were considered in those researches. Overwhelming majority of the study designs were observational, in a form of post-test or preliminary test / post-test interviews, without a control group, whereas randomized controlled studies were presented relatively rarely (4 of 20), and only 1 systematic review was found. According to the modified Kirkpatrick scale, the impact of educational intervention most often consisted of changing knowledge and / or skills. Skills and knowledge were evaluated in 17 analysed studies and attitudes were estimated in 6 ones. Most of papers recorded improvements after cardiac simulation interventions. Usually within the simulation techniques' topic, studies conducted were aimed an immediate assessment of the success in skills on auscultation of the heart. Several well-designed randomized trials included in this review (2 of 4) did not reveal significant differences between cardiac simulations and other interventions. Three studies showed that the students' auscultation skills at the bedside of real patients were not perfected after training in simulators.
CONCLUSIONS: In general, according to data from the 20 scientific papers on the topic found in Pubmed database, the use of a heart simulator contributes to improving auscultation skills in students. Overall, the number of studies on the topic cannot be considered satisfactory. Further researches are needed to be designed in order to strengthen the evidence on the content and scope of the simulation intervention, with the focus on the role of instructors and mentors. The techniques to implement the simulation training into clinical practice are also should be tested in the future researches.

Mutation in platelet receptor gene ITGA2 b and pregnancy

Aizada Marat[1] *, Talshyn Ukybassova[2], Tatyana Vlassenko[1]

[1]Department of Obstetrics and Gynecology №1, Astana Medical University JSC, Astana, Kazakhstan; [2]Obstetric and Gynecological Department, "University Medical Center" National Scientific Center for Motherhood and Childhood, Astana, Kazakhstan

*Corresponding author: Aizada Marat, Department of Obstetrics and Gynecology №1, Astana Medical University JSC, Astana, Kazakhstan. E-mail: aizadamarat0708@gmail.com

BACKGROUND: According to some authors, the role of thrombophilia in the structure of the causes of pregnancy pathology ranges from 40 to 80%. From the modern point of view, thrombophilia is considered as an etiopathogenetic factor for a wide range of diseases and syndromes - fetal loss syndrome, pre-eclampsia, thromboembolic complications of hormonal contraception and hormonal replacement therapy, repeated in vitro fertilization failures (IVF), etc.
The ITGA2 gene is responsible for coding the amino acid sequence of specialized platelet receptors (integrins), for which the platelet interacts with tissue proteins during damage to the vascular wall. Due to its receptors, platelets can form a monolayer in the area of damage, which will be an important condition for the activation of the following components in the blood coagulation chain reaction, due to which the body is prevented from blood loss.
If there is a mutation in this gene, the properties of platelet receptors change, their gluing rate increases, which increases the risk of thrombophilia. The frequency of occurrence of this mutation is from 5 to 7%.
In women with a predisposition to thrombosis (with thrombophilia), pathological hypercoagulation develops during pregnancy, which can lead to early and late reproductive losses.
CASE REPORT: In our work, we describe a clinical case of a 37 year old patient. The patient had a mutation in the ITGA2 platelet receptor gene, in the PAII fibrinolysis system, in the MTRR homocysteine accumulation regulator.
The patient had 3 pregnancies: 1, 2 pregnancies ended in spontaneous miscarriage in terms of 18, 20 weeks. 3 pregnancy occurred spontaneously, registered at 12 weeks. Pregnancy proceeded against the background of thrombophilia, subclinical hypothyroidism. During pregnancy, she took Clexan 0.4 ml / day, Aspirin 100 mg /day, Folacin 5 mg / day and vitamins B on the recommendation of a hematologist. She was hospitalized of 24-25 weeks with a diagnosis of false contractions. Tocolytic therapy with nifedipine according to the regimen was carried out; prevention of fetal RDS with dexamethasone according to the regimen. On transvaginal cervicometry was found a shortening of the length of the cervix of 25 mm or less, in connection with which an obstetric unloading pessary was introduced. 24 hours after the introduction of the obstetric pessary, premature prenatal rupture of the membranes was recorded, the obstetric pessary was removed. After 48 hours, regular labor activity began and with the development of signs of chorionamnionitis. An hour after diagnosis of chorionamnionitis, umbilical cord loops and were recorded intranatal fetal death. After

15 minutes, premature labor was born, the female was prematurely dead, without signs of live birth (breathing "-"; heartbeat "-"; pulsation of the umbilical cord "-"; arbitrary contraction of the umbilical cord "-"), without visible malformations, in the pelvic previa, weight - 780gr., height - 34 cm.

The effectiveness of methods for correcting short cervix

Aizada Marat[1] *, Tatyana Galitskaya[1], Lyazzat Kaldygulova[2]

[1]Department of Obstetrics and Gynecology №1, Astana Medical University JSC, Astana, Kazakhstan; [2]In vitro fertilization department, "University Medical Center" National Scientific Center for Motherhood and Childhood, Astana, Kazakhstan.

*Corresponding author: Aizada Marat, Department of Obstetrics and Gynecology №1, Astana Medical University JSC, Astana, Kazakhstan. E-mail: aizadamarat0708@gmail.com

BACKGROUND: Since 2008, in the Republic of Kazakhstan (and in the city of Almaty as a pilot project since 2002), the introduction of live birth and stillbirth criteria recommended by WHO has begun. Since the implementation of the WHO live birth criteria in our country, the rate of preterm birth has remained relatively stable. In the Republic, there is a slight increase in the rate of preterm birth in 2011 - 6.7%, a decrease in the rate of preterm birth is observed in 2015 - 5.8%. In 2017, the rate of preterm birth in the country was - 6.1%. One of the important predictors of preterm labor is the shortening of the cervix ≤25 mm.
Purpose of the study. Comparison of the effectiveness of methods for correcting short cervix in preventing preterm labor: obstetric pessary, surgical correction and intravaginal progesterone.
METHODS: 125 pregnant women with shortening of the cervix of 25 mm or less, taking into account the criteria for inclusion and exclusion, were selected and divided into 3 groups depending on the method of correction of the short cervix. In group I were included 62 pregnant women with a short cervix, in which obstetric pessary was used to correct for a short cervix, and in group II, 31 pregnant women, in whom a surgical method of correction of a short cervix was applied. Group III included 32 studied patients in whom intravaginal progesterone was used for the treatment of the short cervix (200 mg / day). Clinical observation, examination and treatment of pregnant women was carried out at the clinical bases of the University Medical Center "National Scientific Center for Maternity and Childhood" and the Department of Obstetrics and Gynecology No. 1 Joint-stock company Astana Medical University (Astana Perinatal Center).
RESULTS: Of the 125 pregnant women in time gave birth - 75 (60%), premature birth in the period of more than 34 weeks occurred in 31 (24.8%), premature birth less than 34 weeks occurred in 17 (13.6%) of the subjects. Pregnancy ended in late miscarriage in 2 (1.6%) of the subjects.
Comparison of pregnancy outcomes in the studied groups did not reveal statistically significant differences between the rates of urgent labor. In the study of indicators of preterm labor, preterm delivery up to 34 weeks occurred significantly more often in groups II and III, compared with group I ($p<0,05$).
CONCLUSIONS: The efficiency of correction of the short cervix by surgical and non-surgical methods averages 60% and has no statistically significant differences. The highest rates of childbirth in full-term pregnancy were observed in the short cervical correction group with obstetric pessaries - 63%; surgical cerclage - 58%; vaginal progesterone - 56% ($P>0.05$). However, analysis of cases of preterm birth up to 34 weeks showed that there were significantly more cases of preterm birth up to 34 weeks in the surgical and drug correction groups compared to the obstetric pessary group ($P<0.05$).
The results obtained make it possible to use non-surgical methods for the correction of short cervix, taking into account their advantages over surgical methods in preventing preterm labor.

Risk factors for preterm birth

Aizada Marat[1] *, Tatyana Galitskaya[1], Nazira Kamzayeva[2]

[1]Department of Obstetrics and Gynecology №1, Astana Medical University JSC, Astana, Kazakhstan; [2]Obstetric and Gynecological Department, "University Medical Center" National Scientific Center for Motherhood and Childhood, Astana, Kazakhstan

*Corresponding author: Aizada Marat, Department of Obstetrics and Gynecology №1, Astana Medical University JSC, Astana, Kazakhstan. E-mail: aizadamarat0708@gmail.com.

BACKGROUND: Preterm birth determines the level of perinatal morbidity, mortality and is one of the main problems of maternal and child welfare. The increase in the level of somatic diseases, the active introduction of assisted reproductive technologies, and increase in the number of multiple pregnancies have led to an increase in the frequency of preterm birth. The global medical community is concerned about the lack of a declining trend in the number of preterm births around the world. Therefore, the search for methods of prevention, prediction of preterm birth is an important task of health care.
Purpose of the study. Identify significant risk factors for preterm labor.
METHODS: The main group included 406 pregnant women with a shortening of the cervix 25 mm or less, the control group included 455 pregnant women with a cervix length more than 25 mm during pregnancy between 14 and 20 weeks according to ultrasound cervicometry. With the help of a specially designed questionnaire, pregnant women were interviewed to identify possible risk factors for cervical shortening and preterm birth. In assessing the risk factors for preterm labor, the following were studied: age of the woman; social history (education, place of residence, employment, occupational hazards and bad habits of the mother and father of the child), marital status; the presence of chronic somatic diseases and surgical interventions; gynecological history; features of the implementation of reproductive function (an analysis was made of the number of previous pregnancies of their outcomes, taking into account the period of termination of pregnancies, the number and nature of

intrauterine devices, manipulations on the cervix, surgical interventions on the pelvic organs); the presence of stressful situations.
RESULTS: Statistically significant risk factors for preterm labor are surgical interventions on the cervix (OR-16.7; 95% CI: 3.9-70.8), preterm delivery (OR-3.0, 95% CI: 2.2-4 , 5), perinatal loss syndrome (OR – 3.0; 95% CI: 2.1–4.4), education level of women (OR – 2.3; 95% CI: 1.8–3.2), and a birth history of the newborn ≤ 2500 g., (OR-2.4; 95% CI: 1.7-3.4) (P<0.05), lack of employment (OR-2.3; 95% CI: 1.7-3.0), caesarean section in history (OR-1.7; 95% CI: 1.3-2.3), BMI ≥25 (OR-1.7; 95% CI: 1.3 -2.3), multiparity (OR-1.6; 95% CI: 1.2-2.2), smoking (OR-1.5; 95% CI: 1.0-2.3) (P< 0.05).
CONCLUSIONS: The identification of risk factors for preterm birth will help to transfer the patient to the appropriate level in a timely manner and prevent preterm delivery and complications associated with prematurity of children.

The impact of distance counseling on the quality of life of teenagers with acne

Zhuldyz Kubenkulova[1] *, Gulmira Iztleuova[1], Rosa Aliyeva[1], Zhadra Zharasova[1], Gulzhakhan Isalieva[1], Yerbolat Iztleuov[2]

[1]Department of Phthisiology and Dermatovenereology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan; [2]Course of visual diagnostics, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan

*Corresponding auhor: Zhuldyz Kubenkulova, Department of Phthisiology and Dermatovenereology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan.
E-mail: rtyu-20-1983@mail.ru

BACKGROUND: Acne is a chronic disease that affects more than 85% of adolescents and two thirds of adults aged 18 years and older. Acne impairs the quality of life and contributes to social maladjustment of patients. New opportunities to monitor patients with acne are associated with remote counseling.
The aim of the research is to study the effect of distance counseling on the quality of life of teenagers with acne.
METHODS: From March to December 2018, 273 teenagers (from 15 to 21) were selected in a randomized study for the effectiveness of remote counseling, of which 182 met the inclusion criteria. On examination of the skin, the degree of acne was evaluated according to the classification proposed by the American Academy of Dermatology.
All subjects comparable in age and sex were randomly divided into 2 groups. In the 1st group - remote consulting with the use of Instagram @acne_actobe (training seminars, video lectures 3-4 times a week) and WhatsApp messenger (personal messages, photos to the doctor) 93 people were taken for observation. Initially, patients were examined on an outpatient basis.
In the second group - polyclinic, 89 patients were taken, which were observed on an outpatient basis by the dermatologist on the basis of the SCE "Aktobe Regional Dermatovenerologic Dispensary", could see a doctor - once every two weeks.
Patients in both groups were monitored for 8 months. To study the quality of life, the researcher conducted a survey using the dermatological quality of life index (DIQL) before and after treatment, which included 6 key parameters. Statistical data processing was carried out by the program "Statistica 10".
RESULTS: The quality of life analysis showed that before treatment in teenagers with acne in both groups, the average DLQI score was the lowest (5 points) for mild acne, increased (10 points) with moderate acne, and increased significantly (19 points) for severe acne (P<0.05, Kruskal-Wallis test). The mean score of DLQI before treatment in both groups was 5.8, which indicates a moderate psychological effect of acne on the patient's life.
After therapy, after 8 months, the average DLQI score for teenagers with acne in the first group dropped to 3.08 points (slight psychological impact); acne did not affect and had a slight effect (0-5 points) by 77%, a moderate effect (6-10 points) by 15%, a very strong influence (11 points) by 8%.
In the second group - the average DLQI score in adolescents with acne decreased to 3.7 points (slight psychological impact); acne did not affect and had a slight effect (0-5 points) by 76%, moderate influence (6-10 points) by 14%, a very strong influence (11-19 points) by 10%.
The psycho-emotional state of teenagers in the remote monitoring group corresponds to the outpatient group, but out-patient patients 5.5% tend to miss treatment days and follow-up examination (P=0.8 in the Mann-Whitney test), explaining that they are very sensitive to outsiders, workload of the learning process.
CONCLUSIONS: Remote counseling for patients with acne using mobile applications is necessary to improve their quality of life.

The value of neuron-specific markers in predicting severity and treatment outcomes in patients with acute Traumatic and Vascular Lesions of the Brain

A. Tokshylykova[1] *, Zhanslu Sarkulova[1], Gulnar Kabdrakhmanova[2], Aigul Utepkaliyeva[2], Ainagul Sarbayeva[2], R. Zhiyenalin[1]

[1]Department of Anesthesiology and Intensive Care, [2]Department of Neurology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.

*Corresponding author: A. Tokshylykova, Department of Anesthesiology and Intensive Care, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.

BACKGROUND: To date, the mortality and disability in patients with acute traumatic (26.1%) and vascular lesions of the brain (23.4-31.7%), still remains threatenly high. This is related mostly to the low informative content of conventional research methods that do not reflect the degree of damage in the central nervous system.
The present study is aimed to determine the meaning of neuron-specific blood proteins' markers in predicting the severity and the treatment outcomes in patients with the listed lesions of the brain.
METHODS: A total of 90 patients treated in the intensive care departments of the Aktobe emergency hospitals, aged

21-89 (60.96±14.01) with the mentioned pathology, were involved in the study. Regardless the diagnosis, patients were allocated into 2 groups: survivors (n 52, 57.8%, and deceased persons (n 38, 42.2%). Of them 46.6% were individuals of employable age, mostly men. There were patients with the traumatic brain lesions (TBL, 15.5%), with the hemorrhagic strokes (HS, 42.2%), with the ischemic strokes (IS, 33.3%) and with the subarachnoid hemorrhage (SH, 8.8%). The exclusion criteria were: presence of malignant neoplasms, uremia and hepatic cirrhosis. Laboratory studies were carried out in 1-3-5-7 days. The levels of neuron-specific enolase (NSE) and neurogliac protein (S100) in serum were determined using a human ELISA kit (DiaMetraSrl, cat. No: DKO073, ZI Paciana, Italy) using a solid phase, non-competitive method based on applying the two types of mononuclear antibodies that specifically recognize molecules of NSE and S100B.
Student's *t*-test for dependent and independent samples, as well as the Wilcoxon's test for dependent samples and the Mann-Whitney test for independent ones were used. Equality of variances was evaluated through the Leuven's criterion. Frequency comparisons were performed using Pearson's $\chi 2$ test. To identify the relationship between the studied values the Spearman's correlation analysis was applied.
RESULTS: In both groups the maximum value of the NSE concentration was recorded on the 3rd day, followed by a decrease by the 7th day. Besides, in the 2nd group the concentration of proteins on the 1st day exceeded the indicators of the 1st group by 1.6 times (17.87±11.9 to 22.14±13.7 ng/ml) and then decreased to 1.2 times to the 7th day (16.94±8.6 to 20.84 ± 8.3 ng / ml). Similar changes occurred with the protein S100B. The greatest increase in its concentration occurred in the group of deceased persons. If in the 1st group (survivors) the initial index of S100 was 0.22±0.42 μg/l and decreased 2.2 times (0.10±0.14 μg/ l) on the 7th day, in the 2nd group the protein reduced by 2.08 times. When comparing the S100 protein content by groups, its excesses on the 1st and 7th days of the treatment were 7.1 times and 6 times in the 2nd group, respectively.
CONCLUSIONS: A relative increase in serum concentrations of NSE by 1.23 times and S100 protein by 6.8 times in the group of deceased patients compared to the group of survivors may serve as prognostically significant criteria at the worsening in patients with the acute traumatic and vascular brain lesions. These neuroimmunological markers of the brain damage allow to timely predict the severity and possible outcomes, as well as to provide a set of preventive measures.

Prevalence of presenteeism among industrial workers

Zhangeldy M. Shaimbetov*, Umit A. Satybaldiyeva

West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Zhangeldy.M Shaimbetov, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: zhas.lider@mail.ru

BACKGROUND: The number of unemployed in Kazakhstan by 2018 reached 434,000 people, and the unemployment rate was 4.8%. The loss of work threatens the loss not only of the source of a person's financial stability, but also of his professional self-realization. Unemployment makes a person vulnerable in the family and society, affecting virtually all aspects of his life, including both consumer and demographic opportunities. It is therefore not surprising that people fear unemployment, since losing their job threatens their social well-being. Fear of unemployment often forces the employee to voluntarily go to work during periods of illness and disability. This phenomenon has become the object of study of a wide range of scientists. In recent years, there has been a tendency to a decrease in not only occupational morbidity, but also morbidity with temporary disability. According to the statements of many domestic and foreign occupational pathologists, both temporary disability and occupational morbidity currently do not reflect the real picture of the incidence of the working-age population. Also, by many authors, one of the subjective reasons for the low commitment of workers to the establishment of an occupational disease is precisely the fear of losing their job, so it is natural to assume a high level of presentationism among the working population.
The study was aimed to examine the prevalence of the phenomenon of "presenteeism" among the workers of industrial enterprises.
METHODS: The work was carried out in medical organizations of the city of Aktobe. The study involved 520 individuals. All of them were industrial workers undergoing periodic medical examinations. A survey was conducted using the Stanford Presenteeism Scale (The Stanford Presenteeism Scale, SPS-6), consisting of six questions that are assessed by the subjects on a five-step R. Likert scale (grading: "I completely disagree" / "disagree" / "find it difficult to answer "/" Agree "/" completely agree ").
RESULTS: 23% of respondents denied health problems. The rest (77%) had certain health problems. At the same time, 16% of respondents did not give affirmative answers to all the questions asked, noting the option "I find it difficult to answer." 23% of respondents claimed that due to health problems they were harder able to cope with stress at work. 39% of respondents partially agreed with this statement. At the same time, 24.5% of the workers were convinced that despite the health problem, they were able to complete difficult tasks in their work, and 36.5% of the respondents only partially shared this statement. The health problem did not let enjoy work considered 17.3% of respondents. In part, 43.7% of respondents agreed. The feeling of complete hopelessness, in completing some work tasks, due to health problems, was experienced by 14.0% of respondents, and 47.0% of workers agreed with this statement partially. "At work, I was able to fully concentrate on achieving my goals, despite the problems with my health," considered 25.5% of respondents, 35.5% of respondents partially agreed with this. 28.2% of workers felt energetic enough, despite health problems, and 32.8% of workers did not quite agree with this statement.
CONCLUSION: The absence of presenteeism was revealed only in 23% of industrial workers. The rate of presenteeism among industrial workers appeared to be 61%.

The effectiveness of a single checklist for assessing student knowledge

Tulegenova Dina Ertargynovna*, Minbaeva Larisa Sergeevna, Zubkova Evgeniya Yuryevna, Ibraeva Lyazat Kataevna, Bacheva Irina Viktorovna

Department of Internal Diseases No.3, non-commercial joint-stock company Medical University of Karaganda, Karaganda, Kazakhstan

*Corresponding author: Tulegenova Dina Ertargynovna, Kazakhstan. E-mail: TulegenovaD@kgmu.kz, dina.tulegenova.med@mail.ru

BACKGROUND: In connection with the digitization of science and education, special attention in modern education is paid to the development and application of methods for structuring knowledge in the subject area, which is necessary for the qualitative analysis and synthesis of information obtained from studying various academic disciplines.
METHODS: To improve the efficiency of mastering educational material, universal checklists (in Russian, Kazakh and English languages) were developed and introduced into the educational process, which were filled in by students separately for each nosology of the therapeutic profile (according to the topic of the lesson).
The structure of the checklist is presented in the form of a table, which reflects the student's individual, data, there are 16 columns for determining the required anamnestic and clinical diagnostic characteristics of the disease, instrumental research methods, treatment, prevention, risk factors and complications. The questions presented in the checklist columns and requiring short answers are designed to structure the student's knowledge and form the most complete diagnostic and treatment algorithm. Each item of the check-list is assigned a certain score (in%), which add up to 100%. Therefore, the proposed checklist can be used as a basis for preparing for the lesson, and as a control form for estimation. Specifying the answers facilitates the process of checking the work for teacher and increases the objectivity of the evaluation of knowledge.
The study included 133 students of the 4th year of the specialty "General Medicine", who were divided into 2 streams (n1 = 67, n2 = 66). The number of groups in each stream was 6. In the 1st stream, students structured their knowledge by filling in the developed check list. The check-list was not given in the 2nd stream.
To determine the degree of assimilation of the material studied, basic and final test control for all students were given (20 test questions). The results of the basic control among students of the first and second streams showed that the compared groups are comparable (the percentage in the first stream expressed as a percentage was 67.5%, in the second - 68.1%).
The results of the final control were evaluated as "excellent", "good" and "satisfactory", which in percentage terms was 28.6%: 51.9%: 19.5%, respectively.
Feedback was analyzed using a questionnaire (4 questions with a grade from 1 to 5 points), which was filled in by students after writing the final test.
RESULTS: According to the results of the final testing, it was found that the ratio "excellent", "good" and "satisfactory" in the 1st stream was 28:34:5 (average score - 86.4%), in the second - 10:35:21 (average score - 76%), respectively. Analysis of feedback from students 1 flow showed that the developed checklist contributes to the structuring of knowledge (100% of respondents (N.= 133) - 5 points), facilitates the perception of information (90% (N.=119) - 5 points, 10% (N.=14) - 4 points) and forming of answer (95.4% (N.=127) - 5 points, 4.5% (N.=6) - 4 points). All students (100% (N.=133) - 5 points) noticed that check list can be used both for studying a specific nosology and for structuring other knowledge.
CONCLUSIONS: Thus, the developed checklist improves the efficiency of learning material mastering and can be recommended for using at all levels of education.

Assessment of satisfaction of patients with non-proliferative diabetic retinopathy according to the quality of their visual functions using VF-14 questionnaire

Nurgalieva Zh.Zh.[1] *, Chukanova G.N.[2], Zholdybaeva D.E.[3], Mavlyudova N.M.[4]

[1]Department of Pharmacology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [2]Department of pharmacology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [3]Department of Ophtalmology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [4]Department of Pharmacology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Nurgalieva Zh.Zh., Department of pharmacology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: nzhansulu@mail.ru

BACKGROUND: in recent decades, the incidence of diabetic retinopathy (DR) has increased among the pathologies of the visual organs, which is one of the severe complications of diabetes mellitus (DM) and one of the main causes of blindness and poor vision, including in young and working-age people. In this regard, in our opinion, it is important to study the subjective satisfaction of patients with DR quality of their visual functions.
Purpose: to assess subjective satisfaction with the quality of visual functions of patients with DR compared with patients with type 2 DM who do not have vascular complications using a special ophthalmological questionnaire.
METHODS: the survey of patients was carried out with the help of the international ophthalmological questionnaire VF-14 on the basis of the Eye department of the Medical center of West Kazakhstan Marat Ospanov State Medical University and Endocrinological department of Aktobe regional hospital. The study was approved by the Local Ethics Committee of the West Kazakhstan Marat Ospanov State Medical University. All patients in the these groups had type 2 Diabetes mellitus in the compensation stage (fasting glucose level 4.4-6.1 mmol/l, glycated hemoglobin - 6.5%). All patients were acquainted with the purpose and procedure of the study and signed an informed consent to participate in the study.
RESULTS: the analysis of questionnaires showed that out of 14 points of the VF-14 questionnaire, patients of the studied groups (in average 43% patients in each group) noted difficulties in reading small print and difficulties in performing small manual work. Among patients with non-proliferative DR (an average 40%) were also found complaints of difficulties in reading Newspapers or books.

On the basis of subjective responses of patients, the total rating was calculated in points, which assesed the satisfaction of patients with the quality of their visual functions. Moreover, it was discovered that in diabetic patients without vascular complications overall rating was 81.0 [70.0-89.0], patients with DR – 90.0 [85.0-92.0] (P≥0.05) CONCLUSIONS: according to the VF-14 questionnaire, subjective satisfaction with the state of their visual functions was revealed in patients with type 2 diabetes mellitus in the compensation stage regardless of the absence or presence of diabetic retinopathy.

Features of a course of hepatic encephalopathy depending on degree of dysbacteriosis of a large intestine at patients with cirrhosis

Saule S. Kurmangaliyeva[1] *, Ondasyn M. Aliyev[2], Akgul O. Bayzullina[3]

[1]Department for Academical Work, Marat Ospanov West Kazakhstan State Medical University, Aktobe, Kazakhstan, [2]Department of propaedeutics of internal diseases, [3]Undergraduate of the [2]nd year of training of specialty "Medicine", Marat Ospanov West Kazakhstan State Medical University, Aktobe, Kazakhstan

*Corresponding author: Saule S. Kurmangaliyeva, Department for Academical Work ,West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: saule_cc@mail.ru

BACKGROUND: The heaviest and predictively adverse complications among neurologic frustration at diseases of a liver are the encephalopathies diagnosed for 30%-80% of patients who, remaining throughout a disease, cause certain difficulties of their therapy. Bacterial infections, especially with inclusion of intestinal flora, by frequent complications and can have serious clinical consequences at patients with the cirrhosis (CPU). At the same time, occurrence frequency, clinical duration and features of development of pathology of a large intestine against the background of the CPU are studied insufficiently.
Purpose. To reveal features of a course of hepatic encephalopathy depending on degree of dysbacteriosis of a large intestine at patients with cirrhosis.
METHODS: Within work comprehensive examination of 108 patients with cirrhosis was conducted: from them men — 62 (57.4%), women — 46 (42.6%). Average age of patients was 53.89±10.22. From laboratory methods of a research methods were applied clinical, biochemical, bacteriological (definition a calla on dysbacteriosis). Diagnostics of hepatic encephalopathy was based on clinical and psychometric methods (Reytana test). Stages of the hepatic encephalopathy (HE) were established according to criteria of West-Haven, recommended by the abovestated protocol. 20 healthy people without serious organic diseases (12 men and 8 women) aged from 21 till 55 entered into control group (middle age 31.6 1.12).
RESULTS: At patients from the CPUs having the I stage of PE 1 degree of dysbacteriosis — 1.9%, 2 and 3 degrees on — 3.7% is revealed (p> 0.05). We revealed correlation communication of influence of degree of a disbioz on development of latent PE and PE I of a stage (r = 0.46, p <0.01), reliable decrease in total number of E. coli, Lactobacillus and increase of quantity of S. aureus and opportunistic pathogenic bacteriums (Klebsiella, Enterobacter, Proteus, Morganella, Citrobacteri other) (p <0.05), in comparison with group of control is noted. At patsikent with the II stage of PE the prevalence 2 and 3 degrees of dysbacteriosis of a kikshechnik is observed (p <0.05). Aggravation of PE to the 2nd stage of PE is noted. Patients with the III degree of an intestinal dysbiosis have an increased quantity of S.aureus and other opportunistic pathogenic bacteriums. A feedforward of degree of a disbioz of a large intestine and the TSCh tests (the raised number of hemolitic E. coli and time of performance of TSCh (r = 0.33, p <0.05 and r = 0.31, p <0.05), by quantity of mushrooms of the sort Candida (r = 0.37, p <0.05i r = 0.34, p <0.05), S. aureus (r = 0.24, p <0.05 and r =0.23, p <0.05) and feedback is revealed: between decrease in the Lactobacillus level and time of the Reytana test (r =-0.30, p <0.05 and r =-0.33, p <0.05).
CONCLUSIONS: The received results focus attention to roles of a large intestine in development of PE at the CPU, will be coordinated with results of researches about efficiency of antibacterial therapy with use of not soaking up antibiotics and prebiotics at PE.

Indirect revascularization surgery on diabetic foot syndrome

Basylbek S. Zhakiev, Murat K. Jakanov*, Anuar S. Koyshybayev, Manas M. Mukushev, Bernat K. Zhanabayev, Samat M. Mukanov

Department of General Practice No.2, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan

*Corresponding author: Murat K. Jakanov, Department of General Practice No.2, West Kazakhstan Marat Ospanov State Medical University, Aktobe, the Republic of Kazakhstan.
E-mail: mjakanov@mail.ru

BACKGROUND: For correction of an ischemia of the lower extremities operative methods of an indirect revascularization – tunneling of the soft tissues of the lower extremities, osteotrepanation and osteoperforation of a tibial bone and bones of foot were widely adopted, and it represents their wide application on diabetic foot syndrome.
METHODS: The main group consisted of 85 patients with neuroischemic form of diabetic foot, 41 of which were performed the combination of tunneling of the soft tissues of the lower extremities with an osteoperfration of bones of foot, and 44 – underwent the combination of tunneling of the soft tissues of the lower extremities with osteoperforation of a tibial bone. The control group comprised of 70 patients receiving traditional complex conservative treatment. After the rehabilitation of the purulent area, for 2-3 days, surgical intervention was performed. Results of treatment were estimated by means of ultrasonic doppler sonography, through skin determination of tension of oxygen in tissues $T_{av}O_2$, definitions of the index of the speed of an adhesion of wounds (SAW).
RESULTS: On admission, the disorders of blood circulation of the lower extremities and peripheral innervation against the background of the existing purulent-necrotic defeat of the feet were detected in all patients. Along with

clinical improvement which was noted in absolute majority of patients of main group since 4-5 days after operation, statistically reliable positive changes of an index of average speed of a blood-groove ($V_{average}$) was observed by 14 days after operation, whereas in main group – only by 21 days. By 21 day of the postoperative period in main group reliable increase in an index of $V_{average}$ in tibial arteries for 13.9% (16.4±0.31 cm/s, P<0.01), in an external artery of foot for 11.8% (14.5 ±0.31 cm/s, P<0.01) took place, whereas in control group the increase in an index of $V_{average}$ in tibial arteries and external artery of foot was 11.7% (13.21±0.31 cm/s, P<0.05) and 7.2% (12.1±0.54 cm/s) respectively.
By 21 day of treatment of the ankle-popliteal index (LPI) in main group increased by 26.2% (0.84 ±0.04, P<0.05), in control group only for 12.3% (0.73 ±0.05). By 21 day reliable increase in an index of $T_{av}O_2$ by 38.2% (44.6 ±1.5 mm Hg, P<0.01) in main group was observed, that wasn't noted in control group, where the received $T_{av}O_2$ values had statistically insignificant character - 36.6±2.3 mmHg.
In the main group of patients terms of clarification of wounds were 7.9±0.4 days, in control - 11.1±0.5 days. The indicator of the SAW index authentically increased in main group by 21 day of the postoperative period by 115.6% (8.1±0.4, P<0.01) in comparison with initial value whereas in control for 71.1% (4.7±0.7), at the same time decrease of the area of wounds more than twice in main group and only by 1.4 times in control is noted.
As a result of treatment, supportable foot was kept at 88.2% of patients of main group and at 78.6% of control patients. The quantity of bed days in main group was 23.7±1.3, in control group - 28.1±1.6, lethality - 4.7% and 8.6% respectively.
CONCLUSIONS: Combined indirect revascularization operations are operations of choice in the complex treatment of the neuroischemic form of the diabetic foot complicated by purulent-necrotic lesion.

Modern approaches to the red blood cell transfusion

Ardak A. Arynov[1] *, Zhanna K. Chingissova[2], Vadim V. Chursin[3]

[1]Department of Anesthesiology and Intensive Care, Kazakh Medical University of Continuing Education, Almaty, Republic of Kazakhstan; [2]Kazakh Institute of Oncology and Radiology, Almaty, Republic of Kazakhstan; [3]Department of Anesthesiology and Intensive Care, Kazakh Medical University of Continuing Education, Almaty, Republic of Kazakhstan

*Corresponding author: Ardak A. Arynov, Department of Anesthesiology and Intensive Care, Kazakh Medical University of Continuing Education, Almaty, Republic of Kazakhstan.
E-mail: ardak6183307@gmail.com

BACKGROUND: Transfusion of donor red blood cell (RBC) continues to take a significant place in the anemia correction. In the world the number of transfusions is growing up every year. However, RBC is associated with a number of complications, including increased overall mortality rate, duration of treatment, risk of AKI and other complications. The cost of RBC transfusion remains high. In this regard, clinical trials are conducted to optimize the indications of RBC transfusion. These trials are focused on decreasing hemoglobin threshold level and on restrictive transfusion strategy. In the same time, different patients have different requirements for hemoglobin level for appropriate oxygen delivery. These points of view require the search of more optimal triggers for blood transfusion. The aim of this study is to analyze the state of the problem based on a literature review (RCTs, systematic reviews, meta-analyzes, international and national guidelines) for the period 2008-2018.
METHODS: A literature review was performed for an analysis of the PubMed/Medline, Medscape databases in English from 2008-2018 inclusive. The key words in the search were: blood transfusion, threshold, triggers, oxygen delivery, oxygen extraction, red blood cells. The analysis included systematic reviews, RCTs, meta-analyzes, and original articles and expert opinions.
RESULTS: In general, randomized clinical trials on this topic compared of two transfusion strategies: liberal (LTS) and restrictive (RTS), and studied of the hemoglobin level threshold for blood transfusion. The restrictive strategy showed an improvement in clinical outcomes compared to a liberal one. A number of systematic reviews did not reveal significant differences in mortality between 2 strategies. Most of guidelines are recommended RTT with hemoglobin goal 7-8 g/dl. In some patient groups (patients with cardiovascular and cerebrovascular pathology) LTS is more preferable. The imperfection of using only the hemoglobin level to determine indications for RBC transfusion is emphasized in most articles. As additional criteria for the appointment of blood transfusion, it is proposed to use the blood lactate level, the central venous saturation and the clinical signs of anemia: dizziness, tachypnea, tachycardia and hypotension, decreased exercise tolerance. Some publications recommended to research more physiological triggers for blood transfusion. There are single publications about the possibility of using the indicator of oxygen extraction as trigger for blood transfusion.
CONCLUSIONS: The current state of health care requires further studies directed to find more objective indications for blood transfusion, as well as the optimization and personification of RBC transfusions. Hemoglobin level is not a perfect indicator for the appointment of blood transfusions from the standpoint of optimizing oxygen delivery to the tissues. Our work has shown the necessity for further investigations in this direction and the importance of clinical trials directed to detection of oxygen extraction as an indication to blood transfusions.

Studying of cardiomyocytes p53 and mast cells markers expression under prolonged effect of Lindane

Sapargali B. Rakhmanov[1] *, Yerbol Zh. Bekmukhambetov[2], Aigul B. Zhanabayeva[1], Gabit Gimranov[3]

[1]Department of Normal and Topographic Anatomy, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [2]Department of Oncology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [3]Nazarbayev Intellectual School, Aktobe, Kazakhstan

*Corresponding author: Sapargali B. Rakhmanov, Department

of Normal and Topographic Anatomy, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: s_s_sb@bk.ru

BACKGROUND: The review of relevant literature revealed that there is a great deal of work devoted to investigation of changes in ultrastructural myocardium structure. The reason is that the changes in myocardial infarction associated with cardiovascular pathologies are related to biology because they are associated with irreversible processes and are primarily due to its transformation. Taking into account the direct correlation between cardiac pathologies and the effects of external factors, it is important to study the effects of the pesticides used in agriculture on the myocardium.
Therefore, the purpose of the present study was to determine the extent of expression of apoptosis marker p53 on cardiomyocytes under prolonged effects of Lindane, chlororganic pesticide.
METHODS: For the experimental study, 30 mice were selected from the Visistan Line and divided into 2 groups: by 15 in each group, control and experimental. Lindane in ratio 100 mg/kg was being introduced for 2 months per os. After that the immunohistochemical changes on CD117 expression of mast cells and p53 in cardiomyocytes were revealed and analyzed.
RESULTS: The intensity of expression of the p53 marker during the effect of Lindane did not change significantly compared to the control group. During the effect of Lindane marked positive cells were recorded 22.0 ± 0.2% in experimental group, and 19.3 ± 0.6% in the control one. In general, appearing of cells of low intensity of expression indicates emerging of disorders in cellular tissue or in adaptation mechanisms. Indicators for CD117 expression from mast cells within the period were the following: weak positive cells were found to increase by 11% unlike the control group, and the negative cells decrease was recorded of about 15% of cells in total. Overall, the analysis of the research findings showed that the condition of CD117 expressing cells contributed to apoptosis processes in cardiomyocytes. According to references data, mast cells are multifunctional by their nature and they are involved in the local reactions. The study revealed that the activity of mast cells, which has a direct effect on the apoptosis process, is characterized by the increase in positive cells.
CONCLUSIONS: Thus, the immunohistochemical parameters identified in the myocardial relationships include the relationship between the CD117 expressing cells and apoptosis markers, and these changes are reflected as response reactions in the myocardium staying under the chronic poisoning with Lindane. The weak intensity and uneven change in the expression of p53 reflect the fact that the activity of mast cells is directly involved in cellular disorders or compensatory mechanisms.

Features of functional indicators of the heart left ventricle in conditions of ecological crisis according to ultrasonography

Aigul B. Zhanabayeva[1] *, Makhabbat M. Tuktubayeva[2], Maksat K. Mambetaliyev[3], Ruslan M. Makhatov[3], Sapargali B. Rakhmanov[1]

[1]Department of Normal and Topographical Anatomy with Operative Surgery, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [2] Department of Cardiac Surgery, Aktobe Medical Center, Aktobe, Kazakhstan; [3]The Military Institute of Air Defence Forces named after twice Hero of Soviet Union T.Y. Begeldinov, Aktobe, Kazakhstan

*Corresponding author: Aigul B. Zhanabayeva, Department of Normal and Topographical Anatomy with Operative Surgery, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: aigulzhana@mail.ru

BACKGROUND: The environment problem at present is extremely acute concerning adaptation of the growing organism in current conditions. Despite considerable progress of scientific and technical progress the ecological situation worsens from year to year having the negative reflection on a state health of adult population, children and teenagers [Philip M., 2010]. So for example the tragedy of the Aral Sea caused environmental disaster of the nature of the huge region of Central Asia and the population of this territory. Among morbidity and mortality of the children and teenagers combined forms of the respiratory system, congenital defects and changes of the cardiovascular system are significant and leading [Howard F., 2002, Isaeva R.B., 2007].
The purpose of our research was assessment of ultrasonic indicators of the heart left ventricle in children aged from 11 up to 14 years.
METHODS: Design of the research was case – control. For definition of functional indicators of the heart left ventricle children were divided into groups by age and gender: the first main group - aged from 11 up to 14 years (a boy - a girl - 40) from the Shalkar region and the second control group - aged from 11 up to 14 years (a boy - a girl - 40) from the Martuk's region. The studied children - 80 aged from 11 up to 14 years without the heart diseases noted in the anamnesis.
RESULTS: By means of ultrasonography it was revealed a number of features in the main group of boys at the age of 11-14 years - the final and systolic size of the left ventricle was 2.9±0.05см, in girls were noted increase by 0.3 cm, and in control group these indicators were brought closer to each other. Of course – the diastolic size of the left ventricle in the main group in boys and girls at the age of 11-14 years averaged 4.0±0.06 cm, and in control 3.7±0.04 cm. Despite high rates of the left ventricle in the main group in boys after comparison with girls at the age of 12 years the stroke volume was reduced by 0.4 ml, and at 13 years on 0.5 ml in comparison with control group. These indicators at the age of 11 and 14 years were within norm. Ultrasonic characteristics of the heart are changeable depending on the environment. In the comparative analysis of indicators of the experimental and control groups the specific indicators characterizing functional ability of ventricles of the heart are revealed. Functional indicators of the sizes of the left ventricle are increased in boys of the main group in comparison with girls, and there are no specific changes in the control group.
CONCLUSIONS: Thus, the data obtained confirm the role of an ecological situation of the region and accommodation on formation and development of children's organism depending on gender and age show high adaptation ability of the heart for exertion and unfavorable environmental factors.

Implementation of the projects "Seven Facets of the Great Steppe" in the University

Ubaidilla Datkhayev[1]*, Aliya Sayatova[2], Galiya Alikeyeva[3], Adilya Shakhiyeva[4], Kairat Zhakipbekov[5]

[1]Rectorate of the National Medical University (NMU), Almaty, Kazakhstan; [2]Museum NMU, Almaty, Kazakhstan; [3]Department of General Hygiene, NMU, Almaty, Kazakhstan; [4]Department of Public Health and healthcare, NMU, Almaty, Kazakhstan; [5]Department of Pharmacy organization, Management and Economics of Pharmacy NMU, Almaty, Kazakhstan

*Corresponding author: Ubaidilla Datkhayev, Rectorate of the Kazakh National Medical University, Almaty, Kazakhstan. E-mail: u.datkhayev@kaznmu.kz

BACKGROUND: Today the Kazakh National Medical University received the right to independently determine the structure of the university and prepare the educational programs, ready for integration into the general educational space.
This causes a huge responsibility to the country and the world community. Training requirements of specialists clearly defined in N.A.Nazarbayevs program "Ruhani zhangyru" is the competitiveness of young university graduates, the preservation of national identity, the cult of knowledge.
In N.A.Nazarbayevs work – "Seven Facets of the Great Steppe" he set out six fundamental projects in front of the scientific community, including "Archive-25" and "The Great Names of the Great Steppe".
President N.Nazarbayev emphasized the special relevance and importance of involving museums at educational institutions, recognizing their role as to "create the ethnic history learning movement and involve young people to national history, creating sense of unity of their origins among all Kazakhstan people".
METHODS: To realize the work with archival documents on all systems of scientific and technical documentation selected. Most important principles for the selection of documents: unbiased approach, objectivity, historicism and reliability.
RESULTS: The project "Seven Facets of the Great Steppe" put before the Museum of History of NMU the need to consider in a new way not only the issues of professional education of future doctors, but also the formation of personality. The specifics and methods of the university's museum work connected with two tasks: improving students' knowledge and educating young people about social activity is performed.
In the exposition halls of the Museum presented great encyclopedic scholars of the Middle Ages. These were bright people, very talented in many sciences. One of them was Kipchak-Al-Farabi – who named Second Aristotle and the Teacher of the East. His books translated into many world languages. Back in the 9 th century Al-Farabi was the first, who wrote in his books about the essential need for social well-being of people by the definition of the World Health Organization, today it is included in the concept of total human health.
Historians refer to the names of ancient healers, such as Oteiboydak Tleukabyulu. He was Kazakh folk healer in 15 th century, wrote the book "Confession of a Healer". Oteibadak Tleukabululy didn't know any European languages, this allows assuming that his knowledge, set out in his book, based exclusively on the practices of the nomads.
A big amount of work on selection of historic documents about medicine in Kazakhstan of the 19 th century, followed by research and analyses. Unique archive documents: dates of settlement of the first hospitals for civilian population, the sanitary consequences of the civil war, morbidity and mortality rates among population in the 1920s are studied.
CONCLUSIONS: The results of studies published in journals and used as basic information for teaching aids. Materials included in the lecturing programs and practical classes at the departments of NMU and available for other universities.
The scientific and educational work of the NMU Museum highly appreciated in a review, organized by N.Nazarbayev Foundation - according to the results of the review, the NMU Museum of History won the first place and awarded the Certificate of Honor and the Cup.

Changes in phagocytosis of experimental animals with periodontitis due to modified reactivity

Oleksandr V. Avdeev*, Roksana O. Drevnitska, Alina B. Boykiv, Bogdan O. Avdeev

Department of Pediatric Dentistry, State Higher Education Establishment "I. Horbachevsky Ternopil State Medical University", Ternopil, Ukraine

*Corresponding author: Oleksandr V. Avdeev, Head of Department of Pediatric Dentistry, State Higher Education Establishment "I. Horbachevsky Ternopil State Medical University", Ternopil, Ukraine. E-mail: avalexandr@yahoo.com

BACKGROUND: Taking into account the patho-immune mechanisms of formation of inflammatory process in periodontium, there is a necessity for in-depth study of the pathogenesis of periodontal diseases from the position of changes in the reactivity of the organism.
The Aim. Carrying out a comparative estimation of phagocytic activity of leukocytes of animals with inflammation in periodontium with altered reactivity.
METHODS: Experiments were conducted on 30 white non-linear male rats weighing 180-200 g, 5-6 months old, which were divided into three groups: Group I - 10 white rats with hypoergic reaction; Group II - 10 white rats with hyperergic reaction; The third group - 10 white rats with normergic reaction - control group, which received 1 ml of saline solution intramuscularly. The modeling of the hypoergic reaction was carried out by intramuscular administration of the alkylating cytostatic cyclophosphamide (JSC "Kyivmedpreparat", Ukraine) within 7 days daily at the rate of 10 mg/kg. The simulation of the hyperergic reaction was carried out by intramuscular administration of a immunostimulant of polysaccharide nature - pyrogenal (NIIEM named after M. F. Gamaleya RAMS, Russia) within 7 days daily at the rate of 10 mg/kg per animal in saline solution. Slaughter and blood sampling under thiopental anesthesia was performed 7 days after the beginning of the experiment.
Determination of phagocytic activity of leukocytes is based on the ability of polymorphonuclear leukocytes and monocytes of peripheral blood to adsorb on its surface, absorb and digest microbial test culture. The following parameters were determined: the percentage of phagocytic

leukocytes - the phagocytic index - the number of leukocytes from the hundred that showed phagocytic activity, the phagocytic number - the number of microbes absorbed by an average of one leukocyte and the index of phagocytic activity was calculated [7]. Quantitative indicators were processed by the method of variational statistics.
RESULTS: The phagocytic index (Fi,%) decreased by 2,09 times (P<0,05) at hypoergia, it increased by 1,37 times (P<0,05) at hyperergia; the index of phagocytic activity (IFA) decreased by 1.96 times at hypoergia (P<0.05); growth was 1.94 times (P<0.05) in the hyperergic group of animals. In both experimental groups, the phagocyte number (Fu) increased by 6.25% and 41.7%, with hypoergia and hyperergia, respectively.
Discussion. Thus, discussing the results of the research, due to the indicator of phagocytic activity of leukocytes, our assumption that it changes with the change in the reactivity of the organism, was confirmed. In addition, studies on the development of periodontitis with changes in body reactivity are original. We have independently developed experimental models of periodontitis, the pathogenesis of this disease can be studied, preclinical trials of new drugs and treatments can be conducted on their basis.
CONCLUSIONS: Different directions of changes of the phagocytic index and index of phagocytic activity were observed: increase of these parameters at hyperergia and decrease at hypoergia. An increase in phagocyte number was likely to indicate some autonomy of the process of phagocytosis and independence from the reactivity of the organism. The obtained results indicate the presence of various mechanisms of development of the inflammatory process in the periodontium.

Influence of the Aral sea crisis zone factors on the gingival fluid cytogram of teenagers with chronic catarrhal gingivitis

Rudolf Yuy Tsun-Shu[1] *, Zhanna I. Rysbayeva[2], Maral Zh. Yergazina[1]

[1]Subdepartment of Histology, "National Medical University", Almaty, Kazakhstan; [2]Subdepartment of children's stomatology, "National MedicalUniversity", Almaty, Kazakhstan

*Corresponding author: Rudolf Yuy Tsun-Shu, Subdepartment of Histology, "National Medical University", Almaty, Kazakhstan
E-mail: uyzunshu.r@kaznmu.kz

BACKGROUND: In our research we tried to estimate the cytological changes of periodontium in teenagers living in the zone of the Aral sea suffering from chronic catarrhal gingivitis.
METHODS: Three groups of teenagers we reinvestigated. Control group (healthy teenagers) made up thirty-one teenagers (city of Talgar), group of comparison (chronic catarrhal gingivitis) – thirty-five teenagers (city of Talgar), and the main group (chronic catarrhal gingivitis) – forty teenagers (the Aral sea zone). Smears of the gingival fluid we refixed in the mixture of alcohol and acetone (1:1) during five minutes, then they were stained with May-Grünwald and Romanovsky's dyes. In accordance with the calculation we computed a row of indexes: index of cell differentiation(DI),index of left displacement(LDI),index of multicellular epithelial complexes(MECI),index of destruction of epithelial cells(DisI),and inflammation-destruction index(I-DisI).
RESULTS: The results of cytological investigation of the gingival fluid obtained from teenagers with chronic catarrhal gingivitis both in the main group and in the group of comparison showed the presence of segmented neutrophils which were partially collapsed, and of active vacuolated neutrophils. The number of neutrophils in the gingival fluid cytogram of the main group of teenagers was higher than that of the group of comparison and of the group of healthy children. The smears of the gingival fluid of the main group of teenagers contained monocytes devoid of cytoplasm and intact monocytes. But in the group of comparison the intact monocytes prevailed. The gingival fluid smears of the most teenagers of the main group contained erythrocytes. Erythrocytes were not found in the smears of teenagers of the group of comparison and of the control group. Gingival fluid smears of the three investigated groups contained epithelial cells a tall stages of differentiation. In the teenagers of the main group the chronic catarrhal gingivitis was accompanied by considerable quantitative increase of basal, parabasal, and intermediate cells of the first type, and quantitative decrease of intermediate epithelial cells of the second type, superficial epithelial cells containing pyknotic nuclei, and anucleate epithelial cells; such quantitative decrease took place in the teenagers of the group of comparison as well. Basal, parabasal, and intermediate epithelial cells of the first type were more numerous in the main group of teenagers than in the teenagers of the group of comparison and control group. The smears of the main group and the group of comparison contained fibroblast-like cells. Epithelial cells contaminated by diplococci were also found. Gingival fluid smears of the main group of teenagers and of the group of comparison contained dystrophic epithelial cells (hydropic degeneration). In some epithelial cells one could find invasion of neutrophils and monocytes. Dystrophic epithelial cells and epithelial cells characterized by invasion of neutrophils and monocytes were more numerous in the main group of teenagers than in the group of comparison. Occasionally one could find clusters of cocci and rod-shaped bacteria.
CONCLUSIONS: Chronic catarrhal gingivitis in the investigated teenagers living in the Aral sea crisis zone was characterized by more considerable damage of the period on tiumas compared with the group of comparison due to the considerable sensitivity of children to the influence of noxious agents of the environment. Those noxious gents included high content of salts of sulfates and chlorides, heavy metals, and pesticides in the environment and food.

To the Question of the Prevalence of Oral Mucosal Lesions in Central Kazakhstan

Bagdad K. Nurmukhambetova[1] *, Zhanar G. Tankibayeva[1], Saule B. Akhmetova[2], Marat G. Tusbayev[1], Zauresh Y. Issina[1], Togzhan B. Sagimbayeva[1], Ainur Y. Yermukhanova[2]

[1]Department of Dentistry, Karaganda Medical University, Karaganda, Republic of Kazakhstan; [2]Department of Clinical Immunology, Allergology and Microbiology Karaganda Medical University, Karaganda, Republic of Kazakhstan

*Corresponding author: Bagdad K. Nurmukhambetova, Department of Dentistry, Karaganda Medical University, Karaganda, Republic of Kazakhstan. E-mail: nurmuhambetova@kgmu.kz

BACKGROUND: The sharply continental climate with frequent barometric pressure drops, peculiarities of wind conditions, lack of humidity, and differences in daily temperature in off-season time have a significant impact on the health of the population in Central Kazakhstan. It is also necessary to take into account the fact that the region is an area of concentration of large industrial enterprises. Due to the peculiarities of etiology and pathogenesis, a tendency towards relapse, the possibility of malignancy, chronic Oral Mucosal Lesions (OMLs) take a special place in the structure of dental incidents. Characterized by a long recurrent course and presented with severe clinical symptoms, they can provoke an exacerbation of systemic diseases and lead to an obvious decrease in the quality of life. The aim of the research was to study the frequency and structure of OMLs according to the specialized medical advisory admission of the dental clinic of the Karaganda Medical University.
METHODS: A retrospective analysis of 716 outpatient records of patients with OMLs applied for admission between September 2015 and September 2018 was conducted. The unit of observation in the study of the prevalence (total incidence by appealability) was the primary admission of the patient in the current calendar year about the disease. Clinical data were collected using a modified form of the WHO, where the basis for the diagnosis was established in accordance with the criteria given in the guidelines on epidemiology to diagnose OMLs (WHO). Indicators characterizing the prevalence of OMLs in different age groups were calculated. Statistical tests such as Pearson Chi-square were exercised to test the significance, using SPSS V.19.0 with 0.05 as cutoff level of significance.
RESULTS: The number of observations from September 2015 to September 2016 was 308, from October 2016 to September 2017-198, and from October 2017 to September 2018-210 people.
Most of the patients were women (550 people, 76.8%), most of which were women between 60 and 74 years old. The average age of the patients was 55 years. The least frequent, patients aged 18 to 24 years old applied for the specialty care.
The most common pathology manifested in the oral mucosa were oral lichen planus that is 28.8%(95%CI: 24.33-33.67); candidiasis is 23.7%(95%CI: 19.36-28.41); recurrent aphthous stomatitis is 8,9%(95%CI: 6,4-12,35), leukoplakia is 7.5% (95%CI:5.23-10.75), geographic tongue is 7.3%(95%CI: 5.0-10.43), herpetic gingivostomatitis is 5%(95%CI: 3.21-7.81). The following diseases were also diagnosed: pemphigus is 2.2%(95%CI:1.38-3.59), erythema multiforme is 0.3% (95%CI: 0.05-1.57).
CONCLUSIONS: High prevalence of chronic OMLs in the adult population of Central Kazakhstan was revealed. Depending on the age, the structure of OMLs was quite variable; a certain dependence on gender and age signs was traced.
The high prevalence of chronic OMLs, their clinical diversity, severe pain symptoms, frequent relapses dictate the need for a more thorough study of the causes and risk factors for the occurrence of these diseases.
It should be noted that the clinical picture of chronic OMLs at the present stage changes its connotation: severing of the course (a high proportion of erosive-ulcerative lesions, frequent recurrence, and complicated course) is noted, in which both climate and geographic factors and the environmental features of the region may play the certain role.

Innovative directions in the training of specialists in the field of mental health

Marina Yu. Lyubchenko*, Marina Yu. Antonovich, Tatiana A. Stupina

Department of Neurology, Psychiatry and Rehabilitology, Non-Profit Joint Stock Company Karaganda Medical University, Karaganda, Kazakhstan

*Corresponding author: Marina Yu. Lyubchenko, Department of Neurology, Psychiatry and Rehabilitology, Non-Profit Joint Stock Company Karaganda Medical University, Karaganda, Kazakhstan. E-mail: Lmari05@mail.ru

BACKGROUND: The training of psychiatrists, narcologists and psychotherapists at the present stage cannot be carried out within the narrow framework of biological medicine. For understanding the multifactorial nature of the causes affecting the occurrence of mental disorders, since 2014 our department introduced the elective discipline “Basics of systemic family psychotherapy” for interns specialty “General medical practice” and “Therapy”. The priority tasks of training were the mastering by interns of the basic concepts of an integrative model of a systemic family psychotherapeutic diagnosis, the skills of perceiving intra-family interactions, conducting therapeutic interviews with a family; the formation of systems thinking with the ability to recognize the communicative and metaphorical meaning of the symptom. Training includes theoretical training (lectures, discussions), using active teaching methods: problem lectures, clinical cases, brainstorming, work in small groups, trainings, work with simulative families. Practicing practical skills is carried out through the modeling of therapeutic skills. An important direction in learning is the study of personal history, which is carried out through the independent work of students in the construction and analysis of their own genograms.
METHODS: to determine the effectiveness of training in this area of clinical medicine, we developed a questionnaire for interns. This questionnaire reflected the general satisfaction with the knowledge gained and the possibility of their application in the practice of the doctor.
RESULTS: according to the questionnaire data, the study of this discipline allowed developing an individual approach to patients, eliminating patterned approaches to diagnostics, formulating systemic hypotheses, highlighting the essential characteristics of symptoms, the connections between its components, causes. Also, systemic thinking allowed us to see and evaluate the diagnostic and treatment problem in all its aspects: biological, psychological, social and existential. These skills contributed to the formation of a critical-reflexive style of thinking, which

implies the dynamism of the personality, a departure from the dichotomous model of thinking. Using of a systematic approach has expanded the ability to recognize symptomatic behavior, determine the meaning of a symptom as a communicative message or part of a circular sequence, opens up new possibilities for effective therapy.
CONCLUSIONS: integrative systems approach allows us to understand the vital, formative disease and life, the meaning of pathology. This approach opens up new opportunities for professionals working in the field of mental health to solve problems related to clinical reality.

Current trends in diagnostics and treatment of diseases of peripheral lower limb arteries

Zhakubayev M.A.[1, 2] *, Matkerimov A.Zh.[1], Egemberdiyev T.Zh.[2], Demeuov T.N.[1], Khanchi Miad[1], Tergeusizov A.S.[1], Baubekov A.A.[1, 2], Shamshiyev A.S.[1], Tadjibayev T.K.[1], Saduakas A.E.[1, 2], Makkamov R.O.[1, 2]

[1]Department of the vascular surgery, National scientific center for surgery named after Syzganov A.N., Almaty, Kazakhstan; [2]Department of the cardio-vascular surgery, National medical university, Almaty, Kazakhstan

*Corresponding author: Zhakubayev M.A.
E-mail: mjakubayev@gmail.com

BACKGROUND: A social-significant disease of peripheral arteries, more known as obliterating atherosclerosis of the lower limb arteries, along with elderlies, occurs also in working-age adults. In this regard, it makes sense to develop and implement the current methods of diagnostics and treatment of diseases of peripheral arteries. Most patients with lower limb ischemia suffer from diabetes mellitus that aggravates the atherosclerotic process of the arteries and requires more distal revascularization of the arteries, up to the dorsalis pedis artery, distal part of the posterior tibial artery and plantar artery. Earlier, the patients with affected infrapopliteal arteries were considered not suited for reconstructive surgeries and received only drug and palliative therapies or major amputations. According to the international practice, a multidisciplinary approach is required for the treatment these patients with concurrent diabetes mellitus. To date, endovascular methods or distal bypass are the surgeries of choice throughout the world. As per the TASC II classification, revascularization of occluded/stenosed arteries is an optimal decision for the patients with lesions of the lower limb arteries. But disputes over the methods of revascularization have been still continuing. The general objective of this study was to assess the dynamics of development in the medical assistance rendered to the patients with affected lower limbs arteries.
METHODS: As a material for this study we used case records of 1047 patients with lesions of the lower limb arteries, who were treated at A.N. Syzganov National Scientific Center of Surgery, Department of Vascular surgery, in 2008-2018. Patients with arteritis associated with systemic diseases and patients on a drug therapy were excluded. We chose information analysis and statistical analysis as a method of this study. Patients, who were on inpatient treatment within aforementioned period, underwent standard laboratory tests. Both ultrasound duplex scanning of the lower limb arteries and puncture angiographic study were carried out to verify and clarify the level of lesions. Subsequently, with technological advances we began using multispiral computed tomography with arterial bed contrast enhancement.
RESULTS: According to the obtained records, lesions of the lower limbs prevailed mainly in males. Mean age of the patients was 63 years. Introduction of new technologies and methods of surgeries (interventions and bypass surgeries on the lower leg and pedal arteries) and development of vascular surgery in Kazakhstan resulted in decrease in the number of certain palliative surgeries, right up to the complete cessation of some of them. Number of major amputations of lower limbs was decreased by 35.4% (from 31 to 11). Lumbar sympathectomy was decreased by 20.6% (from 29 to 6). Along with the decrease in the number of certain palliative interventions we noted an increase in the number of direct revascularizing surgeries.
CONCLUSIONS: Having analyzed the case records and reviewed available literature on the diagnostics and treatment of the peripheral artery diseases, we concluded the following:
Due to high prevalence of diabetes mellitus in the patients with lower limb disease, it is useful to perform tests for glycated hemoglobin, since there is data on association of glycated hemoglobin with the outcome of revascularization of the artery bed. Because atherosclerosis has multifocal pattern that affects other vascular pools, it is practical to perform non-invasive studies to assess them with the following development of optimal treatment strategy.

Findings of the survey among the University faculty members on satisfaction with the educational process

Gulnara A.Temirova*, Abdiraman R. Kaliev, Kulanda K. Ermenova, Janat E. Komekba

West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Gulnara Temirova, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: gulnara_acnara@mail.ru

BACKGROUND: Educational monitoring is a systematic process including observation, analysis and rating indicators of the university activities. Survey as a method attracts with its organizational simplicity, efficiency and cost effectiveness. Periodic staff surveys allow for timely identifying positive and negative trends in employee satisfaction with various aspects of the university activities. The purpose of the teaching staff questioning is timely perfecting the educational program (EP) determining the educational process at the university.
METHODS: The survey based on specially developed Questionnaire was carried out by the methodological Department distantly through the automated information system "Sirius" within June 09-17, 2017. The report on survey was approved by the Department meeting (Protocol No. 11 June 29, 2017). The total number of the question-

naire items was 10. Before the questionnaire lauching validation process was performed through the Cronbach's α calculation (0.67) and testing in focus-group. Statistical processing was carried out using Statistica.v.10 (USA, Dell Inc.) software.
RESULTS: Total response rate reached 62.9%. The survey results sufficiently reflected general situation across the university on definite issues. Overwhelming majority of the teaching staff (96%) recorded that the University's authority payed due attention to the content of EP by specialities, as well as to their updating (94%). 325 faculty members were satisfied with the content of EP (91.2%). The teaching staff noted that the quality of education depended primarily on the teacher's professional knowledge (46.9%) and their command of innovation teaching methods (53.1%), in total 76.5% of the responses. On "How effective is the improvement of pedagogical skills at the university?" more than a half of teachers marked "good" (182-51.1%), "satisfactory" 93 (26.1%), and "very good" 64 (18%). The monitoring question "Your level for preparing and teaching a course in English" resulted in the following: language proficiency in 145 teachers (40.7%) turned to be low and very low, in 50 (14%) quite sufficient, and rather high in 12 (3.4%) , respectively. Good level of stimulation and attraction young specialists to the educational process was noted by 276 teachers (77.6%). To the question on how the Curricula facilitate forming ability to analyze situations and predicting skills in students , most of the teaching staff answered positively (313, 87.9%), of them: good - (278, 78.1%), very good - (35, 9.8%). In general, the faculty members the job satisfaction assessed rather high: 91.3% (325) were satisfied with the EP content. Among the issues of the educational process that required urgent solution, insufficient providing with modern technical means recorded 165 faculty members (46.3%), difficulties with identifying a problem was recorded in 100 responses (28.1%), and some drawbacks in time-table fixed in 39 responses (11%).
CONCLUSIONS: According to the survey results, overall, the EP quality equally reflects both possessing and use of innovation teaching methods. Most of respondents noted that the University's authorities, taking into account the nowaday requirements to train a qualified specialist, maintain satisfactory conditions for qualitative implementation of EP.

Five-year survival in young patients diagnosed with gastric cancer comparing to the older groups in the Aktobe province of western Kazakhstan within 2013-2017

Anar B. Tulyaeva*, Yerbolat M. Iztleuov, Saule K. Balmagambetova, Arip K. Koyshybaev, Saganaj T. Djussembekov, Marzhan A. Aitmagambetova

Department of Oncology and Visual Diagnostics, Medical Center of the West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Anar B. Tulyaeva, Department of Oncology and Visual Diagnostics, Medical Center of the West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: dekart_85@mail.ru.

BACKGROUND: Gastric cancer is the third most common cancer worldwide, referred to as one of the deadliest types, accounting for 782,685 deaths worldwide in 2018. Although the global incidence of Gastric cancer and mortality rates in high-income countries are prone to decline, situation in low- and middle-income countries, including Kazakhstan, tends to increase in incidence, especially in young age group. In Kazakhstan, Gastric cancer ranks 3rd in incidence with 15.7 per 100,000 of population of both sexes standardised by age, and 3rd in mortality with 13.4 per every 100,000. Gastric cancer is characterized by a multifactorial etiology of occurrence, thus contributing to the covert course and high mortality rate. As often occurring fact, patients seek medical aid in the advanced stages of the disease, which affects a very low 5-year survival rate (<30%). However, controversial results regarding the survival in young patients are presented in world scientific periodicals.
The present study was aimed to outline the 5-year survival in young patients registered with the diagnosis Gastric cancer in the Aktobe province of western Kazakhstan within 2013-2017, comparing to the older groups.
METHODS: This observational study involved data obtained from the Cancer registry of the Medical center where the oncological aid throughout the province is implemented. The number of population for analysis was obtained from the Aktobe Committee on Statistics as of 01.01.2018. Data presentation: the age of diagnosis was calculated from the day of birth to the time of diagnosis. The stages of Gastric cancer were based on the TNM classification of the American Joint Committee (AJCC), 7th edition, 2009. Inclusion criteria were the following: 1) verified diagnosis of gastric carcinoma; 2) the date of record in the Registry in the period from January 2014 to December 2017. Exclusion criteria: 1) morphologically established diagnosis of Gastric cancer before 2014 or after 2017; 2) Post-mortem patients with Gastric cancer (identified at autopsy). Differences were assessed through the Pearson's $\chi 2$ test, Kaplan-Meier analysis, Log rank test and Cox regression. The overall survival (OS) was defined from the date of intervention to the date of death or the latest follow-up.
RESULTS: Hospital registries for 748 Gastric cancer patients were analysed. Patients were placed into the following groups: young age (YA: ≤39 years; N=23), older adult (OA: from 40 to 69 years; N=456) and elderly (E: ≥70 years; N=307). The majority of YA patients were diagnosed with the advanced disease (clinical stages II/III: 47.8%); locally advanced stages were observed in 53.2% of the OA group and 52.7% of the E group. The fifth year median OS in YA category was 11.6 months (95% CI 2.32;25.51), and the overall survival rate was not significantly different through the age groups (P=0.888). Metastatic disease at diagnosis (HR=5.402; P<0.01) was associated with an increased hazard of death for YA group.
CONCLUSIONS: Thus, the lowest rate of overall 5-year survival was traced in the YA group of patients with Gastric cancer (≤39 years). The main reason was diagnosis at advanced stages of the disease due to late appealability for medical aid.

Structural - functional organization of the thymus gland during the prenatal period of ontogenesis

Turakbay Umbetov, Gulnara Sultanova, Zhanat Komekbay, Akzhenis Berdalinova*, Sara Makhambetova

West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Akzhenis Berdalinova, West Kazakhstan Marat Ospanov State University, Aktobe, Kazakhstan.
E-mail: berdalinova77@mail.ru

BACKGROUND: The thymus gland plays a key role in the homeostasis of the body and helps maintain balance between the mother and the fetus during pregnancy and the birth of a healthy and viable child. Hence, the thymus gland of the fetus is the criterion of the adaptation constant for the "mother – placenta – fetus" system.
The aim of the work is to study the dynamics of structural and functional changes in the thymus gland in the early and late prenatal period of development.
METHODS: The research material was the thymus gland of the 7th embryo after medical abortion and the 22 stillborn fetuses that developed in the physiological conditions of pregnancy and died as a result of birth trauma. The morphology of the thymus gland was studied in the early (7-12 weeks) and late (28-40 weeks) prenatal development. We studied the body weight of the fruit, the weight coefficient of the thymus. After histological posting and staining of histological sections with hematoxylin-eosin and Azur II - eosin, a microanatomical organization was studied - the cortical-cerebral index, the number and size of Gassal bodies and the percentage of cells in the cortex and medulla of the thymus gland were determined.
RESULTS: On the 7th week of embryogenesis, the thymus gland mass increased, mainly due to epithelial cells of the subcapsular zone. At week 8-9, epithelial proliferation occurred and lymphocytes were found in the epithelial network. In the period of 8–9 weeks, an increase in the size of the organ occurred not only by splitting the initial epithelial strand, but mainly by the growth of the epithelium in the surrounding mesenchyme. At week 10 of embryonic development, the thymus gland splits into lobes. By the 12th week of embryonic development, as a result of splitting of the primary epithelial processes in the thymus, the lobules with all their characteristic components — the cortex and medulla and small thymus bodies, were clearly identified. After 12 weeks, the thymus gland mass increases faster. In the later periods of gestation (28-40 weeks), an increase in the mass of the fetus of 37-40 weeks compared with the period of 28-36 weeks of pregnancy by 60%, as well as an increase in the weight of the thymus gland by 40% was found. There was a decrease in the thymus weighting factor by 37–40 weeks compared with a period of 28–36 weeks by 15%. If the cortical-cerebral index in terms of 28-36 weeks was 0.69 units, then in terms of 37-40 weeks it was 1.3.
CONCLUSIONS: The rapid increase in organ mass after 12 weeks is explained by the presence of two growth zones in the gland: the first is on the periphery from the subcapsular zone, the second is inside the organ (reticuloepithelial stroma). In the late lines of gestation, there was a decrease in the weight coefficient of the thymus in terms of 37-40 weeks compared with the periods of 28-36 weeks of pregnancy, which indicates the beginning of the completion of the development of the gland as an organ. An increase in the size of thymic bodies indicates an increase in adaptive voltage.

Cellular composition of regional lymph nodes of the liver during chronic intoxication of the body with sodium tetraborate

Turakbay Umbetov[1], Akzhenis Berdalinova[1] *, Indira Sermagambetova[1], Karina Umbetova[2]

[1]Department of Histology, West Kazakhstan Marat Ospanov State University, Aktobe, Kazakhstan. [2]I-st Moscow Sechenov State Medical University, Moscow, Russia

*Corresponding author: Akzhenis Berdalinova, Department of Histology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: sermagambetovaindira@mail.ru

BACKGROUND: The liver which is functionally located at the border of absorption and systemic circulation of substances, is responsible not only for their metabolism and elimination, but is also the main object of toxic effects. Under these conditions, its regional lymph nodes that realize the function of trapping and blocking foreign antigens are of particular importance.
The research was aimed to study the cellular composition of the functional areas of the regional lymph nodes of the liver during chronic effects of sodium tetraborate on the body.
METHODS: The regional lymph nodes of the liver of 30 white outbred male rats were studied. For 2 months to experimental animals sodium tetraborate was administered intraperitoneally at a dose of 150 mg / kg (1/30 LD50) in 1-2 ml of physiological solution. After histological posting, semi-thin sections (2-4 μm) were stained with toluidine blue, and the cellular elements of functional areas (cortical plateau, paracortical zone, lymphoid nodules without reproduction centers, lymphoid nodules with reproduction centers, pulpy cords, brain sinuses) were counted.
RESULTS: At chronic intoxication of the body with sodium tetraborate in the cortical plate, the number of small lymphocytes decreased 1.7 times compared to the control. A significant amount of plasmablasts, immature plasma cells, and mature plasma cells were detected, but were absent in the control. The number of reticular cells increased almost 1.7 times, and the number of macrophages increased 2.1 times. The number of neutrophils increased by 3.2 times compared to the control. The experiment showed a decrease in small lymphocytes by 1.3 times in the paracortical zone. The number of medium lymphocytes increased 1.5 times and immunoblasts 1.2 times. The number of reticular cells increased by 2.18 times, neutrophils showed an increase by 7.67 times, and macrophages increased 5.2 times, while the number of monocytes decreased. During the experiment, in lymphoid nodules without reproduction centers the number of small lymphocytes decreased by 1.5, with an increase in the number of immunoblasts by 4.2 times and plasmablasts by 3.2 times. Immature and mature plasma cells were detected in a significant amount. The number of retricular cells increased 1.5 times, the number of macrophages increased 5.0 times, besides, the neutrophils were detected in insignificant amount. In the lymphoid nodules with the center of reproduction a sharp decrease (4.1 times)

in the number of small lymphocytes was noted, while the number of immunoblasts increased 1.6 times, with a sharp (8.5 times) increase in plasmablasts. With a slight decrease in the number of reticular cells (1.15 times), the number of macrophages increased 3.3 times along with the increased number of neutrophils. The number of small lymphocytes decreased 1.6 times and 1.65 times both in the pulpy cords and in the cerebral sinuses. The same decrease in the number was observed in the average lymphocytes as 1.9 times and 2.5 times respectively, with a significant increase in the number of reticular cells.
CONCLUSIONS: In response to the sodium tetraborate effect, in the parenchyma of the lymph node proliferation and differentiation of lymphocytes (medium lymphocytes, immunoblasts, plasmablasts, plasma cells) increases, eventually resulting in the growth of the reticulocytes, macrophages and neutrophils number as one of the adaptation mechanisms.

Integration of treatment innovative methods in the Republic of Kazakhstan: photodynamic therapy

Rakhimzhanova R.I.[1], Shanazarov N.A.[1, 2], Turzhanova D.E.[1] *, Tashpulatov T.B[1]

[1]JSC Astana Medical University, Astana, Republic of Kazakhstan; [2]Medical Center Hospital of President's affairs administration of the Republic of Kazakhstan, Astana, Republic of Kazakhstan

*Corresponding author: Turzhanova D.E., JSC Astana Medical University, Astana, Republic of Kazakhstan.
E-mail: dinara.turzhanov@mail.ru

BACKGROUND: The steady growth of malignant tumors is one of the global problems in modern medicine. This problem is also very relevant for the Republic of Kazakhstan, where mortality from cancer is on the second place among the causes of the populationdeath– every year it causes the death of about 15 000 people. At the same time, despite the takenmeasures, the incidence of malignant neoplasms (MN) decreases very slowly. Thus, in 2017 year, the incidence of MN (without skin cancer) formed 178.1 per 100 thousand of population, which is only on 1.3% less than in 2016 year. As a result, country faced with epidemiological crisis caused by the increase of malignant neoplasms incidence and mortality in conjunction with the ever-increasing number of patients living with cancer.
In this regard, the problem of patients with MN treatment is becoming particularly urgent. Despite the fact that the main method of treatment for most of them is surgical (often in combination with chemotherapy or radiation therapy), there is a category of patients with inoperable forms of the disease, as well as persons whose somatic status makes surgery impossible.
One of the topical directions of modern Oncology is the use of photodynamic therapy (PDT), which is currently considered one of the effective methods of malignant tumors treatment. In 2015year, a clinical Protocol "Photodynamic therapy of malignant tumors of external localization and abdominal organs" was developed and approved in Kazakhstan. In accordance with this Protocol, in 2016 year PDT was officially introduced into the activities of the Hospital of the Medical center of Republic Kazakhstan President office.
The aim of the study is to evaluate the effectiveness of PDT in the treatment of patients with malignant tumors.
METHODS: Photosensitizer of 2nd generation on the basis of chlorin E6, Fotolon was usedin this study.
The source of light radiation was the Lakhta-Milon device with a wavelength of 662 nm. PDT was carried out locally by laser irradiation -148 (47%) sessions; in combination with intravenous laser irradiation of blood - 156 (50%) sessions; with the local application of "Rada Gel" of 0.5% -6 (2%) sessions; intraoperative photodynamic therapy for ovarian cancer-2 (1%) sessions. The mean age of patients was 57±25 years.
RESULTS: In the period from 2016 year to 2018 year there were 312 PDT sessionsin the Hospital, including 48 (15,38%) for cancer of the skin, 17 (5,44%) in patients with MN of the digestive system, 5 (1,60%) forMN of the female genital organs, 24 (17,31%) about breast cancer, 1 (0,32%) in a patient with MN respiratory system, 3 (0,96%) for tumors of the brain.
During the study period, complications associated with the introduction of photosensitizer, toxic and allergic reactions were not recorded. In 100.0% of cases, good tolerability of treatment was noted. After the introduction of the photosensitizer throughout the exposure period, the condition of 100.0% of patients remained satisfactory.
Dynamic observation of patients allowed to establish that all patients (100,0%) had clinical efficacy of PDT – in 62,6% of cases in the form of complete tumor regression, and in 37,4% - in the form of partial regression. Relapse-free one-year survival was 100.0%.
CONCLUSIONS: Thus, photodynamic therapy is an effective and safe method of malignant tumors of different localization treatment.

Prevalence of different human Papillomavirus types in women diagnosed with breast cancer

Farida K. Balmaganbetova[1] *, Roza E. Nurgaliyeva[1], Ayman T. Kaldybayeva[1], Azhar N. Zheksenova[2], Ainur Amanzholkyzy[1]

[1]Department of Normal Physiology, [2]Department of Pathological Physiology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Farida K. Balmaganbetova, Department of Normal Physiology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: 10farik@bk.ru

BACKGROUND: The prevention and treatment of oncological diseases is undoubtedly of paramount medical and social importance. To our knowledge, the development of neoplastic processes of the reproductive system is often accompanied by viral infections. To date, more than 100 types of human papillomavirus (HPV) of low and high oncogenic risk are differentiated by molecular-genetic methods, and HPV genotypes 16, 18, 45 are attributed to factors of the most high carcinogenic activity in cervical cancer. Regrettably, methods to reveal the presence of HPV still are not implemented in the organized screening system in Kazakhstan. In addition, HPV infection is not included in the list of infections that are subject to mandatory state registration and accounting in the country. However, the studies on the presence of HPV within oncological diseases are highly relevant and appropriate

in terms of socio-economic, behavioral, medical, hygienic and genetic aspects.
The study is aimed to reveal the HPV types presence and distribution in women diagnosed with Breast Cancer (BC) at the age of 37-65 years.
METHODS: The study was designed as cross-sectional, performed during one visit. All women diagnosed with BC were subjected to taking a swab from the cervix. Presence of HPV DNA was detected by Real time PCR method, and type titers were ranked according to the degree of risk of neoplastic processes: a titer of more than 105 copies of HPV DNA up to 106–108 cells in the sample corresponded to an increased risk of severe dysplasia; more than 103 copies of HPV DNA to 105 cells corresponded to a high risk of dysplasia, and less than 103 copies to 105 cells – to a minimal risk, respectively.
RESULTS: According to preliminar results of this study, in 44% of the BC patients up to 18 different HPV types were detected in different titers. In 11.4% of the examined women, types 45; 56; 73; 53 were associated with an increased risk of severe dysplasia. In 2.5% of women, 6 HPV types were detected simultaneously – 16, 33, 35, 45, 66 and 53, of which 53, 33 and 66 were associated with a clinically significant concentration of the virus and a high risk of dysplasia. In a similar percentage of cases, 5 HPV genotypes were also identified at the same time – 39, 52, 44, 66 and 68, of which titers of types 39, 52 and 66 were characterized by an increased risk of severe dysplasia. Four and three HPV types were found in 5% of women examined, and among the types obtained 44 and 53 had a titer associated with a high risk of dysplasia. The research is continued.
CONCLUSIONS: HPV infection may be referred to as one of the determinant factors in the diagnosis of breast cancer. In the context of the present study, HPV types 44; 45; 53; 73, often encountered and associated with a low/middle risk of varying degrees of cervical intraepithelial neoplasia (CIN), presumably may serve as types of high oncogenic risk in the development of breast cancer.

The influence of biochemical markers of multiple sclerosis activity on the course of the disease

Alima A. Khamidulla[1] *, Gulnar B. Kabdrakhmanova[1], Aigul P. Utepkaliyeva[1], Dauren B. Darin[1], Zhahilsin U. Urasheva[1], Slawomir Michalak[2]

[1]Department of Neurology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [2]Department of Neurochemistry and Neuropathology, Chair of Neurology, Poznan University of Medical Sciences Poznan, Poland

*Corresponding author: Alima A. Khamidulla.
E-mail: alimakhamidulla@mail.ru

BACKGROUND: the purpose of this study was to assess the effect of biochemical markers of multiple sclerosis (MS) activity on the clinical course of the disease.
METHODS: a short-term (annual) study of MS patients was conducted. The inclusion criteria: established diagnosis of MS, relapsing course with a degree of disability not higher than 5.5 points on the EDSS scale. The study included 30 MS patients (21 females, 9 males) aged 38,9±8,7. All studied MS patients received interferon therapy with Betaferon, Avonex, Rebif. Blood sampling for immunological studies was carried out in 2 stages: at the beginning of the study 30 patients and a year later - 23 (4 patients changed their place of residence, 3 refused to participate in the second stage). Serum viperin concentrations were tested using ELISA (Human Virus Inhibitory Protein, Viperin ELISA Kit, MyBiosource, USA). The concentrations of USP18 were analyzed by means of ELISA (Human ubiquitin specific peptidase 18 ELISA Kit, MyBiosource, USA). ELISA method was used for serum SOCS3 evaluation (Human suppressor of cytokine signaling 3 ELISA Kit, MyBiosource, USA). Statistical analysis were performed using the licensed software MedCalc version 18.2.1. (64-bit).
RESULTS: 1 year after start EDSS score was reduced to 3.5 ± 1.8 compared with the initial level - 3.6 ± 1.5. A year after there was an increase in the total number of lesions on MRI from 8.5 ± 3.2 to 9.4 ± 3.2 (P=0.0187). During the observation period 26.5% of patients had experienced relapses. The analysis of the content of biomarkers of MS activity revealed: at baseline viperin concentrations were 0.0 (0.0-0.34) ng/ml, after a year - 0.19 (0.12-0.34) ng/ml; USP-18 at baseline - 2.28 (1.32-4.76) ng/ml, in a year - 6.49 (3.66-9.82) ng/ml; SOCS 3 concentrations at the baseline 0.0 (0.00-108.03) pg/ml, in a year - 96.17 (68.38-138.02) pg/ml. A year later viperin correlated positively with the number of relapses during the study (rS = 0.487, p=0.0184). One year later viperin concentrations were higher in MS patients with relapses (P=0.047). The median in MS patients without relapses was 0.155 (0.102-0.212) ng/ml, in patients with relapses - 0.333 (0.173-0.571) ng/ml. Viperin was significantly decreased in patients with new MRI lesions during the study - 0.00 (0.00-0.302) ng/mL compared with patients without new lesions on MRI - 0.342 (0.0-1.255) ng/mL (P=0.0444). No association was found between viperin concentration and EDSS. Viperin cocentration measured one year after basline showed significance for association with relapses during the study tested using ROC curve analysis. The detected cut-off level for viperin for predicting the risk of relapses was 0.2 ng/ml (AUC - 0.817 (P=0.03), Se - 75%, Sp - 86.7%). A negative correlation was found between EDSS at baseline and USP18 at baseline (rS=-0.46, p=0.0029); and between EDSS after one year with SOCS3 after one year (rS = -0.304, P=0.0448). Analysis of the effect of USP18, SOCS3 on the number of new foci on MRI revealed no significant differences.
CONCLUSIONS: Markers of MS activity such as viperin, USP18, SOCS3 have been clinically significant and can be used in assessing disease activity as well as in assessing the effectiveness of therapy.

Development of Clinical Pharmacy services in Kazakhstan

Alma Shopabayeva[1] *, Saida Mukhanova[2], Kairat Zhakipbekov[1]

[1]Department of Organization and management of pharmacy economics and clinical pharmacy, Asfendiyarov Kazakh National Medical University, Almaty, Kazakhstan; [2]School of Pharmacy, Department of Organization and management of pharmacy economics and clinical pharmacy, Asfendiyarov Kazakh National Medical University, Almaty, Kazakhstan

*Corresponding author: Alma Shopabayeva, Department of Organization and management of pharmacy economics and clinical pharmacy, Asfendiyarov Kazakh National Medical university, Almaty, Kazakhstan. E-mail: almarsh@mail.ru

BACKGROUND: In modern conditions, education becomes a national priority, strategic directions, the development of which is associated with the introduction of new specialties in the university and the training of specialists in accordance with the requirements of the labor market. The modern period of the system of higher education of the Republic of Kazakhstan is characterized by improvement and harmonization of The State Compulsory Education Standards at all levels of training, taking into account the introduction of innovative educational technologies.
METHODS: A clinical pharmacist is a specialist who is familiar with the main types of medical documentation, general syndromology and clinical symptomatology in the clinic of human disease, with the basic methods of clinical, laboratory and instrumental examination of patients, general principles of interpretation of patient examination results, basic guidelines and principles of drug therapy of internal diseases. It is necessary to assess the need for a degree of clinical pharmacy in the Republic of Kazakhstan.
RESULTS: Assessment of foreign experience shows that full patient care is possible with close cooperation in the "doctor-pharmacist-patient" chain. The development of relations contributed to the emergence of the discipline "clinical pharmacy". The concept of the specialty is the active cooperation of the pharmacist together with the doctor in the treatment process, starting with the initial consultation of the patient in the sale of drugs, and then takes part of the responsibility for the quality and optimal results of therapy. The concept of pharmaceutical care is aimed at improving the quality of patient care. The purpose of pharmaceutical care is the constant, highly qualified counseling of patients on the rational use of medicines, the conditions for their proper storage, the rational choice of the dosage form and the rules for using new medicines, and more.
In modern stage of development of the School of Pharmacy in Asfendiyarov Kazakh National Medical University is characterized by the creation of educational, research and cultural potential in the educational program for the preparation of the specialty "Pharmacy" on the basis of the competence approach in the 3-level education system. The program for the implementation of the new model is aimed at training specialists who are capable of solving innovative problems based on modern intellectual technologies. In this regard, our research formed the basis of the order number 1036 in 2016 of the Ministry of Health and Social Development of the Republic of Kazakhstan and made changes and additions to the nomenclature of posts of medical and pharmaceutical specialties with higher pharmaceutical education – "clinical pharmacy and quality management in pharmacy". Now the duties of specialists are being developed.
CONCLUSIONS: Currently, activities are underway to develop and approve standard pharmaceutical care protocols. The mechanisms that can contribute to the development of clinical pharmacy in Kazakhstan are the promotion of pharmaceutical care, assistance from government agencies, and the creation of a specialized association. Clinical pharmacists can play a significant role in the pharmacovigilance system and clinical research, as well as in other segments of pharmacy.

Morphofunctional characteristics of the stomach under acute and chronic exposure to sodium tetraborate

Akzhenis Berdalinova*, Turakbay Umbetov

West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Akzhenis Berdalinova, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: berdalinova77@mail.ru

BACKGROUND: Boron compounds at low concentrations are necessary for the growth and development of animals and plants, and at high concentrations they are toxic. Despite many studies of the biological effects of boron toxicity, many aspects of its effect on the body need to be clarified. The aim of the research is to study the morphofunctional characteristics of the gastric mucosa of rats when exposed to sodium tetraborate.
METHODS: The object of the study was the stomachs of 50 white mongrel male rats. Animals were divided into 2 groups. Animals of the first group (5 rats) were intragastrically injected once with a sodium tetraborate administered in a dose of LD50-5000 mg / kg. 5 rats served as controls. Sodium tetraborate was administered daily to the animals of the second group (20 rats) intragastrically through a probe daily for 30 days at a dose of 1/10 LD50-500 mg / kg. Bred animals from the experiment in time - 7, 14, 21, 30 days. The control to this experiment was served by 20 rats. The resulting material was processed using a review of histological, histochemical, immunocytochemical methods.
RESULTS: With acute exposure to sodium tetraborate (LD50), edema and marked destruction of the epithelium are observed in the gastric mucosa, both in the region of the gastric pits and glands. The mitotic activity of the epithelium of the stomach is reduced compared with the control. In the capillaries of the lamina propria of the mucous membrane, stasis of the shaped elements is observed. In the connective tissue of the gastric mucosa leukocyte infiltration. Analysis of the preparations of animals of the 2nd group of the experiment showed that on the 7th, 14th, 21st and 30th days of exposure to sodium tetraborate in the gastric mucosa, edema, multiple focal desquamation of the intestinal epithelium and epithelium of the glands is observed. The mitotic activity of the mucosal epithelium observed in the cervical glands is low. There is an increase in the zone of proliferative activity of the mucosal epithelium. An increase in the proportion of fibrillar structures in the connective tissue of the lamina propria of the mucous membrane is observed. Destructive changes are more pronounced with a high dose of sodium tetraborate (LD50). Damage to epithelial cells leads to an increase in the zone of proliferative activity of the mucosal epithelium, while mitoses are observed not only in the cervical gland, but also in the body of the gland and in the epithelium of the gastric pits. An increase in the share of fibrillar structures in the connective tissue of the lamina propria of the mucous membrane indicates an increase in the synthetic activity of the cells of the fibroblastic difon, and also indicates a higher resistance of fibroblasts to the action of this exotoxicant.
CONCLUSIONS: The used doses of sodium tetraborate, both in acute and chronic studies, have a negative effect on the structure of the gastric mucosa. The expansion of the

proliferative activity of the mucosal epithelium, aimed at restoring structural homeostasis, does not fully compensate for the significant death of integumentary and glandular cells. An increase in the activity of cells of the fibroblastic differention indicates their greater resistance to the negative effect of sodium tetraborate in comparison with epithelial cells.

Analysis of rough incidence rates of lung cancer in the Aktobe province of western Kazakhstan within 2009-2018

*Anissa Zh. Mukhambetzhan[1] *, Saltanat T. Urazayeva[1], Valery V. Begunov[2], Olzhas N. Urazayev[2]*

[1]Department of Epidemiology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [2]Department of Oncology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Anissa Zh. Mukhambetzhan, Department of Epidemiology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: a_nis_a@mail.ru

BACKGROUND: Lung Cancer (LC) ranks first in the structure of male oncology in Europe as well as in the post-Soviet space. About 1.6 million of new cases are registered annually in the world and about 1.3 million people die. Currently, in low- and middle-income countries more than 50% of LC deaths occur annually. In the Republic of Kazakhstan this malignant neoplasm ranks first in mortality and second in terms of morbidity.
Given the leading position of this cancer by rank, an initial comparative analysis on LC incidence rates amongst the Aktobe population within 2009-2018 was performed.
METHODS: Following the University's IREC approval of this retrospective study, all incident cases of LC diagnosed from 2009 through 2018 in adults aged 20 years and older were obtained from the Cancer registry of the Aktobe regional Oncologic Center. Data of the province' total population within 2009-2018 were requested from the Aktobe Statistical Committee. Rough incidence rates were estimated for each age group at diagnosis (20–39, 40-49, 50-59, 60-69, 70+ years), ethinicities (Kazakhs, representatives of Slavic diasporas, Other ethnicities as it was presented in the Cancer registry), sex and places of residence (urban or rural area). Incidence trends and corresponding 95% CIs were determined by the least squares method of regression analysis and expressed as the number of cases per 100,000 individuals. Statistical processing of the data was carried out using Statistica.10 software (USA, Statsoft - Dell Inc.) For all tests a two-side type I error of $P<0.05$ at 95% CI was assumed statistically significant.
RESULTS: A total of 1,338 cases of LC were recorded within a decade, among them 21.9% were women and 78.1% were men. Kazakhs represented 67.4% of all cases. Age groups were presented as follows: under 39 years – 1.5%, aged 40-49 6.9%, aged 50-59 28.3%, aged 60-69 35.4% and the group of 70+ accounted 27.9%. Until 2011 overall incidence rates fluctuated within 2.2-3.9 per 100,000, but then soared up to 15.1 by 2011, 37.4 by 2013, slightly declining to 29.2 by 2018. The overall incidence trend resulted in 13.2±3.7 (95% CI 9.8;17.5). The incidence trends by sex were as follows: starting from 3.7 by 2009, the incidence in men rocketed up to 60.7 by 2013, showing slight declining to 50.0 by 2018. As for women, the overall trend demonstrated steady growth from 1.1 by 2009 up to 11.1 by 2018, with the peak incidence 17.7 by 2013, and overall trend was similar to men's one, though being significantly lower in values.
CONCLUSIONS: Thus, starting since 2011, the incidence in LC tends to increase steadily and sharply. The disease affects older people aged 50+ and men present the overwhelming majority of first diagnosed LC patients. The research on the issue of the LC epidemiology in the Aktobe province is of great importance given the alarming trends in morbidity and will be continued to determine the annual percent changes, mortality rates and other important parameters, including prognostic indices.

Epidemiology data on human Brucellosis in the Aktobe province of western Kazakhstan within 2008-2017

Aisha Urazayeva[1] *, Zhumabek Bekenov[2], Saltanat Urazayeva[1], Kymbat Tusupkaliyeva[1]

[1]Department of Epidemiology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [2]Department of Infectious Diseases Prevention, National Center of Public Health of the Ministry of Health, Astana, Kazakhstan

*Corresponding author: Aisha B. Urazayeva, Department of Epidemiology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: aisha777.83@mail.ru

BACKGROUND: Human Brucellosis is the most common zoonotic disease worldwide characterized by multiple lesions of the organs and systems of the human body and transmitted to humans only from sick animals and animal products. In Kazakhstan the incidence of Brucellosis is considered high. Between 2011 and 2015, over 300,000 cattle livestock and even more in the previous four years were destroyed throughout the country due to infection outbreaks.
METHODS: A retrospective analysis of the medical records of 504 patients who were treated at the Department of infectious diseases of the Aktobe Regional Hospital within 2008-2017 was performed. Data collected included demographic data of patients, epidemiological history, timing of treatment and laboratory findings. Statistical processing of the data was carried out by the program Statistica.10 (USA, Statsoft - Dell Inc.).
RESULTS: The average age of patients, 65.0% of which were male patients, was 35.9±18.9, M 49.0 (4.0-75.0) years, of them 7.0% were children under 18 years. The number of patients living in urban area amounted to 199 (39,5%) and in rural area 305 (60.5%), respectively. By type of activity, the distribution of patients was as follows: animal breeders - 27 (5.8%), students - 22 (4.7%), unemployed individuals - 230 (49.1%) and persons whose professions were not related to animal husbandry amounted to 189 (40.3%) of cases. According to clinical forms, the distribution of patients was as follows: latent form of Brucellosis was observed in 8.0% of admitted patients, acute form in 53.6%, subacute form in 9.0%, chronic in 26.5%, and residual Brucellosis was diagnosed in 0.5% of patients, respectively. Late appealability for medical aid

was observed throughout all sample: within 5 days from the onset of the disease 10.7% of patients were admitted for treatment, within 6-10 days 12.5%, within 11-20 days 17.6%, within 11-30 days 19.4% and later 30 days 39%, respectively. Family cases of Brucellosis were observed in 35 (6.9%) patients. 38.8% of patients recorded direct contact with infected animals, while 21.2% denied the contact, about the use of dairy products purchased on the market from unknown persons told 26.5% of patients. 137 persons (27.1%) reported presence a healthy cattle in their personal economies. The most epidemiologically unfavorable regarding the number of infected persons turned to be Aktobe, a city of regional importance, with population of about 500,000, where 39,5% of all patients admitted to the hospital lived. The diagnosis of Brucellosis was confirmed by serological methods: Raight and Hedelson's reaction turned to be positive in 19.4% of patients, the pathogen Brucella melitensis was isolated in 51% of all cases.
CONCLUSIONS: Thus, the Brucellosis affected mostly men than women, and the acute form of the disease prevailed along with late hospitalization of patients. Epidemiological history data showed that only 5.8% of patients were infected due to their professional activities, the rest cases were associated with mixed pathways of infection while contact with sick animals in private farms and the use of animal products that not passed the laboratory control for Brucellosis.
To improve the epidemiological situation of Brucellosis in the Aktobe province, large-scale sanitary and educational activities among the whole population should be run, and sanitary and veterinary supervision on the sale of agricultural products should be strengthened.

Evaluation of the efficiency of educational measures to develop the competencies in teachers of medical schools

Gulbakit K. Koshmaganbetova*, Alima R. Kashkinbayeva, Yuliya A. Zame, Gulnura H. Kalbagayeva

Center for Continuing Professional Development, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Gulbakit K. Koshmaganbetova, Center for Continuing Professional Development ,West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: gulbakit66@mail.ru

BACKGROUND: The level of professional competence of a medical school teacher is one of the important factors affecting the quality of the educational process. To date, there are no commonly accepted criteria for assessing the competencies of medical education workers. Each university determines key competencies and criteria for their achievement independently. In 2015, the West Kazakhstan University's Center for Continuing Professional Development introduced approved criteria for assessing the basic competences of own teachers.
The study was aimed to evaluate the efficiency of educational measures applied to develop the competencies in lecturers of the university.
METHODS: A prospective study assessed the teacher's professional competence through the observation method (systematic observation of the university teachers while the educational process, evaluating certain indicators and translating them into points: 0 - does not demonstrate (if the requirement is not implemented), 1- needs improvement (if the requirement is not implemented fully), 2 - demonstrates (if the requirement is implemented fully). According to the modified Kirkpatrick model, efficiency was assessed by the level of practical use of the learning outcomes in 91 medical university teachers who had been trained six months earlier at the Center for Continuing Professional Development. All calculations were done in Statistica.10 (Dell software, USA). For all tests a two side type I error of $P<0.05$ at 95% CI was assumed statistically significant. Non-parametric operational tests were used due to data not being normally distributed. Data were presented as mean values with 95% CIs. Two independent groups were compared for qualitative indicators by Pearson's ($\chi 2$) criterion.
RESULTS: The lowest scores were found in the majority of teachers in "Developer of Programs" competence: under the subitem "use of Bloom's verbs," the average score was 0.42 [95% CI 0.29;0.54], under the "formulation of final results" 0.37 [95% CI 0.23;0.52]. According to the competence of "Estimator / Examinator": under the subitem "Comprehension Tests" 0.47 [95% CI 0.33;0.62], "Application Tests" 0.31 [95% CI 0.18;0.43]. Statistically significant best competencies were established in teachers of preclinical departments.
CONCLUSIONS: The results may be relevant to the medical faculty staffers' skills development programs. Further qualitative research may provide an additional insight into the development needs of medical teachers.

New approaches in the modernization of medical development

Gulnara Sakhipova[1] *, Gauhar Sakhipova[2], Nurgul Abenova[1], Bibigul Karimsakova[1]

[1]Department of General Practice №1, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [2]Department of Foreign Languages, Aktobe K. Zhubanov Regional State University, Aktobe, Kazakhstan

*Corresponding author: Gulnara Sakhipova, Department of General Practice №1, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: gulnara.7110@mail.ru

BACKGROUND: By 2020 standards for medical education will be revised and updated, also for the purpose of compulsory complete acquisition by the students the English language at a level sufficient to obtain and maintain the knowledge and skills in both the scientific and clinical practice. In this regard, within the framework of the Road Map plan for 2015-2020 implementation of the trilingual education is conducted at the University. For the effective implementation of this task improvement of the linguistic competence of the teaching staff is required.
METHODS: For the teaching staff the university arranges free language courses of the state language (an average of 50 people) and English (an average of 60 people) with the assistance of the State body "The Board of Aktobe region

Languages development" at the following levels: A1, A2, B1, Beginner, Elementary, language cycles on selected topics of English language with the provision of the appropriate certificate on the passed training. In the classroom during language trainings interactive teaching methods are actively used, such as brainstorming, method of Jigsaw, Insert method, business and role-playing games: "Where am I? Who am I", "Listening in role", "Hidden emotions" etc. We revised a lot of clinical cases and composed the dialogues "doctor - patient", "doctor - patient's relative". Teacher with the introduction of new lexical units should provide the connection of these units: the Latin word - English word - the Russian word. For example: Operatio (лат.), operation (англ.), операция (русск); fractura (лат.), fracture (англ.), перелом (русск).

Such a comparison of the pharmacological or anatomic terms having a common root gives the possibility to associate foreign language with a specialty.

RESULTS: The number of teaching staff with the Intermediate level certificate or higher within 2016-2017 academic year amounted to 26 (5.1%), within 2017-2018 academic year 35 (6.7%), at the beginning 2018 their number reached 63 (11.3%). Of them 7 teachers have an official certificate of IELTS.

Across Departments, the highest performance level of English language (Intermediate and above) are observed in the Department of Life Science disciplines, the Course of Molecular Biology and Genetics, *the Centre of Continuing Professional Development,* Department of General Practice №1, Department of Surgical Diseases №2. At the same time, faculty members of 10 (23.8%) Departments do not reach the level of proficiency Intermediate and above.

CONCLUSIONS: Most of the world's medical periodicals are published in English. In the context of a joint information space, provided the absence of a foreign language the modern medical professional of mid-level can get an access only to the minimum necessary information from already translated books and articles on the Internet or reports. Knowledge of a foreign language, both for teachers and students, gives a lot of opportunities to study the scientific literature in the original language. For persons having a command of a foreign language an opportunity to pass training abroad in the field of medical education and to consult with foreign colleagues emerges.

Thus, fluency in a foreign language, along with excellent skills in medicine, will enable professionals to acquire a decent work and to establish an effective career.

The most significant risk factors for breast and gastric cancers development in the Aktobe province of western Kazakhstan

Tleuzhan Smagul, Anna Ziganshina, Anastasia Miletskaya, Gaukhar Nurgali, Saule Balmagambetova*, Anar Tulyaeva, Marzhan Aitmagambetova, Olzhas Urazayev, Indira Yedigeyeva, Yerbolat Iztleuov, Gaziza Smagulova, Arip Koyshybaev

Research group of the Project "Breast and Gastric cancers epidemiology and monitoring the treatment by the method of repairing double-strand DNA breaks in lymphocytes", Department of Oncology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Saule Balmagambetova, Department of Oncology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: sau3567@gmail.com

BACKGROUND: According to the Breast Source Globocan, overall 4,211 (13.4%) new cases of Breast cancer were diagnosed in Kazakhstan as of September 2018. Mortality due to the mammary glands tumors ranks first amongst women of the country.

The Gastric Cancer (GC) is the third most common cancer worldwide, referred to one of the deadliest types, accounting for 782,685 deaths worldwide in 2018. Although the global incidence and mortality rates of GC in high-income countries are prone to decline, situation in low- and middle-income countries, including Kazakhstan, tends to increase in incidence. In this relation, issues of the risk factors which eventually majorly contribute to the process of malignancy at these tumor sites are of key interest for oncologists.

METHODS: To establish the risk factors responsible for development the gastric and breast cancers in population of the province, all first diagnosed patients treated in the Aktobe Oncology Center filled in a questionnaire developed on a basis of the world guidelines. Overall, both the questionnaires included several domains by the groups of risk factors and were validated through the Cronbach's α (0.68 and 0.7, respectively). This case-control study implied selection of control groups for both samples – BC patients and GC patients. Comparison was performed through the matching by age. The Pearson's c2 test to identify significant links (with the definition of the Cramer's V criterion), and logistic regression analysis with odds ratio calculation (ORs) were performed. For all tests a two-side type I error of $P \leq 0.05$ at 95% CI was assumed statistically significant.

RESULTS: To date, a total of 79 out of 160 (N for GC), and 97 out of 160 (BC sample) observations were processed with the corresponding number of controls. Preliminary findings for the Gastric Cancer sample are the following: there are no significant links revealed regarding the salted red meat or other harmful food consumption, as well as regarding the place of residence (urban or rural area) and level of education. The most significant risk factors for the GC development turned to be male sex (c2 6.9, P 0.009); age > 50 years (c2 28.6, P<0.0001); income level under the subsistence minimum (c2 25.4, P<0.0001); and the timely medical examination – fibrogastroscopy was neglected by 73.7% of GC diagnosed patients and 33.3% of controls (c2 8.68, P 0.05).

As to the BC sample, there were no links regarding the income level found, whereas a low level of education was decisive within the social risk factors (c2 9.5, P 0.008). The rest factors referred to common reasons, such as number of abortions more than 3 (c2 37.9, <0.0001); traumas or mammar glands surgery in the history (in 91.1% of the cancer patients, c2 105.1, <0.0001) and menstrual cycle disorders (c2 9.35, P 0.009).

CONCLUSIONS: Overall, for both samples, social differences between the groups of population (level of income, awareness through the availability of education, timely medical examination) contributed to the Breast and Gastric cancers development more than well-known risk factors such as dietary habits or lasting the breast feeding.

The ovarian reserve indexes in women living in the Aral Sea environmental disaster region

Aru Balmagambetova*, Gulmira Zhurabekova

Department of Normal and Topographical Anatomy with Operative Surgery, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Aru Balmagambetova, Department of Normal and Topographical Anatomy with Operative Surgery, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan. E-mail: aru.b.84@mail.ru

BACKGROUND: To date, the Aral Sea disaster constitutes the global environmental problem for Kazakhstan. Numerous scientific studies reflected a high incidence rate in the population living in this region associated with the organochlorine pesticides. They belong to the group of "endocrine disruptors", which can be incorporated into the normal cycle of steroidogenesis, leading to cellular damage and disrupting the maturation and fertilization of oocytes. It has been found that in regions with a high content of these compounds, reproductive capabilities in population are reduced due to morphofunctional changes at the organs level.
METHODS: The present case-control study included 108 women aged 27-40 years, where participants living in the city of Aktobe served as controls for women living in Shalkar district, which was referred to zone 1 (1 of 3) of the Aral Sea disaster. Examination of women was carried out on 3-5th (beginning of the follicular phase) and 11-13th days (end of the follicular phase) of the menstrual cycle with the ultrasound study of the ovaries (determination of the ovarian volume and counting the number of antral follicles) with dopplerography of the ovarian vessels and the Anti-Mullearian hormone (AMH) level determining. Statistical processing was performed through the Student's T-test, Mann-Whitney U-test, Spearman's rank correlation (r).
RESULTS: In the studied group, the volume of the left ovary was reduced by 12.7%, the volume of the right ovary by 25.4% compared to the baseline data at the beginning of the menstrual cycle follicular phase. At the end of the follicular phase there was a similar decrease, in the left ovary by 18.5%, and in the right ovary 32.9%, respectively. Besides, the volume of the cortical substance of both ovaries in the studied group was reduced by 2.01 and 2.2 times at the beginning of the follicular phase and by 2.4 and 3.01 times at the end of the follicular phase, respectively, compared to women from the control group. In the studied group the number of antral follicles in the left ovary was reduced by 7.5%, in the right ovary by 41.4%, compared to control group at the beginning of the follicular phase. At the end of the follicular phase, the number of antral follicles in the left ovary was reduced by 15%, in the right ovary by 34.4% compared to the control group. These two valuable ultrasound indicators, such as the volume of the ovaries and the number of antral follicles, clearly demonstrate a decrease in ovarian reserve in the group of women living in the Aral Sea region. In addition, the functional deficit was most expressed in the right ovary, while the function of the left one was close to normal. The level of the AMH marker in the studied group was reduced by 59% compared to control group, thus showing a decrease in the ovarian reserve.
CONCLUSIONS: Positive correlation of the findings on the ovaries ultrasound data and the AMH index evidence a relationship between the morphological parameters of the organ, such as the ovaries volume as well as the number of antral follicles, and the hormone determining the ovarian reserve's level. All these rates were significantly reduced in women of the Aral Sea region, thus proving the role of environmental factors on the functional activity of the organ.

The reform of Nursing: nurses expectations

Zhanar A. Dostanova, Bibigul B. Tleumaganbetova, Nazgul A. Seitmaganbetova, Galina V. Veklenko*, Gaziza A. Smagulova, Aigul A. Zhaubaturova, Gulnara S. Kurmasheva

Department of Internal Diseases and Clinical Pharmacology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Galina V. Veklenko, Department of Internal Diseases and Clinical Pharmacology, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: veklenko@zkgmu.kz

BACKGROUND: Currently, Kazakhstan is implementing the reform of medical education and health care aimed to improve the quality and efficiency of health services for population. One of the most important roles in solving this problem belongs to the nursing staff. Among the causes contributing to low productivity, the International Labour Organization emphasizes long-term work, low wages, lack of incentives and job dissatisfaction. The development of Nursing in Kazakhstan is hampered by the system of training medical workers that do not meet international standards. Besides, the issues of satisfaction with the profession and the readiness of nurses to change still remain unclear.
METHODS: The study was aimed to analyze the satisfaction of nurses with their professional activities. An anonymous survey was run on a basis of the Aktobe Emergency Hospital within February 2018. The questionnaire consisted of mostly closed-ended questions and included a total of 11 items: age, place of work, length of service, marital status, value and importance of the profession, satisfaction with working conditions and wages and etc. The total number of completed questionnaires was 92 out of 289 (response rate 31.8%).
RESULTS: The average age of respondents was 39±4.7 years, and 95% of them worked in the same Hospital. Work experience up to 5 years had 21% of them, up to 15 years 40%, and more than 15 years 53%, respectively. The proportion of nurses married was 59%. Parental status was as follows: 36% of nurses had children under 3 years old, 48% under 7 years, and over 7 years - 89%, respectively, while 25% of the surveyed had no children. All nurses (100%) recorded that they appreciate their specialty despite the challenges. When being asked how and what kind of people around them appreciate them as a nurse, respondents reported that 100% of patients and their relatives respect them, regarding the physicians attitude, the rate was declined to 96%, and appreciation by managers was recorded in 89% of responses. When being asked the question regarding their priorities in professional duties, overwhelming majority of them answered that the most important and professionally respectable is rendering highly qualified medical aid. The needs of the most of respondents were confidence,

supporting by state, by hospital managers and surrounding people, and also a sense of high professional self-worth. The findings of an anonymous survey showed that 76% of nurses were satisfied with working conditions, while 23% of them were dissatisfied. Dissatisfaction with the working conditions was due to the high level of stress, time-consuming filling in a large number of papers and the lack of equipped spaces for relaxation. 94% of nurses positively evaluated their place of work and did not intend to change it, explaining this fact by luckily established respectful relationships in the team. Nonetheless, 5% of nurses would like to change their profession because of low wages and high professional load. Regarding the wages, 60% of respondents were dissatisfied with low salaries, while 40% considered the earnings quite satisfactory.
CONCLUSIONS: The survey showed overall high professional satisfaction of nurses, despite low wages and unsatisfactory working conditions. However, interest in changing the arranging of professional activities and differentiating wages in accordance with the workload and professional qualification turned to be the key expectations.

The effectiveness of medical technology used for patients with diabetic retinopathy

Nurzhibek Beisembinova[1] *, Lyazzat Kosherbayeva[1, 2], Aigul Balmukhanova[1], Manas Tulekenov[2]

[1]Asfendiyarov National Medical University, Almaty, Kazakhstan; [2]Al – Farabi Kazakh National University, Kazakhstan

*Corresponding author: Nurzhibek Beisembinova, Asfendiyarov National Medical University, Almaty, Kazakhstan.
E-mail: silkway88@hotmail.com

BACKGROUND: Over the past 10 years, the widespread use of new technologies and the rapid increase in the prevalence rates of diabetic retinopathy causes the relevance of the qualitative assessment of the clinical and economic efficiency of these methods, while taking into account the preliminary diagnosis, side effects, long-term and cost-effectiveness of the technology.
METHODS: A literature review was conducted on Pubmed, Cochrane Library and other official reports using keywords "evaluation of diabetic retinopathy treatment" or "effectiveness of diabetic retinopathy treatment". And 54 relevant original articles and 3 systematic reviews were analized, measuring clinical effects, side effects, long-term and cost-effectiveness of the technology.
RESULTS: Studies have shown that modern methods of laser photocoagulation (PRP) are effective, safe and cause fewer side effects. The most significant side effect was an increase in the thickness of the macula and edema (DME) leading to temporary visual impairment. For avoiding side effects it is necessary to conduct a diagnosis of DME and use lighter PRP with fewer burns of 1200 -1600 spots once every 2 weeks. However, sample of many PRP studies was very small (40-100 on average) lasting up to 6-12 months and non-randomized.
The use of anti-VEGF (vascular endothelial growth factor) or steroid drugs in combination may additionally reduce the side effects of PRP. Most studies have used such anti-VEGFs drugs as aflibercept, ranibizumab, bevacizumab, or triamcinolone steroid. Sampling also was small, and observations duration was short because DME occurs shortly after PRP. Although most studies declared improved vision and reduced macula thickness in moderate proliferative diabetic retinopathy (PDR), they also reported some side effects such as increased IOP and cataract development.
In addition, adjuvant therapy with different anti-VEGF drugs is expensive compared to PRP, therefore, it is necessary to conduct a more detailed and accurate analysis of the benefits and costs of treatment taking into account side effects, risk factors and the long-term disease-free treatment period.
Systematic reviews published in the Cochrane Library and a similar review prepared by the American Academy of Ophthalmology and the publications of The Royal College of Ophthalmology in England confirm that anti-VEGF injections are fairly safe and effective in the treatment of development of both PDR and DME of development of both PDR and DME. However, these injections also involve potential side effects such as retinal detachment, hypertension, proteinuria and impaired wound healing. Anti-VEGF therapy can also be used for a longer time to reduce the progression of retinopathy, but at the expense of multiple injections.
Currently, of all the available anti-VEGF drugs, Kazakhstan ophtalmologists oficcially use aflibercept only (Eylea). According to many RCT studies, aflibercept has an advantage over ranibizumab and bevacizumab in the treatment of DME for one year, but this advantage has not been studied in the long term (more than two years) comparative effects of these anti-VEGF agents.
CONCLUSIONS: A considerable amount of research has been done studying the effectiveness of a particular medical technology on DR, but all of them were somewhat limited by small sample sizes, short duration and randomization of the studied groups. In addition, some studies have shown that effectiveness in terms of visual acuity in one technology, such as IVT decreases over time, when other treatment technologies, such as PRP requires detailed diagnostics and individually selected therapy, in order to avoid side effects and the necessary additional time for healing and improving vision.

Increase of education efficacy by clinical cases development based on the real laboratory and instrumental data

Larissa S. Minbayeva*, Irina V. Bacheva, Lyazat K. Ibrayeva, Gul`fiya H. Bigaydarova, Gul`yara B. Satzhanova, Ryszhan Y. Bakirova

The Department of Internal Diseases №3, Medical University of Karaganda, Karaganda, Kazakhstan

*Corresponding author: Larissa S. Minbayeva, The Department of Internal Diseases №3, Medical University of Karaganda, Karaganda, Kazakhstan. E-mail: minbayeva_larissa@mail.ru

BACKGROUND: Modern education is focused on development and implementation of training methods that promote critical thinking and creativity of students.
METHODS: A method of teaching based on active involvement of students into educational process was developed by us and put into practice, for improving efficacy of material learning by the students. The idea of the method consisted

of modeling the potential complaints and clinical picture, based on the real patients' laboratory and instrumental data. Students' task was to perform several consecutive steps:
Step 1 – to analyze the results of real patient diagnostic examinations presented by the teacher,
Step 2 – students were to come up with the probable complaints, history, objective findings for the patient according to the presented data,
Step 3 – to compile treatment and rehabilitation program for the modeled patient,
Step 4 – to present the developed clinical case (DCC) (PowerPoint) with further self-assessment,
Step 5 – assessment of the DCC by group mates (to analyze logical structure and reality of the presented work),
Step 6 – comparative analysis of the developed and real clinical case (the teacher presents all information about the real patients at the end of presentation),
Step 7 – teacher's conclusion with checklist filling.
At the first class the teacher explained aims and objectives of the work with detailed description of task completion. At the second class – 4-7 steps were realized.
Comparative analysis of the proposed method efficacy was carried out in 44 6th year students divided into 2 equal groups. In the 1st group the described above method was used, whereas in the 2nd there were only standard training methods.
All students answered initial test control (20 questions, identical for both groups) which showed that the groups were comparable. Thus, the average score expressed in percentage for the 1st and 2nd groups was 65.4% and 66.3%, respectively. Distribution of ratings in the 1st group was as follows: 75% - 1 person, 70% - 5, 65% - 11, 60% - 5. In the 2nd group: 75% - 4 persons, 70% - 7, 65% - 3, 60% - 7, 55% - 1. Percentage of correctly answered final test questions formed the final assessment, used for subsequent analysis. Questions for the initial and final test control were the same.
RESULTS: Performing of the 5th and especially 6th step was always accompanied by emotional rise and involvement of all students in the analysis process.
The final test average score for the 1st and 2nd groups were increased up to 98.4% and 88.1%, respectively. Distribution of ratings in the 1st group was: 100% - 16 persons, 95% - 5, 90% - 1. In the 2nd group: 95% - 4 persons, 90% - 6, 85% - 12. Thus, students' knowledge on the studied topic improved by 33% in the 1st group and by 21.8% in the 2nd.
CONCLUSIONS: Thus, the proposed method allowed increasing of education efficacy, provided the active participation of students in home tasks preparing with creative approach realization. It promoted self-development of students and improved knowledge survival.

Histotopographic relation of lymphoid tissue in the mucosa of the rectum of a man in the post-neonatal ontogeny

Yakov Ya. Maul*, Marina K. Zhanaliyeva, Bolat S. Khamidullin

Department of Human Anatomy with Operative Surgery, Astana Medical University, Astana, Kazakhstan

*Corresponding author: Yakov Ya. Maul, Department of Human Anatomy with Operative Surgery, Astana Medical University, Astana, Kazakhstan. E-mail: maul.yakov.ya@gmail.com

BACKGROUND: The increased interest of followers in the structure, function and topography of lymphoid organs, formation and nodules is understandable and explainable. For the recent years cancer, in young people, "syndrome of transformed immune deficiency", immune dysfunction, are widespread, falsity of transplantation is increased.
Lymphoid tissue is an important part of the human immune system. It is located not only in the peripheral organs of immunogenesis, but also in all organs having a mucous membrane-epithelium of endodermal origin. The rectum is no exception in the list of organs with similar epithelium.
The aim of research is to study anatomical, topographic and morphological and functional features of lymphoid tissue associated with the mucosa of the rectum.
METHODS: Macro and micro preparations of the rectal mucosa taken from the corpses of 82 people who died from persecution and diseases not related to diseases of the digestive and immune systems were used in this work. For macroscopic studies, the Helman method was used, for microscopic staining of sections of hematoxylin-eosin, azur-II eosin, Van-Gizon were used.
RESULTS: During the histotopographic study of the relationship of intestinal glands and vessels with lymphoid scale associated with the mucosa of the rectum, we found several varlants of these relations. Provided that the lymphoid nodule is located in under the mucosa, from it to the epithelium, in the intervals between the glands, 2 are the chains of cells of the lymphoid series. Each chain consists of 3 to 9 rows of lymphoid cells. On the periphery of the intestinal glands of the rectum lymphocytic couplings are formed. The closer to the epithelium is the excretory duct of the intestinal gland, the more cells of the lymphoid series is around the gland. Lymphoid series cells are represented by large medium and small lymphocytes, as well as plasma cells and macrophages. Lymphocytic coupling in such cases consists of 7-12 rows of cells directed to the epithelium of the mucous membrane of the rectum.
In the study of the micropreparations of mucous membrane of the rectum, we found very interesting formations, at first glance, not characteristic of the under studying organ. On a number of points, these formations resemble a splenic periarterial macrophage-lymphocytic clutch.
CONCLUSIONS: Abundance of lymphocytic formation in the rectal mucosa the ability of lymphocytic tissues are migrated depending on the degree of antigenic action, the presence of mechanisms that ensure this migration, as well as the presence of structures characteristic of other organs of immunogenesis, allow us to talk about the rectum as a peripheral organ of immunogenesis.

Comparative characteristics of the width of lymphoid nodules in the urinary organs and sphincter areas of these organs in people of different ages

Marina K. Zhanaliyeva*, Yakov Ya. Maul, Aigul Y. Almabayeva

Department of Human Anatomy with Operative Surgery, Astana Medical University, Astana, Kazakhstan

*Corresponding author: Marina K. Zhanaliyeva, Department of Human Anatomy with Operative Surgery, Astana Medical University, Astana, Kazakhstan. E-mail: marina.zhanalieva.1969@mail.ru

BACKGROUND: The immune system is responsible for realization of specific reactions of the body to the penetration or formation of foreign structures.
Lymphoid tissue, regulating these reactions are found in many organs of the human body. Moreover, this tissue can be represented as compact clusters or nodules, and in the form of diffusely distributed tissue.
The aim of the research is to study the transverse sizes of lymphoid nodules in the ureters and bladder, in the sphincter areas of these organs and then compare their width in different age groups.
METHODS: The materials of the present study were macro-and micro preparations of the urinary organs taken from 97 corpses of people of different ages.
For macroscopic studies, the Hellman method was used, and for microscopic conventional studies histological methods hemotoxylin-eosin, azur II-eosin, van gieson were used.
RESULTS: On total preparations of the urinary organs taken from the corpses of people of different ages, we studied the width of lymphoid nodules located both in the sphincter zones and in the areas of the mucous membrane adjacent to these zones.
In the area of the ureteral-vesicular sphincter and in the area of the sphincter of the bladder, lymphoid nodules reach their maximum width during the second childhood age.
In the first period of adulthood, the width of lymphoid nodules in the ureteral-vesicular sphincter is 1.1 times less than the same indicator in the sphincter of the bladder.
In elderly people there is a significant decrease in the width of lymphoid nodules and this tendency's characteristic of both the urethra-bladder sphincter and the sphincter of the bladder.
The increase in the width of lymphoid nodules in the sphincter zones compared with adjacent parts of the organs is observed in all age groups. However, the maximum valumes of the compared indicators are reached in the period of the second childhood age despite the fact that the width of the lymphoid nodules in the sphincter zones always prevails over the average index in the adjacent areas, the most significant are changes in the width of the lymphoid nodules in the age aspect.
The width of lymphoid nodules in the sphincter zones significantly decreases depending on age. If, in the 2 childhood age, in the area of ureteral-vesicular sphincter, the width of lymphoid nodules is 260.0±4.7, in these case at the elderly, this figure age decreases to 125.6±7.2. The reduction in the width of lymphoid nodules is almost 50%. A similar picture is observed for the area of the sphincter of the bladder.
CONCLUSIONS: The width of the lymphoid nodules of the sphincter zones prevails over the average statistical width in the ureters and in the bladder.
However, despite the difference in the width of lymphoid nodules in the ureteral-vesicular sphincter and in the sphincter of the bladder, there is a common regularity for these areas. In the field of vesicoureteral sphincter and in sphincter are of the urinary bladder lymphoid nodules are based circularly and ring formed and resemble concentric ring if judging its look.

Educational cluster as a system for the integration of education, science and industry

Elmira Serikbayeva*, Kairat Zhakipbekov, Alma Shopabaeva, Ubaidilla Datkhaev

Department of organization, management and economics of pharmacy and clinical pharmacy, National medical university, Almaty, Kazakhstan

*Corresponding author: Elmira Serikbayeva, Department of organization, management and economics of pharmacy and clinical pharmacy, National medical university, Almaty, Kazakhstan. E-mail: Elmira.asyl@mail.ru

BACKGROUND: The key priority of the development strategy of the Kazakhstan Republic is joining the group of *30 most developed countries*. In this regard, it is necessary to develop the holistic policy in the management research and development projects and the formation of a developed National Innovation System with effective mechanisms for interaction between the state, business, science and education.
METHODS: Domestic and foreign literary sources were analyzed on the formation of educational clusters to determine the main aspects of creating educational clusters as a system for integrating education, science and production.
RESULTS: In the innovative development of a continuous vocational education system, the most important is the cluster approach based on interaction, partnership, cooperation between stakeholders. Several key points can be identified in the implementation of the cluster approach of integrating the education of science and production. This is the presence of: a common goal; the legal basis for joint activities of entities; developed mechanisms of interaction between the subjects united in a cluster; mechanism for managing the implementation of the cluster approach; technologies for the implementation of the cluster approach in accordance with the declared common goals.
Among the stages of implementation of the educational cluster model can be highlighted:
1. Organizing the monitoring of employers' thoughts about the presence of the necessary professional, personal qualities among university graduates.
2. Organization of educational activities in accordance with the requirements of the international Quality Management System, which allow you effectively develop and implement systematic corrective actions to improve the emerging social partnership system.
The partnership is based on: continuous access to information about the labor market; timely clarification of the structure of demand for personnel in the labor market; effective organization of student practice in the industry; assessment of the quality of training by independent experts, etc.
3. Organization of production (professional) practice based on the integration of theoretical knowledge and innovative technologies of economic sectors in production conditions, which contributes to increasing the level of motivation for the chosen profession, correcting and updating the content of types of practices, curricula, increasing the percentage of graduates' employment at enterprises career growth.
4. The organization of the work of the ongoing scientific and methodological seminars of the subjects of the educa-

tional cluster, aimed at harmonizing the requirements of customer enterprises to the professional knowledge and skills of university graduates.
5. Development of the sector of additional vocational education, including the training of specialists in working specialties with assignment of qualification categories, in additional specialties of vocational education, the organization of advanced training courses and vocational training, internships for teachers in enterprises.
6. Holding joint events, conferences, business meetings that influence the development of the atmosphere of mutual cooperation.
The cluster as a mechanism for the innovative management of the development of the general education system ensures the effectiveness of the activities of each educational institution included in it, including the development of social partnership, the attraction of extra-budgetary funds to education, the emergence of resources for innovative training, advanced training of teaching staff, qualitatively new educational results based on continuous human development.
CONCLUSIONS: Thus, the cluster approach can become the basis for the formation of new education systems that more fully meet the needs of modern society and man.

Condition of ecology of the Territory of the Mugalzhar district of the Aktobe Region

K.M. Kibatayev*, S.K. Sakhanova, G.M. Urgushbayeva, K.Sh. Tussupkaliyeva, E.I. Kussanova, Zh.T. Nurgazin

West Kazakhstan state medical university of Marat Ospanov, Aktobe, Republic of Kazakhstan

*Corresponding author: Kozy M. Kibatayev, West Kazakhstan state medical university of Marat Ospanov, Aktobe, Kazakhstan.
E-mail: kibatai@mail.ru

BACKGROUND: Except the Semipalatinsk Test Site in the territory of Kazakhstan the ground of Azgirsky, and still the whole series of other proving grounds and platforms was located. One of them is the military proving ground Emba-5 located in the territory of the Aktobe region. Tests were carried out from 1964 to 1998. In 2016 Russia stopped rent of the ground Emba – 5 and transferred to Kazakhstan. The returned lands can be used for the benefit of the businessmen who are engaged in agriculture, the organizations of the minerals which are carrying out activity in the field of exploration and production.
Purpose: To study an ecological condition of the territory of the former military proving ground Emba-5.
Tasks: To carry out environmental monitoring of the territory of the former proving ground "Emba-5" for identification of pollutants of the soil, water and plants.
METHODS: Sample soil was made according to interstate standards. Measurement of a gamma hum noise (MED) – MKS, RKS, DKS AT dosimeters 1123; an eskhalyation of a radon and the DPR – Ramón; determination of content of radionuclides – alpha, - beta, scale – spectrometers (JV Progress) etc according to standards and techniques of a research. Measurements of levels of a radon in the enclosed space, a gamma hum noise and a research of tests on the content of heavy metals and radionuclides were carried out by the accredited testing laboratory Aliya & Co LLP.
RESULTS: At a research of the surface water from the Zhem River increase in water hardness is revealed, availability of Calcium, Magnesium, carbonates, hydro carbonates, Sodium the Potassium were defined. In tests of water from the Zhem River: in points No. 3 (at item Emba-5), No. 4 (at item Emba-5), No. 5 (Emba-5) are revealed the content of copper from 0.063 to 0.073 mg/l. The maintenance of radionuclides of Sr-90 in water didn't exceed maximum allowable concentration; however presence of Cs-137 was noted. In test of the soil in point No. 1 (Emba-5 ground) the increased Copper content (3.91 maximum allowable concentrations), Zinc presence (0.4 maximum allowable concentrations), Lead (0.23 maximum allowable concentrations) is revealed. At all analyses there was Manganese not exceeding maximum allowable concentration. In analyses of the soil in Emba-5 (Zhem), Emba-5 (No. 1 the ground), Emba-5 (No. 2 the ground) the maintenance of Cs-137 was made by from 3.25±2.27 to 4.15±2.90 Bq/kg, the maintenance of Sr-90 made from 5.68±3.98 to 77.15±54.00 Bq/kg.
Contents in vegetation: Cs-137 - the Zhem River – 4.25±2.97 Bq/kg, Emba-5 (t. No. 1, the ground) – 10.78±4.43 Bq/kg and (t. No. 2, the ground) – 13.55±4.11 Bq/kg; Sr-90 - near the Zhem River – 7.28±5.09, Emba-5 (t. No. 1, the ground) – 12.8±8.96 Bq/kg and (t. No. 2, the ground) – 23.9±16.73 Bq/kg. Measurements hum noise scale apart showed 50 cm from the Earth's surface (F-50): in Aktobe – 0.13 mcsv /h, Alga – 0.14 mcsv/h, Mr. Kandyagash - 0.16 mcsv/h, the Emba-5 ground - 0.21 mcsv/h.
CONCLUSIONS: In tests of the soil, water and vegetation of the territory of the ground "Emba-5, Copper content is increased; there are heavy metals (zinc, lead, manganese) and techno genic radionuclides (Cs-137 and Sr-90). The gamma hum noise is higher, than regional average indicators.

The comparative analysis of results of screening of the mammary gland in the Aktobe region

K.M. Kibatayev[1] *, A.K. Amreev[2] , G.M. Urgushbayeva[1], A.K. Zhakan[1], G.Zh. Kandygulova[1], Zh.M. Abilova[1]

[1]West Kazakhstan State Medical University of Marat Ospanov, [2]Regional Management of Health Care Aktobe, Republic of Kazakhstan

*Corresponding author: Kozy M. Kibatayev, West Kazakhstan State Medical University of Marat Ospanov, Aktobe, Kazakhstan.
E-mail: kibatai@mail.ru

BACKGROUND: Frequency of diseases of mammary glands steadily grows in recent years. Various pathology of the Mammary gland occurs approximately in 25% of women aged up to 30 years and at 60% of women 40 years are more senior. The undoubted threat of life and to health of the woman is represented by a breast cancer which steadily keeps the first place in structure of oncological incidence and mortality among women in the developed countries including in Kazakhstan. Therefore the problem of diagnosis of diseases of a mammary gland, so far, remains extremely relevant.
Research objective: To carry out the comparative analysis of incidence of a mammary gland of women of the Aktobe region by results of a mammography research.

METHODS: The analysis of data of screening of a mammary gland of women of the Aktobe region for 2014 and 2018. The second reading was carried out in the ZKGMU Medical center of Marat Ospanov. The report is submitted on BIRADS scale. In total underwent reading a mammogram of 16314 women for 2014 and 17406 women for 2018, at the age of 50-60 years.
RESULTS: In 2018 the number of the examined women increased in comparison with 2014 by 6.7%. In 2014 on BIRADS scale, above regional average these inhering's to the 2nd category (cysts, lipomas) women in Bayganinskom (62%), by Mugolzharsk (61.0), Uilsk (62.8) and Kobdinsk (58.9) areas are revealed. Falling into the 3rd category BIRADS, above regional average data, are revealed in Kobdinskom (13.5%), Kargalinsk (14.1%) areas and Aktobe (9.3%). To the 4th category, demanding the morphological analysis by realization of a puncture biopsy, women of Irgizsky district (1.1%), Khromtau District (1.15) and Aktobe (0.8%) were carried. The women having strong indications of breast cancer on mammograms are revealed in Mugolzharsky district (1.1%), Shalkarsky district (1.1%) and Aktobe (0.04%). In 2018 the number carried to BIRADS M4 increased by 31 women and made 0.8% of investigated against 0.6% in 2014. The women belonging to BIRADS M5 increased by 15 that made 0.1% of investigated (0.04% in 2014). In 2018 around the city Aktobe women of inhering's to BIRADS M5 made 0.1% of number surveyed (in 2014 - 0.04%). It should be noted increase in the women carried to BIRADS M4 and BIRADS M5 in Alginsky, Hobdinsky, Mugalzharsky and Khromtau districts.
CONCLUSIONS: 1) In 2018 the number of mammography researches increased by 6.7%, 2) On area the number of the women carried to BIRADS M4 (by 2.5 times) and BIRADS M5 increased (by 2.5 times). 3) Body height of indexes on incidence of a mammary gland on scales of BIRADS M4 and BIRADS M5 are revealed in the industrial regions of area (Alginsky, Khromtau, Mugalzharsky) and Aktobe.

Incidence of the population of the Mugalzhar district of the Aktobe region

K.M. Kibatayev*, S.K. Sakhanova, G.M. Urgushbayeva, N.Zh. Zholdassova, K.B. Tazhgarina, K.N. Shayakhmetova

West Kazakhstan state medical university of Marat Ospanov, Aktobe, Republic of Kazakhstan

*Corresponding author: Kozy M. Kibatayev, West Kazakhstan state medical university of Marat Ospanov, Aktobe, Kazakhstan.
E-mail: kibatai@mail.ru

BACKGROUND: The military proving ground "Emba – 5" (the total area of 791 thousand hectares) was located in the territory of the Aktobe region. In 1963 on the ground the first tests are begun. In 1993-1999 on the ground tests of anti-aircraft missile systems were most often carried out: "Circle", "Cube", "Buk", "Torahs", "Wasp", "C-300B", "Tungus", means of air defense, operational and tactical short-range missiles.
In 2016 the territory of the Emba-5 ground is transferred to the Republic of Kazakhstan for use for the benefit of the businessmen who are engaged in agriculture, the organizations of the minerals which are carrying out activity in the field of exploration and production.
Purpose: Research of the state of health of the population of Mugalzharsky district of the Aktobe region (territory of the ground "Emba-5).
Tasks: To study incidence and mortality of the population of the Mugalzharsky district which is in a zone of influence of the former military proving ground "Emba – 5".
METHODS: The retrospective analysis of incidence and mortality of the population of Mugalzharsky district (from 1995 to 1999, 2006-2007 and 2016-2017) was carried out according to the central district hospital and the Aktobe regional management of health care.
RESULTS: According to Mugalzharsky district hospital the number of the registered diseases revealed for the first time on the area in 1995 made 63.0% of average incidence on area counting on 100,000 population. Mortality for 26.4% was below regional average data. In 1996 sharp increase in incidence is noted (for 40.5% in comparison with 1995) and reaches the level of a regional average indicator. However, decrease in death rate is noted. Indexes of incidence and mortality in 1997 tend to decrease, with small rise in 1998. By 1999 the incidence decreased by 3.37 times, mortality by 2.5 times in comparison with regional average data. In 2006 the incidence on the area (in comparison with 1999) grew almost by 3.7 times, mortality increased by 3.1 times and exceeded a regional average indicator for 35.3%. At the same time data on incidence on SVA No 1 Zhem are higher the midway and approached a regional average indicator, however mortality is lower, than on average in the area. Data on the area on incidence in 2016 were higher regional average for 22.9%, on mortality for 21.5%. In 2017 the incidence on the area was above regional average data for 11.7%, mortality for 9.0%
CONCLUSIONS: 1) Low indexes of incidence and mortality in 1995-1999, apparently, it is bound to privacy of the proving ground and lack of a reliable data; 2) Body height of indexes in 2006-2007 and excess of indexes in 2016 and 2017 of regional average data assumes a possibility of influence of the factors (chemical and physical) arising on proving grounds, on the state of health of residents of settlements adjacent to the ground (including remote a consequence).

Analysis of complications associated with higher order compared to lower order cesarean sections performed in the Aktobe Tertiary Care Center

Ibrahim Abdelazim[1,2], A. Alanwar[1,2], Svetlana Shikanova[3], Gulmira A. Zhurabekova[4] *, Kanshaiym Z. Sakiyeva[3]

[1]Department of Obstetrics and Gynecology, Ain Shams University, Cairo, Egypt; [2]Department of Obstetrics and Gynecology, Ahmadi Hospital, Kuwait Oil Company (KOC), Kuwait; [3]Department of Obstetrics and Gynecology No.1, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan; [4]Department of Normal and Topographical Anatomy, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan

*Corresponding author: Gulmira A. Zhurabekova, Department of Normal and Topographical Anatomy, West Kazakhstan Marat Ospanov State Medical University, Aktobe, Kazakhstan.
E-mail: zhurabekova@inbox.ru

BACKGROUND: To date, approximately 20-30% and even more of women who have a cesarean section (C-section) in history (if there is no reason why a cesarean section was performed in previous births and other contraindications) are given an attempt to give birth on their own. About 60% of such births go well, in other cases, a repeated C-section is performed. The Aktobe Regional Tertiary Care Center is a state-sponsored institution which provides all kinds of obstetric aid to female population of the region and also runs repeat C-sections. Total number of deliveries within a year usually exceeds 7,000 deliveries, of them approximately 10-12% are C-sections. Hence, the issue on how to prevent possible complications while a surgery of higher order are being run is of great interest of obstetricians.
METHODS: The present study was aimed to analyze a nature and frequency of complications which took place while higher order C-section performed. Medical records of a total 450 women undergoing repeat operative births within 2017-2018 were selected according to Inclusion criteria and divided into two groups: who had ≥3 previous C-sections (group 1) and those who experienced previous one C-section (group 2) to evaluate the complications associated with higher order compared to lower order C-sections.
The following issues were in focus of the researchers: total number of postoperative bed-days through both groups, site of the injuries while surgery if the injuries occurred, amount of bleeding, total duration of the surgery, total timing of the access to uterus, state of the newborn by the Apgar scale. Non-parametric operational tests were used due to a priori missing a normal distribution. To analyze the quantitative variables in two independent samples the Mann-Whitney (U) test and the Pearson's χ^2 test for frequencies comparison were performed. To identify the relationship between the studied values the Spearman's correlation analysis was applied. SPSS Statistics.v.20 software (IBM, Armonk, NY, USA) was applied for calculations. For all tests a two-side type I error of $p \leq 0.05$ or less at 95% CI was assumed statistically significant.
RESULTS: Of a total 450 women undergoing repeat C-section 32.2% (145/450) had ≥3 previous C-sections and 67.8% (305/450) had previous one C-section. There were no significant links revealed on the state of newborns (χ^2 5.3, p 0.09) between groups and total duration of the surgery (χ^2 9.3, p 0.06). The dense omental adhesions were presented significantly higher in women with previous ≥3 cesarean sections compared to women who had previous one C-section (χ^2 93.3, p 0.001), Spearman's r 0.73. Bladder, bowel injuries, cesarean hysterectomies and blood transfusions were also significantly higher in women with >3 previous cesarean sections compared to women with previous one C-section (χ^2 99.1, $p \leq 0.0001$).
CONCLUSION: Overall, contraindications for further potential births should be strictly observed to avoid unfavorable outcomes while repeat cesarean section. Women should be aware of the potential risk of surgical births of higher order.