

Mini-Case: Endochondral Ossification

(reference: Text book Saladin Page209-215)

Part A.

A race between two runners is often used as an analogy to describe the mechanism of endochondral ossification. Review endochondral ossification. In endochondral ossification, who are the two runners? Did each runner begin the race at the same time? Who is in the lead? How does the race end?

Part B.

What roles do osteoclasts and osteocytes play in endochondral ossification?

Part C.

8-year old Sandra breaks her left leg in a car accident. X-rays indicate that her left femur is fractured at the epiphyseal plate. The bone fracture eventually heals. Years later, Sandra begins to notice that her right leg is slightly longer than her left leg. What might account for the difference in length between Sandra's two legs? Explain Sandra's condition with respect to the race that you described in part A.

Part D.

20-year old Sandra begins to worry about her lopsided legs. She wonders if her right leg will continue to grow longer than her left. Sandra consults a doctor who takes an x-ray of each of her femurs. After the x-ray, the doctor informs Sandra that she has reached full height; she should expect no further difference in length between the two legs. How did the doctor use the x-rays to determine that Sandra had reached full height?

Mini-case Hormones& Bone Growth

(reference: Text book Saladin Page215-219)

Part A.

6-year old Jose inherited a disorder that increases the activity of cells in his pituitary gland. Therefore, Jose experiences an overproduction of growth hormone (GH) before puberty. What effect would you predict this will have on his height? Explain.

Part B.

Russell enters puberty ~5 years later than average age. What effect would you predict this will have on his height? Explain.

Part C.

A race between two runners is often used as an analogy to describe the mechanism of endochondral ossification. Review endochondral ossification. How does each of the above cases relate to the “race” during endochondral ossification?

Part D.

Form a hypothesis for why adult women are typically shorter than adult men.