

Questions W3: Bones & Joints

1. You begin exercising heavily: you lift weights three times per week, and run with a 10kg backpack twice per week.
 - a. What will happen to your bones in response to these exercises?
 - b. **Why** does this happen (tell me the mechanism involved)?
 - c. What type of bone cell is responsible for these changes?
2. You suddenly stop ingesting calcium, **but** continue to exercise heavily.
 - a. What hormone will be secreted in response?
 - b. What will happen to your bones now?
 - c. Name the bone cell responsible for these changes, and explain its job.
3. Consider your hip and shoulder joints:
 - a. Structurally, what are the commonalities between these joints?
 - b. What movements are both capable of?
 - c. Now, explain (**give 3 reasons**) why the hip joint is very stable, while the shoulder joint is very unstable.
4. Please explain **three** major differences between endochondral and intramembraneous ossification.
5. Draw (from memory if possible) a cross section of a long bone, labeling, osteons, periosteum, endosteum, central canals, canaliculi, lacunae, osteocytes, and all types of lamellae.
6. The following data shows changes in rate of hip fracture in Hong Kong women of various ages. Over the 20 year period documented, rates of hip fracture in all age groups have **doubled**. This change has occurred along with a general **improvement** in nutritional profile as the population has become more industrialized, but *also* more sedentary. Please explain why this trend might be occurring and explain why it should be more pronounced in women than in men.

