

Study Guide — HBS Unit 1: Road to Rehabilitation (End-of-Unit Test)

Human Body Systems · Unit 1 — Road to Rehabilitation · Modeled on the PLTW Guided Review format

Vocabulary to know cold

Term	Definition
Oste/o	Combining form meaning bone.
My/o	Combining form meaning muscle.
Arthr/o	Combining form meaning joint.
Chondr/o	Combining form meaning cartilage.
Medial / Lateral	Medial = toward the midline; lateral = away from the midline.
Proximal / Distal	Proximal = nearer the trunk; distal = farther from the trunk.
-itis / -ectomy / -scopy	Suffixes: inflammation / surgical removal / visual examination.
Plantar flexion / Dorsiflexion	Pointing toes down / lifting toes up.
Hinge / Pivot / Ball-and-socket	One-plane bending / rotation / all-plane movement with rotation.
Sprain vs. Strain	Sprain = ligament injury; strain = muscle/tendon injury.
Antagonist pair	Opposing muscles; one flexes while the other extends a joint.
Compact vs. spongy bone	Dense, strong shaft tissue vs. lightweight marrow-filled end tissue.
Range of motion (ROM)	Degree of movement at a joint, tracked during rehabilitation.

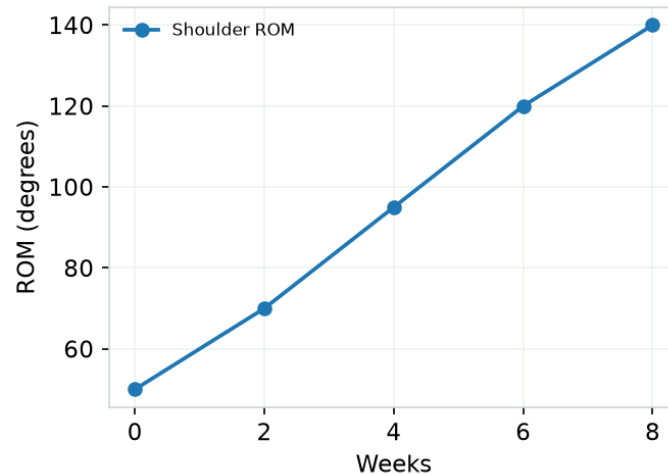
Worked examples (follow the reasoning)

Example 1. A runner has Achilles tendon damage. Explain, using anatomy and terminology, why they cannot push off the ground.

- Locate the Achilles tendon: it connects the calf muscles to the heel bone (calcaneus).
- Recall the tendon's job: it transmits the calf muscle's pull to produce plantar flexion (pointing the foot down).
- Pushing off the ground requires plantar flexion to drive the body forward.
- With the tendon damaged, the pulling force can't reach the foot, so plantar flexion fails.

Answer: The Achilles tendon enables plantar flexion; when it is damaged the calf muscle cannot point the foot down, so the runner cannot push off.

Example 2. Interpret a rehab line graph and decide whether the program is working.



- Read the starting value: 50° at week 0.
- Read the final value: 140° at week 8.
- Compute the change: $140^\circ - 50^\circ = 90^\circ$ improvement.
- Note the line rises at every interval, showing a steady positive trend.

Answer: Yes — shoulder ROM rose steadily by 90° over 8 weeks, indicating the rehabilitation program is effective.

Example 3. Build the term for 'inflammation of bone and joint' from its parts and define it.

- Choose 'oste/o' for bone.
- Choose 'arthr/o' for joint.
- Add the suffix '-itis' for inflammation.
- Combine: oste/o + arthr/o + itis.

Answer: Osteoarthritis = inflammation of bone and joint (a degenerative joint disease).

Practice questions (with reasoning)

1. In anatomical position, which describes the relationship of the elbow to the shoulder?

- A. Proximal
- B. Distal
- C. Medial
- D. Superior

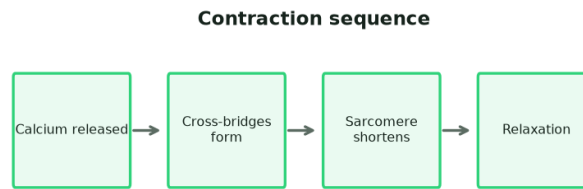
Answer: B. The elbow is distal (farther from the trunk) relative to the shoulder.

2. Which joint type allows the greatest range of motion, including rotation?

- A. Hinge
- B. Pivot
- C. Ball-and-socket
- D. Gliding

Answer: C. Ball-and-socket joints (shoulder, hip) move in all planes and rotate.

3. Order the muscle contraction steps: I) sarcomere shortens, II) calcium released, III) cross-bridges form, IV) relaxation.



A. I, II, III, IV

B. II, III, I, IV

C. III, II, I, IV

D. II, I, III, IV

Answer: B. Calcium release → cross-bridges form → sarcomere shortens → relaxation (II, III, I, IV).

4. A patient stretches but does not tear a calf muscle during exercise. This minor muscle injury is a:

A. Sprain

B. Strain

C. Fracture

D. Dislocation

Answer: B. Muscle/tendon injuries are strains; this is a mild calf strain.

5. Why do clinicians measure both the injured and uninjured limbs during rehab assessment?

A. To waste time

B. To provide a baseline comparison (control) for tracking recovery

C. Because the injured limb has no data

D. To diagnose unrelated diseases

Answer: B. Comparing to the healthy limb provides a control/baseline, sound experimental design applied to clinical data.