A Review of Safe Lifting Techniques

Back Safety: Return To Work Programs and Safe Lifting Techniques

Section 3: A Review of Safe Lifting Techniques

[learner name]



1. Back Safety: Return To Work Programs and S…

Introduction

After a brief review of safe lifting techniques and signs that a patient is exerting themself, you will watch a number of videos that also review safe lifting techniques.

Because our patients are so unique, and each will have their own demands and deficits, it is important to take your existing knowledge with any learned in this course and apply it to each individual patient.

2. Introduction

Correct Neutral Posture

OSHA (Occupational Safety and Health Administration) defines correct neutral posture as follows:

"(The correct) postures where the body is aligned and balanced while sitting or standing: the head is kept upright and is not turned to either side more than 30 degrees or tilted forward or backward more than about 15 degrees.

When the worker is standing, the torso is not bent more than 10 to 20 degrees from the vertical position and the natural curves of the spine are maintained.

The pelvis and shoulders should face straight ahead to avoid twisting the torso.

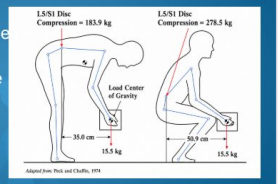
The shoulders are relaxed and knees slightly bent.

The arms hang normally at the side, with elbows close to the body. "

3. Correct Neutral Posture

OSHA Definition (cont.)

"The elbows are not bent more than about 90 degrees and the palms face in toward each other and the center line of the body.



The wrists are in line with the forearms and are not bent sideways, forward (towards the palm), or backward (towards the back of the hand.)

When the worker is seated, the buttocks and feet are firmly supported."

OSHA Ergonomic Principles Index (Lifting)

4. OSHA Definition (cont.)

Planning a Lift

Safe lifting requires PLANNING:

- Assess the load and check overall condition;
- Check route for obstacles and a clear path (be careful in a busy setting--this can change quickly);
- Use mechanical aids when possible;
- Break down large and heavy loads (avoid the "lazy-man-load," where you try to carry as much as possible to decrease the number of trips you have to make);
- Know your limits;
- Seek help if necessary; and
- Use extra caution with awkward loads/lifts.

5. Planning a Lift

Safe-Lifting Leverage

The optimum safe lifting zone is close to the body, between mid-thigh to mid-chest height.



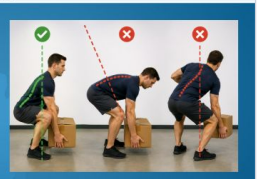
This is the safest area for lifts, because this is where a person's upper body and back muscles can lift the most with the least amount of effort.

Keep the object as close to the body as you are able to (decreasing torque on the body).

6. Safe-Lifting Leverage

Safe Lifting - Trunk Alignment

For safe lifting, the vertical trunk alignment should be within 10 degrees of vertical.



The spine should be straight (normal curvature of the spine).

Vertical trunk alignment is not always possible, and when it isn't, make sure the spine is straight.

If possible, do not rotate the trunk.

7. Safe Lifting - Trunk Alignment

Safe Lifting - Speed

Excessive speeds with lifting should be avoided due to increased **peak spinal compressive force.**

These forces are most noted at the L5/S1 vertebral segment, aka the lumbosacral joint (*Greenland, 2013*).

Lifts that are too slow can also be dangerous.

Cumulative spinal compressive loading forces are much greater with slower lifting tasks.

Some research suggests that faster lifting of heavy objects would reduce the exposure time, and is likely less hazardous than slow lifting (*Greenland, 2013*).

However, most feel that a moderate pace is best when performing a dynamic lift.

8. Safe Lifting - Speed



9. Slide 9

Safe Lifting - Lower Legs

For safe lifting, bend at the hips and knees as much as possible.

Place feet shoulder width apart, with one foot beside and the other foot behind the object that is being lifted, strongest leg in back.

The knee that has the least ROM should be beside the box. (The knee beside the box only has to bend to about 90 degrees, and if the hip is abducted even further, it can alter the lift so the knee will bend even less.)

Pivot and weight shift as appropriate.

Do not "plant" the feet; this can cause shearing stress on the knees, hips, and ankles, causing ligament or cartilage tears or sprains.

10. Safe Lifting - Lower Legs

Dynamic Lifts

The following are the types of dynamic lifts:

- Floor to waist;
- Waist to overhead;
- Push/pull; and
- Bilateral or unilateral carry.



11. Dynamic Lifts

Physical Effort

There are believed to be certain signs of **physical effort** that can be utilized to determine lifting performance. Therapists should watch for these signs of physical effort during a persons lift to determine when the lift is becoming unsafe.

The number of signs of physical effort present during a lift does not determine if the lift is safe or not.

For example, if a person's face reddens, he uses accessory muscles for the lift, and comes up on tip toes to reach the shelf with the object, it does not mean that the lift is unsafe.

It is the therapist's job to determine when a lift should be stopped.

Education should be given as well so the patient is better able to determine when he/she should stop a task and/or seek assistance for the lift.

Assistance can be via a tool or another person.

12. Physical Effort

Signs of Physical Effort

The following are the dynamic strength signs of physical effort:

- Use of accessory muscles;
- Elbow extension;
- Posterior trunk lean;
- Loss or inability to maintain trunk in vertical alignment;
- Difficulty holding/grasping box/controlling box;
- Increased blood pressure or heart rate;
- Shoulder girdle position;
- Throwing box/object in an uncontrolled manner;
- Speed of lift;
- Shaking or quivering of muscles; and
- Pain

13. Signs of Physical Effort

Use of Accessory Muscles (Signs of Physical Effort cont.)

Excessive use of shoulder girdle muscles, arm muscles, neck muscles, or even calf muscles during a lift.



14. Use of Accessory Muscles (Signs of Physical…

Elbow Extension (Signs of Physical Effort cont.)

Arms are too weak to maintain elbow flexion and the patient is relying on ligaments and bones to assist in holding an object.



15. Elbow Extension (Signs of Physical Effort con…

Posterior Trunk Lean (Signs of Physical Effort cont.)

Throwing the body weight back, trying to use momentum to lift an object.

This puts excessive pressure on the vertebral column in the lumbar area.



16. Posterior Trunk Lean (Signs of Physical Effort…

Maintaining Trunk In Vertical Alignment (Signs of Physical Effort cont.)

The loss or inability to maintain vertical trunk alignment may occur when a person is unable to assume a full squat when reaching for an item. Weakness of leg or back muscles can also make it difficult to maintain vertical trunk alignment.

Vertical trunk alignment is important for determining a "safe" vs. "unsafe" lift.

Many therapists feel that this is the single most important factor for determining if a lift is safe or not.

17. Maintaining Trunk In Vertical Alignment (Sign…

Trunk Posture Study (Signs of Physical Effort cont.)

One study focused on static trunk postures during a typical workday of workers in a school for children with severe handicaps and its relationship to LBP.

Although there were some weaknesses in the study, such as a relatively small subject group of 33 participants, the findings suggest that subjects with LBP, spent a significantly longer time in static trunk postures when compared to normal, and they also spent a longer time in trunk flexion of more than 10 degrees *(Wong, Lee & Yeung, 2009).*

18. Trunk Posture Study (Signs of Physical Effort…

Difficulty Holding/Grasping/Controlling Box (Signs of Physical Effort cont.)

Handles are not available or the box is too wide to get a decent grip, which makes the task unsafe.



19. Difficulty Holding/Grasping/Controlling Box (Si…

Increased Blood Pressure or Heart Rate (Signs of Physical Effort cont.)

The patient should consider wearing a heart rate monitor.

People often unintentionally or unknowingly use the "Valsalva Maneuver" to provide stability for heavy lifting tasks.

However, this is dangerous because it can increase intra-abdominal pressure, and thus increase blood pressures causing dizziness and a potential to pass out upon standing, aka orthostatic hypertension.

20. Increased Blood Pressure or Heart Rate (Sign…

Shoulder Girdle Position (Signs of Physical Effort cont.)

Although some shoulder depression is expected, too much or excessive shoulder movement with heavy lifting can cause musculoskeletal disorders.

Poor shoulder stabilization can cause damage to the shoulder girdle.

With lifting, scapular depression, protraction, or a combination may occur, and should be monitored.

21. Shoulder Girdle Position (Signs of Physical Ef…

Uncontrolled Throwing of Object (Signs of Physical Effort cont.)

The person may be attempting to use momentum to assist in the lift, making the task unsafe.

Muscles and ligaments are more likely to be damaged in high-speed lifts than slower controlled lifts.

When patients use momentum to assist in the lift, they can cause an injury before they even feel the pain.

22. Uncontrolled Throwing of Object (Signs of Ph…

Speed of Lift (Signs of Physical Effort cont.)

As mentioned earlier, excessive speeds with lifting should also be avoided due to increased peak back compressive force.

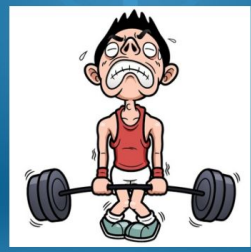
These forces are most noted at the L5/S1 vertebral joint *(Greenland, 2013)*.

Lifts that are too slow can also be dangerous due to cumulative spinal compression *(Greenland, 2013)*.

23. Speed of Lift (Signs of Physical Effort cont.)

Shaking or Quivering of Muscles (Signs of Physical Effort cont.)

This is most likely due to weakness or muscles reaching near maximum effort and fatigue.



24. Shaking or Quivering of Muscles (Signs of Ph…

Pain and Perceived Exertion

Signs of pain and perceived exertion should be monitored during dynamic lifting tasks.

Use Visual Analog Scale and Rate of Perceived Exertion Scale.

25. Pain and Perceived Exertion

Best Lifting Techniques

Remember, that because each person is different we cannot always teach our patients the same lift and may have to alter a lift to the "safest lift" a person can do.

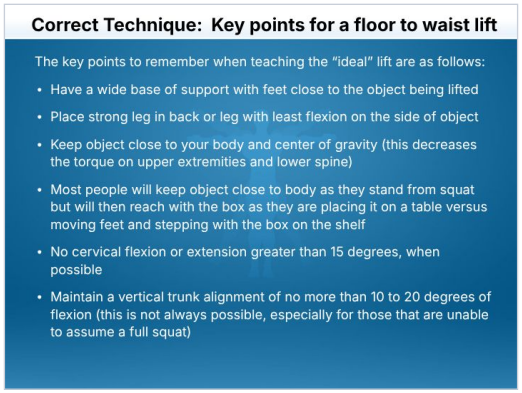
An individual may have the following:

- Limited knee flexion due to Osteoarthritis (OA) or a TKR;
- Limited hip flexion due to OA or a THR;
- Limited hip abduction due to OA or joint pathology;
- Limited elbow flexion/extension; and/or
- Weakness in one extremity more than others.

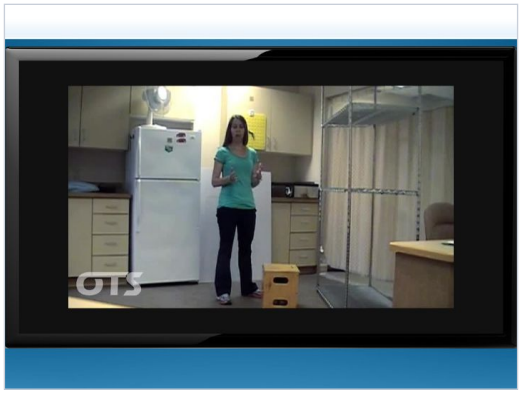
26. Best Lifting Techniques



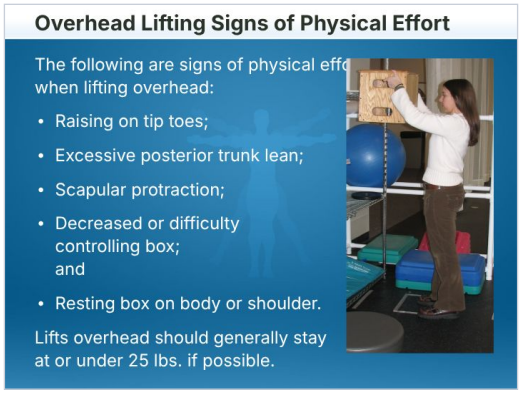
27. Slide 27



28. Correct Technique: Key points for a floor to w…



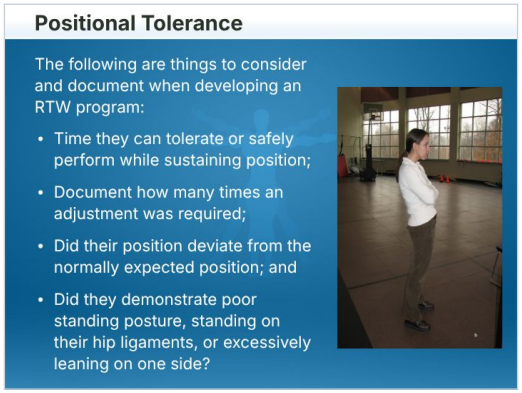
29. Slide 29



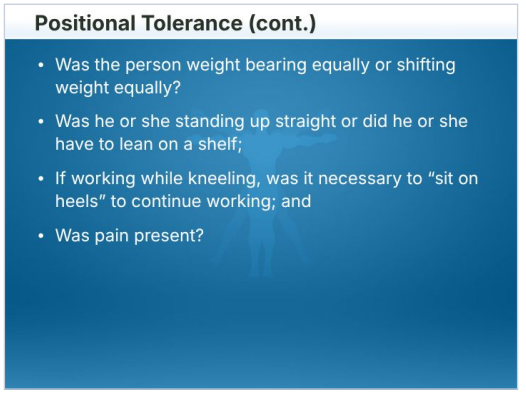
30. Overhead Lifting Signs of Physical Effort



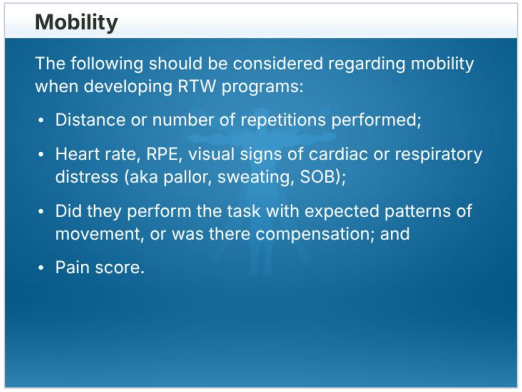
31. Slide 31



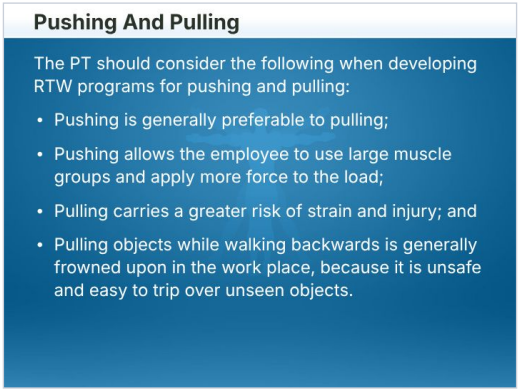
32. Positional Tolerance



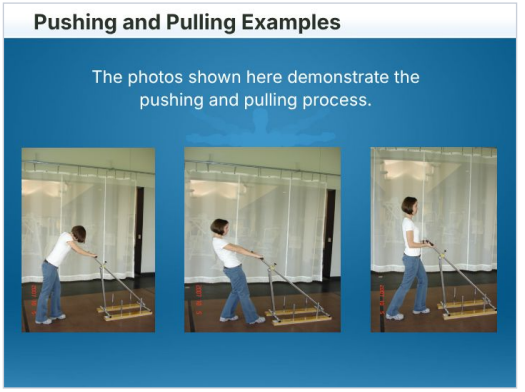
33. Positional Tolerance (cont.)



34. Mobility



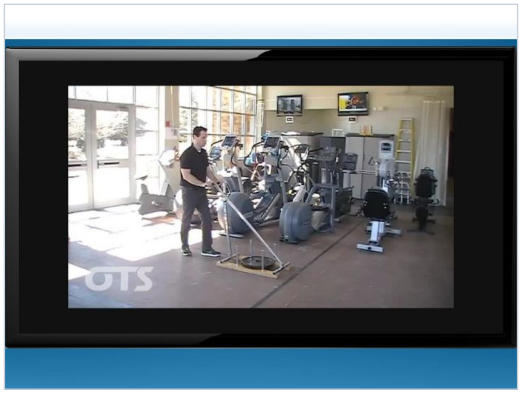
35. Pushing And Pulling



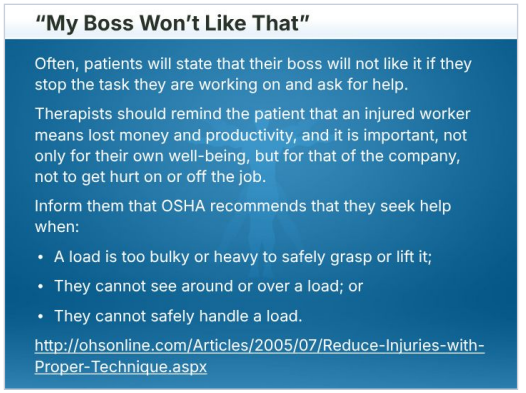
36. Pushing and Pulling Examples



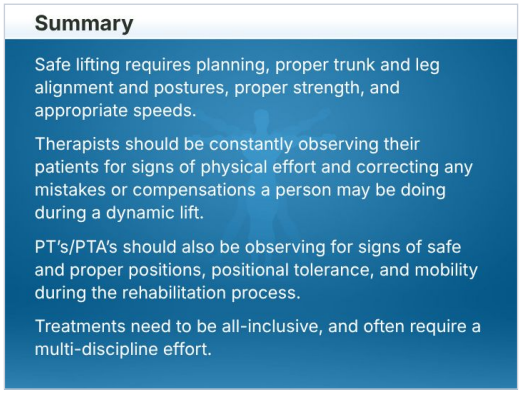
37. Slide 37



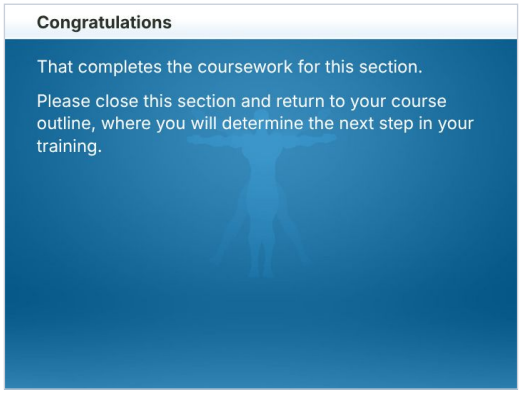
38. Slide 38



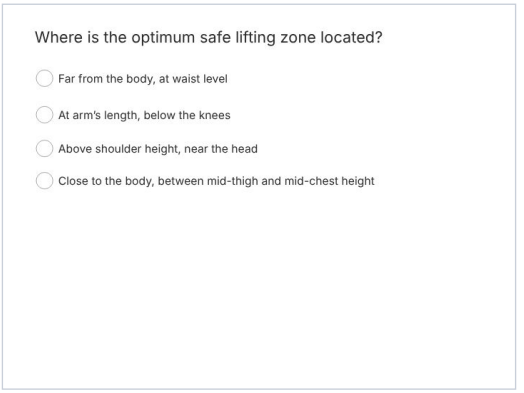
39. "My Boss Won't Like That"



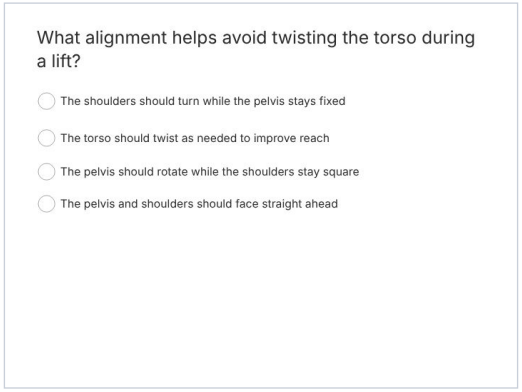
40. Summary



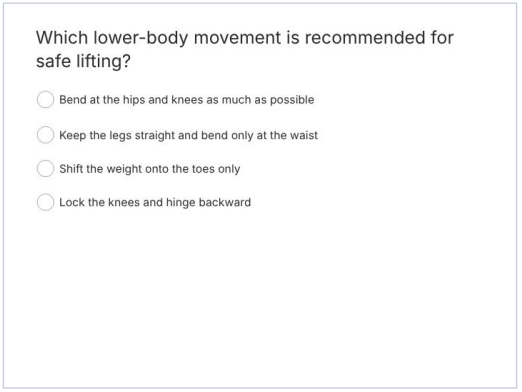
41. Congratulations



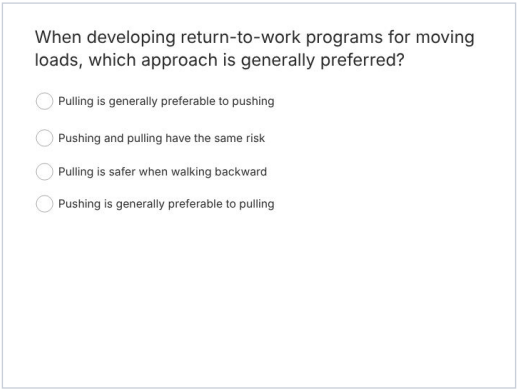
42. Where is the optimum safe lifting zone locate…



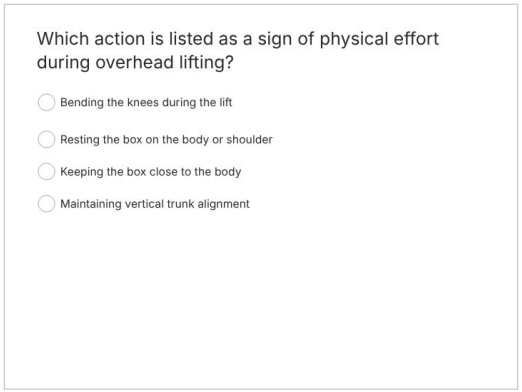
43. What alignment helps avoid twisting the torso…



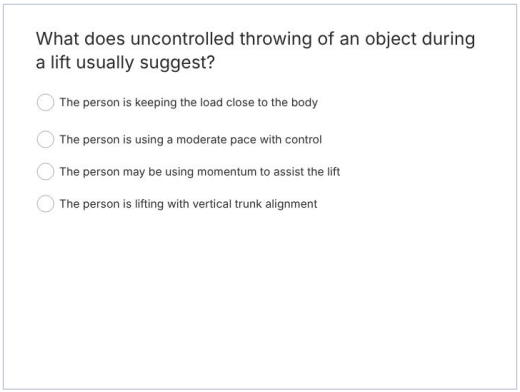
44. Which lower-body movement is recommende…



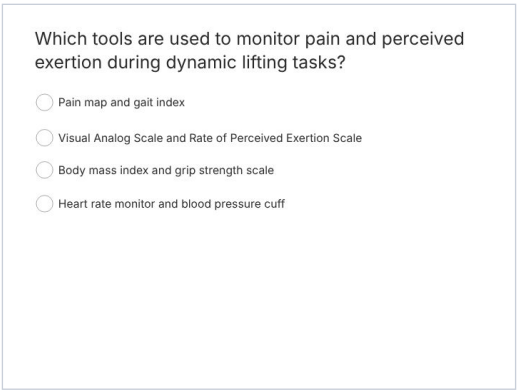
45. When developing return-to-work programs for…



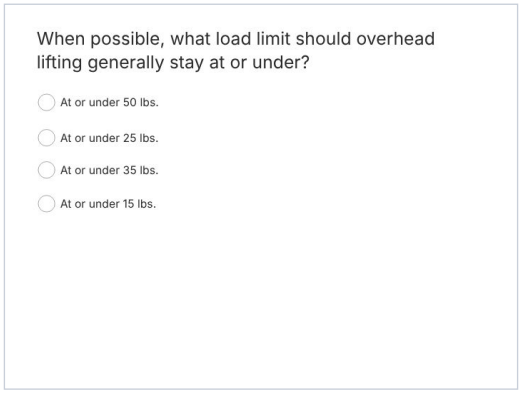
46. Which action is listed as a sign of physical eff…



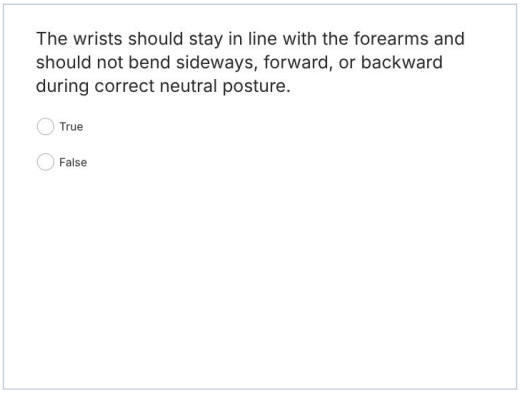
47. What does uncontrolled throwing of an object…



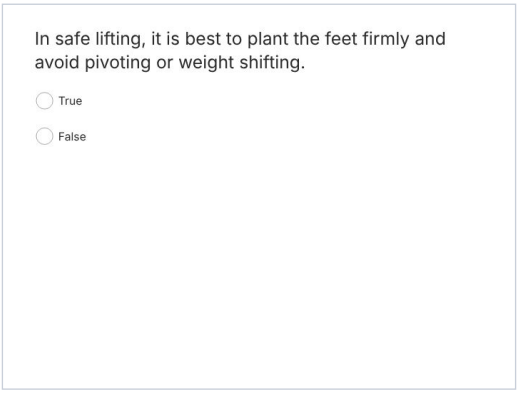
48. Which tools are used to monitor pain and perc…



49. When possible, what load limit should overhe…



50. The wrists should stay in line with the forearm…



51. In safe lifting, it is best to plant the feet firmly…