



Development of innovative training solutions in the field of functional evaluation aimed at updating of the curricula of health sciences schools



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MODULE BIOMECHANICS OF SPINE

Didactic Unit D: INSTRUMENTED ANALYSIS OF THE SPINE

D.4. How is a normal biomechanical assessment of the lumbar spine?

Self-Questionnaire

Self-questionnaire:

- Self-questionnaire aimed to test the knowledge acquired.
- It will include 5 objective questions with 4 answer options.
- Mark in bold the correct answer.

Type of questions:

- **Drag and drop into text:** Students select missing words or phrases and add them to the text by dragging boxes to the correct location. Items may be grouped and used more than once.
- **Drag and drop markers:** Students drop markers onto a selected area on a background image. Unlike the drag and drop onto image question type, there are no predefined areas on the underlying that are visible to the student.
- **Drag and drop onto image:** Students make selections by dragging text, images or both to predefined boxes on a background image. Items may be grouped.
- **Matching:** A list of sub-questions is provided, along with a list of answers. The respondent must “match” the correct answers with each question.
- **Multichoice:** With the multichoice question type you can create single-answer and multiple-answer questions, include pictures, sound or other media in the question and/or answer options and weight individual answers.
- **Select missing words:** Students select a missing word or phrase from a dropdown menu. Items may be grouped and used more than once.
- **True/False:** In response to a question (that may include an image), the respondent selects from two options: True or False.

Question 1

Drag the correct word to the appropriate sentence and place. Two words are not used.

inclinometry

reaction force

myoelectric silence

hip

ranges

velocity

photogrammetry

electromyography

isokinetic

By means of an ... **isokinetic** ... assessment, the spinal extensor/flexor muscles ratio can be determined.

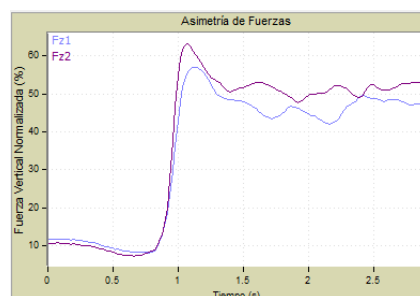
Angular... **velocity** ... is biomechanical information that can be obtained with **photogrammetry**... measuring equipment.

To measure the lumbar range of motion, we can use a dual **inclinometry** technique.

In people without pain or lumbar pathologies, ... **myoelectric silence** ... is not usually found, which is recorded using ... **electromyography** ...

In lumbar spine flexion, **hip**.... flexion must be taken into account.

Question 2



Fz1 represents the reaction force of the right lower limb and Fz2 the reaction force of the left side during the performance of an activity (in this case, the activity is rising from a chair). Look at the graph, is there an asymmetry in the load distribution between the lower limbs?

- A Yes, there is a decreased vertical force on the left side.
- B Support asymmetries cannot be detected with the reaction forces.
- C Yes, on both sides, with a decreased vertical force with respect to the normal values.
- D **There is no asymmetry when rising, but at the end of the movement, during the stabilization in the standing position, there is more support on the left side.**

Question 3

Both photogrammetry and surface electromyography are instrumental techniques for biomechanical analysis that can be used to assess any aspect related to the movement of a person with low back pain.

- A **True**
- B False
- C True, but only in radicular injuries.
- D False. These measuring techniques are only used in gait analysis.

Question 4

Which parameter cannot be obtained with an analysis of the lumbar spine using photogrammetry or inertial techniques?

- A Angular acceleration of the spine.
- B Approximation to the range of motion of the lumbar spine.
- C **Reaction force.**
- D Angular velocity of the spine.

Question 5

Match the instrumental technique used in a biomechanical test of the lumbar spine with its result.

- | | |
|---|------------------------------------|
| <input type="checkbox"/> Myoelectric silence b | a. Dynamometric platform |
| <input type="checkbox"/> Peak of muscle strength d | b. Surface electromyography |
| <input type="checkbox"/> Angular acceleration c | c. Photogrammetry |
| <input type="checkbox"/> Reaction force a | d. Isokinetics |



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