Supplementary file 1: Shoulder muscles strengthening program.

<table>
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<th>EXERCISES PROGRAM</th>
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<tr>
<td>A) SHOULDER EXTERNAL ROTATION</td>
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<tr>
<td>1. Shoulder external rotation at 0°</td>
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<tr>
<td>- Hold a weight in your hand.</td>
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<tr>
<td>- Lie on the opposite side of the hand holding the weight.</td>
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<tr>
<td>- With the trunk upright, flex the elbow 90 degrees. Tighten the abs.</td>
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<tr>
<td>- Lift the weight so that your hand is upward, keeping your elbow at 90 degrees.</td>
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<tr>
<td>2. Shoulder external rotation at 45°</td>
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<tr>
<td>- Hold a weight in your hand.</td>
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<tr>
<td>- With the trunk upright, flex the elbow 90 degrees. Tighten the abs.</td>
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<tr>
<td>- Lift your arm to 90° of abduction while</td>
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Keeping your elbow flexed at 90°.
- Lift the weight in order to bring your hand upwards and backwards while keeping your elbow flexed at 90° and your arm abducted at 45°.

### B) SHOULDER INTERNAL ROTATION

1. **Shoulder internal rotation at 0°**
   - Tie an elastic band level to your hips. Turn aside.
   - With your trunk straight, flex the elbow 90 degrees. Tighten the abs.
   - Pull the elastic to bring the hand from the outside to the inside, make sure that the elbow does not take off from the body. Keep the elbow at 90°.

### C) ARM ELEVATION (SCAPTION)

1. **Scaption with weight**
   - Use a weight to make the scaption movement.
   - Raise your arm by keeping your elbow extended in a 45° motion plane.
   - Do not lift the shoulder up or lean the trunk to the opposite side.
### D) SHOULDER PROTRACTION

**1. Protraction with weight**

- Lie on your back with your knees bent and your back in a neutral position. Contract your abs.
- Raise your arm up to reach 90°. When your arm is upright, push your hand toward the ceiling keeping your back flat, without lifting your shoulders.

![Protraction with weight](image1.png)

### E) SHOULDER EXTENSION

**1. Shoulder extension with an elastic band**

- With both hands, grasp the ends of a rubber band attached at shoulder height.
- Keep your back straight and your shoulders slightly back. Tighten the abdominals, tuck in the chin.

![Shoulder extension with an elastic band](image2.png)
- With arms outstretched, slowly pull backwards so that your hands are shifted to the outside of your hip. Keep your back straight and your shoulders slightly backwards throughout the exercise.

### F) HORIZONTAL ABDUCTION

#### 1. Horizontal abduction with weight

- Lying prone, with your elbow flexed 90° and a weight in each hand.
- Lift your arms up 1 or 2 cm without lifting your shoulders from the table.
- Extend your elbows.
- Flex back your elbows to 90° and lower your arms in the starting position.
G) ELEVATION

1. Elevation with weight

- With arms raised about 30° to the side, bring both shoulders slightly back and towards the eyes.
- Tighten the abdominals, tuck in the chin.