Strengthening, stretching and proprioception program for injury prevention

Given the findings for many of the players for flexibility and strength (last page of the document), we have developed some exercises to help address these issues in the hopes of helping with the development of healthy and well balanced players. Including these exercises as part of the training program pre-season or during season could help prevent injuries, develop stronger athletes and ultimately help with the performance of the team. Most of these issues are deficits commonly found in players who have injuries. Addressing these potential deficits would also help ensure a long and productive club, university or national team career.

Players with specific injuries or issues should consult coaches and/or team therapists before doing these exercises to ensure they are appropriate for them. Exercises should be pain free and done with proper technique and posture. Specific on court volleyball drills and warm-up are not addressed in here but are a key part of performance and injury prevention.

Study and program developped by the therapists of the VC men’s national volleyball team:

Athletes in action:

Photographs, editing and layout by the VC coordinator of the mens’ program:
LOWER BODY strengthening, stretching and proprioception

**Strengthening**

**STEP DOWN**
- Step down from a step (about 6 inches) slowly (3-5 seconds) with an elastic band around your ankle pulling you towards the outside.
- As you go down, make sure your hips stay parallel to the floor, keep your knee aligned with your 2nd toe.
- 4 X 10

**MODIFIED SQUAT**
- With an elastic band around your knees, tight enough as to pull your knees inward, keep your feet shoulder width apart, knees aligned with your toes and perform a squat.
- 4 X 10

**CLAMSHELL**
- Starting position: knees and heels together with an elastic band around your knees, tight enough as to buckle your knees together. Keep your heels together as you put your knees away from each other.
- Make sure you keep your hips facing forward so that you do not turn the pelvis backwards.
- 3x10
LOWER BODY strengthening, stretching and proprioception

**Strengthening**

**SINGLE LEG BRIDGE (Strengthening the gluteus maximus, hamstrings and trunk).**
- One leg is up parallel with the other one with the knee bent. Contract your buttock muscles and lift your gluts up to be in line with the rest of the body. Can also be performed with an elastic band around the knees.
- 3x10

![Single Leg Bridge](image)

**HIP ABDUCTION**
- Put an elastic band around your ankle that is pulling you towards the inside with a good resistance. As you keep your hips parallel to the floor, bring the leg to the side ≈ 40-50 cm and hold it for 5-10 seconds. Then come back in the initial position.
- 3x10

![Hip Abduction](image)

**HEEL RAISE**
- You can start the exercise with the heels in line with or slightly lower the step. Step on your toes and then slowly control your descent. This exercise can be performed with free weights in each hand or with a bar at shoulder level.
- 3x10

![Heel Raise](image)
LOWER BODY strengthening, stretching and proprioception

**Strengthening**

**CORE**

- **Static**: the plank 4 x 30 seconds (things to be careful about: losing form, back pain, muscle twitch, straight back).
- **Side plank**: 4 x 30 seconds each side for both, you need to keep your body in a straight line as much as possible.
- **Bird dog**: lift opposite arm and leg and hold it for 5 seconds and then do the opposite side. *Straight back is really important.
- **3x10**

**Stretching**

**FOAM ROLLER**

RELAXATION OF THE ILIO-TIBIAL BAND

**STRETCHING OF THE ILIO-TIBIAL BAND**
LOWER BODY strengthening, stretching and proprioception

Proprioception

Proprioception/balance exercises should be included in the exercises program to prevent ankle and knee injuries.

**BALANCE BOARD**

- Bipodal (both directions front/back and side to side)
- Unipodal balance (one foot)
- Squat
- While doing balance use a ball as a distraction (passing, throwing ...)

**BOSSU**

- Unipodal (one foot)
- Squat
- Lunge
UPPER BODY strengthening, stretching and proprioception

Strengthening

ROTATOR CUFF
INTERNAL ROTATION

- With an elastic band (adequate strength) in the hand, the arm is up so that the elbow (elbow is bent at 90 degrees) is at the level as the shoulder.
- Keep a good posture with your shoulder blades back and a straight back.
- Turn your arm towards the floor with the elastic until your forearm is almost parallel to the ground, and controlling the movement back.
- 3 x 10

EXTERNAL ROTATION

- Repeat the exercise with the elastic resistance in the other direction and the opposite movement.
- The exercise can also be done with the arm against the body by turning the arm outward or inward.
- 3 x 10

PUSH-UPS

- Keep your body straight and parallel to the ground and activate the core muscles to stabilize the body.
- Go down towards the floor until your elbows are at the same level as your shoulders and back. Do not descend too low to avoid stretching the front of the shoulder.
- 3 x 10
SCAPULAR

- The belly is on an exercise ball or on a bench, your arms are raised so that the elbows (bent at 90 degrees) are at the same level as the shoulders.
- Keep a good posture with your shoulder blades in the back and with a straight back.
- Raise your arms towards the ceiling while squeezing your shoulder blades. Hold for 5 seconds, then release.
- Repeat the same exercise with your arms up just like in a block.
- 3 x 10
UPPER BODY strengthening, stretching and proprioception

Strengthening, stretching and proprioception

PECTORAL MUSCLES

- Stand against a wall with your elbow bent at 90 degrees. Then pull the body away from the wall until you feel a stretch in the front of the shoulder in the chest. Make sure you do not bring the shoulder forward.
- Repeat (3 x 10) the same exercise with your arm slightly higher to stretch the second portion of the pectoral muscle.

POSTERIOR CAPSULE

- Position yourself against a wall or floor with bonded blades back and a good posture.
- Cross arm to shoulder height without the blade forward in order to feel a stretch in the back of your shoulder.
- Hold for 2 seconds and repeat 10 times.

LATISSIMUS DORSI MUSCLE (LAT MUSCLE)

Option 1

- On the ground with knees bent, your forearms are placed so that your palms are facing the ceiling and your elbows and hands are aligned with the shoulders.
- Start with the body up, then go down towards the floor until you feel a stretch in the shoulder or along the blade.
- Hold for 20-30 seconds and repeat twice

Option 2

- Lying on the back with a stick in your hands, palms facing each other and elbows and hands in line with shoulders.
- Raise the arms above your head until you feel a stretch. Make sure to keep your back on the floor.
- Hold for 20-30 seconds and repeat twice.
**EXTERNAL ROTATION OF THE SHOULDER**

- Keep a good posture with shoulder blades back and a straight back.
- With a stick in the hands, turn the arms outward with the elbow pressed against the body until you feel a stretch in the top front of the shoulder.
- Repeat 10 times.
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<th>Musculo-skeletal assessments stats for men volleyball junior national team 2012</th>
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Musculo-skeletal assessments were performed on July 26\textsuperscript{th} 2012 with the 14 players selected to the national junior team. *The core stability has been tested on the 14 FTC (full-time training centre) athletes on September 3rd, 2012. The percentages are rounded and the number next to the percentage represents the numbers of players.*