

SPORTS NEUROMUSCULAR WARM-UP PROTOCOL from Pasanen K, et al.
[Neuromuscular training and the risk of leg injuries in female floorball players: cluster randomised controlled study](#). BMJ. 2008 Jul 1;337:a295.

Neuromuscular training programme

Running exercises (5-7 minutes)

Each training session starts with two minutes' jogging (20 m distance back and forth), then three to four minutes of eight running technique exercises, which are listed below (1 or 2 repetitions each of 20 m distance). The running exercise session ends with a speed run (2-3 repetitions of 20 m distance)

- Carioca running
- Sideways gallop
- Zigzag running forward
- Zigzag running backwards
- Skipping
- Walking lunges × 4-8 steps and slow forward running
- Slow alternate bounding
- Combination hops (right-right-left-left-right-right)

Balance and body control exercises (5-7 minutes): one of three exercises

Squat technique with stick (either double or single leg)

- Double leg—2-3×10-15 repetitions
- Single leg (right and left)—2-3×8-10 for right leg and 8-10 repetitions for left leg

Balance exercise with medicine ball

- Single leg (right and left)—2-3×4-6 for right leg and 4-6 throws for left leg

Balance board exercise (double or single leg)

- Double leg: with or without stick or ball—2-3×20-30 seconds
- Single leg (right and left): with or without stick or ball—2-3×20-30 seconds for right leg and 20-30 seconds for left leg

Plyometrics (5-7 minutes): one of three exercises

Forward jumps (double or single leg)

- Double leg jumps—2-3×3-5 repetitions
- Single leg hops (right and left)—2-3×3-5 for right leg and 3-5 repetitions for left leg

Jumps in place

- Three alternative exercises (lateral skate leap, split squat jump, or cycled split squat jump)—2-3×8-12 repetitions

Jumps over stick or sticks (double or single leg)

- Double leg: three alternative exercises (backward and forward jumps, lateral jumps, or three dimensional jumps)—2-3×8-12 repetitions
- Single leg (right and left): three alternative exercises (backward and forward hops, lateral hops, or three dimensional hops)—2-3×4-8 for right leg and 4-8 repetitions for left leg

Strengthening exercises (5-7 minutes): one exercise for lower legs and one for core stability

Double leg squat with partner on back—2-3×8-12 repetitions

Single leg split squat (right and left)—2-3×4-8 for right leg and 4-8 repetitions for left leg

Nordic hamstrings—2-3×4-8 repetitions

Isometric side and front bridge (right side and front and left side)—2-3×10-30 seconds for right side, 10-30 seconds for front, and 10-30 seconds for left side

Cross curl-up (right and left)—2-3×10-20 for right side and 10-20 repetitions for left side

Stretching exercises (5 minutes): for players with limits on low back function and flexibility

The exercises were introduced during the first two weeks of training. After that the players were advised to carry out the exercises in their own time

Seated hip and low back neutral zone exercise—2-3×20 seconds

Hamstring stretch (right and left)—1-2×20 seconds for right and 20 seconds for left

Kneeling hip flexor stretch (right and left)—1-2×20 seconds for right and 20 seconds for left

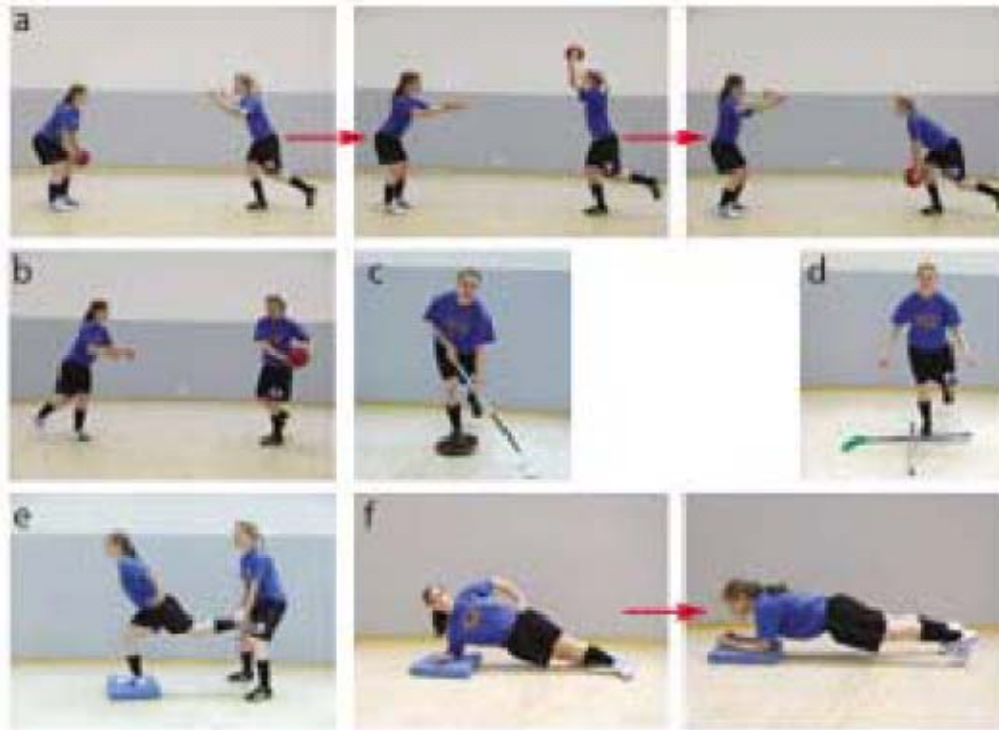


Fig 1| (a) Balance exercise with medicine ball (assistant stands on two legs and player on one leg: assistant throws ball to player, who catches ball overhead and returns it below knee); (b) balance exercise with medicine ball (on one leg players throw and catch ball from side of body); (c) balance board exercise with stick and ball on one leg; (d) three dimensional leg hops over sticks; (e) leg split squat; and (f) isometric side and front bridge