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## **FIS Medical Committee Educational Series**

Ryan Oughtred

Former member of the Canadian Team, Certified Naturopath

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### **5 Ways to Prevent Low Back Problems in the Alpine Skier**

Injury to the lower back is one of the more common injuries incurred by the alpine skier. Waiting for back problems to happen before doing anything about them is probably a bad idea; the discs and bones of the spine generally only have nerves on their outermost portions, which means that damage to the inner portions of the vertebrae and discs can occur without experiencing any pain at all. The spine can degenerate ‘from the inside out’ for many years without any warning signals, and by the time an athlete is 26 years old – at the peak of a career – the spine can have significant amounts of permanent wear-and-tear damage.

Here are the 5 most important preventive measures that athletes and support staff can take to prevent back problems:

1. Build progressions in training schedules:
  - a. The risky forces for the spine are flexion, rotation, compression, and shear – all of which are involved in skiing. Because avoidance of these risky forces is not possible, the athlete must be exposed to them gradually over time. Both on-snow and dry-land training should gradually involve progressions in both volume and intensity of activities that involve bending forward, twisting, weight lifting, and eccentric loading.
  - b. The adolescent spine may be especially vulnerable because the growth plates of the vertebrae are softer than in an adult, making them more prone to injury from compression and shear forces.
2. Sit less, and never lift heavy weights after sitting:
  - a. Any time the spine is flexed forward for a period of time, such as with sitting, a phenomenon called ‘creep’ occurs in the tissues. The tissues are melded toward a shape that is different than normal. Heavy lifting or other compressive activity (such as ski racing) should be avoided immediately following a prolonged period of sitting or forward bending.
  - b. To combat the effects of creep from sitting on planes, in cars, or on chairlifts, athletes can perform extension exercises like McKenzie press-ups or other extension movements any time they have been prolonged to excess flexion.
  - c. When travelling – I would never allow athletes to lift heavy bags immediately after riding in a van or on a plane for hours. Stand up, walk around, and maybe bend the spine back a couple of times before lifting anything heavy.
  - d. When riding the chair lift – athletes should take time after every chair lift ride to stand up, bend back a little, and warm up before diving into another race run. While riding the chair, a relaxed upright posture is probably best.
3. Compress and twist the spine judiciously
  - a. Twisting while you lift heavy weight doubles the load through the back. Athletes should be taught to never twist while they are lifting, unless it is an exercise specifically designed to prepare them for skiing.
  - b. Discourage athletes from packing heavy bags, and encourage them to share the work of lifting with other people.
4. Keep your spine neutral and stable:
  - a. We know that stability of the spine will prevent injury, but applying that to practice is not a simple task.
    - i. Maintain a neutral spine as much as possible when training, especially when lifting heavy weights or twisting.

- ii. Focus on endurance of the spinal related muscles, not just strength.
  - iii. Integrate components of instability, unpredictability and precision into dry land training.
  - iv. Full body exercises are probably better than isolated muscular activities. Even if the athlete feels like the exercise is too easy, it is still doing something for them.
  - v. Make sure athletes can breathe evenly throughout entire exercises.
  - vi. Encouraging the athlete to lightly draw in their tummy, or 'feel like they are stopping a pee' while working out, might add to their spinal stability.
  - vii. Train everything. All the muscles of the core probably contribute to injury prevention in some way, as does the lower body and upper body. Search for balance, find weaknesses and eliminate them.
5. Proper biomechanics - the earlier better:
- a. Taking the time to consult with someone who understands normal spinal mechanics and how to assess it could be a valuable investment.
  - b. If one area of the spine is not moving well, other spinal regions may be forced to work too hard, or in an unbalanced fashion. Detecting these kinds of imbalances early in a career may prevent future injury or even enhance athletic performance.

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**More to read:**

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