



MEDICAL PARK

FIS YOUTH SEMINAR DUBLIN

Injury prophylaxis
for young athletes in ski racing

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Do not mistake young athletes for simply small adults.



Our children and youngsters are extremely overweight.
- Nutrition and movement deficiencies





The health benefits of alpine skiing distinctly outweigh its risks arising from injuries.

It is essential to also consider the musculoskeletal system is especially in alpine ski racing.



Growing seam



The growing seams' load capacity decreases significantly with the youngster's entry to puberty.

Musculature



- ❑ The development and growth of the muscles trail far behind that of the skeleton system.
- ❑ Consequently, substantial disproportions ensue.
- ❑ The muscles almost completely fail to take their natural effect of injury protection.

Cartilage



When finding itself exposed to increased strain, the cartilage functionally adapts itself by enlarging its diameter. The permanent overburden of the cartilages will be followed by negative consequences.



Bone

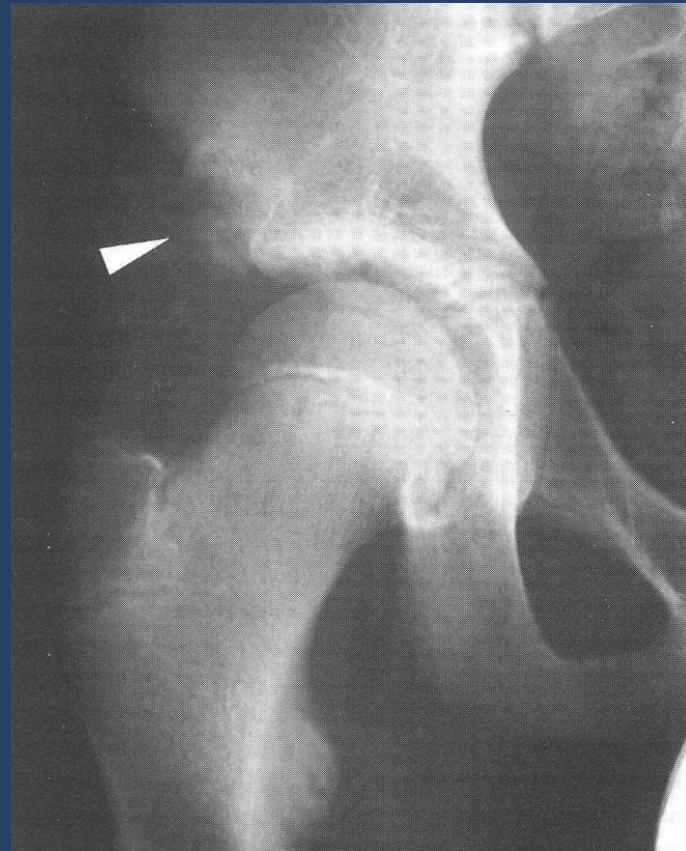


- ❑ The still immature bone of a child is much more flexible than that of an adult, while its compression-tension endurance limit is lower.
- ❑ Under load, juvenile bones tend to fracture more easily than that of adults.

Sinews and ligaments



The starting point of the sinews and ligaments in the bone are most critical.



Thermoregulation

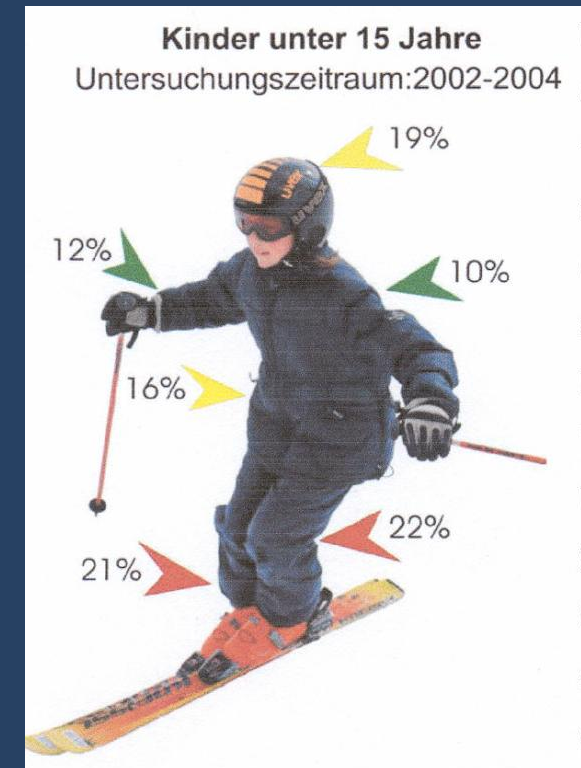


in colder surroundings, the relatively large body surface (BSA) gives way to a considerable loss of heat.

Ski-Injuries

30% of all skiing accident affect children and youngsters.

70% as relative to the overall number of skiers.



Most common ski-injuries



- ❑ Isolated tibial fracture
- ❑ The number of forearm and upper arm fractures as well as head injuries rises slightly.
- ❑ The number of damages of the capsular ligament of the knee joint increases.

Mechanism of accident



- ❑ Twisting of the leg out over the outer edge of the ski
- ❑ footborder-fracture



Overuse injuries



Direct force or chronic overuse may give rise to the surpass of the individual performance limit of the tissue.

Causes of overuse injuries



- ❑ Increased strains during puberty
- ❑ Loading subject to disadvantageous outer conditions
 - Materials - piste – etc. -
- ❑ Technically wrong movements
- ❑ Excessive recurrent strains

Avoidance of injuries



Skiing technique

- ❑ Strong backward lean including a 90 degree angle of the knee joint is to be avoided.
 - ➔ Loss of control
 - ➔ Injuries of the knee joint derived from flexion-valgus lateral rotations
- ❑ Jump training in steep terrain



Physical preparatory exercises

❑ Muscular building

Increased demands as to leg and trunk musculature in particular

❑ Coordination

A neutral body centre is required due to the shorter skis.

Even slight changes of the position of the body may give rise to skiing mistakes.

❑ Active fall training

e. g. judo



Mental preparatory exercises

teach:

- To fight fear of jumping
- To ban fear of speed
- To eliminate fear to fail

Step-by-step approach

Guidance-motivation-but no compulsion

Material-plate



"The propability of shearing not only but largely depends on the standing height, because the larger the standing height the smaller the contact angle that is enough to make the ski start shearing."

(Niessen/Müller 1999)



Material-ski

"The intensity of shearing (lateral deviation of the ski from the intended course per unit of time) in turn depends on the radius of constriction."



Material-binding

The binding must be set to suit the needs of the juvenile body!

Thus preferably a tiny bit more loosened than to tight

- Cruciate ligament
- lower leg



Material-helmet-protectors

- ❑ Compulsory use of helmets for all events
- ❑ Special protectors and impact fenders for the young ski racers not simply the smaller version of the adult design



Piste - weather conditions



- Deliberate exercises on artificial snow
 - Apply reasonable care in case of low visibility
 - Routing
- Big bump – flat landing

Curve radius



When turning a curve with a speed of about 100km/h (male downhill race), the internal body angle might sum up to 75 degrees.

With a curve radius of less than 21m, the load of 4g can no longer be maintained.



Safety on the race course



the slope

Interruption of the current race

Evacuation of injured athlete

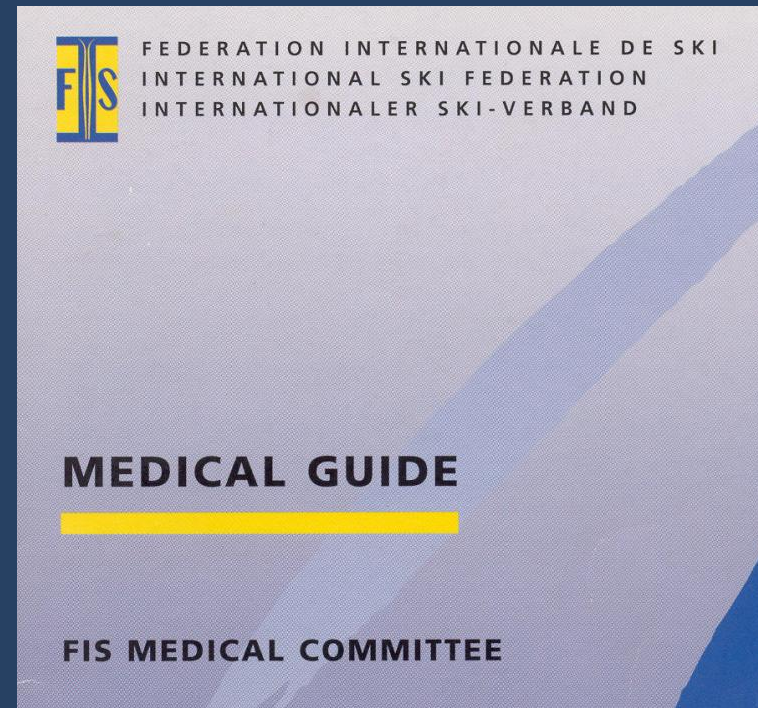


Rules



Medical guide

FIS medical commission



Overuse



- ❑ Realisation of physiological fatigue
- ❑ Extensive regeneration in between
- ❑ Rehabilitation for complete healing up of overusage and injuries



Alpine ski racing for children and youngsters



YES,

if the distinctive features of the young ski racers
are taken notice of.

No risk – no fun



More fun - more risk!



Thank you!