

## **Injuries in Skiing and Snowboarding – What do we know?**

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One of the main purposes of snow sport injury research is to reduce the rate of serious injuries in the different disciplines by effective scientific based interventions.

At the Oslo Sport Trauma Research Center (OSTRC) we are approaching injury prevention in 3 stages: Stage I is to identify the types and rates of potential injuries within certain sports, Stage II consists of identifying the injury mechanisms and risk factors for those injuries at interest, and Stage III is to intervene by Randomised Controlled Trails, if possible, to evaluate the effect of the intervention on the risk factors and thereby the injury rates identified. In this lecture we will present our knowledge from each of these steps within recent international ski- and snowboard injury research.

Stage I and II studies are typical epidemiological studies disclosing the distribution of injuries in the different skiing disciplines and snowboard; their rates and trends over years showing a significant decline in the overall injury rate and the rate of lower leg fractures, whereas knee injuries is a major concern. The exact numbers presented however, may vary according to the level of emergency at which the injury data has been extracted. Another controversy is how to define the exposure to risk. Anyhow, the Stage I and II studies show the influence on injury risk by gender, age and skiing ability; the women being more vulnerable to knee injuries, and beginners more prone to injuries over all. Yet, how to define the different skiing ability categories has not been a consensus so far. Some studies justify the use of protective vices to prevent certain injuries. Stage II studies further relate injuries to equipment being used, such as the skies which act as a lever to twist and bend the knees. They may also reveal sport specific injury situations such as collisions, and organ specific injury mechanism such as the Phantom foot mechanism described for knee injuries in skiing. Generally, there is a wide range of epidemiological Stage I and II studies within skiing and snowboarding. They help us identify and select suitable targets for injury prevention. However, for effective intervention, the knowledge of injury mechanisms might be the crucial point. A variety of injury mechanisms are described in the literature, but methodological problems are apparent. However, two Stage III studies, both Randomised Control Trails, addressing one of the knee injury mechanisms described – the Phantom foot – has shown success in reducing the rate of injuries by 62-80%. Another RCT, introducing wrist protectors among snowboarders, significantly reduced the risk of wrist distortions in this population. Except for these three studies however, Stage III studies are spares, although these are the kind of studies that would document the effect of preventive measures proposed.