WINDSURFING
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Windsurfing doesn't need presentation. It is a very popular sport practiced by millions of participants all around the world. From 1984 windsurfing has been an olympic sport, in the form of a course racing Event.
There are many disciplines in windsurfing. Olympic Boardsailing, Formula windsurfing and race boarding are course racing events. In slalom smaller boards are used in strong wind conditions to complete a slalom course while Super X also involves tricks performed along a short slalom course. In Speed Racing the aim is to complete a 5 hundred m course in the shortest time possible. Freestyle and wave sailing are judged competitions in which various tricks are performed.
Wavesailing is the most extreme discipline in this sport practiced with large waves and strong wind conditions: there are two sub disciplines: wave jumping and wave riding. Wave riding consists of riding waves performing turns and cutbacks in locations with wave breaks (breaks).
In wave jumping the peak of unbroken waves is used like a ramp allowing the athletes to perform aerial stunts involving rotations in the air.
The dependence on wind conditions limits the use of participation hours in evaluating injury incidence since being on the board doesn't necessarily mean active windsurfing.
An overall average injury rate of 1.5/person/year was found.

Injuries are almost double in wave and Slalom rather than in race boarding and Injuries seem to be more common while using a short board rather than a longboard.
Muscle and tendon strains are the most common injuries.
Muscle strains are particularly common among race boarders.
Serious cuts and fractures are more common among wave and Slalom competitors due to the high energy involved.
In the upper body injuries involve mainly the shoulder, the upper arm and wrist.

Recurrent tendon and muscle strain are common in the region between the neck and the elbow.
Head and neck injuries are quite common in wave and Slalom and are mainly caused by collision with the boom or the mast.
Rib fractures are the most common type of fracture (44% of all fractures) and they are mainly caused by high speed falls or catapults and they result from contact with the boom.
Most injuries are to the lower limbs: in particular knee, ankle and foot ligaments (AR/ET/HAI) are at high risk of injury in wave and slalom as a consequence of the stress during take off and landing in aerial freestyle tricks. Knee injury is often due to a rotation of the (FIMAR)femur with respect to the fixed tibia.
3/4 (three quarters) of the lower extremity fractures and ligament injuries are a consequence of the foot getting caught in the footstrap. Lisfranc dislocation or fracture and ankle injury (including fractures) are common consequences of this kind of trauma.
Severe injuries include drowning, near drowning, concussion and spine fractures.
Some deaths caused by penetrating fin trauma has also been reported: in particular caused by long pointed blade fin.
In Windsurfing in general (64.5%), and in wave and slalom competitors in particular, the main cause of injury is collision with equipment when overpowered by wind and waves: equipment such as the boom, the footstraps, the mast, the board and the fin.

Injuries are also caused by contact with the sea floor, impact with the water, collision with other windsurfers or personal watercraft.
The maneuver more often resulting in injuries is jumping including loops (inverted jumps) and one handed jumps but since most extreme athletes spend less than 5% of their windsurfing time jumping it contributes a disproportionately high number of injuries. Other predominant causes of trauma are uncontrolled falls (37%).

<table>
<thead>
<tr>
<th>Maneuver</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jumping &amp; Looping</td>
<td>21%</td>
</tr>
<tr>
<td>High Speed Fall</td>
<td>17.8%</td>
</tr>
<tr>
<td>Catapult Fall</td>
<td>14%</td>
</tr>
<tr>
<td>Launching</td>
<td>9.4%</td>
</tr>
<tr>
<td>Jibing</td>
<td>7%</td>
</tr>
<tr>
<td>Water Starting</td>
<td>5.9%</td>
</tr>
<tr>
<td>Low Speed Fall</td>
<td>5.3%</td>
</tr>
<tr>
<td>Sailing</td>
<td>4.4%</td>
</tr>
<tr>
<td>Beach Starting</td>
<td>3.5%</td>
</tr>
<tr>
<td>Wave riding</td>
<td>2.6%</td>
</tr>
<tr>
<td>Rigging/Dismounting</td>
<td>2.1%</td>
</tr>
<tr>
<td>Uphauling</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

In low speed falls the cause of foot and ankle injury (including fractures) are the rotational forces that the long lever arm of the board may exert on foot (UEGD)wedged in the footstrap in the case of unexpected falls.

In high speed falls injuries are mainly due to catapults.
Catapulting happens because the sailor is unable to detach the harness quick enough and so he is launched into the air, often landing on the mast or on the boom.
Hanging on the boom while falling is the way in which anterior shoulder dislocations usually happen. Jumping looping and catapult falls are related to injuries requiring medical care.
Acute injuries prevail in high wind conditions. No significant correlation was found between the wind speed and the need of medical attention following an injury. More injuries occur in choppy-water rather than in calm water.
Winsurfers commonly suffer neck and back pain, tendonitis of the elbow and the shoulder, and carpal tunnel syndrome. Lower back pain is more a consequence of a long time spent in a lordotic posture when the wind is light.
In addition while using big sails, uphauling repetitively - with poor technique - may be a cause of back stress among less expert windsurfers. This movement can cause disk disruption or herniation or strain of lumbar muscles.
On the other hand also with short boards, strong wind sailors are prone to back pain, probably as a consequence of twisted postures, fatigue and repetitive stress due to waves and gusts of wind.
Posterior interosseus nerve compression has been correlated to holding the boom with the (FOR/ARM) forearm (PRONETED) pronated.
Coaching the athlete to hold the boom with their forearm in supination, after adequate rest and conservative therapy, resolved this problem in almost all cases reported. In addition it has been found that the position of the two hands in supination and the use of a wishbone of 28mm in diameter limits fatigue in the forearm.
Personal flotation gear is an important tool to reduce the risk of drowning. On the other hand, its use is controversial among some expert wave sailors because in the case that the equipment is lost it can make ducking under oncoming waves impossible and may hinder the recovery of the equipment.
Puncture resistant footwear is able to prevent foot lacerations from contact with the sea floor and animals.
The effects of chronic ultraviolet exposure of the skin and eyes include ageing, pigmentation, lentigines, melanoma and non melanoma skin cancer.
The use of protective clothing (including sunglasses) and creams or lotions offering a high sun protection factor is recommended, in kitesurfing as well as other water sports.
Wetsuits which cover the whole body, including the neck and the limbs, offer protection against hypothermia, sunburn and stings from jellyfish (the jellyfish population is in constant increase due to environmental and climatic changes) and other marine species.
When attempting freestyle maneuvers, and jumps in particular, shock adsorbent equipment including an impact vest should be worn.
Since a commotive (HED) head trauma may lead to (DRAUNING)drowning, also beginner should use an helmet because of the possibility of collision with the sail rig. Even a face mask could be useful to protect the face and teeth.

Despite this, the use of a helmet (ZRUAT) throughout windsurfers is still uncommon.
An adequate physical preparation and achieving an optimal sailing technique with a correct (POSTCIA) posture of the body on the board are probably more effective in preventing injuries.
Since the 1996 Olympics, race pumping was allowed, making race boarding highly demanding not only with strong winds. Pumping is a forced repetitive pulling and pushing movement of the boom - used to improve sailboard speed - when the wind is light to moderate, enhancing the effect of the wind (sail acts as a wing) but also increasing dramatically the physical demand in windsurfing. Pumping effort engages both lower and upper body muscle activity.
The aerobic demand is similar to marathon running, cross country running and rowing but even elite athletes may easily reach anaerobic (ZRESCIOLD) threshold during pumping. For these reasons an elite athlete partakes in more than 25 h/week of training.
In freestyle and waveriding the best way of training for a windsurfer is probably to spend as many hours as possible on the water trying his man(u)euvers and tricks again and again.