


Water Sports Injuries



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Agenda

- Discuss motorized and non-motorized water sport injuries, presentation and treatment
- Explain the presentation and treatment of motorized boating injuries, including water skiing and wakeboarding
- Explain the presentation and treatment of windsurfing and kite boarding injuries
- Explain the presentation and treatment of kayaking injuries

Who am I?

Small boat sailor

Kayaker (whitewater & flatwater)

Whitewater rafter

Terrible wakeboarder

What watersports do you love?



Sailing

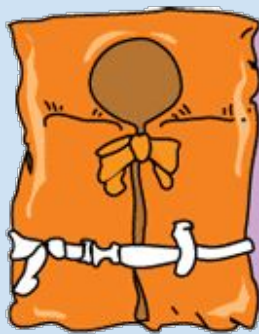


- Fatality rate 1.19/million sailing days, injury rate 0.6-4.6/1000 sailing day
- Weather or hazardous water most common risk factor
- Falling over or capsizing were most common cause of death
 - 82% not wearing PFD
 - ETOH involved in 12% of accidents
- Common injuries
 - Leg contusions 11%
 - Hand lacs 8%
 - Arm contusions 6%
- Common mechanisms
 - Trip or fall
 - Hit by object
 - Caught in lines
- Study showing PFD use 30%, sunscreen use 80% in all sailors



TYPE I

Off-shore life jacket—over 20 pounds of buoyancy, designed to turn an unconscious person face-up.



TYPE II

Near-shore buoyant vest—minimum 15.5 pounds of buoyancy, designed to turn an unconscious person face-up.



TYPE III

Flotation aid—minimum 15.5 pounds of buoyancy, not designed to turn an unconscious person face-up; more comfortable for water sports.



TYPE IV

Throwable device—minimum 16.5 pounds of buoyancy, designed to be grasped, not worn.



TYPE V

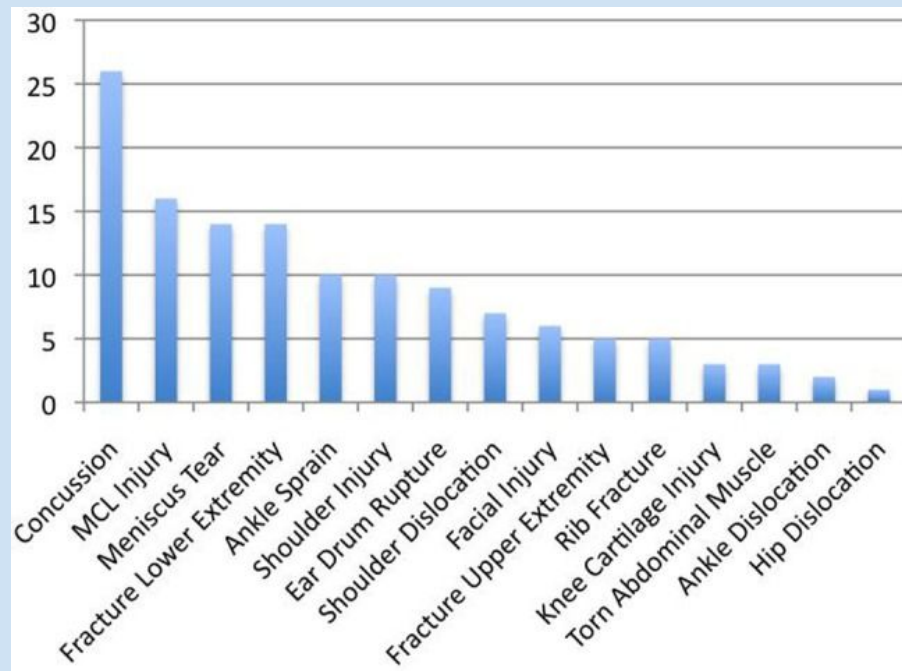
Special-use device—must be used in accordance with any requirements on the approval label.



Wakeboarding



- High rates of head injury (30% of all tx in EDs)
 - Facial laceration most common injury type
- Lower rates of lower extremity injury than water skiing
 - But ACL tears reported by 42% of professional wakeboarders due to non-contact axial loading
- 77% of all wakeboarders report being injured



Waterskiing



- Estimated injury rate 2.5x great than for wakeboarding
- Leg and ankle injuries due to excessive asymmetric loading in slalom skiing
- Lower rates of head injury than other towed watersports (4.3% of those in ED tx)
 - Deceleration/acceleration head injuries also a risk
- Trunk strains more common than upper extremity from overextension

Table 2. Characteristics of water-sports related injuries* by Sport, 2000-2007.

Body Location and Diagnosis	Wakeboarding		Water skiing	
	Estimate†	%	Estimate†	%
Overall‡	18882		51923	
Head and Neck	9081 (3623-14529)	47.9	12736 (9336-16135)	24.6
Concussion	2261 (939-3583)	24.9	1239 (578-1900)	9.7
Contusion/Abrasion	300 (45-555)	3.3	654 (274-1034)	5.1
Fracture	261 (18-504)	2.9	595 (227-964)	4.7
Laceration	4660 (1235-8086)	51.3	5901 (4036-7767)	46.3
Strain/Sprain	197 (0-396)	2.2	1550 (960-2140)	12.2
Other	1402 (349-2454)	15.4	2323 (1799-3675)	21.5
Hip and Lower Extremity	5009 (2573-7445)	26.5	18644 (14215-23072)	35.9
Contusion/Abrasion	362 (74-650)	7.2	1850 (1089-2611)	9.9
Dislocation	84 (0-223)	1.7	164 (0-419)	0.9
Fracture	1065 (346-1785)	21.3	1990 (1169-2811)	10.7
Laceration	227 (4-450)	4.5	1618 (704-2533)	8.7
Strain/Sprain	2870 (1208-4531)	57.3	10444 (8034-12855)	56.0
Other	402 (43-760)	8.0	2578 (1450-3706)	8.7
Shoulder and Upper Extremity	2802 (823-4781)	14.8	9479 (6287-12672)	18.3
Contusion/Abrasion	711 (0-1598)	25.4	1772 (1001-2543)	18.6
Dislocation	945 (174-1716)	33.7	950 (55-1843)	10.0
Fracture	366 (76-656)	13.1	964 (345-1584)	10.2
Laceration	35 (0-104)	1.2	590 (180-999)	6.2
Strain/Sprain	582 (204-959)	20.8	3109 (1971-4247)	32.8
Other	164 (0-375)	5.9	2094 (1204-2984)	22.1
Trunk	1990 (860-3119)	10.6	11064 (8352-13777)	21.3
Contusion/Abrasion	703 (195-1210)	35.3	3138 (2128-4147)	28.4
Dislocation	35 (0-104)	1.7	87 (0-230)	0.8
Fracture	216 (0-435)	10.9	1594 (927-2261)	14.4
Internal Injury	16 (0-47)	0.8	74 (0-210)	0.7
Sprain/Strain	722 (258-1186)	36.3	4273 (2730-5816)	38.6
Other	298 (17-580)	15.0	1832 (1095-2569)	15.9

Windsurfing



- Reported injury rates of 1/1000 days-participant
- Most common site of injuries in lower extremities
- Soft tissue injuries very common
 - Sprain 26%
 - Lacerations 21%
 - Contusions 16%
 - Fractures 14%
- Mechanism most often direct contact with equipment
 - Ground contact & jumping injuries also common
 - Boom contact most common cause

Mechanism of Injury (n = 339)

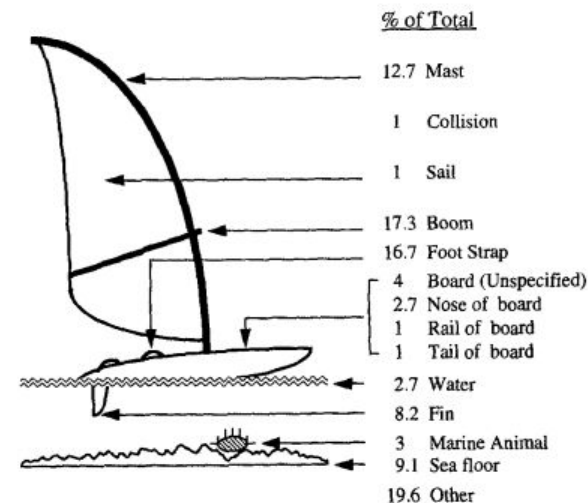


Figure 2. Percentage of acute windsurfing injuries by reported mechanism.

Kiteboarding



- 7-10.5/1000 hrs self reported from Netherlands study
- 45% of injuries while jumping or landing a trick
- Inability to detach from kite or board
 - Use of quick release system improves safety
 - However, only 7% of time was activated
- Extremities primary site of injury
 - Unique injury includes knee ligament damage (ACL/MCL)
- Polytrauma also reported
- Most injuries mild
 - 80% of athletes returned to play within 1 week
 - 14% of injuries required medical care

Table 2

The types of injuries

Injury	n	%
Abrasion	45	25
Contusion	35	19
Joint sprain	31	19
Muscular sprain	18	10
Deep/open wound	16	9.0
Fracture	7	4.0
Concussion	7	4.0
Ligament rupture	4	2.2
Meniscus tear	2	1.1
Nerve damage	1	0.6
Other	11	6.2
Total	177	100

Whitewater Paddling

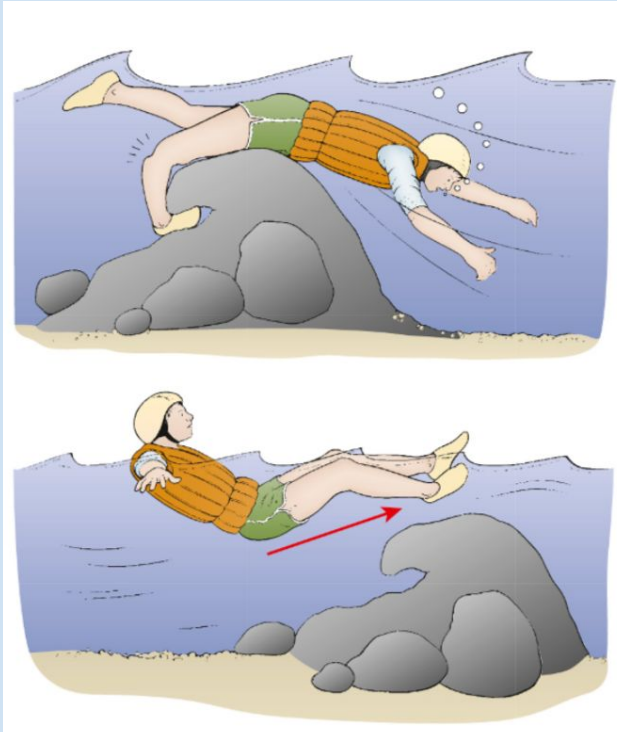
- Injury rate 2/10,000 commercial trips, fatality rate 0.68/100k
- Majority of injuries musculoskeletal or soft tissue
 - 44% to head or face including facial trauma from paddles or rocks
 - Extremity injuries including blisters from paddles
 - Overuse injuries (de Quervain's)
 - Shoulder dislocations from high brace done incorrectly or poor rolling technique
 - 5-15% of injured kayakers with shoulder dislocations



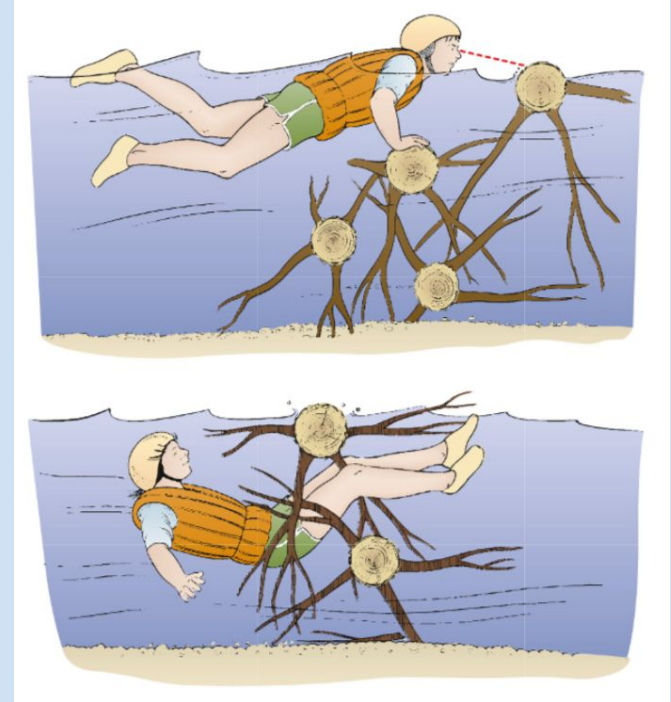
Whitewater - Shoulder Dislocation



Whitewater - River Hazards



Foot Entrapment



Strainers

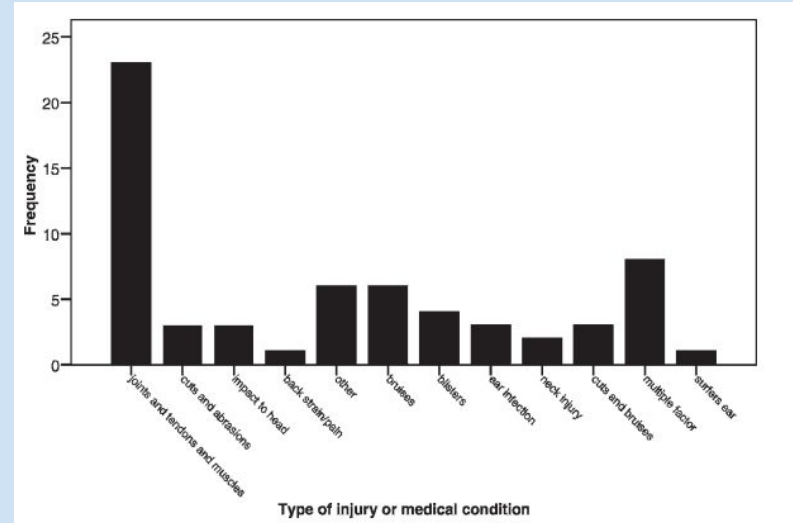
Whitewater - River Grading



Flatwater Kayaking



- Far lower injury rates than other studied sports due to lower forces involved
- More chronic and minor injuries than whitewater
 - Also more environmental i.e. hypothermia
- Injury risk factors include:
 - Separation from kayak
 - No PFD
- Higher severity in calm water/light wind
- Very rare shark attacks



Summary

- Injury rates in most watersports are low
- Most common sites are extremities, head
- Most common injuries are soft tissue wounds/contusions
- Certain sports mechanisms result in unique injuries
 - i.e. ACL in wakeboarding, shoulder dislocation in whitewater
- Extremely limited data on these sports
- Common sense, PFDs and safety gear, preventing intoxication to help prevent injuries

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