SURFING INJURIES

GLENN S CHAPMAN III, DO
C-NMM/OMM, CAQSM, CAQPM, RMSK
AOASM, AUSTIN 2019
SURFING – PAST & FUTURE
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TYPES OF SURFING

- Body surfing
- Body boarding
- Trad. surfing
- Stand-up-paddleboard (SUP) surfing
- Wind surfing
- Kite surfing
FOIL SURFING – THE FUTURE IS HERE

https://www.youtube.com/watch?v=GjmpKXGLsbM
FOIL SURFING – THE FUTURE IS HERE
TIDAL BORE “DU MASCARET”
SURFING
DORDOGNE RIVER NEAR BORDEAUX, FRANCE
TIDAL BORE “THE SILVER DRAGON”

QIANTANG RIVER, HANGZHOU BAY, CHINA
STANDING WAVE RIVER SURFING

BEND WHITEWATER PARK AT THE DESCHUTES RIVER, BEND, OREGON
DANGERS OF RIVER SURFING

HELMETS AND PFDS ARE RECOMMENDED. BOARD LEASHES, HOWEVER, SHOULD NOT BE USED AS THEY CAN GET CAUGHT ON UNDERWATER OBJECTS.
SURFING LAKE MICHIGAN
GLACIER SURFING ALASKA

https://www.youtube.com/watch?v=qFKgQwou7ls

Glacier calving
INLAND WAVE POOLS

Wavegarden in Zarautz, Spain

Disney’s Typhoon Lagoon, Orlando, FL

Surf Snowdonia, Wales, UK

Wadi Adventure Wave Pool, Al Ain, UAE
<table>
<thead>
<tr>
<th>INLAND WAVE POOLS</th>
</tr>
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<tbody>
<tr>
<td>• AVALANCHE BAY (BOYNE FALLS, MICHIGAN, USA)</td>
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<tr>
<td>• BIG SURF (TEMPE, ARIZONA, USA)</td>
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<tr>
<td>• DISNEY'S TYPHOON LAGOON WATER PARK (ORLANDO, FLORIDA, USA)</td>
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<tr>
<td>• HIMLABADET (SUNDSVALL, SWEDEN)</td>
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<tr>
<td>• KALAHARI INDOOR WATERPARK (WISCONSIN DELLS, WISCONSIN, USA)</td>
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<tr>
<td>• N-LAND (AUSTIN, TEXAS, USA)</td>
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<tr>
<td>• SIAM PARK (TENERIFE, CANARY ISLANDS)</td>
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<tr>
<td>• SUNWAY LAGOON (BANDAR SUNWAY, MALAYSIA)</td>
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<td>• SURF SNOWDONIA (DOLGARROG, UK)</td>
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<tr>
<td>• SURF'S UP NH (NASHUA, NEW HAMPSHIRE, USA)</td>
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<tr>
<td>• WADI ADVENTURE (AL AIN, UNITED ARAB EMIRATES)</td>
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<tr>
<td>• WAVE HOUSE (SAN DIEGO, CALIFORNIA, USA)</td>
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<tr>
<td>• BSR SURF RANCH (WACO, TEXAS)</td>
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<td>• RIF010 (ROTTERDAM, THE NETHERLANDS)</td>
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<td>• THE WAVE BRISTOL (BRISTOL, UK)</td>
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<tr>
<td>• URBNSURF MELBOURNE (MELBOURNE, AUSTRALIA)</td>
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<td>• URBNSURF PERTH (PERTH, AUSTRALIA)</td>
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<td>• URBNSURF SYDNEY (SYDNEY, AUSTRALIA)</td>
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<tr>
<td>• KELLY SLATER WAVE COMPANY (LEMOORE, CALIFORNIA, USA)</td>
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<tr>
<td>• WAVEGARDEN (ZARAUTZ, SPAIN)</td>
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</table>
MAIN SURFING INJURY VARIABLES

• BOARD SHAPE OR STYLE
• FIN SETUP AND SHAPE
• LEASH WITH OR WITHOUT
• BREAK TYPES AND CHARACTERISTICS
BOARD SHAPE OR STYLE

DIFFERENT TYPES AND SIZES OF SURFBOARDS

- Bodyboard
- Fish
- Shortboard
- Hybrid
- Gun
- Funboard
- Longboard
- SUP Board
FIN SETUP AND SHAPE
LEASH
LEASH INJURY

5’11” board + 4’ leash + hard head = ER visit
BREAK TYPES

- beach break
- point break
- reef break
- rivermouth break
SURFING – THE NUMBERS

- 2002 – 10 Million surfers worldwide
- 2014 – 35 Million surfers worldwide (world pop 7.2 billion)
- 2018 – 60 million surfers worldwide estimated

Wave riding activities in 162 countries

Estimated in 2014 the global surf-related industry is currently responsible for revenues ranging between $70 and $130 billion each year.

YOU AND ONE HUNDRED OF YOUR BEST FRIENDS

Hawaii

Southern California

Australia
SURFER DEMOGRAPHICS – 2009 SURVEY

• 3.3 million surfers in the US
• 108 days a year surfed on average
• 34 years old median age
• $75,000 median annual income
• 90% male: 10% female
• 62% college educated or higher
• 16 years median years of surf experience
• 2.5 hours median time spent in single surf session
• 1.9-3.1 billion spent in associated surf trips per year

WSL (WORLD SURF LEAGUE)

Formed from the ASP (Assoc. of Surfing Professionals) in 2015

December 2017 - 6.5 million plus Facebook fans, more than the National Hockey League, the Association of Tennis Professionals and Major League Soccer.

Sports Business Journal reported that 28 million hours of WSL digital video content were consumed during the 2017 season, making WSL the third most watched sport online, behind NFL and NBA.

January 2018 - signed an exclusive deal for digital broadcast rights with Facebook worth $30 million over two years.


Forbes, 2018
IS SURFING DANGEROUS?
TYPES OF INJURIES IN SURFING

EQUIPMENT
• Surfboard - #1 Risk
• Fins
• Leash

WAVES
• Fractures/Dislocations/Strains
• Ruptured tympanic membrane
• Drowning

ENVIRONMENT
• Hypothermia/Sunburn
• Bites/Envenomations
• Bottom/Obstacles
• Pterygium/Exostosis of the E
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<thead>
<tr>
<th>Section</th>
<th>Body Parts</th>
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<tr>
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<td></td>
<td>Head</td>
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<td></td>
<td>Legs</td>
<td>16%</td>
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<td></td>
<td>Arms</td>
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<tr>
<td>Contusions</td>
<td>Face</td>
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<td>Chest</td>
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<td></td>
<td>Arms</td>
<td>9%</td>
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<td></td>
<td>Legs</td>
<td>8%</td>
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<tr>
<td></td>
<td>Feet</td>
<td>8%</td>
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<tr>
<td>Sprains/Strains</td>
<td>Knee</td>
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<td>Shoulder</td>
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<td>Neck</td>
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<td></td>
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<td>8%</td>
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PINGUECULA/PTERYGIUM

- Conjunctival reaction from repeated micro-trauma from wind and water
- Sail shaped fibrous tissue growth usually on the medial side
- Once extending to the cornea called Pterygium
- Painless but larger ones can become irritated
- Surgically scraped when effects vision
- Decrease risk with glasses/goggles
- Eye drops don’t help
SURFERS EAR

BONY EXOSTOSIS OF THE EXTERNAL EAR CANAL

- From repeated exposure to cold water/air
- No pain but can result in trapped debris or complete occlusion
- 100% of surfers will have some degree if surfing long enough
- Confused with cancerous growth
- Haruka Nakanishi MD, PhD performs transcanal surgery.
BITES & ENVENOMATIONS

**Sharks** – 20 out of 375 species are a threat to humans

**Sea Snakes** – 80% of bites don’t administer venom, usually don’t hurt, onset of symptoms 30min-4hrs

**Saltwater Crocodiles** – recorded fatal attacks in surf, most common around river mouths

**Reef Rash** – reef is living and some corals can poison directly like Firecoral, has various bacteria, viruses, parasites
**BITES & ENVENOMATIONS**

**Stingrays** – extremely painful, soak in non-scalding (114°F, 45 °C) water for 10 min, can be fatal i.e. Steve Irwin

**Stone Fish** – intense pain lasting hours to days, treat like stingrays, Anti-venom available in Australia

**Sea Urchins** – 80 of 750 can inject poison, burning pain can last hours to a week, pigment, allergic rxn, non-scalding water

**Jellyfish** – most benign, Portuguese man-of-war severe sting, Aust. Box jellyfish most potent toxins known, can result CV failure
THE INTERNATIONAL SHARK ATTACK FILE
UPDATED APRIL 18, 2018 (1580 AD)

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<th>Territory</th>
<th>Total attacks</th>
<th>Fatal attacks</th>
<th>Last fatality</th>
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<tr>
<td>Florida (USA)</td>
<td>812</td>
<td>11</td>
<td>2014</td>
</tr>
<tr>
<td>South Africa</td>
<td>252</td>
<td>54</td>
<td>2014</td>
</tr>
<tr>
<td>New South Wales (Australia)</td>
<td>238</td>
<td>61</td>
<td>2015</td>
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<tr>
<td>Queensland (Australia)</td>
<td>189</td>
<td>50</td>
<td>2011</td>
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<td>California (USA)</td>
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<td>Western Australia (Australia)</td>
<td>89</td>
<td>16</td>
<td>2017</td>
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<tr>
<td>North Carolina (USA)</td>
<td>64</td>
<td>3</td>
<td>2001</td>
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https://www.surfertoday.com/surfing/the-most-shark-infested-waters-in-the-world
KELLY SLATER

• 11-Time world champion warming up for the 2019 championship tour season.


• Born 1972 in Cocoa, FL.

Vissla Sydney Surf Pro. March 20, 2019
Kelly Slater - J-Bay Open 2017

SHAWN DOLLAR

- September 2015 California
- Shawn Dollar – former record holder for largest wave ever paddled into
- Hit head on underwater rock and fractured 4 cervical vertebrae
- Four months later cleared to resume normal activities
- Near-constant headaches, memory loss, mood swings, severe depression, suicidal thoughts
- SPECT performed and demonstrated damage comparable with NFL players brains.

INTERESTING INJURY FACTOIDS

- Risk of significant injury doubles for a surfer in his 40s or later
- Majority of injuries happen in smaller waves
- Occurrence of significant injury is twice as likely in overhead surf
- Take off and tube riding are the maneuvers most commonly leading to injury
SURFING SPEED

• The waves at jaws were moving forward about 20MPH. Add another 20MPH to that the speed traveling down the face of the wave and you're about 40. So I would estimate between 30-40MPH on the average with the peaks near 50 at times. Kind of like downhill skiing but the slope is always moving and the mountain is trying to fall on you...

• The waves at your typical beachbreak move in at about 7-10mph on the average. On a really fast and steep wave a surfer might get up to 20MPH but usually averages 10-15MPH. So you could say the surfers are going at least three times as fast at JAWS.

• Also, as Nick Carroll adds, it's worth factoring in the speed relative to the water surface. Since water's being drawn up the wave face, you're going even quicker than it appears. This definitely counts when it comes to surfboard design -- it's why the little boards work better. (Less friction.)
### MITIGATING RISK

<table>
<thead>
<tr>
<th>EQUIPMENT CHANGES</th>
<th>BEHAVIOR CHANGES</th>
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<tbody>
<tr>
<td>• Blunt nose boards</td>
<td>• Training</td>
</tr>
<tr>
<td>• Nose and tail guards</td>
<td>• Conditioning</td>
</tr>
<tr>
<td>• Soft boards – foam or inflatable</td>
<td>• Warm-up</td>
</tr>
<tr>
<td>• Flexible fins</td>
<td>• Hydration</td>
</tr>
<tr>
<td>• Finless surfboards</td>
<td>• Experience</td>
</tr>
<tr>
<td>• PFD</td>
<td>• Humility</td>
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<tr>
<td>• Helmets</td>
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<tr>
<td>• Leashes</td>
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<tr>
<td>• Foils – shift risk</td>
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</tbody>
</table>
MITIGATING RISK

- Blunt nose board
- Flexible fins
- Nose and tail guards
- Finless surfboard
- Soft boards
- PFD (vests)
MITIGATING RISK - HELMETS

Tom Carrol, Dec 1991, Pipe Masters
Comparison of admissions to Basque Coast’s Emergency Dept.
350 - 2006 June 21\textsuperscript{st} to September 30\textsuperscript{th}
287 - 2014 July to August – 287 admissions

- Surfer vs. Sea Floor 13\% - 90\% sand and 10\% reef
- Collisions 17\% - SvS 66\%, SvSwimmer 27\%, SvBodyboarder 5\%, SvFloating object 2\%
- Surfer vs. Own Surfboard 60\%
- Laceration 61\% by fins 56\%, nose of board 30\%, head lac 70\%
- Leash 3.7\% (13 cases) – 8 Fx (4 open), 1 amputation, 6 requiring surgery
- Male 78\%, Female 22\%
- Average age 26yo
- Experience: Beginner 35\%, Intermediate 34\%, Experience 31\%
- Cervical fractures #3
- No drownings
- Hospitalizations 5\%
As far as acute injuries, most of what we see are natural-footer surfers’ right knees, mostly MCL injuries.

Most are on impact, so they’re landing a floater or an air (like John John did recently) or they’re getting pinched in a barrel.

Recreational about one injury per 1,000 hours of surfing. Professional about one injury per 100 hours.

Interview on Magicseaweed.com, 8th September 2018
THE END