

SURFING INJURIES IN RECREATIONAL SURFERS

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Definitions

- Surfing leash – Device used to attach a surfer to their surf-craft. Generally made from polyurethane compounds and of 2.2metres in length.

- Aerials – manoeuvres performed in surfing where the surfer and board momentarily leave the water's surface, travel through space, and land back on the wave's surface.

Abstract

A detailed reply paid questionnaire was posted via surface mail to overseeing members of Australian surfboard riding clubs in May 2004. Clubs from Western Australia, Victoria, New south Wales and Queensland participated. Further participants were randomly recruited from surfing locations throughout Australia including beaches in Queensland, New South Wales, and Victoria. Participants were asked to recall injury details over a retrospective period of two years.

A total of 146 surfers participated in the study. Of the 146 participants, 24 were female (16%) and 122 were male (84%). The mean age of participants was 30.05 years.

There were 1329 reported injuries, 698 were lacerations (52%), 473 contusions (36%), 51 muscle strains or tears (4%), 49 fractures (4%), 40 joint sprains (3%), and 18 joint dislocations (1%). These results compare to similar studies, which found laceration accounting for 41%¹ to 57%² and 66%³ of reported injuries.

Conclusions:

Laceration is the most common surfing injury (52%), followed by contusions (36%), muscle strains or tears (4%), fractures (4%), joint sprains (3%), and joint dislocations (1%). Lower limbs are the most commonly injured area, followed by upper limbs, and the head and face. Surfing safety equipment should be designed to protect the limbs from lacerations, and aid in the prevention of serious injuries such as vertebral, facial and skull fractures.

Delayed onset muscle soreness is common amongst recreational surfers. Medical doctors are the most commonly consulted health care practitioner by surfers for treatment of surfing related injury, followed by Physiotherapists and Osteopaths.

INTRODUCTION

Surfing is a sport which is growing increasingly popular throughout Australia and the world. An estimated 4 million surfers exist worldwide, with approximately 1 million in Australia and New Zealand, 2.275 million in the United States, 175,000 in Hawaii, 700, 000 in Japan, and a large number along the coasts of Europe, South Africa, South America and many other ocean bordering countries.⁴ One author suggests males outnumber females by almost 10:1, with an approximate average age range of 16 – 21 years,⁴ however this is relatively unknown.

At an elite level, large multi-national companies sponsor hundreds of competitions and individual competitors worldwide involving millions of dollars in endorsements.

Consequently, surfing is becoming a very competitive, highly skilled, and an extremely professional sport.

So, as with many sports, a good scientific knowledge of factors affecting the healthy participation in surfing is essential.

Recreational surfers now have greater access to magazines and audio-visual equipment. This allows surfers to observe and aspire to the performance standards laid down by professional competitors in the sport. Surfing styles have become increasingly radical, involving complex body movements performed at a greater intensity than ever before. New manoeuvres such as aerials can cause dramatic increases in compressive and shearing forces on joints, bones and soft tissue structures. Constant positional readjustment and placing of the body into awkward

positions during the act of wave-riding can cause further stress on spinal and peripheral joints, particularly in the lumbar spine, knees and ankles. Degenerative changes and dysfunction of soft-tissue structures may lead to the onset of acute and chronic injuries.

Surfing also involves paddling in the prone position for extended periods of time. Paddling involves inward arm rotation and repeated shoulder hyperextension. This can lead to repetitive strain injuries such as rotator cuff tendinitis and chronic muscular hypertonicity.⁴

Anecdotally, mid to lower spinal facet joint sprains are reported to be common among regular surfers. This could occur as a result of the hyper-extended paddling position involved in surfing. The author's research aims to validate whether the incidence of this and other injuries is high, however, further studies may investigate the mechanisms behind why they occur.

Generally, many sports include warm up and stretching routines prior to performance. Lowdon et al found, 57% of the surfers in his study, never or rarely practiced stretching or mobility routines prior to surfing.¹ Anecdotal evidence also suggests surfers as a whole do not perform these routines. Factors such as these may predispose them to injuries. Also, there are periods when work, a lack of waves, and other factors can lead to physical deconditioning. Deconditioning is when a person loses physical fitness during periods of inactivity and is consequently more vulnerable to injury upon returning to exercise.⁵

However, according to existing statistical data, surfing is a relatively safe participation sport. There is an incidence of 3.5 and 4.0 moderate to severe injuries per 1000 surfing days in recreational and professional surfers respectively.^{1,6}

Some other studies on surfing injuries suggest injury rates of 1 per 17500⁷ and 6.8 per 1000.⁸

The most commonly occurring injury in surfing is suggested to be laceration, with rates varying between 41%¹ and 57%² and 66%³ of overall reported injuries. Kennedy et.al. reported that the most commonly injured areas were the head and neck,⁹ whereas Lowdon et.al., reported that the body and limbs were the main areas of injury.¹ Nathanson et.al., also concluded that lacerations were the most common type of acute injury, and the head and neck or the lower extremities were most commonly affected.³ That particular study suggested that contact with fins or the nose of the board were the most common causes of the lacerations.

Most of the studies outlined a moderate incidence of muscular strains and sprains, while Nathanson et.al. indicated musculoskeletal strains and sprains as the most common chronic injury, with shoulder strains occurring at 16% of all reported chronic injuries.³

Other common acute injuries involve bruising which occurred at a rate of 12%, along with sprains at 11% and fractures at 6% of all acute injuries reported.⁹

In pre-1990s studies, fractures appeared to occur more commonly, for example, fractures of the skull (17% of the acute injury total), the nasal bone (38%), the mandible (12%) and teeth (33%).¹

Modernisation of surfing equipment, even in the last five years, may have had a significant effect on injury occurrence rates. Severe cases of ocular trauma have been reported, and in all cases the recipients were noted as wearing surfing leashes and had come off a wave.¹⁰ The elastic recoil of the surfing leash was thought to have caused a collision between the surfer's own board and body. More modern surfing leashes are manufactured to possess a decreased elastic recoil capacity, or at least a decreased

velocity of recoil, in order to reduce the incidence of this type of injury mechanism. However Lowdon et.al., in 1983, found 9% of injuries were caused this way,¹ whereas Nathanson et.al., in 2002, found 13% of all acute injuries were caused by the elastic recoil of the leash.³ There is some suggestion that the surfing leash may have decreased the number of injuries caused by other surfers' boards, but there is debate as to whether the modern leash has created any decrease in specific injury rates.

Modern surfboards often have hard or pointed edges. Fins which are involved in steering the boards are usually sharp. Surfboards are considerably lighter and less buoyant in comparison to boards manufactured twenty years ago when most injury occurrence research was performed. Less buoyancy in the surf-craft now, means greater work must be performed in order to paddle a surfboard through the water. Therefore, the incidence of repetitive strain injuries and other injury types, related to paddling a surfboard, may have changed since earlier studies were performed, due to technological changes in equipment.

There is minimal information on what treatment modalities surfers seek for their surfing injuries. This information may be of interest to the relative health care professionals, particularly from a marketing perspective. One study performed by Lowdon et.al, suggested that the most common treatments of injuries in his studies were performed by, in decreasing order: Medical practitioners (allopathic), Physiotherapists, and Acupuncturists.¹ In light of these dated figures, this particular study also aims to investigate how often specific treatment modalities are used and the injuries they are used to treat. Further, by requesting this information, the researcher can get an idea as to the approximate severity of an injury, although this information may be highly subjective and depend on a participant's relative tolerance to pain, and willingness to seek care.

Overall, by looking at the type, and the anatomical location of injuries occurring in surfers, this study aims to aid in the formulation of up to date injury preventative and treatment measures, to look at possible increases in specific injury incidences over time, and provide a basis for further studies examining the effects of age, experience, the use of safety equipment, and the geographical location of a surfer on the incidence of specific surfing injuries.

Methods

A detailed retrospective reply paid questionnaire was posted via surface mail to overseeing members of Australian surfboard riding clubs in May 2004. Each questionnaire was packaged with an attached university cover letter outlining necessary respondent information.

Surfboard riding clubs with contact details posted on the Surfing Australia organisation website were contacted via telephone and their club was asked to participate in the study. Those who agreed were posted, via surface mail, between five and fifteen individual surfing injury surveys. Surveys were then distributed to club members by the club nominated overseer, secretary or president, at club meetings and competitions. The researcher requested that surveys be handed out to members above 18 years of age, without regard to their perceived surfing ability, experience or gender in order to avoid selection bias. Surveys were filled out then placed into reply paid envelopes and returned to the university.

Clubs from Western Australia, Victoria, New south Wales and Queensland participated in the study.

Further participants were randomly recruited from surfing locations throughout Australia including beaches in Queensland, New South Wales, and Victoria. They were approached by the researcher with the survey, given a brief verbal introduction

about the study, asked to read the cover sheet, and answer the questions which were dictated to them as the survey was filled out. Participants were encouraged to answer the questions as honestly as possible. This was to ensure that data collected by this method, was not biased or influenced by the researcher in any way. All participants were over eighteen years of age.

The questionnaire elicited information on age, gender, and details relating to traumatic injuries including fractures, lacerations, contusions, muscle and joint strains, sprains and dislocations. Additional questions requested information on the type of treatment received for any injuries incurred while surfing.

In the survey, medical terminology was clearly defined. All questions were designed in order to gain as medically specific an answer as possible from a lay subject.

Participants were asked to recall various injury details over a period of two years prior to the present. This retrospective period was chosen as it was successfully used in a previous study.¹

A brief follow up phone call was made to all participating club overseers reminding them to post the surveys back to the university in early July 2004.

Raw data was pooled from the surveys, and entered into electronic spreadsheets in the computer program Microsoft Excel. This program was used to develop descriptive statistics including percentages, tables and graphs.

The study was approved by and complied with all guidelines set by the Human Research Ethics Committee, Department of Human Development, Victoria University, Australia.

Results

A total of 146 surfers participated in the study. Of the 146 participants, 24 were female (16%) and 122 were male (84%). The mean age of participants was 30.05 years. Just over half of the participants resided in Victoria (51%), a third in Queensland (30%), and approximately ten per cent in Western Australia (11%) and New South Wales (8%). Of the 280 surveys mailed out to participants, 62 (22%) responded. A further eighty four surfers (78%) were directly interviewed by the authors at surfing locations.

There were 1329 reported injuries, 698 were lacerations (52%), 473 contusions (36%), 51 muscle strains or tears (4%), 49 fractures (4%), 40 joint sprains (3%), and 18 joint dislocations (1%).

(Insert Table 1 and 2 here)

The information in tables 1 and 2, represents the number of reported lacerations or contusions in each anatomical area. The averages in the adjacent column represent the average number of lacerations or contusions suffered by surfers reporting these types of injuries. Numbers at the base of the columns display the total number of lacerations or contusions suffered by the surfers, as well as the average number of lacerations or contusions incurred overall by surfers reporting these types of injuries. The same

applies to the figures representing the occurrence of fractures in table 3 and joint sprains and dislocations in table 4 and 5.

(Insert graph 1 here)

66% of participants reported suffering muscle soreness to varying degrees following a surfing session; the most common response was suffering muscle soreness “sometimes” (56%), followed by “often” (17%), “rarely” (16%) and “every time” (9%).

(Insert Table 3 here)

(Insert Table 4 and 5 here)

The information in table 6 represents the treatment modalities used by surfers for the treatment of their surfing injuries, and the nature of the injury they sought treatment for. The numbers in the columns represent the number of surfing injuries each practitioner was reported to have treated over the retrospective period of two years.

(Insert Table 6 here)

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Discussion

Male and female data were combined as there were few differences in the data on examination of the key variables.

200 (15%) of all reported injuries received medical, allied, or alternative medical treatment. Therefore it can be suggested that 15% of all reported injuries were of moderate to serious severity. Most of the 24 reported lacerations requiring treatment were sutured by Medical Doctors and in one case a Veterinarian, however others required general first aid such as cleaning and covering which was provided by physiotherapists. In three cases the lacerations became infected and required pharmaceutical intervention. Only 24 (3%) of the 698 lacerations were thought to be severe enough to have required therapeutic intervention, indicating the most common injury suffered by surfers is minor to moderate laceration. Overall lacerations made up 52% of the injury total (1329).

These results are comparable to those of similar studies, which found laceration to account for 41%¹ to 57%² and 66%³ of overall reported injuries. The authors' study found the most commonly lacerated areas of the body were the feet and lower legs, followed closely by the hand and wrist and further by the head and face. Nathanson et.al., also concluded lacerations were the most common type of acute injury and the head and neck, or the lower extremities were most commonly affected.³ Lowdon et.al, similarly reported the feet and legs were the main areas of laceration injury.¹

Nathanson's particular study also suggested contact with fins or the surfboard's front tip were the most common causes of the lacerations.³

It is not surprising therefore, to find little change in the incidence of laceration over time. This is because surfboards have had sharp fins and pointy noses for over twenty years, and until the majority of surfers wear effective protective accessories, or use surfboards with blunt noses and fins, it is unlikely to change.

Kennedy et.al., the most dated study, reported that in regards to all types of injury, the most commonly injured areas while surfing were the head and neck.⁹ Whereas Nathanson et.al. and the authors of this study concluded that the lower limbs followed by the head and neck were the most commonly injured areas.³

These results in combination suggest over time there has been a decrease in skull and facial injuries and an increase in lower limb injuries. It is beyond the scope of the author's to comment on possible reasons behind this as this study did not aim to examine injury mechanisms, however it seems advisable that safety/comfort apparatus such as surfing boots should be more widely worn to decrease the amount of lacerations occurring to the feet and lower limbs.

Contusions were reported to occur more commonly in this study than in other studies, representing 36% of all reported injuries. Lowdon et.al. and Nathanson et.al. found contusions to occur at 3% and 13% respectively.^{1,3} However Lowdon et. al. defined reported contusions as those causing the sufferer to lose days surfing or seek medical treatment, indicating less severe contusions were unlikely to be reported. Again the lower limbs were most likely to be injured. There may be some argument towards developing safety devices to protect the lower limbs from blunt trauma, however due to the seemingly minor severity of the bruising reported in the author's data, it would be unlikely to be functional or economically viable.

Data showed muscle injury occurred at 4% of the total reported injuries, and was found to be slightly more common than joint strains and sprains (3%).

Muscle injuries due to repetitive motions involved in surfing have long been implicated in causing muscle injuries in surfers.⁴ Other studies have suggested musculoskeletal strains as being the most common chronic injury.³ Shoulder muscle strains was found to be the most frequently occurring type of muscle strain (24%), and surfers generally reported them occurring after long periods of continuous surfing over several regular surfing sessions. Lowdon et. al. also reported a high number of shoulder strains and sprains.¹ Although in Lowdon's study, the injuries shoulder muscle strain, and shoulder joint sprain, were classed as the same injury,¹ making it difficult to know whether the incidence of muscle strains have become more common since then. Shoulder muscle strains may be increasing in incidence due to an overall decrease of volume in modern surfboards, causing them to be less buoyant, requiring a surfer to perform more work in order to propel a surfboard through water. Increasing the buoyancy of surfboards without sacrificing their performance capabilities, may decrease the incidence of shoulder muscle injury in surfers by making surfboards easier to paddle. Further research would, however, be needed to verify this hypothesis.

Groin muscle strains or tears were equally as common as the shoulder; except most surfers reported them as occurring suddenly, after falling or being positioned awkwardly during one session of surfing. High incidences of groin strains have not been previously documented. Surfing styles have become increasingly radical, allowing surfers to travel along the waves at greater speeds than ever before with the onset of new surfboard technology. Surfers are often projected through the air during aerial manoeuvres involving hard landings back onto a wave's surface. These heavy

or awkward landings could be a reason for an increase in groin muscle strains or tears associated with the development of modern surfboards.

It may also explain why spinal joint ligament sprains (zygapophyseal), are the most common joint sprain or strain (table 3) due to repetitive irritation during paddling in the prone position while surfing lower volume surfboards. Heavy or awkward landings may also contribute to the ankle and knee joint ligaments being more commonly injured during surfing (at 22% of all joint sprains or strains). The incidence of these injuries have also increased over the last twenty years, backing the idea that changes in surfing style's to become faster and more erratic, have affected the incidence of some injuries overall. Benefits may be achieved from specific stretching routines of the commonly injured muscle and joint areas, although there is some debate as to the benefits of pre – exercise stretching routines in injury prevention.^{11,12,13} General muscle soreness was commonly reported in the data (66%). Relief from muscle soreness following surfing sessions may also be achieved by performing stretching routines after surfing sessions if these routines are proven to be effective in reducing the severity of delayed onset muscle soreness.

Some previous studies have reported a high number of the total fractures occurring to the facial bones.⁹ This study also found a high percentage of fractures overall occurring to the head or face (16%), although it was less than those occurring to the lower limbs and feet combined (34%). Most of the surfers reporting head or facial area fractures suggested that their own board was responsible, whereas impact with the ocean floor was often mentioned as being responsible for the skull fractures. The incidence of skull (head) fractures may be decreased by the use of surfing helmets, although most of these helmets do not provide adequate facial protection and may not be effective in preventing facial fractures.

Spinal fracture was reported to account for 12% of fractures overall. Some of the surfers described the incident in which the fractures occurred. One was reported to have occurred to the T4 vertebra after the surfer landed head first into hard sand after falling off a wave. Another was due to the downward force of a wave placing a surfer into a hyper-extended position causing fracture of the L3 lumbar vertebra. None reported permanent paraplegia or quadriplegia; however it appears important to educate surfers about the dangers of surfing in shallow water or in powerful waves.

As a whole, fractures were reported to be occurring to the same bony areas as twenty years ago, although the relative incidence of fractures compared to other injuries appears to be less than what was reported by earlier studies on Australian surfers.¹ The increasingly radical style approach to surfing, or changes in equipment does not appear to have caused an increase in the incidence of fractures overall.

Overall there were many more injuries reported in this study per surfer than in previous studies. This is most likely because some studies mainly surveyed hospital records,^{2,7,9} while others only reported injuries which required the surfer to miss surfing days or seek medical attention.¹ This may have lead to an under estimation of minor injuries. Also many similarities were found between

A surfer's age, may play an important role in the type and incidence of surfing injuries. Nathanson et al suggested older surfers, more expert surfers, and those surfing large waves, have a higher relative risk of suffering significant injuries.³ Further studies may clarify which injuries are commonly occurring, relative to specific age groups.

Surfers are still more commonly seeking "mainstream medical" treatment including allopathic medicine and physiotherapy to treat surfing injuries as found by earlier studies.¹ Although Osteopaths and Bowen therapists are also frequently consulted,

especially for “non specific back pain”, muscle injuries and general muscle soreness respectively (table 4).

Fractures, lacerations and muscle injuries were the most commonly treated injuries reported in this study. Medical doctors are most commonly consulted because of the nature of injuries such as fractures and more severe lacerations, which may require them to perform procedures including reduction, surgery, casting, or suturing. This is generally beyond the capabilities of other professionals mentioned in the study.

The use of Osteopaths by surfers has not been mentioned in previous studies, and the number of surfers receiving acupuncture, or Traditional Chinese Medicine for treatment, appears to have dropped since the 1980's. The increased use of osteopaths probably reflects the increased number of osteopathic practitioners over the last few years, but no obvious explanation can be found for the decrease in use of acupuncturists.

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Conclusions

The aims of this study were to establish the incidence of injuries amongst recreational surfers in Australia, and the treatment received by injured surfers for their injuries.

Therefore, this study can only hypothesize on what factors or changes may help to decrease the number of further injuries, although it does indicate the most vulnerable anatomical areas' to injury. This contributes to the formulation of appropriate safety equipment. It also provides a foundation for further research into this field.

This study concludes:

Laceration is the most common surfing injury (52%) with most being of minor to moderate severity, followed by contusions (36%), muscle strains or tears (4%), fractures (4%), joint sprains (3%), and joint dislocations (1%). Lower limbs are the most commonly injured area, followed by upper limbs, and the head and face. The high incidence of lacerations to the lower limbs suggests that current safety apparatus such as surfing boots are either relatively ineffective in preventing injury, or that they are seldom worn by surfers while surfing. Surfing safety equipment should be designed to protect the limbs from lacerations, and to aid in the prevention of serious injuries such as vertebral, facial and skull fractures.

Potential external hazards such as sharp surfboard fins and pointy noses are modifiable, whereas jagged rocks, hard sand and reef are part of the natural environment where the act of surfing takes place. Educating surfers about hazards once formally identified and modifying habits where possible, could decrease their incidence of injury overall.

Delayed onset muscle soreness is relatively common amongst recreational surfers. Regular stretching routines involving shoulder and groin muscles could help prevent muscle injuries and delayed onset muscle soreness if proven to be effective.

Medical doctors are still the most commonly consulted health care practitioner by surfers' for the treatment of surfing related injury, followed by Physiotherapists' and Osteopaths'. The usage of acupuncturists' by surfers has decreased since the 1980's when their usage by surfers was last reported, whereas there has been a rise in the usage of Osteopaths' during the same period.

The limitations of this study include an inability to definitively identify the severity of each injury, the possible mechanisms behind the acquisition of surfing injuries, or prove why they occur. In addition, further research is needed to determine the relationship between the use of safety equipment and the incidence of specific injuries. Finally, the incidence of some injuries may have been over estimated due to the reporting of minor injuries which may have been classed as insignificant by other researchers.

Table 1 & 2 summarise the most commonly lacerated and contused areas in descending order and the average number of times each surfer reported suffering the injury:

Body Area Injured	Number & Percentage of the Total Lacerations Occurring Overall	Average Number of Lacerations Per surfer	Body Area Injured	Number & Percentage of the Total Contusions Occurring Overall	Average Number of Contusions Per Surfer
Foot	373 (53%)	7.5	Leg Below Knee	151 (32%)	2.6
Leg Below Knee	101 (14%)	2.8	Leg Above Knee	92 (19%)	2
Hand & Wrist	87 (12%)	4.6	Foot	53 (11%)	2.4
Head or Face	38 (5%)	2	Arm Below Elbow	40 (8%)	2.4
Leg Above Knee	24 (3%)	1.6	Head or Face	32 (7%)	1.9
Lower Back	22 (3%)	3.1	Groin & Buttocks	30 (6%)	1.7
Arm Below Elbow	19 (3%)	1.9	Abdomen	18 (4%)	12.3
Arm Above Elbow	9 (1%)	1	Arm Above Elbow	17 (4%)	1.3
Groin & Buttocks	9 (1%)	1.5	Chest	16 (3%)	3.2
Abdomen	6 (1%)	1.2	Hand & Wrist	11 (2%)	1.8
Upper Back	6 (1%)	1.2	Lower Back	6 (1%)	1.2
Neck	3(0.5%)	1	Upper Back	3 (0.5%)	1
Chest	1 (0.5%)	1	Neck	3 (0.5%)	1
			Ribs	1 (0.2%)	1
Total	698	3.8	Total	473	2.1

Graph 1 displays the most commonly strained or torn muscle areas:

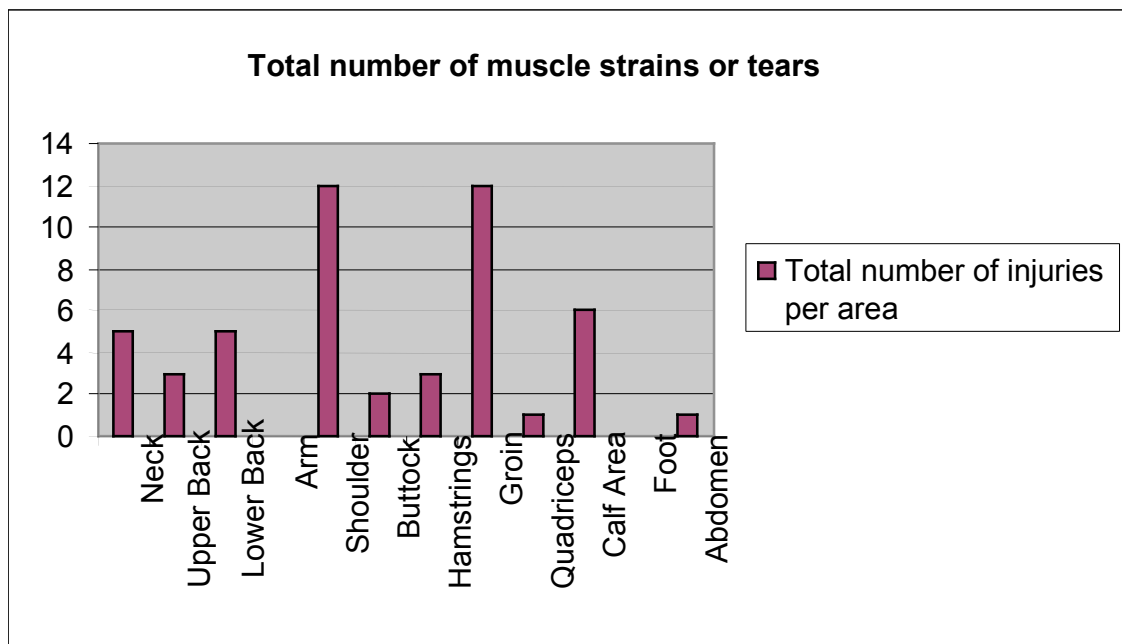


Table 3 displays the most commonly fractured areas in descending order and the average number of times each surfer reported suffering the injury:

		Number & Percentage of the Total Fractures Occurring Overall		Average Number of Fractures Per Surfer							
Body Area Injured											
Foot		9(18%)		1.8							
Head or Face		8(16%)		2							
Ribs		8(16%)		1.6							
Leg Below Knee		6(12%)		1							
Hip & Pelvis		5(10%)		1							
Wrist		5(10%)		1.25							
Area of Joints	Back	3(6%)		Area of Joints	Shoulder	10(56%)		Average Number of Dislocations Per Surfer			
	Spinal	2(4%)			Rib	3(17%)					
Leg Above Knee		2(4%)		1		2					
Neck		2(4%)		1		1					
Upper Back		1(2%)		1		1					
Arm Above Elbow		1		0		1					
Arm Below Elbow		1		0		1					
Total		49		1.7							
Wrist		4(10%)		2		Foot/Toe		1(5%)		1	
Foot/Toe		0		0		Elbow		0		0	
Elbow		0		0		Spinal		0		0	
Hand or Finger		0		0		Knee		0		0	
Total		40		1.3		Wrist		0		0	
						Total		18		1.8	

Table 4 and 5 display the most common joints sprained or dislocated in descending order and the average number of times each surfer reported suffering the injury:

Frequency of the Treatment Modality Used in the Treatment of Surfing Injuries									
Injury	Medical Doctor	Physio-therapist	Osteopath	Bowen Therapist	Massage Therapist	Acupuncture T. Chinese Medicine	Chiro-practor	Other*	
Fracture	49	2							
Laceration	21	2						1	
Contusion	1								
Muscle Injury	20	13	12	8			2		
Ligament Sprain	12	8	1			2			
Joint Dislocation	5	1					1		
Non specific "Back Pain"	5	1	5	4	6		1		
Other injuries*	8	5				4			
Total Treatments Received	121	32	18	12	6	6	4	1	200
Percentage of total treatments received	56.59%	17.58%	9.89%	6.59%	3.30%	3.30%	2.20%	0.55%	100%

Table 6 displays the most common treatment modalities used by surfers for the treatment of their injuries:

(Note table 5: *Other Therapists: including a Veterinarian. *Other injuries: including those that did not fit into the above categories or which were described by participants as the following: ear infections or “surfers ear”, “foot problems”, concussion, and “pelvic pain” of a non-specified source).

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