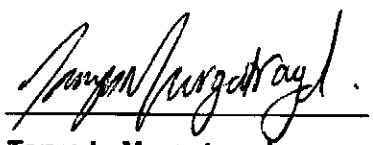
# A Retrospective Cohort Analysis of the Injury Profile of Internationally Competitive Surfers.

By

**Taryn Lyn Murgatroyd**

***Dissertation submitted in partial compliance with the requirements for the Master's Degree in Technology: Chiropractic at Durban University of Technology.***

I, Taryn Lyn Murgatroyd, do declare that this dissertation is representative of my own work in both conception and execution.

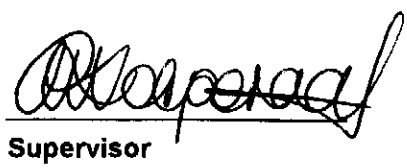


**Taryn L. Murgatroyd**

01 · 09 · 2009

**Date**

**APPROVED FOR EXAMINATION**



**Supervisor**

**Dr. C.M. Korporaal**

**M.Tech: Chiropractic (SA) CCFC (SA), CCSP (USA), ICSSD (USA)**

01 · 09 · 2009

**Date**

## DEDICATION

To my mom - my best friend and biggest supporter! Along this journey, we've laughed, we've cried, we've raged and now we celebrate. You are the reason I am here today. For your endless encouragement, love and support, I dedicate this research to you.

## ACKNOWLEDGEMENTS

It's been a long, long road, with many winding turns. So I would like to thank the following people for helping me make it to the end. Without your help, it wouldn't have been possible.

- To all the DUT staff that have helped me along the way. Your knowledge and wisdom has been invaluable. A special mention to Pat and Linda, our clinic moms. You only want the best for us, and have always done everything in your power to see us succeed.
- To my supervisor and HOD Charmaine. You are the backbone of the chiropractic fraternity, always going above and beyond the call of duty. Thank you for all your help, especially with my dissertation.
- To all the special friends I've made. You know who you are. Thanks for the best years of my life so far. So many amazing memories, that will be cherished forever.
- To the best friend a girl could ask for. Jo Catlin, you've been with me every step of the way. Early hours, late nights, we've done it all. Let the good times continue to roll…
- To my Dad, Ian, Kate and Craig Murgatroyd, your love and support knows no boundaries. I am what I am because of you. Words can never describe my gratitude for everything you have provided me with.
- Lastly, to my rock, Stewart Theunissen. Thank you for enduring this roller coaster ride with me. I certainly couldn't have done it without you. I will always treasure your patience and love during this period in my life. You are my one in a million.

## Abstract

**Introduction:**

Modern surfing dates as far back as the 1960's when the first amateur and professional surfing competitions were held (1). Since these humble beginnings, surfing has enjoyed a sustained growth over the last half a century, principally through increased commercialization of surfing apparel and an increased positive association with the lifestyle of surfers.

**Objectives:**

The aim of this study was to determine a retrospective cohort analysis of the injury profile of internationally competitive surfers and provide information on chronic, repetitive strain injuries suffered by them.

Therefore, for the purpose of this study, the following information was gathered in order to create an injury profile:

- Demographics of internationally competitive surfers competing in the Mr. Price Pro, Durban, South Africa,
- Prevalence of surfing injuries,
- Treatment received for injuries.

**Methods:**

This study was a retrospective, quantitative, epidemiological study (9), on the Chiropractic Student Sports Association's (CSSA) questionnaire in order to produce a retrospective cohort analysis of the injury profile of internationally.

On entry into the Chiropractic treatment facility, the surfer is requested to complete their portion of the CSSA questionnaire. Thereafter the senior intern then takes a brief case history, elaborating on the information provided by the surfer, followed by a standard clinical assessment related to the anatomical region or list of differential diagnoses based on the history.

The study was limited to any surfer, male or female, who was competing on the World Championship Tour or the World Qualifying Series and registered to compete in the Mr. Price Pro.

**Results:**

Chronic injuries made up for 52.7% of surfing injuries, with the spine and surrounding musculature being the most commonly affected regions. Factors associated with injury were the repetitive nature of certain aspects of surfing and the age of the surfer.

The findings in this study concurred with previous literature with the respect to sustaining of an injury related to surfing. However, many of the findings in this study differed to that of previous literature with respect to the common site of injury. The spine was the most common site of injury, as opposed to lower extremities as had been previously reported. The factors associated with injury also differed somewhat from previous literature. Therefore, this warrants further investigation with due consideration to the recommendations from this study.

**Keywords:** surfing; injuries; quantitative profile

# Table of Contents

**CHAPTER 3**



**CHAPTER 4**

**CHAPTER 5**

## LIST OF TABLES

## LIST OF FIGURES

# LIST OF APPENDICES

## Definitions

**Anterior:**

The front surface of the body.

**ASP:**

The Association of Surfing Professionals (ASP) is the leading governing body of professional surfing. They are responsible for organizing a competitive calendar, filled with contests around the world, that competitive surfers may enter, (Mendez-Villanueva, et al. 2006).

**Cervical:**

Relating to the neck.

**Confidentiality:**

Confidentiality is defined as meaning that one is not able to associate individual people with specific questionnaire responses (Salant and Dillman, 1994).

**Competitive surfer:**

For the purpose of this study will be defined as any professional surfer on the World Qualifying Series or on the World Championship Tour, and competing in the Mr. Price Pro Surfing Competition.

**Curvilinear:**

Consisiting of curved lines.

**Dry needling:**

The use of an accupunctue type needle that is inserted into a muscle in order to treat myofascial trigger points (areas of hyperirritability in a muscle) effectively (Rachlin, 1994).

**Duck dive:**

Pushing the board underwater, nose first, and diving through an oncoming wave instead of riding it, (http://en.wikipedia.org/wiki/surfing, 2008).

**Extension:**

Indicates straightening or increasing the angle between the bones or parts of the body (Moore and Dalley, 1999).

**Flexion:**

Indicates bending or decreasing the angle between the bones or parts of the body (Moore and Dalley, 1999).

.

**Goofy surfer:**

A colloquial term used by surfers to describe a technique in surfing when the left foot is on the back of the board whilst riding a wave, the surfer is left foot dominant, (http://en.wikipedia.org/wiki/surfing, 2008).

**Intern:**

A student that is currently attending the Durban University of Technology and enrolled as a Master's Student in the Chiropractic Programme.

**Internal rotation:**

Also known as medial rotation. It brings the anterior surface of a limb closer to the median plane (Moore and Dalley, 1999).

**Manipulation:**

Chiropractic Manipulation is a small-amplitude, high-velocity movement at the end of a subject's available range of motion in a joint, in order to restore mobility of that segment.

**Mr. Price Pro:**

An annual WQS surfing event held in Durban. Previously known as the Gunston 500, (www.mrpricepro.com).

**Myofascial:**

Relating to the fascia surrounding and separating muscle tissue (Stedman's medical dictionary, 2005)

**Natural surfer:**

A colloquial term used by surfers to describe a technique in surfing when the right foot is on the back of the board whilst riding a wave, the surfer is right foot dominant, (http://en.wikipedia.org/wiki/surfing, 2008).

**Plantarflexion:**

This action turns the foot or toes towards the under surface of the foot (Moore and Dalley, 1999)

**Proprioceptive Neuromuscular Facilitation (PNF) Stretch**

The mode of stretching whereby the muscle is stretched by taking it to the end of its range of motion, the prestretched muscle is then isometrically contracted against immovable resistance and then stretched again to a new point of limitation (Heyward, 1997).

**Posterior:**

The back surface of the body.

**Pronated:**

Movement of the forearm and hand around the longitudinal axis of the radius so that the palm of the hand faces anteriorly.

**Static stretch:**

When a muscle is stretched with the joint at its end of range of motion, and torque is added to the muscle to stretch it further (Heyward, 1997).

**Surfing:**

The sport of riding on the crest or along the tunnel of a wave, especially while standing or lying on a surfboard.

## Abbreviations

| | | |
|---|---|---|
| **CF** | - | Cervical facet |
| **Conf** | - | Confusion |
| **CSSA** | - | Chiropractic Student Sports Association |
| **df** | - | Degrees of Freedom |
| **Jnt** | - | Joint |
| **Lacer** | - | Laceration |
| **LF** | - | Lumbar facet |
| **MS** | - | Muscle strain |
| **Myo** | - | Myofascial |
| **N** | - | Sample Size |
| **PFPS** | - | Patellofemoral Pain Syndrome |
| ***p* value** | - | Probability value (if <0.05 then significant) |
| **TF** | - | Thoracic facet |
| **WCT** | - | World Championship Tour |
| **WQS** | - | World Qualifying Series |

# Chapter 1

# Introduction to the study

## 1.1 Introduction

This chapter introduces the study before presenting the aims and objectives, which include the hypotheses. Lastly the limitations are discussed before a short conclusion summarizes this chapter.

### 1.1.1 Background of surfing

Surfing is defined as the sport of riding on the crest or along the tunnel of a wave, especially while standing or lying on a surfboard, (http://www.thefreedictionary.com/surfing, 2007). Based on the requirements to achieve these activities Meir *et al.* (1991) categorizes the sport's activity patterns into arm paddling, the ducking under of broken waves, a stationary phase whilst selecting an appropriate wave, riding of the wave (which usually includes a variety of manoeuvres) and exiting of the wave (which either entails being dumped by, or jumping off, the wave).

When considering each of these categories Fyfe (2006) states that certain phases of surfing are physically demanding, repetitious (the paddling element as well as the riding of the wave) and is often a hazardous sport, especially for those who like to push the boundaries.

This is of particular significance in the modern era of surfing, where the standards are higher, and there is more public exposure and increased competitiveness amongst the surfers. This pushes those at the top to attempt more radical maneuvers and tackle bigger waves, thus leading to an increased likelihood of injuries. In addition, greater speed and sharper turns have been

made possible by advances in surfboard technology, thus further contributing to surfing injuries (Fyfe, 2006). These assumptions are underpinned by Zoltan *et al.* (2005) who indicated that sprains, strains, dislocations, fractures and lacerations were found to be the most common surfing injuries. The same research showed that more advanced surfers, who often surf larger waves and in more extreme conditions, were found to have more injuries than less experienced or amateur surfers. This concurs with research conducted by Nathanson (2007) who showed that impact with the surfers own board as well as that of his competitors, are the most common mechanisms of injury. Other noted causes of injury are contact with the ocean floor, the surfer's own body motion and the hydraulic force of a wave.

Notwithstanding the seeming increase in popularity of the sport and the concomitant afflictions (Zoltan *et al.,* 2005; Nathanson*,* 2007), little is known about surfing injuries. In this context, Williams (1980) defines an injury as the result of the application to the body, or part of the body, to forces which exceed the body's ability to adjust to them. These forces may be applied instantaneously (acute/traumatic) or over a considerable period (repetitive strain).

According to Lachmann and Jenner (1994) the cause of acute traumatic injuries is usually complex; involving impact, twisting, friction, shearing or stretching forces, or a combination of both, which inflicts damage to a part of the body. A review of the literature reveals studies on acute/traumatic surfing injuries (Zoltan *et al.,* 2005; Nathanson*,* 2007). An example of an acute injury is illustrated in research conducted by Nathanson (2007) who shows that impact with a surfboard (both the surfer's own board as well as that of other competitors), is one of the most common causes of injury.

Conversely overuse injuries result from cumulative microtrauma leading to excessive tissue injury. They occur when the body is unable to absorb forces generated by repeated cyclic loading (i.e. the paddling motion of surfers or

freestyle action of swimmers) of mobile segments or links in the kinematic chain (Renstrom, 1993). Examples of chronic repetitive strain type injuries are the arm paddling phase of surfing which involves a repetitive, freestyle action of the arms (similar to that of swimmers (Shamus and Shamus, 2001)) and the maneuvers performed whilst riding the wave, which involve many repeated actions. It is important then to note, that there is very little information on chronic, repetitive strain type injuries, which involve a force being applied to the body over a considerable period of time, (Williams, 1980; Zoltan *et al.,* 2005; Nathanson, 2007). As it is possible to assume that as in swimmer's shoulder, which is a combination of rotator cuff rupture and Impingement Syndrome (of the subacromial bursa) due to the continuous use of the shoulder joint and muscles (McMaster and Troup, 1993; Hershman, 1995), surfers will suffer from similar conditions.

Therefore this research has focused on the types of chronic, repetitive strain type injuries surfers are most prone to suffer, with the aim of this study having been to determine a retrospective cohort analysis of the injury profile of internationally competitive surfers.

## 1.1.2 Aim of the study

The aim of this study was to determine a retrospective cohort analysis of the injury profile of internationally competitive surfers.

## 1.2 Objectives and Hypotheses

The first objective was a profile of internationally competitive surfers attending the Mr. Price Pro in Durban, KwaZulu-Natal, South Africa with respect to the data obtained from a previously validated sports questionnaire. Data collection was with respect to the following factors:

- Demographics of internationally competitive surfers,
- The surfers' diagnostic history,
- The surfers' treatment history and
- The cohort tracking of surfers over 10 years.

Hypothesis One: The surfers profile would be dissimilar to the literature.

The second objective was to implement cohort tracking when a participant had attended the treatment facility at the Mr. Price Pro for a number of years. This included tracking the diagnostic and treatment history of the participant, any correlations between the two and the regression/progression of the injury.

Hypothesis Two: Injuries were not of a repetitive nature.

## 1.3 Rationale behind the study

Current literature on surfing injuries focuses on acute/traumatic injuries (Zoltan *et al.*, 2005). Surfing does however include repetitive loading of the body during the paddling phase, as well as during the stance phase (Meir *et al.*, 1991). The rationale of this research was to focus and provide information on chronic, repetitive strain injuries suffered in internationally competitive surfers.

By analyzing the above mentioned data, health care professionals (e.g. chiropractors, biokineticists, physiotherapists and athletic trainers) would be able to diagnose and treat chronic, repetitive strain type surfing injuries more effectively (Renstrom, 1993). In addition to this, understanding the etiological factors of the injuries as well as the mechanism of injury (Renstrom, 1993), the profile will also lend insight into what appropriate rehabilitation and training techniques need to be recommended to the injured surfer in their recovery phase, in order to rehabilitate the surfer and prevent further injury.

## 1.4 Limitations

When conducting a study of this nature, it required surfers that were willing to take part in the research, by giving their consent for the recording of their data for research purposes. To enable this, the surfer had to understand the purpose of the research and the researcher had to answer any questions with truthfulness and honesty.

One should also take into account when considering the accuracy of information on injuries reported by the surfer in that ‘memory decay’ (Mouton, 1996) may provide slightly inaccurate results that are unintentional on the part of the surfer. Therefore this research relied on trained chiropractic students for the capturing of the surfers’ diagnoses and treatment protocols, thus improving the accuracy of

the results. However, it must be considered that the data recorded in this study, was based on clinical diagnoses that were determined in part by trainee chiropractors under the guidance of clinical supervisors; therefore the diagnoses may be limited in their scope, but their relevance in terms of the presenting signs and symptoms are not questioned as it is not ethical practice for trainees or their clinical supervisors to treat patients for conditions that are not present (Allied Health Professions Act 63 of 1982).

## 1.5 Conclusion

Very few studies regarding the chronic, repetitive strain type injuries surfers are most prone to suffer, have been done. There has also never been a cohort analysis of the same surfers' injuries over a period of 9 years. Therefore the aim of this study was to determine a retrospective cohort analysis of the injury profile of internationally competitive surfers competing in the Mr. Price Pro in Durban, KwaZulu-Natal, South Africa; in order to determine the chronic, repetitive strain type injuries, surfers are most prone to suffer.

In **this chapter** an introduction to competitive surfing and a background to the sport and the reason for the study were provided. In **Chapter Two**, a definition of surfing will be provided, as well as an explanation and breakdown of the relative governing bodies of surfing. Broad categories of surfing injuries, both acute and chronic, will be discussed in greater detail. In **Chapter Three**, the materials and methods used in this study are discussed and explained. **Chapter Four** deals with the results obtained in the study, as well as a discussion of each result. The cohort tracking of surfers that have attended the treatment facility at the Mr. Price Pro for a number of years will also be explained. In **Chapter Five**, conclusions are drawn from this study, and recommendations for future studies are made. In **Chapter Six** the conclusions and recommendations drawn in Chapter Five are summarized.

# Chapter 2

# Literature Review

## 2.1 Introduction

This chapter provides a definition of surfing and provides more information on surfing as a sport. Shamus and Shamus (2001) state that understanding the sport in which an athlete participates, contributes greatly to accurate diagnosis and treatment of injuries. Therefore, the biomechanics related to the sport and a discussion on the broad categories of acute and chronic injuries suffered by surfers will also be discussed.

## 2.2 Definition of surfing

The objective of surfing is to paddle from the beach to a point beyond the inside area of smaller breaking waves where sets of waves will peak and break on an outlying sandbank or reef (Everline, 2007).

Surfing is defined as the sport of riding on the crest or along the tunnel of a wave, especially while standing or lying on a surfboard[1], (http://www.thefreedictionary.com/surfing, 2007). Meir *et al.* (1991) goes further to categorize the sport's activity patterns into arm paddling, the ducking under of broken waves, a stationary phase whilst selecting an appropriate wave, riding of

[1]Modern surfboards have a rigid foam centre, with an outer covering of fibreglass. They weigh between three and seven kilograms, are less than two metres in length, have a pointed nose, three fins on the under surface of the surfboard and are very manoeuvrable. The leash, which varies in length according to the length of the board, is strapped to the rider's ankle at one end, and the surfer's board at the other (Nathanson *et al*., 2007).

the wave (which usually includes a variety of manoeuvres) and exiting of the wave (which either entails being dumped by, or jumping off, the wave).

Originally and historically, surfing was considered the sport of Hawaiian kings, and could be enjoyed by them (Mendez-Villanueva and Bishop, 2005). However modern surfing according to Nathanson (2007) dates back to the first amateur and professional surfing competitions in the 1960's. During this time surfing competitions were held in California, Hawaii and Australia. Since these humble beginnings, surfing has enjoyed a sustained growth over the last half a century, principally through increased commercialization of surfing apparel and an increased positive association with the lifestyle of surfers (Sunshine, 2003; McDonald Taylor *et al.,* 2005; Nathanson, 2007). Currently, it is estimated that there are more than 2.1 million surfers in the United States alone, and approximately 18 million surfers worldwide. As a result of this large following, the Association of Surfing Professionals is lobbying for the inclusion of this event as an Olympic sport (Nathanson *et al.*, 2002; Nathanson, 2007).

In this modern era of surfing, the standards within the surfing arena are higher; there is more public exposure and increased competitiveness amongst the surfers. These factors all have a direct impact on the surfers, especially those that rely on their performances for income through sponsorship. Thus those at the top of the rankings, tend to attempt more radical manoeuvres and tackle bigger waves in order to achieve higher ratings to maintain their ranking and placement. This however increases the likelihood of injuries as the surfer is likely to utilize greater speed, sharper turns and bigger waves in addition to the advantages provided by the advances in surfboard technology in an attempt to reach the perfect score (Fyfe, 2006).

To better understand the surfer's unique environment and therefore also the context of the injuries, it is important to understand the system of rules that govern the sport, therefore the next section deals with this in more detail.

## 2.3 Surfing as a sport

Surfing contests are held over a one to ten day “holding period”, with organisers attempting to run the heats when weather and wave conditions are the most favourable. When the conditions permit, the surfers are grouped into heats of between two to six men or women. These surfers are then allowed to paddle out into the surf before a heat begins. The heats are between 15 - 30 minutes long, with the surfers attempting to gain points by surfing as many waves as they are able in the given period. This, on average will be three to ten waves but can sometimes be as many as fifteen. This is done to generate two or three scores (usually the top two or three scores of all the waves surfed by one surfer), in order to advance to the next heat. Usually the surfers with the highest combined scores advance to the next stage of the competition (Mendez-Villanueva *et al*., 2006; Nathanson, 2007).

These scores are generated through judging criteria which state that, “a surfer must perform committed radical manoeuvres in the most critical sections of a wave with style, speed and power to maximize scoring” (Mendez-Villanueva *et al.,* 2006). Generally the most innovative and progressive surfing style (composed of a series of individual manoeuvres) will be taken into account when awarding points for committed surfing sequence. Therefore the surfer who executes the criteria with the highest degree of difficulty, yet showing control of the elements on the better / best waves is rewarded with the higher / highest scores (Mendez-Villanueva *et al.,* 2006). Thus even if the elements (wind, water and conditions are not supportive of the surfing competition all surfers are judged against the same elements. The only changes that may be brought into an event are changes in the heat duration, the number of scoring waves and the times at which the heats are to be held. These decisions are applied by the rules that govern the surfing fraternity as represented by the Association of Surfing Professionals (ASP) and the International Surfing Association. Each of these

bodies have regional and country based federations /associations which regulate the sport regionally (Mendez-Villanueva *et al.*, 2005).

The ASP is responsible for organizing a competitive calendar for professional surfers around the world. This calendar runs for almost the entire year, with a short break at the end of the year, before starting again in January (Mendez-Villanueva *et al.*, 2005). Therefore the ASP is the regulating surfboard or governing body that oversees all events and ensures appropriate standards. As such they have introduced a two-tiered competition system, which has been operational since 1992.

This system is recognised by the World Championship Tour (WCT) and the World Qualifying Series (WQS). In principle the WCT consists of the top 45 and 17 male and female surfers respectively in the world (http://www.aspworldtour.com/, 2007). These surfers compete throughout the season against each other in prime world surfing locations worldwide (Mendez-Villanueva *et al.,* 2005).

The WQS is the feeder system for the WCT. At the end of each competitive season, the last 16 surfers in the WCT automatically lose their place in the WCT, and are replaced in the subsequent season with the top 16 WQS surfers (Mendez-Villanueva *et al.*, 2005). This mechanism achieves two vital elements, it allows for continued competition for surfers to remain in the WCT, as well as stimulates competition in the WQS in order for these surfers to enter the WCT. These two mechanisms therefore allow for a continued high standard of surfing, but also places a high stress load on the surfers who are constantly needing to surf in order to obtain points to improve their rankings or maintain their rankings, as these rankings relate directly to their position in either the WCT / WQS as well as their ability to access sponsorship within these systems. This is particularly vital if the surfer is a professional surfer who relies on sponsorships and winnings to sustain his continued interaction with the sport.

To maintain this level the surfer has to be both mentally and physically strong. In order to understand the requirements of this sport, the biomechanics will now be discussed before injuries related thereto will be presented.

## 2.4 Biomechanics of Surfing

Mendez-Villanueva *et al.* (2006) and Meir *et al.* (1991) classify surfers' activities into four distinct categories; these are paddling time, stationary time, wave riding, and miscellaneous or other. These four categories are defined as (Mendez-Villanueva *et al.*, 2005; Mendez-Villanueva *et al.*, 2006):

- Paddling, this is the forward propulsion of the surfboard and surfer, using alternate-arm paddling actions. This category accounts for approximately 51% of the total surfing (in water) activity.

- Stationary time, which is when the surfer sits or lies on his surfboard, with no locomotion activity. This usually occurs when the surfer is awaiting a wave that has the potential to be ridden. This time accounts for approximately 43% of the time spent in the water.

- Wave riding, also known as the time from the surfer's last arm stroke before he rises to stand on the surfboard, to the moment that his feet lose contact with the surfboard (surfer is dumped by a wave) or he effectively finishes riding the wave (surfer exits the wave). Wave riding, although the most critical for the surfer to gain points, accounts for only 4% of the time spent in the water.

- Lastly the miscellaneous portion is defined as that time in which the surfer restores himself to a stationary phase. This may include recovering and getting back on the surfboard (after being dumped by a wave) or lying

back down on the surfboard after exiting a wave and paddling back out through the surf (ducking under of waves) to attain a position in which he is ready to wait for another potential wave to be ridden. This last phase has been calculated as representing only 2% of the time in the water.

## 2.4.1 Paddling

In many ways paddling can be likened to the freestyle stroke in swimming. Freestyle is described as an alternating movement of the arms in extension over the head with a bilateral alternating kick (Shamus and Shamus, 2001; Sutherland, 2008).

The arm strokes of paddling can be divided into the hand entry phase, glide phase, catch phase, pull-through and recovery phases.

The kicking portion of paddling can be divided into the downbeat phase and upbeat phase.

### 2.4.1.1 Arm strokes

#### 2.4.1.1.1 The hand entry phase

This phase begins as the hand enters the water. Its starts with the fingertips entering the water first to reduce water drag, and is then followed by the rest of the hand. During the hand entry phase, the forearm is pronated and there is internal rotation of the shoulder (Shamus and Shamus, 2001; Sutherland, 2008). The arm is slightly flexed and the elbow is in a higher position than the hand.

### 2.4.1.1.2 The glide phase

As the wrist and elbow enters the water the arm reaches forward to full extension. This is the glide phase of the stroke, but is also known as the stretch phase. As the arm reaches forward to full extension, the wrist remains in a neutral position with the palm of the hand facing downwards. The timing of the stretch should correspond with the start of the recovery phase of the opposite arm (Maglischo, 1982; Sutherland, 2008).

### 2.4.1.1.3 The catch phase

After the glide phase has occurred, the catch phase follows. This is in preparation for the pull-through phase. The catch phase is when the wrist flexes approximately 40 degrees, the hand is rotated outwards and the elbow begins to flex. It is essential that the swimmer has a powerful catch. After the catch the hand speed should increase in a downward and outward motion to begin the pull-through phase of the stroke (Maglischo, 1982; Sutherland, 2008).

### 2.4.1.1.4 The pull-through phase

According to Maglischo (1982) the pull-through phase can be divided into the downsweep, insweep and upsweep.

In the downsweep the hand moves in a curvilinear path downwards and outwards. The outward motion of the hand occurs naturally as the shoulder rolls into the stroke and follows the downward movement. In order to maintain the downward motion of the hand, the elbow joint is gradually flexed. The speed of the downward sweep of the hand increases throughout the duration of the downsweep. The velocity of the downward motion must exceed the velocity of the backward motion (Maglischo, 1982; Sutherland, 2008) in order to achieve

optimal propulsion through the water and in order to prepare the hand for the next phase of the stroke.

The palm of the hand faces downwards and is flexed in a cupped position. The hand then moves downward, outward and backward in direction. This causes water to move backwards as it moves under the hand (Maglischo, 1982; Sutherland, 2008).

The downsweep phase has the least propulsion, but is essential, as when it is performed correctly it maximises the effectiveness of the insweep. At the deepest point of the stroke the downsweep rounds-off into the insweep phase of the pull-through. As the hand nears the deepest point of the downsweep, the hand motion is rounded-off, from a downward and outward movement in the downsweep to an inward, upward and backward motion as the hand moves from a position outside the shoulder moving under the body and towards the midline, during the insweep. As the hand approaches the midline of the body the inward, upward and backward motion of the hand sweep is accelerated. The angle of the hand changes from an outward, downward and backward position to an inward, upward and backward position, thus causing the water to push backwards as it passes over the palm, thumb and fingers. When the hand is at the midline under the body or between the midline and the outer border of the body, the insweep is complete (Maglischo, 1982; Sutherland, 2008).

During the upsweep the hand is pushed backwards as the hand movement and pitch change from an inward to an outward position. The upsweep begins as the hand passes under the surfer's head. The hand pushes directly backwards from the chest to the waist. As the hand reaches the hip, the hand motion is accelerated in an outward, upward and backward direction until the hand reaches the thigh. The palm of the hand is rotated inward thus allowing the hand to exit the water with minimal drag. The surfer's elbow is flexed as the hand exits the water. This indicates the start of the recovery phase of the paddling stroke. The

hand speed is increased as the hand moves outwards and then upwards during the upsweep. The upsweep is the most propulsive phase of the stroke (Maglischo, 1982; Sutherland, 2008).

### 2.4.1.1.5 The recovery phase

The recovery phase of paddling allows the surfer to reposition his hand in the correct position for the next stroke (Maglischo, 1982). The recovery phase of surfing can be divided into the elbow lift, mid-recovery and hand entry. During the recovery phase the arm is out of the water and is reaching forward. The arm should be kept as relaxed as possible to ensure it has time to rest before the start of the next stroke cycle. In the recovery phase the elbow is flexed and kept high out of the water (Shamus and Shamus, 2001; Sutherland, 2008).

During the recovery phase the elbow exits the water and begins to move forward while the hand is finishing the upsweep. The elbow is flexed and moves in an upward and forward direction after exiting the water, the forearm and hand follow the path of the elbow. The palm of the hand is rotated inwards as it exits the water with the little finger leaving the water first, thus a minimal amount of drag will be experienced. During the first half of the recovery phase of the stroke, the arm moves in an upward, outward and forward motion. As the hand reaches for the entry position the arm moves in a forward, inward and downward motion. The arm must begin reaching forward preparing for the hand entry as soon as the hand passes the shoulder. The elbow will begin to extend and continues to extend as the hand enters the water (Shamus and Shamus, 2001; Sutherland, 2008).

Everline (2007) states that during the paddling phase, the surfer lies prone on his surfboard. The surfer is often in spinal hyperextension , with the suprapubic area of the abdomen the only point of contact with the surfboard. This posture is necessary in order for the surfer to see oncoming sets of waves, whilst

navigating himself around currents and hazards. This puts a significant amount of pressure on both the spine and the surrounding musculature.

### 2.4.1.2 Kicking strokes

#### 2.4.1.2.1 The downbeat phase

The downbeat phase of the kick is the most powerful and results in the propulsion. The downbeat is initiated by a forceful contraction of hip flexors, iliopsoas and rectus femoris (Moore and Dalley, 1999) followed by a powerful knee extension by the contraction of quadriceps femoris (Moore and Dalley, 1999). The ankle joint is held in plantarflexion by gastrocnemius, soleus, tibialis posterior and peroneus longus and brevis muscles (Moore and Dalley, 1999) through out the flutter kick, which allows for a maximal surface area of the foot to be used (Sutherland, 2008).

#### 2.4.1.2.2 The upbeat phase

The upbeat of the kick is achieved by active hip extension due to the gluteal, hamstrings and gracillis muscles (Moore and Dalley, 1999). The knee is in full extension and the ankle is plantarflexed. The upbeat phase of the kick is said to be the recovery phase of the legs (Shamus and Shamus, 2001; Sutherland, 2008).

### 2.4.1.3 Muscles used during paddling and kicking phase

The table below lists the muscles that are involved in the paddling and kicking phase of surfing.

**Table 2.1 Muscles used in the paddling and kicking phase of surfing** (Moore and Dalley, 1999; Travell and Simons, 1993; Travell and Simons, 1999; Sutherland, 2008)

| Muscle | Origin | Insertion | Action |
|---|---|---|---|
| **Latissimus dorsi** | Spinous processors of inferior 6 thoracic vertebrae, Thoracolumbar fascia, iliac crest and the inferior 4 ribs | Intertubercular groove of the humerus. | Extends, adducts and internally rotates the humerus. |
| **Teres major** | Dorsal surface of the inferior angle of the scapula | Intertubercular groove of the humerus. | Adducts and internally rotates the arm. |
| **Teres minor** | Superior part of the lateral border of the scapula | Inferior facet of the greater tubercle of the humerus | Externally rotates the arm and helps hold the humeral head in the glenoid cavity. |
| **Deltoid** | Lateral third of clavicle, acromion and the spine of the scapula | Deltoid tuberosity of the humerus | Anterior: flexes and internally rotates the arm.<br>Medial: abducts the arm<br>Posterior: extends and externally rotates the arm. |
| **Supraspinatus** | Supraspinous fossa of the scapula | Superior facet of the greater tubercle of the humerus | Abduction of the arm |
| **Infraspinatus** | Infraspinous fossa of the scapula | Greater tubercle of the humerus | Externally rotates the arm and Helps hold the humeral head in the glenoid cavity. |
| **Subscapularis** | Subscapular fossa | Lesser tubercle of the humerus | Internally rotates the arm and adducts it. Helps hold the humeral head in the glenoid cavity. |
| **Pectoralis major** | Clavicles head: anterior surface of the medial half of the clavicle.<br><br>Sternocostal head: anterior surface of the sternum, | Lateral lip of the intertubercular groove of the humerus | Adducts and internally rotates the head of the humerus. Draws the scapula anteriorly and inferiorly |

| | | | |
|---|---|---|---|
| | superior 6 costal cartilages. | | |
| **Trapezius** | Medial 1/3 of superior nuchal line, external occipital protuberance and spinous processors of C7- T12 vertebrae | Lateral third of the clavicle, acromion and the spine of the scapula | Elevates, retracts and rotates the scapula |
| **Levator scapula** | Posterior tubercles of C1-C4 transverse processors | Superior part of the medial border of the scapula | Elevates the scapula and rotes the scapula thus tilting the glenoid cavity inferiorly. |
| **Rhomboid** | Minor: nuchal ligament, spinous processors of C7 and T1<br>Major: spinous processors of T2-T5 | Medial boarder of the scapula | Retracts scapula and rotates it to depress the glenoid cavity. |
| **Quadriceps**<br>• Rectus Femoris | Anterior iliac spine and ilium superior to the acetabulum. | Base of the patella via the patella ligament to the tibial tuberosity. | Extend leg at knee, stabilises the hip joint and aids Iliopsoas flex the hip. |
| • Vastus lateralis | Greater trochanter and the lateral lip of the linea aspera of the femur | Base of the patella via the patella ligament to the tibial tuberosity. | Extend leg at knee |
| • Vastus medialis | Intertrochanteric line and the medial lip of the linea aspera of the femur | Base of the patella via the patella ligament to the tibial tuberosity. | Extend leg at knee |
| • Vastus intermedius | Anterior and lateral surface of body of the femur. | Base of the patella via the patella ligament to the tibial tuberosity. | Extend leg at knee |
| **Gastrocnemius** | Lateral head: lateral aspect of the lateral femoral condyle.<br>Medial head: popliteal surface of the femur superior to the medial femoral condyle. | Posterior surface of the calcaneus via the calcaneal tendon | Plantarflexes the ankle when the knee is extended. Raises the heel during walking and flexes the leg at the knee joint. |
| **Soleus** | Posterior aspect of the fibula head and medial boarder of the tibia | Posterior surface of the calcaneus via the calcaneal tendon | Plantarflexes the ankle independent of the knee position and steadies the foot |
| **Tibialis posterior** | Posterior surface of the tibia and fibula | Tuberosity of the navicular, cuneiform and cuboid, base of the $2^{nd}$ to $4^{th}$ metatarsals | Ankle plantarflexion, inverts the foot |

| | | | |
|---|---|---|---|
| **Peroneus Longus** | Head and superior part of the fibula | Base of the 1st metatarsal and medial cuneiform | Everts the foot and act as a weak plantar flexor of the ankle |
| **Peroneus Brevis** | Inferior part of the lateral side of the fibula | Doral surface of the tuberosity on the lateral side of the base of the 5th metatarsal | Everts the foot and act as a weak plantar flexor of the ankle |
| **Gracillis** | Body and inferior part of the pubic ramus. | Superior part of the medial tibial surface | Adducts the thigh, flexes the leg and assists with medial rotation of the thigh. |
| **Gluteus muscles**<br>• Gluteus maximus | Ilium posterior to the posterior Gluteal line, dorsal surface of the sacrum and coccyx and sacrotuberous ligament | Iliotibial tract that insert on the lateral condyle of the tibia. Other fibres insert on the Gluteal tuberosity of the femur. | Extends thigh, lateral rotation of the thigh. |
| • Gluteus medius | External surface of the ilium, between the anterior and superior Gluteal lines | Lateral surface of greater trochanter of the femur. | Abducts and medially rotates thigh |
| • Gluteus minimus | External surface of the ilium, between the anterior and inferior Gluteal lines | Anterior surface of the greater trochanter of the femur. | Abducts and medially rotates thigh |
| **Hamstring**<br>• Semitendinosus | Ischial tuberosity | Medial surface of the superior part of the tibia | Extends thigh; flexes leg and rotates it medially when the knee is flexed. When the thigh and knee are flexed, these muscles can extend the trunk. |
| • Semimembranosus | Ischial tuberosity | Posterior part of the medial tibial condyle, lateral to the femoral condyle | Extends thigh; flexes leg and rotates it medially when the knee is flexed. When the thigh and knee are flexed, these muscles can extend the trunk. |
| • Biceps Femoris | Long head: Ischial tuberosity<br>Short head: linea aspera and lateral supracondylar line of the femur | Lateral aspect of the fibula head. The tendon splits at this site by the fibular collateral ligament of the knee | Flexes the leg and rotates it laterally when the knee is flexed. Extends the thigh |

## 2.4.2 Stationary time

Once a surfer has safely negotiated his way through the surf and is in a position to paddle onto oncoming breaking waves, he often sits balanced on the surfboard. This position relies heavily on spinal muscles to maintain the hips in line with the surfboard and water. Although the surfboard is often nestled between the thighs without much effort, it is necessary in choppy surf conditions, to use the hip adductors and subtle tilting of the pelvis to keep the surfboard in this position (Everline, 2007).

## 2.4.3 Wave riding

Once the wave of choice has presented, the surfer aligns the surfboard correctly and assumes the prone paddling position once again. When the surfer has caught the wave, he must stand quickly and balance on the surfboard. This stance is most often a half-squatting position with the knees flexed at 30-80°. The rear knee will often be stressed in a valgus position (Everline, 2007).

Once the surfer is balanced and riding the face of the breaking wave, a variety of manoeuvres may be performed. These manoeuvres may be performed using two different stances, depending on which is more comfortable. When the front foot forward is the left foot, the stance is known as regular. When the front forward is the right foot, the stance is known as goofy. Everline (2007) describes cutbacks, stalling, snapping and aerials as the main manoeuvres performed by surfers.

These manoeuvres will be explained in more detail below using the regular stance as an example:

### 2.4.3.1 Cutbacks

Cutbacks are toward and away from white-water sections. This manoeuvre requires the left shoulder and hip rotation with foot dorsal flexion for a regular-footed left cutback or right shoulder and hip rotation and foot plantar flexion for a regular-footed right cutback (Everline, 2007).

### 2.4.3.2 Stalling

This manoeuvre is when the surfer decelerates the surfboard deeper into the unbroken part of the wave in order to position himself in the airspace under the breaking wave. This airspace is commonly known as a 'barrel'. Everline defines stalling as "the means of lifting the front foot with the leading hip and using knee flexion to allow the tail of the board to submerge slightly, robbing it of its ability to plane on the water". In order for the surfer to fit in this airspace, he has to crouch and therefore place severe valgus stresses on the back knee (Everline, 2007).

### 2.4.3.3 Snapping

Snapping enables the surfer to obtain enough speed to oppose the momentum of a wave and climb the face of it whilst rotating the trunk, hips and surfboard. The snap is obtaining a rotating axis by flexing the front hip and knee whilst extending the back hip and knee. The shoulder winds away from the direction of the snap before explosively uncoiling the head, shoulders and then the hips. This is done whilst the back hip is flexed and the front hip is extended, all whilst maintaining balance on the back leg (Everline, 2007).

### 2.4.3.4 Aerials

An aerial is when the surfer obtains enough speed to oppose the momentum of the wave, climb the face of the wave, launch both himself and surfboard off of the wave and into the air, land back onto the face of the wave and re-descend. When the surfboard and surfer are in the air, the surfer must flex his hips and knees in order to get a hand on the surfboard in order to prevent it from slipping away. Re-entry into the wave places a severe valgus force on the back knee (Everline, 2007).

## 2.5 Surfing Injuries

Williams (1980) defined an injury as occurring as a result of the application to the body, or part of the body; forces which exceed the body's ability to adjust to them. These forces may be applied instantaneously (acute) or over a considerable period (chronic). In agreement with this Peterson and Renstrom (2001) state that varying degrees of trauma cause injuries and thus divided injuries into acute/traumatic injuries, caused by large forces (macrotrauma), and chronic/overuse injuries, caused by repetitive microtrauma.

### 2.5.1 Acute surfing injuries

Acute traumatic injuries (sudden impact, sudden onset) are common in athletes generally (and surfers more specifically) and attract the most amount of publicity as they usually necessitate the athlete to be withdrawn from the event; and research because the cause of the injury can usually be identified, making it easier to define the injury and apply an appropriate treatment protocol. Thus the cause/effect relationship as well as the severity of acute injuries are generally obvious and can easily be measured as the athlete usually experiences a rapid onset of pain and swelling begins to develop in the region of the injury (Peterson and Renstrom, 2001).

## 2.5.1.1 Epidemiology

### 2.5.1.1.1 Incidence and Prevalence

In this regard Nathanson *et al.,* (2002), who reported on 1237 surfers, stated that direct trauma from a surfboard was the most common cause of acute injuries in surfers, resulting in 67% of all injuries. Of this total, 82% of these injuries were inflicted by the surfer's own surfboard, and 18% were from the surfboards of other surfers. In the case of the surfer's own surfboard, the injury was caused mainly by the rail of the surfboard, whereas in the case of another surfer's surfboard, the injury was caused by the fins or nose. Of the remaining 33% of injuries, contact with the seabed caused 17% of acute surfing injuries; with lacerations or injury from coral reef or submerged rocks most commonly reported; whereas only 5% of all acute injuries were related to the excessive body movement required whilst performing manoeuvres on a wave. Additionally 7% of acute injuries were caused solely by the hydraulic force of the wave (being dumped by a wave), where surfers complained of / presented with ruptured tympanic membranes, near drownings and / or shoulder dislocations. Whereas, marine animals (jelly fish, sea urchins and stingrays) caused only 3% of acute injuries; and only 3 shark bites (<1%) were noted.

When classified in terms of the phase of surfing (Mendez-Villanueva and Bishop, 2005; Mendez-Villanueva and Bishop, 2006), 62% of acute injuries occurred whilst the surfer was riding a wave, 16% followed unsuccessful take-offs and another 16% followed turning manoeuvres (Nathanson *et al*., 2002). Therefore it can be seen that the surfer is most likely to be injured in the phase where he they spends the most amount of energy in the least amount of time (Mendez-Villanueva and Bishop, 2005; Mendez-Villanueva and Bishop, 2006). This therefore may account for the findings in a follow up study by Nathanson, (2007),

who calculated that the injury rates for competitive surfers were 13 injuries per 1000 hours of competitive surfing.

When looking at surfer demographics, only Nathanson *et al.,* (2002) established that the mean age of injured surfers was 23.6 years and that there was a distinct trend between the severity of the injury and the age of the surfer at the time of the injury. In this respect, the risk for significant injury nearly doubled amongst surfers 40 years of age or older, when compared with surfers of 20 years of age.

### 2.5.1.2 Type of injury

The most common acute injuries found in surfers were lacerations, strains and sprains. A study on 650 surfers conducted by McDonald Taylor *et al.,* (2004) showed that approximately one half of the injuries reported were lacerations and one quarter of the injuries was strains and sprains. Cumulatively, contusions, dislocations and fractures combined, made up for almost one-fifth of the total injuries, with factors such as hypothermia and near drownings making up for a much less significant portion.

These findings seemed to concur with the earlier findings of Nathanson *et al.,* (2002) and Kim *et al.,* (1998) who found that of the 20% of serious injuries noted by McDonald Taylor *et al.,* (2004) concussion injuries accounted for 16% of head and neck injuries, whilst tympanic membrane rupture is also fairly common.

Nathanson *et al*., (2002) also reported that environmental injuries such as marine animal bites or stings, near drowning and hypothermia[2] were less common injuries found in surfers.

[2] Hypothermia occurs when the body looses more heat than it produces, and the core body temperature of the body drops below 35°C. It is likely to occur in sports involving water immersion of the body (Brukner and Khan, 2006).

### 2.5.1.3 Location of injury

From the literature it would seem that lower extremity injuries are the most common acute injuries suffered by surfers, especially of the knee, foot and ankle (McDonald Taylor *et al.,* 2004; Nathanson, 2007). McDonald Taylor *et al.* (2004) reported that lower extremity injuries accounted for approximately 50% of the total injuries in their 2004 study, with their 2005 study reporting frequencies of between 26%-37% of surfing injuries to the head, facial and neck region (McDonald Taylor *et al., 2*005). It would seem that the aggressive turning and aerial manoeuvres[3] score very highly in surfing competitions; however they place a large amount of strain on the knee and surrounding soft tissue. This accounts for the lower extremity being the most popular site of injury. In addition it should be noted that these manoeuvres are very difficult to perform, which may explain why the frequency of knee injuries is higher in professional surfers than in recreational surfers.

Nathanson, (2007) and McDonald Taylor *et al.* (2004) reported much lower percentages for upper extremity injuries. Nathanson *et al.* (2002) stated that out of 162 upper extremity injuries in their study, 37% of upper extremity injuries related to the shoulders and 22% related the hands. Furthermore Nathanson *et al.* (2002) reported that a further 13% of acute injuries were to the trunk, with majority of injuries occurring in the back and chest area.

[3] A maneuver whereby the surfer propels himself and his board up the face of a wave and into the air (Nathanson *et al.,* 2002)

## 2.5.1.4 Mechanism of injury

Research conducted by Nathanson (2007), shows that impact with a ***surfboard***; both the surfer's own surfboard as well as that of other competitors is the most common causes of injury. Crowded surfing spots and surfers cutting in front of each other, are both contributing factors to collisions occurring (Nathanson *et al.,* 2002). Previously Nathanson *et al.* (2002) found that 72% of lacerations and 66% of contusions were caused by the surfers' own surfboard. Kim *et al*. (1998) states that the sharp pointed nose of the surfboard and the leash keeping the surfer at close proximity to the surfboard following a fall, are common contributing factors to surfing injuries. Additionally shoulder dislocations can be caused by a direct blow to the shoulder (for example from a surfboard impact or being pulled by a jet ski) or a forced, excessive motion of the shoulder (hitting the reef / sand). With a shoulder dislocation, the head of the humerus displaces itself from the glenoid cavity of the shoulder (Brukner and Khan, 2008).

The **posture** of surfers should also be taken into account when looking at causative factors of acute injury. During paddling, the surfer's trunk is hyperextended, which puts severe stress on the spine, as well as surrounding musculature. Back spasms are common in surfers. Injury can also occur during the high-intensity, rapid movement of certain manoeuvres (Sunshine, 2003).

Other causes of injury are contact with the ***ocean floor***, where a sea floor with a sandy bottom is more forgiving than a sea floor consisting of rocks or reef. Certain reefs also have a variety of plant and animal life that can be found on them. Thus reefs can cause lacerations as well as associated infections (Nathanson, 2007). In this respect, Nathanson (2007) found that injury rates of surfers more than double when surfing larger waves or rocky reefs.

Furthermore the ***hydraulic force of a wave*** (Nathanson, 2007) grows as the wave grows in height (the energy that the wave creates increases). Thus, the

hydraulic force that a wave imparts onto both surfer and surfboard increases. When large waves break they release more kinetic energy than smaller waves and cause both surfer and surfboard to tumble together for great distances in event of a fall. Shoulder dislocations, tympanic membrane ruptures and near-drownings are all injuries caused by the hydraulic force of a wave (Nathanson *et al.*, 2002). The tympanic membrane is commonly known as the “ear drum”, and is the boundary between the external and middle ear (Stedman’s Medical Dictionary for the Health Professions and Nursing, 2005). This membrane may rupture when a surfer is hit by a powerful wave or if a surfer falls and hits the water with a powerful force (Zoltan *et al.,* 2005). Pain, bleeding from the ear or impaired hearing, are indicative of a ruptured tympanic membrane (Brukner and Khan, 2006).

In this ***environment***, lacerations caused by the reefs, rocks or surfboards may become infected with marine organisms. Common pathogens causing infection in seawater and marine wounds are *Staphylococcus aureus, Myobacterium marinum, Vibriovulnificus* and the Streptococcus species (Zoltan *et al.*, 2005). If these lacerations are left untreated, they may form what is commonly known as a sea ulcer. These are found most commonly on the hands, feet and ankles of surfers. Frequent exposure to sea water erodes scabs and decreases the body’s healing capabilities (Sunshine, 2003). Zoltan *et al.* (2005) and Sunshine (2003) also state that surfers often come into contact with free-floating jellyfish. These animals have a main body and multiple dangling tentacles with venom-filled cells that can cause extreme pain when coming into contact with human skin. Other symptoms include swelling, erythema, edema and bullae formation. Furthermore stingrays spend most of their time on the seabed and are often encountered by surfers when entering and exiting the water. Their tail has a sharp spine that can penetrate wetsuits and water shoes. Surfers that have been stung by a stingray may present with puncture wounds or lacerations, usually in the lower extremity (Sunshine, 2003; Zoltan *et al.*, 2005). More seriously, sharks attacks, although widely publicized throughout the world, are extremely rare, but remain a hazard

to surfers. Zoltan *et al.* (2005) and Sunshine (2003), state that approximately half of all unprovoked shark attacks worldwide involve surfers or windsurfers.

Lastly in terms of the ***surfer's actual activities***, it would seem that the aggressive turning and aerial manoeuvres[4] score very highly in surfing competitions; however they place a large amount of strain on the knee and surrounding soft tissue (Everline, 2007). This accounts for the lower extremity being the most popular site of injury (McDonald Taylor *et al.*, 2005; Nathanson, 2007). In addition it should be noted that these manoeuvres are very difficult to perform, which may explain why the frequency of knee injuries is higher in professional surfers than in recreational surfers. In addition unsuccessful takeoffs, tube riding (riding under the crest of a breaking wave) and duck diving (pushing the surfboard under an oncoming wave whilst paddling out) were also reported to have caused acute surfing injuries (Nathanson, 2007).

## 2.5.2 Chronic surfing injuries

Chronic injuries are those which involve a force being applied to the body over a considerable period of time (Williams, 1980). As such overuse injuries result from cumulative microtrauma leading to excessive tissue injury. They occur when the body is unable to absorb forces generated by repeated cyclic loading[5] of mobile segments or links in the kinematic chain (Renstrom, 1993).

Generally speaking, surfers do not follow any specific training or conditioning programs. They do however spend between 2 and 7 hours a day surfing, at least 5 days a week (Mendez-Villanueva and Bishop, 2005). This amount of surfing could make them vulnerable to overuse injuries, especially in the absence of an

[4] A maneuver whereby the surfer propels himself and his board up the face of a wave and into the air (Nathanson *et al.,* 2002).

[5] The paddling motion of surfers or freestyle action of swimmers (Shamus and Shamus, 2001; Sutherland, 2008).

appropriate supportive training programme that is responsible for maintaining cardiovascular fitness, general and specific muscle tone as well as being rehabilitative in nature (for injuries previously encountered) (Mendez-Villanueva *et al.*, 2005; Everline, 2007; Nathanson, 2007).

### 2.5.2.1 Type of injury

Due to prolonged exposure to the sun and water, surfers often suffer from bony exostosis of the external auditory canal, otitis externa, sinusitis, pinguecula and pterygium.

***Bony exostosis*** is when bony growths protrude from the temporal (of the temple) bone into the ear. This is caused by prolonged exposure to cold water. This condition may be without symptoms, or may present a progressive loss of hearing, regular ear infections and / or pain in the ear. Studies have shown that surfers who surf more frequently, for more years and in colder water have a greater chance of suffering from bony exostosis (Wong *et al*., 1999; Kroon *et al.*, 2002; Sunshine, 2003; Zoltan *et al.,* 2005). Due to this bony exostosis forming and prolonged exposure to moisture, water may accumulate and stagnate in the ear canal, causing infection (***otitis externa***). Trauma from foreign bodies and wave pressure can also be causative factors, resulting in itching, pain in the ear and discharge from the ear (Sunshine, 2003; Zoltan *et al.,* 2005).

Prolonged exposure to water may also cause impaired draining of the paranasal sinuses. This leads to stagnation of water and mucous in the sinuses and infection which then lead to ***chronic sinusitis*** (Dhingra, 1998).

In contrast the prolonged exposure to ultra violet rays, especially those people living in the subtropical and tropical climates can cause diseases of the

conjunctiva[6] and / cornea[7], namely ***pterygium or pinguecula*** (Fisher and Trattler, 2009). Pterygium is when the conjunctiva thickens and grows inwards onto the cornea. Usually triangular in shape, it is relatively common and can go untreated unless there is growth over the cornea and vision is affected (Fisher and Trattler, 2009). Whereas pinguecula is when the conjunctiva thickens, but is seen as yellowish nodules in the conjunctiva. These nodules are harmless, and only removed if the patient sees the condition as a cosmetic blemish (Bankes, 1987).

### 2.5.2.2 Mechanism of injury

The vast amount of time that surfers spend in the harsh sun, windy surf and often freezing cold water, is the main cause of the reported chronic injuries in surfers. This prolonged exposure can lead to chronic injuries such as bony exostosis of the external auditory canal and otitis externa, sinusitis, pinguecula and pterygium formation are also reported by some surfers (Wong *et al*., 1999; Kroon *et al.*, 2002; Sunshine, 2003; Zoltan *et al.,* 2005).

These conditions are made all the more frequent in that surfers spend most of their time paddling or stationary on their surfboards (Mendez-Villanueva and Bishop, 2005). Furthermore both these actions entail a surfer to lie flat on their stomachs. The surface of the surfboard is usually covered by a special wax that is rough in nature and prevents the surfer from slipping off his/her surfboard whilst riding a wave. Prolonged exposure of the chest, abdomen and knees to this rough surface can cause skin abrasions, as well as infections to the area

[6] The conjunctiva is a mucous membrane that covers the front of the eyeball and the back of the eyelid (Stedman's Medical Dictionary for the Health Professions and Nursing, 2005).

[7] The cornea is the anterior (front) sixth of the outer wall of the eye (Stedman's Medical Dictionary for the Health Professions and Nursing, 2005).

(Nathanson, 2002; Sunshine, 2003). This condition is commonly known as surfer's dermatitis, and can also be caused by prolonged rubbing of the skin by a wetsuit, as well as wind, sunburn and sweat (Sunshine, 2003).

Due to continuous bumping of the dorsal aspect of the foot during take-off, soft tissue (heloma molle and heloma dura[8]) prominences are common on the first metatarsophalangeal joint (Nathanson *et al.*, 2002; Sunshine, 2003).

More recently Everline (2007) revealed that shoulder strains are common chronic injuries in surfers, which are thought to be caused by the shearing forces of vigorous paddling as well as contact of the shoulder with the ocean floor. In this same publication Everline (2007) states that the surfing-medicine community has not made an effort to combine data on the types of musculoskeletal (of muscle and bone) injuries suffered by surfers.

Everline (2007) bases this assertion on the fact that surfing is a sport that is characterised by the repetitive nature of the paddling phase of surfing and the manoeuvres performed whilst riding a wave. In addition the continuous impact of the surfer's body with surfboard, sand, rocks and reefs, it stands to reason that there should be more literature / information available on the chronic musculoskeletal injuries as experienced by the surfers.

This is of particular importance as the lifespan of a surfing professional is limited, as can be seen by the average age of professional surfers attending the Mr. Price Pro, which will be addressed in the next chapters to follow. This limitation may be due to unreported / unrecorded injury which has resulted from the almost all year round competition in order to earn points, improve rankings and be paid. Furthermore, surfers may not want to be seen as having an injury, as this not

[8] Heloma dura is a hard corn over a toe joint. Heloma molle is a soft corn formed by pressure between two toes.

only serves as a psychological hindrance for themselves, but also a psychological advantage for their competitor(s). Therefore having an injury has a huge impact on their social status, their psychological status and financial earnings.

## 2.6 Stages of acute / chronic injury

Kirkaldy-Willis (1992) describes the three phases of degenerative disease. It is imperative to have an understanding of this concept, in order to understand the different phases an injury can go through.

The first phase is **dysfunction.** A minor trauma occurs in a particular site and puts strain on the relevant joint. The muscles that are attached to that joint become hypertonic and contract in order to protect the injured joint. If the muscle contraction is sustained, the muscles are said to have 'splinted' and the joint dysfunction is maintained. A surfer in the dysfunction phase will complain of low back pain (Kirkaldy-Willis, 1992).

The dysfunctional phase then leads onto the **unstable** phase, where with each injury the healing becomes less complete. Normal collagen is replaced with that of scar tissue, which is a lot weaker than normal collagen, and thus the joint becomes weaker and unstable. This instability makes the area more prone to further injury. Further injury makes the instability more marked. A surfer in this phase of degeneration will complain of severe low back pain and a feeling as if the back wants to 'give way'. An injury can shift between phase one and two (Kirkaldy-Willis, 1992).

Once the injury reaches the third phase, which is **stabilization**, there is no shifting back to phase one or two, as this is the phase in which there is hardening of all the supporting structures in response to the instability in phase two. A surfer in the stabilization phase, will have a history of severe back pain, but at present

will be experiencing less and only episodes of low back pain which are usually muscular in origin (Kirkaldy-Willis, 1992).

## 2.7 Conclusion

Therefore it can be seen that since the late 1980's, not only have the surfboards have become lighter, new manoeuvres have evolved, surfing has structured itself to be more competitive, arenas continue to get more crowded and surfers continue venturing into more dangerous and bigger wave breaks (McDonald Taylor *et al.*, 2004; Everline, 2007) in order to achieve their dreams and aspirations.

Notwithstanding this, Nathanson, (2007) state that very little is known about surfing injuries (and what is known is mostly on acute injuries) and that most of the published surfing injury incidences and prevalence's rely on survey data, which is often based on self-reported injuries. In these studies, the limitations of responder bias and memory decay (problems of recall) pose an inherent problem (Mouton, 1996).

Lowdon *et al.* (1983) also states that previous reports of surfing injuries have relied on data collected retrospectively from first aid stations at surfing contests or hospitals near surfing venues. This data does not include a full range of surfing injuries, as it will exclude injuries such as strains and sprains that don't require immediate, if any, medical attention.

Therefore it can be seen that research is needed in order to document all injuries, both acute and chronic in order to determine a holistic view of injuries, which will allow health care providers in providing the most appropriate care for surfing professionals.

# Chapter 3

# Material and Methods

This chapter will discuss the research methodology and data collection used in this study.

## 3.1 Study Design

This study was a retrospective, quantitative, epidemiological study (Mouton, 1996). The Chiropractic Student Sports Association's (CSSA) questionnaire was completed by all participants. The questionnaire has already been validated (Korporaal, 2002).

Based on this design, the research was approved by the Faculty of Health Sciences Research and Ethics Committee at the Durban University of Technology (Appendix II). This approval implies that the research complies with the requirements of the Declarations of Belmont, Nuremberg and Helsinki of 1975.

## 3.2 Allocation of the surfers

### 3.2.1 Sampling

A purposive sample method (Esterhuizen, 2009) was used in this study as the Chiropractic treatment facility at the Mr. Price Pro was available to medical staff, event organisers and support staff. These records were excluded from the study, and only surfers at the Mr. Price Pro were analysed.

### 3.2.2 Sample Size

On average, the interns at the Mr. Price Pro Chiropractic treatment facility treat approximately 150 surfers each year. The data that was available was from the year 2000 – 2008. Thus 1499 questionnaires were available from the Chiropractic Student Sports Association's (CSSA) questionnaires.

## 3.3 Criteria for Participation in the Study

### 3.3.1 Permission required for the study

Permission was granted by the event organisers to allow a Chiropractic treatment facility at the Mr Price Pro. At this Chiropractic treatment facility, surfers had access to treatment that was free of charge to them and allowed them to have any general or musculoskeletal complaint assessed for referral or treatment as necessary.

In order to access the Chiropractic treatment facility all surfers were required to complete the CSSA questionnaire (Appendix I).

Those patients that did not agree to complete the forms were excluded from being treated at the Chiropractic treatment facility at the Mr. Price Pro and referred for treatment at another local facility if it was deemed necessary or if the surfer requested a referral.

By completing the CSSA questionnaire, the surfer gave consent to be treated as well as for the data that was generated to be utilised as part of a research process.

### 3.3.2 Inclusion Criteria

The inclusion criteria for the surfers were as follows:

- Competitive male and female surfers who are:
  - competing on the World Qualifying Series or World Championship Tour.
  - registered and competing in the Mr. Price Pro.

### 3.3.3 Exclusion Criteria

The organisers, medical staff and support staff of the Mr. Price Pro were also able to access the Chiropractic treatment facility throughout the event. They were however excluded from the study, as they are not surfers competing in the Mr. Price Pro.

## 3.4 Data Collection Procedure

### 3.4.1 Background to the Process and Procedure at the event

Based on an agreement between the principal sponsor of the Mr Price Pro and the Chiropractic Programme at the Durban University of Technology, a Chiropractic treatment facility is available to all surfers at the Mr Price Pro.

This Chiropractic treatment facility consists of six to eight portable Chiropractic beds and all the equipment the Chiropractic interns need in order to treat the surfers efficiently. Massage and stretching techniques are often provided to the surfer as a pre-heat warm-up or post-heat warm down. When a surfer presents to the Chiropractic treatment facility with a specific complaint, he is treated under the scope of practice of a chiropractor, and as defined in Act 63 of the

Government Gazette (1982 (as amended)). If the surfer's complaint does not fall under the Chiropractic scope of practice, he is referred to another medical professional.

The Chiropractic treatment facility is available to every surfer on the surfers' level of the Mr. Price Tower, the official "building" of the surfing event (Korporaal, 2008). There are no limitations on the use of the Chiropractic treatment facility and no prerequisites for entry into the Chiropractic treatment facility (e.g. payment for the facility). There is the exception of a surfer giving informed consent to be assessed and treated at the Chiropractic treatment facility, which is expressed by the surfer voluntarily entering the Chiropractic treatment facility and then also completing the required details on the CSSA questionnaire (Appendix I). Those patients who do not agree to complete the CSSA questionnaires are excluded from being treated at the Chiropractic treatment facility and referred for treatment at another local facility.

On entry into the Chiropractic treatment facility, the surfer is requested to complete his portion of the CSSA questionnaire. At this juncture it is explained that the CSSA questionnaire is a tool utilised to record the surfer's treatment over the time period of the event in order to allow for consistent care (Act 63 of 1982 (as amended)) as well as over consecutive Mr Price Pro events. Additionally the CSSA questionnaire allows for research / report backs to the Association of Surfing Professionals and the Mr Price Pro organising committee in terms of the effectiveness of care at the event over time (Fitch, 2007).

Thereafter the senior intern then takes a brief case history, elaborating on the information provided by the surfer, followed by a standard clinical assessment related to the anatomical region or list of differential diagnoses based on the history. The intern then compiles the case in order to present to a clinical supervisor for discussion and approval prior to the surfer being treated (Act 63 of 1982 (as amended); Clinic manual; Dept handbook). Therefore all diagnoses

arrived at and treatments given at the Chiropractic treatment facility are compiled by senior interns; and confirmed by a supervising qualified clinical supervisor (a qualified chiropractor) as is standard practice in the Chiropractic Day Clinic at the DUT (Government Gazette, Act 63 of 1982, (as amended); Clinic Manual, 2007).

This procedure is followed for each visit by the surfers to the Chiropractic treatment facility, whether they have had had previous care / multiple treatments within the duration of an event or over consecutive events.

Thus all clinically relevant information is recorded for each of the surfers at each visit to the Chiropractic treatment facility. This is in line with standard recording and reporting procedures for any patient visit as would be recorded in standard clinical practice (Government Gazette, Act 63 of 1982 (as amended)).

Between events or when the CSSA questionnaires are not required at the Chiropractic treatment facility, they are kept securely stored in a locked storeroom that houses all sports equipment. Thus confidentiality is maintained (Mouton, 1996).

## 3.4.2 Procedure of the research process

All the records from the 2000-2008 Mr Price Pro Surfing Contests were drawn from the storeroom and collated per year that the surfers were seen.

All records were reviewed for purposes of meeting the inclusion and exclusion criteria (see section 3.3.2 and 3.3.3).

An appointment was then made with a statistician to review a CSSA questionnaire in order to establish the most practical manner to analyse the data that had been captured (Esterhuizen, 2007). Data was captured in MS Excel and

converted to SPSS version 15.0 (SPSS Inc., Chicago, Illinois, USA), (Esterhuizen, 2007) for data analysis.

## 3.5 Development of the Questionnaire

The CSSA questionnaire was developed by Korporaal, (2002). Once the questionnaire was developed, a focus group was formed.

A focus group provides a means of interaction and discussion between the researcher and individuals with a vested interest in the topic. It also provokes the development of ideas and understanding on the topic (Morgan, 1996). A focus group also aids the researcher in finding and accessing the relevance and appropriateness of the questions used in the development of the questionnaire (Morgan, 1996). Comments are requested from each of the participants in the focus group on how the questionnaire could be modified and improved so that it could be used to accurately assess sporting injuries.

After the focus group has been completed, a pilot study is done. A pilot study is when the researcher chooses two to three people to answer the questionnaire as if they were the athlete / questionnaire user. These people then evaluate the questionnaire and highlight any problems they may have experienced whilst trying to answer the questions. Sentence structure, grammar, ambiguity and other logistical issues such as time are all very important factors to take into consideration.

According to Fink and Kosecoff (1985) the purpose of a pilot study is to answer the following questions

- Will the questionnaire provide the necessary information?
- Are certain questions in the questionnaire redundant or misleading?

- Are the questions appropriate for the individuals who will be participating in the survey?
- Will the information that the researcher collects enable him to use the survey forms properly?
- Are the procedures standardized?
- How consistent is the information obtained by the survey
- How accurate is the information obtained by the survey

The above two processes, the focus group and the pilot study, were used to validate the questionnaire.

In this context validity refers to establishing the accuracy and trustworthiness of an instrument, data and findings in the research thereby ensuring that future research utilizing that particular tool is accurate (Bernard, 2000).

Once the questionnaire has been validated, it may be used in the research process.

## 3.6 Statistical Analysis

SPSS version 15.0 (SPSS Inc., Chicago, Illinois, USA) was used for analysis of data. A p value of $<0.05$ was considered statistically significant.

Descriptive statistics involved the use of frequency tables and bar charts in the case of categorical variables.

Associations between the demographic variables and region of complaint, clinical impressions and treatment were assessed using Pearson chi-square (Esterhuizen, 2009).

# CHAPTER 4

# Results

## 4.1 Introduction

This chapter reveals the results obtained from the statistical analysis of the data collected.

## 4.2 Outline of the Objectives of the Study

The first objective was a profile of internationally competitive surfers attending the Mr. Price Pro in Durban, KwaZulu-Natal, South Africa with respect to the data obtained from a previously validated sports questionnaire.

The second objective was to implement cohort tracking when a surfer had attended the treatment facility at the Mr. Price Pro for a number of years.

## 4.3 Data

### 4.3.1 Primary data

In this study, information was collected by performing a retrospective, quantitative, epidemiological study (Mouton, 1996), on the Chiropractic Student Sports Association (CSSA) questionnaire. This questionnaire is handed to every surfer seeking treatment at the Mr. Price Pro and has already been validated (Korporaal, 2002).

### 4.3.2 Secondary data

In this study all secondary data was collected from the following sources: journal articles, books and personal communications with relevant people in the field of surfing and sports medicine.

## 4.4 Abbreviations used in this Chapter

| | | |
|---|---|---|
| **CF** | - | Cervical facet |
| **Conf** | - | Confusion |
| **df** | - | Degrees of Freedom |
| **Jnt** | - | Joint |
| **Lacer** | - | Laceration |
| **LF** | - | Lumbar facet |
| **MS** | - | Muscle strain |
| **Myo** | - | Myofascial |
| **N** | - | Sample Size |
| **PFPS** | - | Patellofemoral Pain Syndrome |
| ***p* value** | - | Probability value (if <0.05 then significant) |
| **TF** | - | Thoracic facet |

## 4.5 Results

***The first objective was a profile of internationally competitive surfers attending the Mr. Price Pro in Durban, KwaZulu-Natal, South Africa with respect to the data obtained from a previously validated sports questionnaire.***

### *4.5.1 INJURY PROFILE – PART ONE:*

Data was analysed from all 1499 questionnaires, thus N=1499.

## 4.5.1.1 DEMOGRAPHICS:

## 4.5.1.1.1 Nationality:

Table 4.1 shows that 37.2%% of surfers were from Australia and 28.8% were from South Africa.

**Table 4.1: Frequency distribution by Country**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Australia | 558 | 37.2 |
| | South Africa | 431 | 28.8 |
| | United States of America | 159 | 10.6 |
| | No data | 132 | 8.8 |
| | Brazil | 87 | 5.8 |
| | France | 59 | 3.9 |
| | New Zealand | 17 | 1.1 |
| | Portugal | 11 | .7 |
| | Spain | 8 | .5 |
| | United Kingdom | 8 | .5 |
| | Puerto Rico | 7 | .5 |
| | Morocco | 5 | .3 |
| | Argentina | 3 | .2 |
| | Japan | 3 | .2 |
| | Morocco | 2 | .1 |
| | Peru | 2 | .1 |
| | Puerto Rico | 2 | .1 |
| | Tahiti | 2 | .1 |
| | Costa Rico | 1 | .1 |
| | England | 1 | .1 |
| | Germany | 1 | .1 |
| | Total | 1499 | 100.0 |

## 4.5.1.1.2 Race

Table 4.2 shows that 92.9% of surfers were White.

**Table 4.2: Frequency distribution by Race**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | White | 1393 | 92.9 |
| | Other | 51 | 3.4 |
| | No data | 47 | 3.1 |
| | Black | 5 | .3 |
| | Indian | 3 | .2 |
| | Total | 1499 | 100.0 |

## 4.5.1.1.3 Age

Figure 4.1 reflects that 28.4% were under 21 years while 43.5% were between 21 and 25 years and 20.3% were between 26 and 30 years.

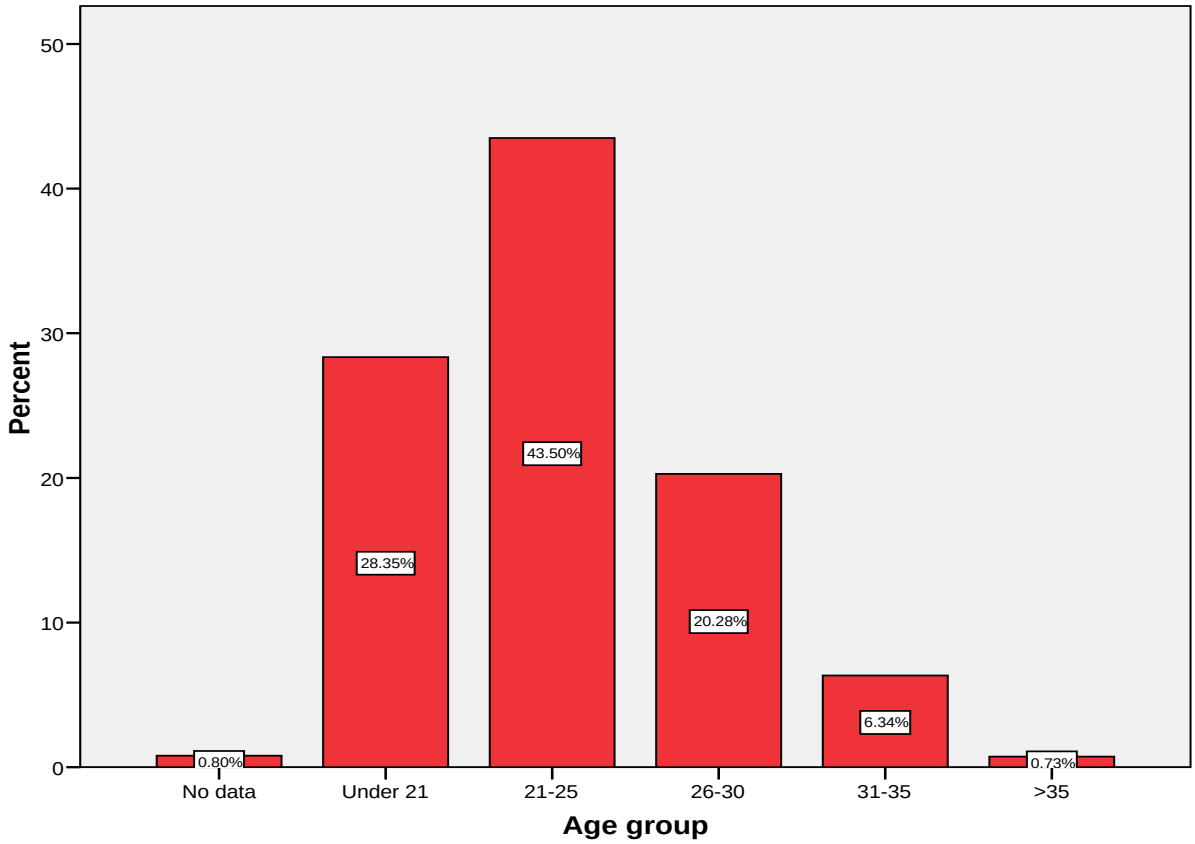



**Figure 4.1 : Age distribution of participants**

## 4.5.1.1.4 Gender

Table 4.4 reflects that 77.5% of participants were male and 22.2% were female.

**Table 4.4: Frequency distribution by Gender**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | No data | 5 | .3 |
| | Male | 1161 | 77.5 |
| | Female | 333 | 22.2 |
| | Total | 1499 | 100.0 |

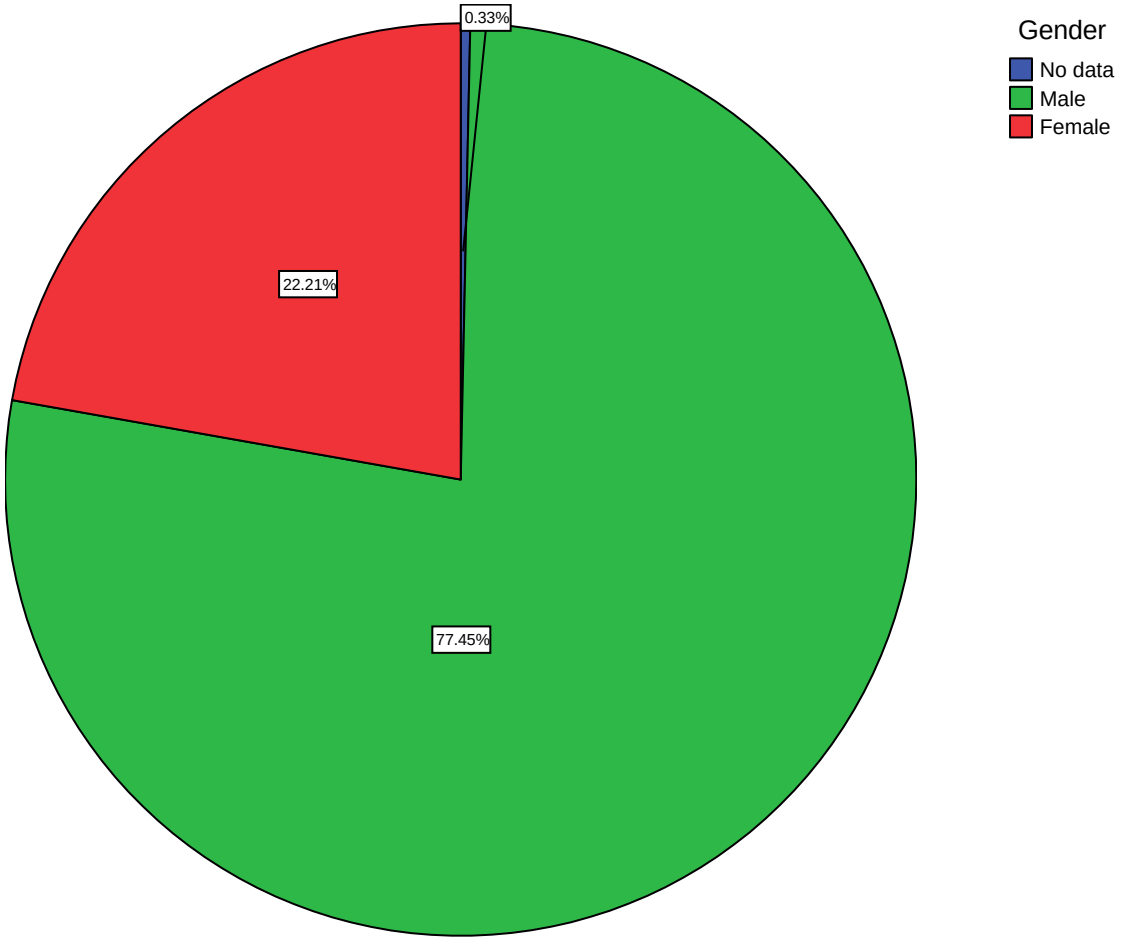



**Figure 4.2: Gender distribution of participants**

## 4.5.1.2 PREVALENCE OF SURFING INJURIES

### 4.5.1.2.1 Type of patient

Table 4.5 shows that 54.6% were new patients and 45.1% were repeat patients.

**Table 4.5: Frequency distribution by Patient**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | No data | 4 | .3 |
| | New patient | 819 | 54.6 |
| | Repeat care | 676 | 45.1 |
| | Total | 1499 | 100.0 |

### 4.5.1.2.2 Type of complaint

Table 4.6 shows that 54.6% of complaints were new complaints and 45.0% were continuation of care.

**Table 4.6: Frequency distribution by Complaint**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | No data | 5 | .3 |
| | New complaint | 819 | 54.6 |
| | Continuation of care | 675 | 45.0 |
| | Total | 1499 | 100.0 |

## 4.5.1.2.3 Region of complaint

Figure 4.3 shows that the lumbar spine (55.2%) was the most common region of complaint, followed by the thoracic (42.2%) and then neck complaints (36.8%).

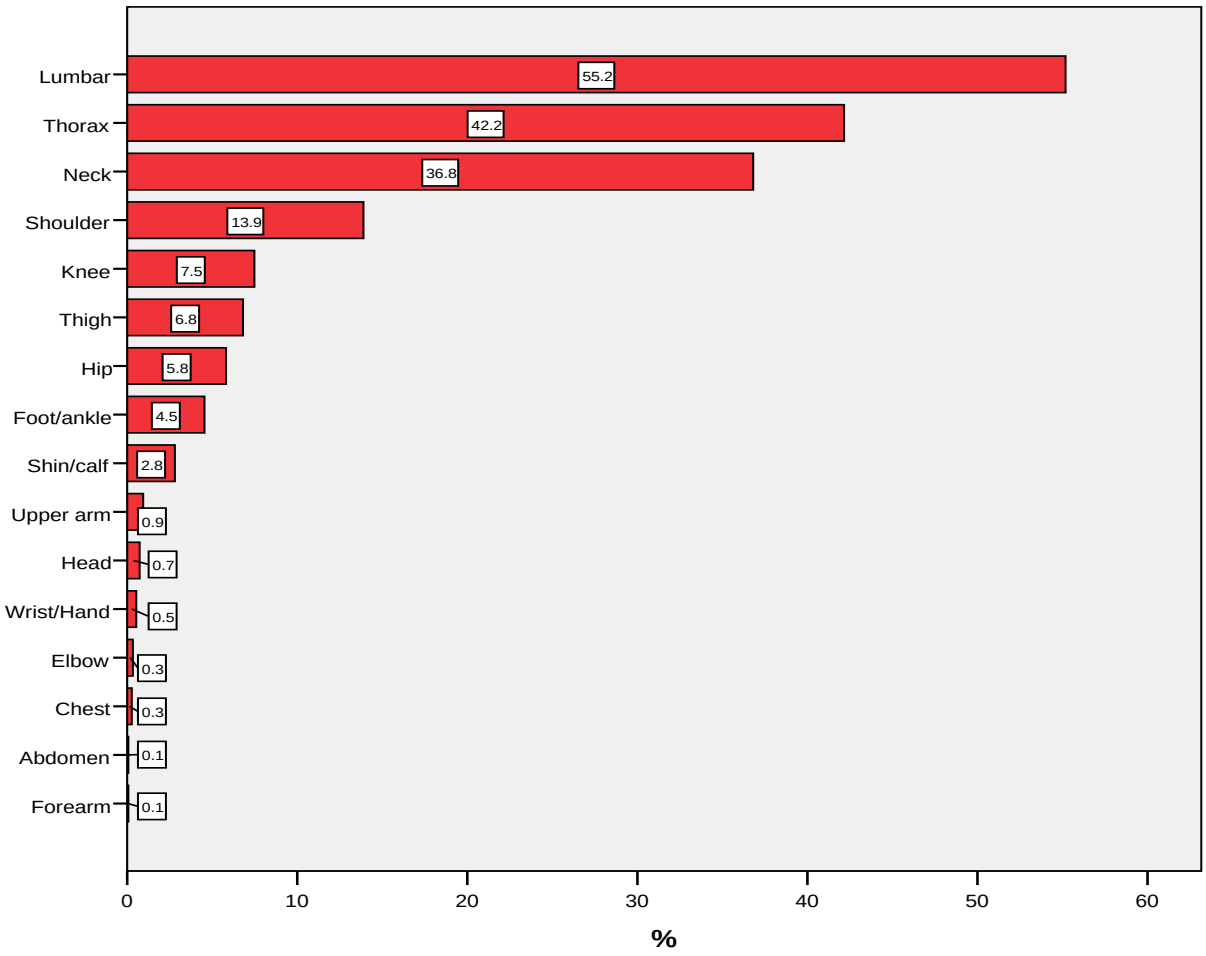



**Figure 4.3: Percentage of region of complaints**

### 4.5.1.2.4 Perceived mechanism of injury

Table 4.7 shows that surfing (47.5%) and paddling (10.9%) were the most common perceived mechanism of injury. Traveling and trauma from a surfboard / wave / sandbank / reef accounted for an equal 5.3% portion of the perceived mechanisms of injury. Unknown mechanisms of injury accounted for 16.5%.

**Table 4.7: Frequency distribution by Mechanism of injury**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Surfing | 712 | 47.5 |
| | No data | 247 | 16.5 |
| | Paddling | 163 | 10.9 |
| | Overuse | 47 | 3.1 |
| | Traveling on a plane | 45 | 3.0 |
| | Trauma from wave | 37 | 2.5 |
| | Long flight on a plane | 35 | 2.3 |
| | Incorrect sleeping position | 30 | 2.0 |
| | Duck diving | 9 | .6 |
| | Post competition stiffness | 7 | .5 |
| | Running | 7 | .5 |
| | Trauma from board | 7 | .5 |
| | Inversion sprain | 6 | .4 |
| | Prolonged sitting | 6 | .4 |
| | Medial collateral ligament tear | 5 | .3 |
| | Muscle fatigue | 4 | .3 |
| | Poor posture | 4 | .3 |
| | Patient doesn't stretch | 4 | .3 |
| | Rheumatoid Arthritis | 4 | .3 |
| | Soccer | 4 | .3 |
| | Tore lateral ligaments of knee | 4 | .3 |
| | Trauma | 4 | .3 |
| | Trauma from sandbank | 4 | .3 |
| | Clavicle dislocation | 3 | .2 |
| | Collision with an object | 3 | .2 |
| | Inversion ankle sprain | 3 | .2 |
| | Motor vehicle accident | 3 | .2 |
| | Patient fell | 3 | .2 |
| | Repetitive trauma | 3 | .2 |
| | Ankle sprain 2 months previously | 2 | .1 |
| | Carrying heavy luggage | 2 | .1 |

## Table 4.7: Frequency distribution by Mechanism of injury cont…

| | Frequency | Percent |
|---|---|---|
| Cliff jumping | 2 | .1 |
| Dislocation 1 year prior | 2 | .1 |
| Fall during snowboarding | 2 | .1 |
| Fell off surfboard | 2 | .1 |
| General stiffness | 2 | .1 |
| Motor vehicle accident 6yrs ago | 2 | .1 |
| Insidious | 2 | .1 |
| Motor vehicle accident | 2 | .1 |
| Not applicable | 2 | .1 |
| Rheumatoid arthritis | 2 | .1 |
| Surfing and traveling | 2 | .1 |
| Taking off wetsuit | 2 | .1 |
| Valgus stress | 2 | .1 |
| Labial tear to left hip (2001) | 1 | .1 |
| Ankle reconstruction on right | 1 | .1 |
| Ankle sprain 2 weeks previously | 1 | .1 |
| Bad sleeping posture | 1 | .1 |
| Boxing | 1 | .1 |
| Canoeing | 1 | .1 |
| Carrying surfboards | 1 | .1 |
| Climbing stairs | 1 | .1 |
| Cut foot | 1 | .1 |
| Driving long distance | 1 | .1 |
| Fall from balcony | 1 | .1 |
| Fell off skateboard | 1 | .1 |
| Fracture of fibula 3-4 months ago | 1 | .1 |
| Gym | 1 | .1 |
| Gym training | 1 | .1 |
| Hyperextension | 1 | .1 |
| Impact trauma 2 week previously | 1 | .1 |
| Injury during sit ups | 1 | .1 |
| Insidious | 1 | .1 |
| Jumped off a boat | 1 | .1 |
| Lifting heavy object | 1 | .1 |
| Micro trauma | 1 | .1 |
| Muscle overload | 1 | .1 |
| Motor vehicle accident 6yrs previously | 1 | .1 |
| No trauma | 1 | .1 |
| Occurs in the morning | 1 | .1 |

## Table 4.7: Frequency distribution by Mechanism of injury cont…

| | Frequency | Percent |
|---|---|---|
| Other training | 1 | .1 |
| Paddling and trauma from wave | 1 | .1 |
| Paddling / traveling on plane | 1 | .1 |
| Picked up heavy object | 1 | .1 |
| Post-surgery | 1 | .1 |
| Post adjustment stiffness | 1 | .1 |
| Post competition stiffness | 1 | .1 |
| Right knee injury | 1 | .1 |
| Rowing machine | 1 | .1 |
| Rugby tackle 12 yrs ago | 1 | .1 |
| Ruptured medial collateral ligaments | 1 | .1 |
| Scoliosis | 1 | .1 |
| Sleeping posture | 1 | .1 |
| Slipped off board | 1 | .1 |
| Snowboarding | 1 | .1 |
| Static wave | 1 | .1 |
| Surfing and exam stress | 1 | .1 |
| Surfing and incorrect sleeping position | 1 | .1 |
| Swimming-butterfly | 1 | .1 |
| Swimming | 1 | .1 |
| Torn intercostal muscle at $8^{th}$ left rib | 1 | .1 |
| Trauma from bike | 1 | .1 |
| Trauma from reef | 1 | .1 |
| Trauma from surfboard | 1 | .1 |
| Trauma to coccyx | 1 | .1 |
| Traveling on plane | 1 | .1 |
| Traveling on plane / surfing | 1 | .1 |
| Twisting while surfing | 1 | .1 |
| Unknown | 1 | .1 |
| Walking | 1 | .1 |
| Total | 1499 | 100.0 |

## 4.5.1.2.5 Severity of injury

Table 4.8 reflects that only 3.3% of injuries were severe enough to prevent the surfer from participating further in the Mr. Price Pro surfing contest.

**Table 4.8: Frequency distribution by - Did the injury cause the surfer not to participate further in the Mr. Price Pro surfing contest?**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | No | 1367 | 91.2 |
| | N/A | 83 | 5.5 |
| | Yes | 49 | 3.3 |
| | Total | 1499 | 100.0 |

Table 4.9 reflects that 98.3% of the surfers seen at the Chiropractic treatment facility at Mr. Price Pro surfing contest were able to continue surfing after treatment.

**Table 4.9: Frequency distribution by - Can the surfer continue surfing?**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | No | 18 | 1.2 |
| | Yes | 1474 | 98.3 |
| | N/A | 7 | .5 |
| | Total | 1499 | 100.0 |

## 4.5.1.2.6 Injury history

Table 4.10 reflects that 48.4% had a previous injury in the area.

**Table 4.10: Frequency distribution by Has the area been injured before?**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 725 | 48.4 |
| | No | 579 | 38.6 |
| | N/A | 195 | 13.0 |
| | Total | 1499 | 100.0 |

## 4.5.1.2.7 Clinical impression of the injury

Table 4.11 shows that 52.7% of all injuries were chronic type injuries.

**Table 4.11: Frequency distribution by Clinical impression**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | Chronic | 625 | 52.7 |
| | Acute | 561 | 47.3 |
| | Total | 1186 | 100.0 |
| Missing | System | 281 | |
| | Acute on chronic | 28 | |
| | Not applicable | 4 | |
| | Total | 313 | |
| Total | | 1499 | |

## 4.5.1.2.8 Most common muscles involved in injury

From tables 4.12- 4.16 below, it can be seen that the Quadratus Lumborum (34.6%), Trapezius (34.6%), Paraspinal (18.4%) and Rhomboid (18.1%) muscles respectively, were the most common muscles involved in injury.

**Table 4.12: Frequency distribution by muscle 1**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | | 163 | 10.9 |
| | Adductors | 1 | .1 |
| | Biceps | 1 | .1 |
| | Cervical paraspinals | 1 | .1 |
| | Erector spinae | 24 | 1.6 |
| | Gastrocnemius | 2 | .1 |
| | Gastrocnemius | 9 | .6 |
| | Gluteus maximus | 3 | .2 |
| | Gluteus medius | 6 | .4 |
| | Gluteus medius | 14 | .9 |
| | Gluteus muscles | 12 | .8 |
| | Hamstring | 1 | .1 |
| | Hamstrings | 21 | 1.4 |
| | Hip flexors | 1 | .1 |
| | Illiopsoas | 2 | .1 |
| | Illiopsoas | 2 | .1 |
| | Infrapatella tendon | 1 | .1 |
| | Infrapatella tendon | 1 | .1 |
| | Infraspinatus | 7 | .5 |
| | Intercostals | 2 | .1 |
| | Iliotibial band | 4 | .3 |
| | Iliotibial band | 6 | .4 |
| | Latissmus dorsi | 3 | .2 |
| | Left adductors | 1 | .1 |
| | Left posterior capsule of ankle | 1 | .1 |
| | Left deltoid | 3 | .2 |
| | Left erector spinae | 1 | .1 |
| | Left extensor hallicus longus | 2 | .1 |
| | Left gastrocnemius | 6 | .4 |
| | Left gluteus medius | 11 | .7 |
| | Left gluteus muscles | 2 | .1 |
| | Left hamstring | 6 | .4 |
| | Left illiopsoas | 1 | .1 |

## Table 4.12: Frequency distribution by muscle 1 cont…

| | Frequency | Percent |
|---|---|---|
| Left infrapatella tendon | 4 | .3 |
| Left infraspinatus | 3 | .2 |
| Left iliotibial band | 9 | .6 |
| Left latissmus dorsi | 2 | .1 |
| Left latissmus dorsi | 1 | .1 |
| Left lateral collateral ligament | 1 | .1 |
| Left levator scapulae | 10 | .7 |
| Left lumbar paraspinals | 1 | .1 |
| Left medial collateral ligament | 9 | .6 |
| Left medial meniscus | 1 | .1 |
| Left peroneii | 3 | .2 |
| Left piriformis | 6 | .4 |
| Left popliteus | 4 | .3 |
| Left pterygoid | 1 | .1 |
| Left quadratus lumborum | 26 | 1.7 |
| Left quadriceps | 6 | .4 |
| Left rhomboid | 6 | .4 |
| Left rhomboid | 1 | .1 |
| Left sternocleidomastoid | 1 | .1 |
| Left supraspinatus | 6 | .4 |
| Left teres major | 1 | .1 |
| Left teres minor | 5 | .3 |
| Left trapezius | 19 | 1.3 |
| Left tricep | 1 | .1 |
| Left vastus lateralis | 1 | .1 |
| Levator scapulae | 3 | .2 |
| Levator scapulae | 9 | .6 |
| Lumbar paraspinals | 32 | 2.1 |
| Medial collateral ligament | 1 | .1 |
| Medial meniscus | 1 | .1 |
| Patella tendon | 1 | .1 |
| Pectoralis | 1 | .1 |
| Peroneii | 2 | .1 |
| Peroneus longus | 1 | .1 |
| Piriformis | 5 | .3 |
| Piriformis | 2 | .1 |
| Popliteus | 1 | .1 |
| Posterior cervicals | 96 | 6.4 |
| Quadratus lumborum | 254 | 16.9 |
| Quadratus lumborum | 9 | .6 |
| Quadratus lumborum | 1 | .1 |
| Quadriceps | 14 | .9 |

## Table 4.12: Frequency distribution by muscle 1 cont…

| | Frequency | Percent |
|---|---|---|
| Rectus femoris | 1 | .1 |
| Rhomboid | 1 | .1 |
| Rhomboid | 81 | 5.4 |
| Right anterior cruciate ligament | 3 | .2 |
| Right adductor | 1 | .1 |
| Right anterior deltoid | 1 | .1 |
| Right bicep | 4 | .3 |
| Right bicep | 1 | .1 |
| Right brachioradialis | 1 | .1 |
| Right gastrocnemius | 2 | .1 |
| Right deltoid | 2 | .1 |
| Right digitorum profundus | 1 | .1 |
| Right extensor hallicus | 1 | .1 |
| Right gastrocnemius | 1 | .1 |
| Right gluteus maximus | 2 | .1 |
| Right gluteus medius | 16 | 1.1 |
| Right gluteus minimus | 1 | .1 |
| Right hamstring | 2 | .1 |
| Right illiopsoas | 4 | .3 |
| Right infraspinatus | 7 | .5 |
| Right iliotibial band | 8 | .5 |
| Right latissmus dorsi | 2 | .1 |
| Right lateral collateral ligament | 2 | .1 |
| Right levator scapularis | 11 | .7 |
| Right lumbar paraspinals | 1 | .1 |
| Right medial collateral ligament | 6 | .4 |
| Right pectoralis major | 3 | .2 |
| Right peroneii | 2 | .1 |
| Right piriformis | 5 | .3 |
| Right popliteus | 2 | .1 |
| Right posterior cervical | 2 | .1 |
| Right iliopsoas | 3 | .2 |
| Right quadratus lumborum | 41 | 2.7 |
| Right quadriceps | 7 | .5 |
| Right rectus femoris | 1 | .1 |
| Right rhomboid | 10 | .7 |
| Right rotator cuff | 1 | .1 |
| Right scalene | 1 | .1 |
| Right sternocleidomastoid | 2 | .1 |
| Right supraspinatus | 3 | .2 |
| Right teres minor | 3 | .2 |
| Right trapezius | 28 | 1.9 |

## Table 4.12: Frequency distribution by muscle 1 cont…

| | Frequency | Percent |
|---|---|---|
| Right tricep | 5 | .3 |
| Right vastus intermedialis | 1 | .1 |
| Right vastus medialis | 1 | .1 |
| Scalenes | 1 | .1 |
| Sternocleidomastoid | 2 | .1 |
| Sternocleidomastoid | 1 | .1 |
| Seratus posterior | 1 | .1 |
| Suboccipitals | 3 | .2 |
| Subscapularis | 1 | .1 |
| Supraspinatus | 2 | .1 |
| Supraspinatus | 1 | .1 |
| Teres major | 1 | .1 |
| Tensor fascia lata | 3 | .2 |
| Thoracic paraspinals | 75 | 5.0 |
| Tibialis posterior | 1 | .1 |
| Trapezius | 1 | .1 |
| Trapezius | 235 | 15.7 |
| Triceps | 3 | .2 |
| Vastus lateralis | 1 | .1 |
| Whole left side of body | 1 | .1 |
| Total | 1499 | 100.0 |

## Table 4.13: Frequency distribution by muscle2

| | | Frequency | Percent |
|---|---|---|---|
| Valid | | 624 | 41.6 |
| | Adductors | 1 | .1 |
| | Anterior scalene | 1 | .1 |
| | Anterior tibialis | 1 | .1 |
| | Cervical paraspinals | 1 | .1 |
| | Deltoid | 1 | .1 |
| | Extensor carpi radialis longus | 1 | .1 |
| | Erector spinae | 17 | 1.1 |
| | Gastrocnemius | 4 | .3 |
| | Gluteus maximus | 3 | .2 |
| | Gluteus medius | 13 | .9 |
| | Gluteus medius | 16 | 1.1 |
| | Gluteus muscles | 28 | 1.9 |
| | Gluteus muscles | 1 | .1 |
| | Hamstrings | 8 | .5 |
| | Iliopsoas | 3 | .2 |
| | Infraspinatus | 5 | .3 |
| | Iliotibial band | 3 | .2 |
| | Latissmus dorsi | 4 | .3 |
| | Left anterior talofibular ligament | 1 | .1 |
| | Left biceps | 2 | .1 |
| | Left forearm flexors | 1 | .1 |
| | Left gastrocnemius | 6 | .4 |
| | Left gluteus medius | 8 | .5 |
| | Left hamstring | 1 | .1 |
| | Left iliopsoas | 1 | .1 |
| | Left infraspinatus | 4 | .3 |
| | Left iliotibial band | 6 | .4 |
| | Left levator scapulae | 9 | .6 |
| | Left medial meniscus | 2 | .1 |
| | Left patella tendon | 1 | .1 |
| | Left pectoralis major | 1 | .1 |
| | Left pectoralis major | 1 | .1 |
| | Left peroneii | 2 | .1 |
| | Left piriformis | 2 | .1 |
| | Left plantar fascia | 1 | .1 |
| | Left popliteus | 2 | .1 |
| | Left quadratus lumborum | 11 | .7 |
| | Left quadratus lumborum | 3 | .2 |
| | Left quadriceps | 1 | .1 |
| | Left rhomboid | 1 | .1 |

## Table 4.13: Frequency distribution by muscle2 cont…

| | Frequency | Percent |
|---|---|---|
| Left soleus | 3 | .2 |
| Left supraspinatus | 4 | .3 |
| Left tensor fascia lata | 1 | .1 |
| Left thoracic paraspinals | 1 | .1 |
| Left trapezius | 7 | .5 |
| Left triceps | 2 | .1 |
| Left triceps | 1 | .1 |
| Levator scapulae | 8 | .5 |
| Levator scapulae | 27 | 1.8 |
| Lumbar paraspinals | 62 | 4.1 |
| Pectoralis major | 4 | .3 |
| Peroneii | 1 | .1 |
| Piriformis | 10 | .7 |
| Piriformis | 1 | .1 |
| Post cervicals | 38 | 2.5 |
| Quadratus lumborum | 77 | 5.1 |
| Quadratus lumborum | 8 | .5 |
| Quadriceps | 3 | .2 |
| Rhomboid | 4 | .3 |
| Rhomboids | 112 | 7.5 |
| Right adductors | 1 | .1 |
| Right biceps | 1 | .1 |
| Right deltoid | 4 | .3 |
| Right gastrocnemius | 2 | .1 |
| Right gluteus maximus | 1 | .1 |
| Right gluteus medius | 18 | 1.2 |
| Right gluteus minimus | 3 | .2 |
| Right hamstring | 1 | .1 |
| Right iliopsoas | 4 | .3 |
| Right infraspinatus | 1 | .1 |
| Right latissmus dorsi | 1 | .1 |
| Right levator scapulae | 8 | .5 |
| Right lumbar paraspinals | 1 | .1 |
| Right paraspinals | 1 | .1 |
| Right piriformis | 2 | .1 |
| Right posterior cervicals | 7 | .5 |
| Right posterior cervicals | 3 | .2 |
| Right iliopsoas | 2 | .1 |
| Right quadratus lumborum | 11 | .7 |
| Right quadriceps | 4 | .3 |
| Right rectus femoris | 2 | .1 |
| Right rhomboid | 7 | .5 |
| Right scalene | 1 | .1 |

## Table 4.13: Frequency distribution by muscle2 cont…

| | Frequency | Percent |
|---|---|---|
| Right supraspinatus | 5 | .3 |
| Right teres major | 2 | .1 |
| Right teres minor | 2 | .1 |
| Right tensor fascia lata | 3 | .2 |
| Right trapezius | 10 | .7 |
| Scalenes | 3 | .2 |
| Sternocleidomastoid | 1 | .1 |
| Sternocleidomastoid | 1 | .1 |
| Seratus anterior | 1 | .1 |
| Soleus | 3 | .2 |
| Suboccipitals | 1 | .1 |
| Supraspinatus | 2 | .1 |
| Supraspinatus | 7 | .5 |
| Teres minor | 1 | .1 |
| Tensor fascia lata | 1 | .1 |
| Tensor fascia lata | 2 | .1 |
| Thoracic erector spinae | 1 | .1 |
| Thoracic paraspinals | 40 | 2.7 |
| Trapezius | 150 | 10.0 |
| Triceps | 1 | .1 |
| Total | 1499 | 100.0 |

## Table 4.14: Frequency distribution by muscle3

| | | Frequency | Percent |
|---|---|---|---|
| Valid | | 1088 | 72.6 |
| | Adductors | 1 | .1 |
| | Biceps | 1 | .1 |
| | Deltoids | 1 | .1 |
| | Extensor carpi ulnaris | 1 | .1 |
| | Erector spinae | 7 | .5 |
| | Gastrocnemius | 1 | .1 |
| | Gastrocnemius | 4 | .3 |
| | Gluteus maximus | 1 | .1 |
| | Gluteus maximus | 1 | .1 |
| | Gluteus medius | 3 | .2 |
| | Gluteus medius | 5 | .3 |
| | Gluteus minimus | 2 | .1 |
| | Gluteus muscles | 4 | .3 |
| | Hamstrings | 2 | .1 |
| | Iliopsoas | 1 | .1 |
| | Iliopsoas | 3 | .2 |
| | Infraspinatus | 6 | .4 |
| | Iliotibial band | 1 | .1 |
| | Latissmus dorsi | 2 | .1 |
| | Left anterior tibialis | 2 | .1 |
| | Left biceps | 1 | .1 |
| | Left gastrocnemius | 4 | .3 |
| | Left gluteus medius | 1 | .1 |
| | Left hamstring | 3 | .2 |
| | Left iliotibial band | 2 | .1 |
| | Left levator scapulae | 1 | .1 |
| | Left piriformis | 1 | .1 |
| | Left iliopsoas | 1 | .1 |
| | Left quadratus lumborum | 2 | .1 |
| | Left quadriceps | 2 | .1 |
| | Left rhomboids | 1 | .1 |
| | Left subscapularis | 1 | .1 |
| | Left supraspinatus | 1 | .1 |
| | Left supraspinatus | 2 | .1 |
| | Left teres minor | 4 | .3 |
| | Left tensor fascia lata | 2 | .1 |
| | Left thoracic paraspinals | 1 | .1 |
| | Left trapezius | 1 | .1 |
| | Left triceps | 1 | .1 |
| | Levator scapulae | 7 | .5 |
| | Levator scapulae | 20 | 1.3 |

## Table 4.14: Frequency distribution by muscle3 cont…

| | Frequency | Percent |
|---|---|---|
| Lumbar paraspinals | 17 | 1.1 |
| Occipitals | 1 | .1 |
| Paraspinals | 1 | .1 |
| Pectoralis major | 1 | .1 |
| Piriformis | 8 | .5 |
| Piriformis | 1 | .1 |
| Posterior cervicals | 27 | 1.8 |
| Quadratus lumborum | 59 | 3.9 |
| Quadratus lumborum | 4 | .3 |
| Quadriceps | 4 | .3 |
| Rhomboids | 41 | 2.7 |
| Right biceps | 1 | .1 |
| Right deltoids | 1 | .1 |
| Right gluteus maximus | 1 | .1 |
| Right gluteus medius | 8 | .5 |
| Right gluteus minimus | 2 | .1 |
| Right hamstring | 2 | .1 |
| Right iliopsoas | 2 | .1 |
| Right infraspinatus | 4 | .3 |
| Right levator scapulae | 3 | .2 |
| Right peroneii | 1 | .1 |
| Right piriformis | 5 | .3 |
| Right posterior cervical | 1 | .1 |
| Right quadratus lumborum | 3 | .2 |
| Right quadriceps | 2 | .1 |
| Right rhomboid | 5 | .3 |
| Right scalene | 2 | .1 |
| Right sternocleidomastoid | 1 | .1 |
| Right seratus anterior | 1 | .1 |
| Right soleus | 1 | .1 |
| Right suboccipital | 1 | .1 |
| Right teres major | 1 | .1 |
| Right teres minor | 1 | .1 |
| Right tensor fascia lata | 2 | .1 |
| Right trapezius | 3 | .2 |
| Scalenes | 7 | .5 |
| Sternocleidomastoid | 1 | .1 |
| Seratus posterior | 1 | .1 |
| Soleus | 1 | .1 |
| Suboccipitals | 2 | .1 |
| Supraspinatus | 1 | .1 |
| Supraspinatus | 1 | .1 |
| Tensor fascia lata | 2 | .1 |

## Table 4.14: Frequency distribution by muscle3 cont…

| | Frequency | Percent |
|---|---|---|
| Thoracic paraspinals | 23 | 1.5 |
| Trapezius | 45 | 3.0 |
| Triceps | 1 | .1 |
| Total | 1499 | 100.0 |

## Table 4.15: Frequency distribution by muscle4

| | | Frequency | Percent |
|---|---|---|---|
| Valid | | 1370 | 91.4 |
| | Adductors | 1 | .1 |
| | Gastrocnemius | 1 | .1 |
| | Deltoids | 1 | .1 |
| | Erector spinae | 1 | .1 |
| | Gastrocnemius | 1 | .1 |
| | Gluteus maximus | 1 | .1 |
| | Gluteus medius | 1 | .1 |
| | Gluteus medius | 3 | .2 |
| | Gluteus minimus | 1 | .1 |
| | Gluteal muscles | 1 | .1 |
| | Hamstring | 1 | .1 |
| | Hamstring | 2 | .1 |
| | Infraspinatus | 1 | .1 |
| | Iliotibial band | 1 | .1 |
| | Latissmus dorsi | 1 | .1 |
| | Left gastrocnemius | 1 | .1 |
| | Left hamstring | 1 | .1 |
| | Left iliopsoas | 1 | .1 |
| | Left infraspinatus | 1 | .1 |
| | Left quadriceps | 1 | .1 |
| | Left soleus | 1 | .1 |
| | Left supraspinatus | 1 | .1 |
| | Left teres minor | 1 | .1 |
| | Levator scapulae | 6 | .4 |
| | Lumbar paraspinals | 10 | .7 |
| | Pectoralis major | 2 | .1 |
| | Piriformis | 2 | .1 |
| | Posterior cervicals | 7 | .5 |
| | Quadratus lumborum | 18 | 1.2 |
| | Quadratus lumborum | 1 | .1 |
| | Rhomboids | 7 | .5 |
| | Right adductors | 1 | .1 |
| | Right deltoid | 1 | .1 |
| | Right hamstring | 1 | .1 |
| | Right iliopsoas | 1 | .1 |
| | Right Iliotibial band | 2 | .1 |
| | Right latissmus dorsi | 2 | .1 |
| | Right piriformis | 4 | .3 |
| | Right rectus femoris | 1 | .1 |
| | Right scalene | 1 | .1 |
| | Right sternocleidomastoid | 1 | .1 |

## Table 4.15: Frequency distribution by muscle4 cont…

| | Frequency | Percent |
|---|---|---|
| Right subscapularis | 1 | .1 |
| Right teres minor | 1 | .1 |
| Scalenes | 3 | .2 |
| Sternocleidomastoid | 1 | .1 |
| Sternocleidomastoid | 1 | .1 |
| Seratus anterior | 1 | .1 |
| Subscapularis | 1 | .1 |
| Supraspinatus | 3 | .2 |
| Teres minor | 1 | .1 |
| Thoracic paraspinals | 7 | .5 |
| Trapezius | 15 | 1.0 |
| Total | 1499 | 100.0 |

**Table 4.16: Frequency distribution by muscle5**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | | 1481 | 98.8 |
| | Deltoids | 1 | .1 |
| | Gluteus medius | 1 | .1 |
| | Infraspinatus | 1 | .1 |
| | Left tensor fascia lata | 1 | .1 |
| | Lumbar paraspinals | 2 | .1 |
| | Posterior cervicals | 2 | .1 |
| | Quadratus lumborum | 6 | .4 |
| | Quadriceps | 1 | .1 |
| | Right gluteus medius | 1 | .1 |
| | Right quadratus lumborum | 1 | .1 |
| | Supraspinatus | 1 | .1 |
| | Total | 1499 | 100.0 |

## 4.5.1.2.9 Injury with concomitant Neurogenic/Systemic defects

Table 4.17 shows that 99.9% of the surfers were neurologically and systemically intact.

**Table 4.17: Frequency distribution by Neurogenic/Systemic injuries**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | No | 1491 | 99.9 |
| | Yes | 1 | .1 |
| | Total | 1492 | 100.0 |
| Missing | System | 7 | |
| Total | | 1499 | |

## 4.5.1.3 TREATMENT OF SURFING INJURIES

### 4.5.1.3.1 Manipulation

Table 4.18 shows that 70.4% of the surfers received a chiropractic manipulation[1].

**Table 4.18: Frequency distribution by manipulation**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | No | 443 | 29.6 |
| | Yes | 1053 | 70.4 |
| | Total | 1496 | 100.0 |
| Missing | System | 3 | |
| Total | | 1499 | |

[1] Chiropractic Manipulation is a small-amplitude, high-velocity movement at the end of a subject's available range of motion in a joint, in order to restore mobility of that segment.

Table 4.19 – 4.22 shows that the thoracic spine was by far the most common spinal level adjusted (42.8%). This was followed by the cervical spine (27.1%) and the sacroiliac joint (24.9%) respectively, which were almost equal in value. The lumbar spine and then other joints were in the minority.

**Table 4.19: Frequency distribution by level of the spine or specific joint1**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | 10th Costotransverse | 2 | .1 |
| | 2nd Metacarpal | 1 | .1 |
| | 4th Costotransverse | 1 | .1 |
| | 5th Costotransverse | 4 | .3 |
| | 5th Metatarsal | 1 | .1 |
| | 6th Costotransverse | 2 | .1 |
| | Acromioclavicular | 5 | .3 |
| | Acromioclavicular | 2 | .1 |
| | C0 | 1 | .1 |
| | C1 | 17 | 1.1 |
| | C2 | 101 | 6.7 |
| | C3 | 51 | 3.4 |
| | C4 | 35 | 2.3 |
| | C5 | 14 | .9 |
| | C6 | 16 | 1.1 |
| | C7 | 22 | 1.5 |
| | Calcaneus | 1 | .1 |
| | Cuboid | 1 | .1 |
| | Elbow | 2 | .1 |
| | Hip | 2 | .1 |
| | Knee | 1 | .1 |
| | L1 | 1 | .1 |
| | L1 | 10 | .7 |
| | L2 | 19 | 1.3 |
| | L3 | 24 | 1.6 |
| | L4 | 37 | 2.5 |
| | L5 | 37 | 2.5 |
| | Mortise | 2 | .1 |
| | N/A | 526 | 35.1 |
| | Navicular | 2 | .1 |
| | Occiput | 1 | .1 |
| | Right hip | 1 | .1 |
| | Scaphoid | 1 | .1 |

## Table 4.19: Frequency distribution by level of the spine or specific joint1 cont…

| | Frequency | Percent |
|---|---|---|
| Sacroiliac | 230 | 15.3 |
| Subtalar | 2 | .1 |
| T1 | 9 | .6 |
| T10 | 22 | 1.5 |
| T11 | 4 | .3 |
| T12 | 11 | .7 |
| T2 | 8 | .5 |
| T3 | 22 | 1.5 |
| T4 | 60 | 4.0 |
| T5 | 52 | 3.5 |
| T6 | 38 | 2.5 |
| T7 | 35 | 2.3 |
| T8 | 33 | 2.2 |
| T9 | 15 | 1.0 |
| Talocrural | 6 | .4 |
| Talocrural | 1 | .1 |
| Tibiofibular | 1 | .1 |
| Tibiofibular | 6 | .4 |
| Temperomandibular | 1 | .1 |
| Total | 1499 | 100.0 |

## Table 4.20: Frequency distribution by level of the spine or specific joint2

| | | Frequency | Percent |
|---|---|---|---|
| Valid | 4th Costotransverse | 1 | .1 |
| | 5th Costotransverse | 3 | .2 |
| | 6th Costotransverse | 1 | .1 |
| | 6th Costotransverse | 1 | .1 |
| | 7th Costotransverse | 1 | .1 |
| | 9th Costotransverse | 1 | .1 |
| | Cervico-thoracic junction | 1 | .1 |
| | C1 | 5 | .3 |
| | C2 | 37 | 2.5 |
| | C3 | 20 | 1.3 |
| | C4 | 17 | 1.1 |
| | C5 | 11 | .7 |
| | C6 | 2 | .1 |
| | C7 | 9 | .6 |
| | Cuboid | 2 | .1 |
| | Elbow | 1 | .1 |
| | L1 | 7 | .5 |
| | L2 | 21 | 1.4 |
| | L3 | 17 | 1.1 |
| | L4 | 31 | 2.1 |
| | L5 | 33 | 2.2 |
| | N/A | 935 | 62.4 |
| | Navicular | 1 | .1 |
| | Sacroiliac | 82 | 5.5 |
| | Subtalar | 1 | .1 |
| | T1 | 3 | .2 |
| | T10 | 12 | .8 |
| | T11 | 5 | .3 |
| | T12 | 13 | .9 |
| | T2 | 5 | .3 |
| | T3 | 12 | .8 |
| | T4 | 51 | 3.4 |
| | T5 | 41 | 2.7 |
| | T6 | 46 | 3.1 |
| | T7 | 27 | 1.8 |
| | T8 | 31 | 2.1 |
| | T9 | 9 | .6 |
| | Talocrural | 1 | .1 |
| | Talocrural | 1 | .1 |
| | Tibiofibular | 1 | .1 |
| | Total | 1499 | 100.0 |

## Table 4.21: Frequency distribution by level of the spine or specific joint3

| | | Frequency | Percent |
|---|---|---|---|
| Valid | 1st Rib | 1 | .1 |
| | 2nd Metatarsophalangeal | 1 | .1 |
| | 7th Costotransverse | 2 | .1 |
| | Acromioclavicular | 1 | .1 |
| | Acromioclavicular | 1 | .1 |
| | C0 | 1 | .1 |
| | C1 | 1 | .1 |
| | C2 | 14 | .9 |
| | C3 | 7 | .5 |
| | C4 | 4 | .3 |
| | C5 | 5 | .3 |
| | C6 | 4 | .3 |
| | C7 | 2 | .1 |
| | L1 | 3 | .2 |
| | L2 | 5 | .3 |
| | L3 | 10 | .7 |
| | L4 | 11 | .7 |
| | L5 | 8 | .5 |
| | N/A | 1291 | 86.1 |
| | Navicular | 1 | .1 |
| | Navicular | 1 | .1 |
| | Sacroiliac | 47 | 3.1 |
| | Subtalar | 3 | .2 |
| | T1 | 4 | .3 |
| | T10 | 6 | .4 |
| | T11 | 4 | .3 |
| | T12 | 3 | .2 |
| | T2 | 4 | .3 |
| | T3 | 4 | .3 |
| | T4 | 10 | .7 |
| | T5 | 7 | .5 |
| | T6 | 12 | .8 |
| | T7 | 7 | .5 |
| | T8 | 10 | .7 |
| | T9 | 2 | .1 |
| | Talocrural | 2 | .1 |
| | Total | 1499 | 100.0 |

## Table 4.22: Frequency distribution by level of the spine or specific joint4

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Atlas | 1 | .1 |
| | C1 | 1 | .1 |
| | C2 | 3 | .2 |
| | C5 | 1 | .1 |
| | C6 | 1 | .1 |
| | C7 | 1 | .1 |
| | L1 | 2 | .1 |
| | L2 | 1 | .1 |
| | N/A | 1462 | 97.5 |
| | Navicular | 1 | .1 |
| | Sacroiliac | 15 | 1.0 |
| | T2 | 1 | .1 |
| | T3 | 2 | .1 |
| | T4 | 3 | .2 |
| | T5 | 3 | .2 |
| | T9 | 1 | .1 |
| | Total | 1499 | 100.0 |

Table 4.23 – 4.26 shows the frequency of the directions in which the above spinal levels were manipulated. Posterior to anterior (P-A) rotation was the most frequent (35.2%). Second most frequent was extension (28.5%).

**Table 4.23: Frequency distribution by direction of manipulation1**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Anterior-Posterior | 19 | 1.3 |
| | Abduction | 1 | .1 |
| | Eversion | 1 | .1 |
| | Extension | 204 | 13.6 |
| | Flexion | 4 | .3 |
| | Horizontal flexion | 1 | .1 |
| | Horizontal extension | 2 | .1 |
| | Internal rotation | 1 | .1 |
| | Lateral flexion | 79 | 5.3 |
| | Long axis distraction | 3 | .2 |
| | Long axis distraction | 7 | .5 |
| | Lower flexion | 1 | .1 |
| | Medial-Lateral | 1 | .1 |
| | Middle extension | 1 | .1 |
| | N/A | 673 | 44.9 |
| | Posterior-Anterior | 285 | 19.0 |
| | Upper extension | 11 | .7 |
| | Upper flexion | 40 | 2.7 |
| | Upper flexion | 165 | 11.0 |
| | Total | 1499 | 100.0 |

## Table 4.24: Frequency distribution by direction of manipulation2

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Anterior-Posterior | 4 | .3 |
| | Dorsiflexion | 1 | .1 |
| | Extension | 167 | 11.1 |
| | Flexion | 2 | .1 |
| | Flexion | 3 | .2 |
| | Lateral flexion | 40 | 2.7 |
| | Long axis distraction | 2 | .1 |
| | Medial-Lateral | 1 | .1 |
| | N/A | 1021 | 68.1 |
| | Posterior-Anterior | 179 | 11.9 |
| | Upper flexion | 78 | 5.2 |
| | Upper flexion | 1 | .1 |
| | Total | 1499 | 100.0 |

## Table 4.25: Frequency distribution by direction of manipulation3

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Anterior-Posterior | 2 | .1 |
| | Dorsiflexion | 1 | .1 |
| | Eversion | 1 | .1 |
| | Extension | 48 | 3.2 |
| | Flexion | 1 | .1 |
| | Horizontal flexion | 1 | .1 |
| | Inversion | 1 | .1 |
| | Lateral flexion | 21 | 1.4 |
| | Lateral flexion | 1 | .1 |
| | Long axis distraction | 1 | .1 |
| | Long axis distraction | 1 | .1 |
| | Lower flexion | 1 | .1 |
| | N/A | 1321 | 88.1 |
| | Posterior-Anterior | 55 | 3.7 |
| | Posterior | 1 | .1 |
| | Upper extension | 1 | .1 |
| | Upper flexion | 1 | .1 |
| | Upper flexion | 40 | 2.7 |
| | Total | 1499 | 100.0 |

**Table 4.26: Frequency distribution by direction of manipulation4**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Extension | 3 | .2 |
| | Extension | 6 | .4 |
| | Lateral flexion | 3 | .2 |
| | Lower flexion | 1 | .1 |
| | N/A | 1463 | 97.6 |
| | Posterior-Anterior | 9 | .6 |
| | Upper extension | 1 | .1 |
| | Upper flexion | 13 | .9 |
| | Total | 1499 | 100.0 |

Table 4.27 – 4.30 shows the frequency of which sides were most commonly adjusted. The right side was the most commonly adjusted side. This was followed closely by the left side.

**Table 4.27: Frequency distribution by side of manipulation1**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Bilateral | 60 | 4.0 | 4.0 | 4.0 |
| | Left | 1 | .1 | .1 | 4.1 |
| | Left | 309 | 20.6 | 20.6 | 24.7 |
| | N/A | 739 | 49.3 | 49.3 | 74.0 |
| | Right | 390 | 26.0 | 26.0 | 100.0 |
| | Total | 1499 | 100.0 | 100.0 | |

## Table 4.28: Frequency distribution by side of manipulation2

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Bilateral | 41 | 2.7 |
| | Left | 166 | 11.1 |
| | N/A | 1083 | 72.2 |
| | Right | 209 | 13.9 |
| | Total | 1499 | 100.0 |

## Table 4.29: Frequency distribution by side of manipulation3

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Bilateral | 6 | .4 |
| | Left | 67 | 4.5 |
| | N/A | 1345 | 89.7 |
| | Right | 81 | 5.4 |
| | Total | 1499 | 100.0 |

## Table 4.30: Frequency distribution by side of manipulation4

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Bilateral | 2 | .1 |
| | Left | 12 | .8 |
| | N/A | 1467 | 97.9 |
| | Right | 18 | 1.2 |
| | Total | 1499 | 100.0 |

### 4.5.1.3.2 Stretches

Both Static and Proprioceptive Neuromuscular Facilitation (PNF) stretches were performed on surfers. Table 4.31 below shows that 36.7% of surfers received static stretching.

**Table 4.31: Frequency distribution by static stretch**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | No | 948 | 63.3 |
| | Yes | 549 | 36.7 |
| | Total | 1497 | 100.0 |
| Missing | System | 2 | |
| Total | | 1499 | |

Tables 4.32 – 4.35 show the frequency with which different muscles were stretched statically. The Trapezius (11.9%) and Quadratus Lumborum (11.6%) muscles were almost equal in value as the most frequently stretched muscles. This was followed by the Gluteus Muscles (5.7%), the Rhomboid (5.5%) muscles and the posterior cervical (4.5%) muscles respectively.

**Table 4.32: Frequency distribution by static stretch1**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Biceps | 1 | .1 |
| | Bilateral suboccipitals | 1 | .1 |
| | Cervical paraspinals | 1 | .1 |
| | Erector spinae | 2 | .1 |
| | Gastrocnemius | 1 | .1 |
| | Gastrocnemius | 8 | .5 |
| | Gluteus maximus | 1 | .1 |
| | Gluteus medius | 7 | .5 |
| | Gluteus medius | 3 | .2 |
| | Gluteal muscles | 14 | .9 |
| | Hamstrings | 9 | .6 |
| | Hip flexors | 1 | .1 |
| | Iliopsoas | 3 | .2 |
| | Infraspinatus | 1 | .1 |
| | Intercostals | 1 | .1 |
| | Iliotibial band | 1 | .1 |
| | Iliotibial band | 2 | .1 |
| | Latissmus dorsi | 1 | .1 |
| | Left anterior tibialis | 1 | .1 |
| | Left erector spinae | 1 | .1 |
| | Left foot | 2 | .1 |
| | Left gastrocnemius | 2 | .1 |
| | Left gluteus medius | 4 | .3 |
| | Left hamstring | 2 | .1 |
| | Left infraspinatus | 2 | .1 |
| | Left Iliotibial band | 3 | .2 |
| | Left latissmus dorsi | 1 | .1 |
| | Left levator scapulae | 7 | .5 |
| | Left medial meniscus | 1 | .1 |
| | Left peroneii | 2 | .1 |
| | Left piriformis | 5 | .3 |
| | Left quadratus lumborum | 10 | .7 |
| | Left quadratus lumborum | 2 | .1 |

## Table 4.32: Frequency distribution by static stretch1 cont…

| | Frequency | Percent |
|---|---|---|
| Left rhomboid | 2 | .1 |
| Left sternocleidomastoid | 1 | .1 |
| Left teres minor | 1 | .1 |
| Left tensor fascia lata | 1 | .1 |
| Left trapezius | 10 | .7 |
| Left vastus lateralis | 1 | .1 |
| Lumbar paraspinals | 5 | .3 |
| N/A | 999 | 66.6 |
| Peroneii | 1 | .1 |
| Piriformis | 4 | .3 |
| Posterior cervicals | 36 | 2.4 |
| Quadratus lumborum | 114 | 7.6 |
| Quadratus lumborum | 7 | .5 |
| Quadratus lumborum | 4 | .3 |
| Rhomboids | 20 | 1.3 |
| Right anterior cruciate ligament | 1 | .1 |
| Right bicep | 1 | .1 |
| Right gastrocnemius | 2 | .1 |
| Right extensor hallicus | 1 | .1 |
| Right gastrocnemius | 1 | .1 |
| Right gluteus medius | 5 | .3 |
| Right gluteus minimus | 1 | .1 |
| Right hamstring | 1 | .1 |
| Right infraspinatus | 3 | .2 |
| Right Iliotibial band | 2 | .1 |
| Right latissmus dorsi | 1 | .1 |
| Right levator scapulae | 5 | .3 |
| Right pectoralis | 3 | .2 |
| Right popliteus | 1 | .1 |
| Right iliopsoas | 1 | .1 |
| Right quadratus lumborum | 16 | 1.1 |
| Right quadriceps | 3 | .2 |
| Right rectus femoris | 1 | .1 |
| Right rotator cuff | 1 | .1 |
| Right supraspinatus | 3 | .2 |
| Right teres minor | 2 | .1 |
| Right tensor fascia lata | 1 | .1 |
| Right trapezius | 9 | .6 |
| Right tricep | 1 | .1 |
| Scalenes | 1 | .1 |
| Sternocleidomastoid | 1 | .1 |
| Seratus anterior | 1 | .1 |
| Seratus posterior | 1 | .1 |

## Table 4.32: Frequency distribution by static stretch1 cont…

| | Frequency | Percent |
|---|---|---|
| Tensor fascia lata | 1 | .1 |
| Tensor fascia lata | 1 | .1 |
| Thoracic paraspinals | 17 | 1.1 |
| Trapezius | 100 | 6.7 |
| Triceps | 1 | .1 |
| Total | 1499 | 100.0 |

## Table 4.33: Frequency distribution by static stretch2

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Adductors | 1 | .1 |
| | Extensor carpi radialis longus | 1 | .1 |
| | Erector spinae | 6 | .4 |
| | Gastrocnemius | 3 | .2 |
| | Gluteus medius | 2 | .1 |
| | Gluteus medius | 7 | .5 |
| | Gluteus minimus | 1 | .1 |
| | Gluteal muscles | 14 | .9 |
| | Hamstrings | 7 | .5 |
| | Iliopsoas | 1 | .1 |
| | Infraspinatus | 2 | .1 |
| | Iliotibial band | 1 | .1 |
| | Latissmus dorsi | 1 | .1 |
| | Left forearm flexors | 1 | .1 |
| | Left gluteus medius | 6 | .4 |
| | Left hamstring | 2 | .1 |
| | Left iliotibial band | 3 | .2 |
| | Left levator scapulae | 4 | .3 |
| | Left medial collateral ligament | 1 | .1 |
| | Left pectoralis | 1 | .1 |
| | Left peroneii | 1 | .1 |
| | Left piriformis | 2 | .1 |
| | Left iliopsoas | 1 | .1 |
| | Left quadratus lumborum | 3 | .2 |
| | Left quadriceps | 1 | .1 |
| | Left rhomboid | 1 | .1 |
| | Left supraspinatus | 3 | .2 |
| | Left tensor fascia lata | 1 | .1 |
| | Left trapezius | 1 | .1 |
| | Levator scapulae | 2 | .1 |
| | Levator scapulae | 14 | .9 |
| | Lumbar paraspinals | 12 | .8 |
| | N/A | 1196 | 79.8 |
| | Pectoralis | 2 | .1 |
| | Piriformis | 3 | .2 |
| | Piriformis | 1 | .1 |
| | Posterior cervical | 19 | 1.3 |
| | Quadratus lumborum | 24 | 1.6 |
| | Quadratus lumborum | 2 | .1 |
| | Quadriceps | 1 | .1 |
| | Rhomboids | 3 | .2 |
| | Rhomboids | 41 | 2.7 |

## Table 4.33: Frequency distribution by static stretch2 cont…

| | Frequency | Percent |
|---|---|---|
| Right gastrocnemius | 1 | .1 |
| Right gluteus medius | 7 | .5 |
| Right gluteus minimus | 2 | .1 |
| Right infraspinatus | 1 | .1 |
| Right iliotibial band | 1 | .1 |
| Right latissmus dorsi | 1 | .1 |
| Right levator scapulae | 5 | .3 |
| Right piriformis | 2 | .1 |
| Right post cervical | 3 | .2 |
| Right quadratus lumborum | 3 | .2 |
| Right rhomboid | 4 | .3 |
| Right supraspinatus | 2 | .1 |
| Right teres major | 1 | .1 |
| Right teres minor | 4 | .3 |
| Right trapezius | 6 | .4 |
| Scalenes | 1 | .1 |
| Sternocleidomastoids | 1 | .1 |
| Seratus anterior | 1 | .1 |
| Soleus | 1 | .1 |
| Supraspinatus | 1 | .1 |
| Tensor fascia lata | 2 | .1 |
| Thoracic paraspinals | 10 | .7 |
| Trapezius | 40 | 2.7 |
| Total | 1499 | 100.0 |

## Table 4.34: Frequency distribution by static stretch3

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Achilles tendon | 1 | .1 |
| | Extensor carpi ulnaris | 1 | .1 |
| | Erector spinae | 2 | .1 |
| | Gluteus maximus | 1 | .1 |
| | Gluteus medius | 1 | .1 |
| | Gluteus medius | 1 | .1 |
| | Gluteal muscles | 3 | .2 |
| | Iliopsoas | 1 | .1 |
| | Infraspinatus | 3 | .2 |
| | Iliotibial band | 1 | .1 |
| | Latissmus dorsi | 1 | .1 |
| | Left gastrocnemius | 1 | .1 |
| | Left hamstring | 1 | .1 |
| | Left iliotibial band | 2 | .1 |
| | Left peroneii | 1 | .1 |
| | Left quadratus lumborum | 4 | .3 |
| | Left supraspinatus | 2 | .1 |
| | Left teres minor | 2 | .1 |
| | Left tricep | 1 | .1 |
| | Levator scapulae | 1 | .1 |
| | Levator scapulae | 5 | .3 |
| | Lumbar paraspinals | 4 | .3 |
| | N/A | 1378 | 91.9 |
| | Piriformis | 4 | .3 |
| | Piriformis | 1 | .1 |
| | Posterior cervicals | 9 | .6 |
| | Quadratus lumborum | 15 | 1.0 |
| | Quadratus lumborum | 1 | .1 |
| | Quadriceps | 2 | .1 |
| | Rhomboids | 11 | .7 |
| | Right deltoid | 2 | .1 |
| | Right deltoid | 1 | .1 |
| | Right gluteus medius | 2 | .1 |
| | Right iliopsoas | 3 | .2 |
| | Right infraspinatus | 1 | .1 |
| | Right iliotibial band | 1 | .1 |
| | Right latissmus dorsi | 1 | .1 |
| | Right levator scapulae | 1 | .1 |
| | Right piriformis | 1 | .1 |
| | Right rhomboid | 1 | .1 |
| | Right sternocleidomastoid | 1 | .1 |
| | Right subscapularis | 1 | .1 |

## Table 4.34: Frequency distribution by static stretch3 cont…

| | | Frequency | Percent |
|---|---|---|---|
| | Right teres major | 1 | .1 |
| | Right teres minor | 1 | .1 |
| | Scalenes | 2 | .1 |
| | Sternocleidomastoids | 1 | .1 |
| | Supraspinatus | 2 | .1 |
| | Thoracic paraspinals | 4 | .3 |
| | Trapezius | 11 | .7 |
| | Total | 1499 | 100.0 |

## Table 4.35: Frequency distribution by static stretch4

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Latissmus dorsi | 1 | .1 |
| | Left hamstring | 1 | .1 |
| | Left piriformis | 1 | .1 |
| | Left quadriceps | 1 | .1 |
| | Levator scapulae | 2 | .1 |
| | Lumbar paraspinals | 4 | .3 |
| | N/A | 1475 | 98.4 |
| | Quadratus lumborum | 3 | .2 |
| | Rhomboids | 3 | .2 |
| | Right gluteus medius | 1 | .1 |
| | Right infraspinatus | 1 | .1 |
| | Right latissmus dorsi | 2 | .1 |
| | Right piriformis | 1 | .1 |
| | Sternocleidomastoid | 1 | .1 |
| | Supraspinatus | 1 | .1 |
| | Thoracic paraspinals | 1 | .1 |
| | Total | 1499 | 100.0 |

Table 4.36 below shows that 18.2% of surfers received PNF stretching.

**Table 4.36: Frequency distribution by PNF stretching**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | No | 1224 | 81.8 |
| | Yes | 273 | 18.2 |
| | Total | 1497 | 100.0 |
| Missing | System | 2 | |
| Total | | 1499 | |

Tables 4.37 – 4.40 show the frequency with which different muscles were stretched by PNF. The Trapezius and Quadratus Lumborum muscles were the most frequently stretched. This was followed by the Gluteus and Hamstring muscles respectively.

**Table 4.37: Frequency distribution by PNF stretch1**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Biceps | 1 | .1 |
| | Erector spinae | 2 | .1 |
| | Gastrocnemius | 1 | .1 |
| | Gastrocnemius | 2 | .1 |
| | Gluteus maximus | 2 | .1 |
| | Gluteus maximus | 1 | .1 |
| | Gluteus medius | 2 | .1 |
| | Gluteus medius | 6 | .4 |
| | Gluteal muscles | 7 | .5 |
| | Hamstring | 1 | .1 |
| | Hamstring | 17 | 1.1 |
| | Iliopsoas | 1 | .1 |
| | Iliotibial band | 2 | .1 |
| | Iliotibial band | 3 | .2 |
| | Left adductors | 1 | .1 |
| | Left extensor hallicus longus | 1 | .1 |
| | Left gastrocnemius | 6 | .4 |
| | Left gluteus medius | 2 | .1 |
| | Left hamstring | 1 | .1 |
| | Left iliopsoas | 2 | .1 |
| | Left medial collateral ligament | 2 | .1 |
| | Left peroneii | 1 | .1 |
| | Left popliteus | 1 | .1 |
| | Left quadratus lumborum | 4 | .3 |
| | Left quadriceps | 2 | .1 |
| | Left rhomboid | 1 | .1 |
| | Left rhomboid | 1 | .1 |
| | Left supraspinatus | 1 | .1 |
| | Left teres minor | 1 | .1 |
| | Levator scapulae | 1 | .1 |
| | Lumbar paraspinals | 1 | .1 |
| | N/A | 1239 | 82.7 |
| | Piriformis | 2 | .1 |
| | Piriformis | 2 | .1 |
| | Posterior cervicals | 13 | .9 |

## Table 4.37: Frequency distribution by PNF stretch1 cont…

| | Frequency | Percent |
|---|---|---|
| Quadratus lumborum | 40 | 2.7 |
| Quadratus lumborum | 5 | .3 |
| Quadriceps | 1 | .1 |
| Rhomboids | 11 | .7 |
| Right adductors | 1 | .1 |
| Right gluteus maximus | 2 | .1 |
| Right gluteus medius | 1 | .1 |
| Right hamstring | 2 | .1 |
| Right iliopsoas | 1 | .1 |
| Right iliotibial band | 4 | .3 |
| Right levator scapulae | 1 | .1 |
| Right pectoralis | 1 | .1 |
| Right piriformis | 3 | .2 |
| Right popliteus | 1 | .1 |
| Right iliopsoas | 2 | .1 |
| Right quadratus lumborum | 11 | .7 |
| Right quadriceps | 4 | .3 |
| Right rhomboid | 1 | .1 |
| Right supraspinatus | 1 | .1 |
| Right tensor fascia lata | 1 | .1 |
| Right trapezius | 2 | .1 |
| Right tricep | 1 | .1 |
| Scalenes | 1 | .1 |
| Sternocleidomastoid | 1 | .1 |
| Subscapularis | 1 | .1 |
| Supraspinatus | 1 | .1 |
| Tensor fascia lata | 1 | .1 |
| Tibialis posterior | 1 | .1 |
| Trapezius | 1 | .1 |
| Trapezius | 62 | 4.1 |
| Total | 1499 | 100.0 |

## Table 4.38: Frequency distribution by PNF stretch2

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Erector spinae | 5 | .3 |
| | Gastrocnemius | 3 | .2 |
| | Gluteus maximus | 1 | .1 |
| | Gluteus maximus | 2 | .1 |
| | Gluteus medius | 5 | .3 |
| | Gluteus medius | 3 | .2 |
| | Gluteal muscles | 5 | .3 |
| | Hamstring | 1 | .1 |
| | Hamstring | 1 | .1 |
| | Iliopsoas | 1 | .1 |
| | Infraspinatus | 1 | .1 |
| | Iliotibial band | 1 | .1 |
| | Latissmus dorsi | 1 | .1 |
| | Left anterior tibialis | 1 | .1 |
| | Left biceps | 1 | .1 |
| | Left gastrocnemius | 1 | .1 |
| | Left gluteus medius | 1 | .1 |
| | Left infraspinatus | 1 | .1 |
| | Left iliotibial band | 1 | .1 |
| | Left quadratus lumborum | 2 | .1 |
| | Left quadriceps | 1 | .1 |
| | Left teres minor | 1 | .1 |
| | Left tensor fascia lata | 1 | .1 |
| | Left trapezius | 1 | .1 |
| | Levator scapulae | 1 | .1 |
| | Levator scapulae | 3 | .2 |
| | Lumbar paraspinals | 1 | .1 |
| | Lumbar paraspinals | 2 | .1 |
| | N/A | 1343 | 89.6 |
| | Piriformis | 2 | .1 |
| | Piriformis | 1 | .1 |
| | Posterior cervicals | 9 | .6 |
| | Quadratus lumborum | 14 | .9 |
| | Quadratus lumborum | 2 | .1 |
| | Quadriceps | 1 | .1 |
| | Rhomboids | 2 | .1 |
| | Rhomboids | 29 | 1.9 |
| | Right adductors | 1 | .1 |
| | Right gluteus medius | 4 | .3 |
| | Right paraspinals | 1 | .1 |
| | Right piriformis | 1 | .1 |
| | Right iliopsoas | 2 | .1 |

## Table 4.38: Frequency distribution by PNF stretch2 cont…

| | | Frequency | Percent |
|---|---|---|---|
| | Right quadratus lumborum | 2 | .1 |
| | Right quadriceps | 2 | .1 |
| | Right rectus femoris | 2 | .1 |
| | Right tensor fascia lata | 2 | .1 |
| | Right trapezius | 2 | .1 |
| | Scalenes | 1 | .1 |
| | Thoracic paraspinals | 1 | .1 |
| | Trapezius | 25 | 1.7 |
| | Triceps | 1 | .1 |
| | Total | 1499 | 100.0 |

## Table 4.39: Frequency distribution by PNF stretch3

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Adductors | 1 | .1 |
| | Erector spinae | 1 | .1 |
| | Gastrocnemius | 1 | .1 |
| | Gastrocnemius | 1 | .1 |
| | Gluteus medius | 2 | .1 |
| | Gluteus minimus | 2 | .1 |
| | Gluteal muscles | 1 | .1 |
| | Left gluteus medius | 1 | .1 |
| | Left hamstring | 2 | .1 |
| | Left levator scapulae | 1 | .1 |
| | Left quadratus lumborum | 1 | .1 |
| | Levator scapulae | 1 | .1 |
| | Levator scapulae | 2 | .1 |
| | N/A | 1434 | 95.7 |
| | Piriformis | 3 | .2 |
| | Posterior cervicals | 10 | .7 |
| | Quadratus lumborum | 8 | .5 |
| | Rhomboids | 10 | .7 |
| | Right gluteus medius | 3 | .2 |
| | Right gluteus minimus | 1 | .1 |
| | Right iliopsoas | 1 | .1 |
| | Right piriformis | 1 | .1 |
| | Right posterior cervicals | 1 | .1 |
| | Right quadratus lumborum | 2 | .1 |
| | Scalenes | 3 | .2 |

## Table 4.39: Frequency distribution by PNF stretch3 cont…

| | | Frequency | Percent |
|---|---|---|---|
| | Thoracic paraspinals | 2 | .1 |
| | Trapezius | 1 | .1 |
| | Trapezius | 2 | .1 |
| | Total | 1499 | 100.0 |

## Table 4.40: Frequency distribution by PNF stretch4

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Adductors | 1 | .1 |
| | Gluteus maximus | 1 | .1 |
| | Gluteus medius | 1 | .1 |
| | Hamstrings | 1 | .1 |
| | Left teres major | 1 | .1 |
| | Levator scapulae | 1 | .1 |
| | N/A | 1480 | 98.7 |
| | Piriformis | 1 | .1 |
| | Posterior cervicals | 2 | .1 |
| | Rhomboids | 3 | .2 |
| | Right iliopsoas | 1 | .1 |
| | Right piriformis | 1 | .1 |
| | Right scalene | 1 | .1 |
| | Scalenes | 1 | .1 |
| | Suboccipitals | 1 | .1 |
| | Trapezius | 2 | .1 |
| | Total | 1499 | 100.0 |

## 4.5.1.2.3 Voltaren and Transact

Table 4.41 and 4.42 show that Voltaren (2.6%) and Transact (0.3%) were rarely used for treating surfers.

**Table 4.41: Frequency distribution by Voltaren used**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | No | 1458 | 97.4 |
| | Yes | 39 | 2.6 |
| | Total | 1497 | 100.0 |
| Missing | System | 2 | |
| Total | | 1499 | |

**Table 4.42: Frequency distribution by Transact used**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | No | 1492 | 99.7 |
| | Yes | 5 | .3 |
| | Total | 1497 | 100.0 |
| Missing | System | 2 | |
| Total | | 1499 | |

## 4.5.1.2.4 Mobilisation

Table 4.43 shows that 9.6% of surfers were treated using mobilization techniques.

**Table 4.43: Frequency distribution by Mobilization**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | No | 1354 | 90.4 |
| | Yes | 143 | 9.6 |
| | Total | 1497 | 100.0 |
| Missing | System | 2 | |
| Total | | 1499 | |

Table 4.44 shows that the knee (2.5%) was the most common joint mobilized.

**Table 4.44: Frequency distribution by spinal level or specific joint1**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | 6th Costotransverse | 1 | .1 |
| | Acromioclavicular | 1 | .1 |
| | Ankle | 5 | .3 |
| | Cervical spine | 12 | .8 |
| | C2 | 2 | .1 |
| | C5 | 1 | .1 |
| | Costotransverse | 2 | .1 |
| | Entire spine | 2 | .1 |
| | Hip | 4 | .3 |
| | Knee | 22 | 1.5 |
| | Knee and patella | 1 | .1 |
| | Lumbar spine | 6 | .4 |
| | Lumbar and thoracic spine | 1 | .1 |
| | L1 | 2 | .1 |
| | L3 | 1 | .1 |
| | Left ankle | 1 | .1 |
| | Left hallux | 1 | .1 |
| | Left hand | 1 | .1 |
| | Left patella | 1 | .1 |
| | Left scapular | 1 | .1 |
| | Left shoulder | 3 | .2 |
| | Mid-foot | 1 | .1 |
| | N/A | 1376 | 91.8 |
| | Patella | 7 | .5 |
| | Ribs | 2 | .1 |
| | Right ankle | 1 | .1 |
| | Right knee | 4 | .3 |
| | Right shoulder | 1 | .1 |
| | Scapula | 2 | .1 |
| | Scapula | 1 | .1 |
| | Scapulae | 1 | .1 |
| | Shoulder | 7 | .5 |
| | Shoulders | 2 | .1 |
| | Sacroiliacs | 3 | .2 |
| | Sacroiliac | 4 | .3 |
| | Subtalar | 1 | .1 |
| | Thoracic and lumbar spine | 1 | .1 |
| | Thoracic spine | 5 | .3 |
| | Thoracic and cervical spine | 2 | .1 |
| | Thoracic and lumbar spine | 3 | .2 |

**Table 4.44: Frequency distribution by spinal level or specific joint1 cont…**

| | | Frequency | Percent |
|---|---|---|---|
| | T12 | 1 | .1 |
| | Talocrural | 1 | .1 |
| | Tibiofibular | 1 | .1 |
| | Wrist | 1 | .1 |
| | Total | 1499 | 100.0 |

Table 4.45 shows that no particular direction of mobilization was used most frequently.

**Table 4.45: Frequency distribution by direction**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Anterior-Posterior | 1 | .1 |
| | All | 15 | 1.0 |
| | Anterior | 1 | .1 |
| | Extension | 1 | .1 |
| | Lateral flexion | 2 | .1 |
| | Long axis distraction | 2 | .1 |
| | N/A | 1471 | 98.1 |
| | Posterior-Anterior | 2 | .1 |
| | Upper extension | 1 | .1 |
| | Upper flexion | 1 | .1 |
| | Total | 1499 | 100.0 |

Table 4.46 shows that the mobilization techniques were applied to the left and right sides equally.

**Table 4.46: Frequency distribution by side**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Bilateral | 17 | 1.1 |
| | Both | 3 | .2 |
| | Left | 24 | 1.6 |
| | N/A | 1429 | 95.3 |
| | Right | 26 | 1.7 |
| | Total | 1499 | 100.0 |

## 4.5.1.2.5 Massage

Massage therapy was a very common treatment, with 82.3% of surfers receiving some form of a massage as treatment.

**Table 4.47: Frequency distribution by massage**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | No | 259 | 17.3 |
| | Yes | 1234 | 82.3 |
| | Total | 1493 | 99.6 |
| Missing | System | 6 | .4 |
| Total | | 1499 | 100.0 |

Table 4.48 – 4.51 show the muscles that most commonly received massage therapy. The Quadratus Lumborum (31.3%) and Trapezius (29.8%) muscles were the most common, followed by the Paraspinal muscles (15.7%), the Rhomboids (15.5%) and the posterior Cervical (10.2%) muscles respectively.

**Table 4.48: Frequency distribution by muscle-1 (Massage)**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Adductors | 1 | .1 |
| | Anterior capsule of left ankle | 1 | .1 |
| | Biceps | 1 | .1 |
| | Bilateral suboccipitals | 1 | .1 |
| | Cervical paraspinals | 3 | .2 |
| | Erector spinae | 17 | 1.1 |
| | Gastrocnemius | 1 | .1 |
| | Gastrocnemius | 9 | .6 |
| | General back | 1 | .1 |
| | Gluteus medius | 5 | .3 |
| | Gluteus medius | 3 | .2 |
| | Gluteal muscles | 10 | .7 |
| | Gluteus medius | 1 | .1 |
| | Hamstring | 1 | .1 |
| | Hamstring | 9 | .6 |
| | Iliopsoas | 2 | .1 |
| | Infrapatella tendon | 1 | .1 |
| | Infraspinatus | 5 | .3 |
| | Intercostals | 1 | .1 |
| | Iliotibial band | 3 | .2 |
| | Iliotibial band | 5 | .3 |
| | Latissmus dorsi | 1 | .1 |
| | Left anterior tibialis | 2 | .1 |
| | Left deltoid | 2 | .1 |
| | Left erector spinae | 1 | .1 |
| | Left extensor hallicus longus | 2 | .1 |
| | Left gastrocnemius | 7 | .5 |
| | Left gluteus medius | 4 | .3 |
| | Left hamstring | 4 | .3 |
| | Left iliopsoas | 1 | .1 |
| | Left infrapatella tendon | 2 | .1 |
| | Left infraspinatus | 6 | .4 |
| | Left Iliotibial band | 7 | .5 |
| | Left latissmus dorsi | 2 | .1 |

## Table 4.48: Frequency distribution by muscle-1 (Massage) cont…

| | Frequency | Percent |
|---|---|---|
| Left lateral collateral ligament | 1 | .1 |
| Left levator scapulae | 6 | .4 |
| Left medial collateral ligament | 4 | .3 |
| Left peroneii | 2 | .1 |
| Left piriformis | 4 | .3 |
| Left popliteus | 2 | .1 |
| Left pterygoid | 1 | .1 |
| Left quadratus lumborum | 21 | 1.4 |
| Left quadriceps | 8 | .5 |
| Left rhomboid | 1 | .1 |
| Left rhomboid | 2 | .1 |
| Left sternocleidomastoid | 1 | .1 |
| Left supraspinatus | 1 | .1 |
| Left teres major | 1 | .1 |
| Left teres minor | 6 | .4 |
| Left trapezius | 12 | .8 |
| Left tricep | 1 | .1 |
| Left vastus lateralis | 1 | .1 |
| Left quadratus lumborum | 1 | .1 |
| Levator scapulae | 2 | .1 |
| Levator scapulae | 12 | .8 |
| Lumbar paraspinals | 39 | 2.6 |
| N/A | 382 | 25.5 |
| Pectoralis | 2 | .1 |
| Peroneii | 2 | .1 |
| Peroneus longus | 1 | .1 |
| Piriformis | 2 | .1 |
| Posterior cervicals | 73 | 4.9 |
| Quadratus lumborum | 261 | 17.4 |
| Quadratus lumborum | 10 | .7 |
| Quadriceps | 15 | 1.0 |
| Rectus femoris | 1 | .1 |
| Rhomboids | 1 | .1 |
| Rhomboids | 68 | 4.5 |
| Right anterior deltoid | 1 | .1 |
| Right bicep | 2 | .1 |
| Right gastrocnemius | 2 | .1 |
| Right adductor | 1 | .1 |
| Right deltoid | 2 | .1 |
| Right gastrocnemius | 1 | .1 |
| Right gluteus medius | 5 | .3 |
| Right gluteus minimus | 1 | .1 |
| Right hamstring | 2 | .1 |

## Table 4.48: Frequency distribution by muscle-1 (Massage) cont…

| | Frequency | Percent |
|---|---|---|
| Right iliopsoas | 1 | .1 |
| Right infraspinatus | 5 | .3 |
| Right iliotibial band | 4 | .3 |
| Right latissmus dorsi | 1 | .1 |
| Right lateral collateral ligament | 1 | .1 |
| Right levator scapulae | 7 | .5 |
| Right medial collateral ligament | 1 | .1 |
| Right pectoralis | 1 | .1 |
| Right peroneii | 1 | .1 |
| Right piriformis | 2 | .1 |
| Right post cervicals | 1 | .1 |
| Right quadratus lumborum | 32 | 2.1 |
| Right quadriceps | 6 | .4 |
| Right rectus femoris | 1 | .1 |
| Right rhomboid | 9 | .6 |
| Right rotator cuff | 1 | .1 |
| Right scalene | 1 | .1 |
| Right supraspinatus | 1 | .1 |
| Right teres minor | 2 | .1 |
| Right tensor fascia lata | 2 | .1 |
| Right trapezius | 25 | 1.7 |
| Right tricep | 3 | .2 |
| Right vastus medialis | 1 | .1 |
| Scalenes | 2 | .1 |
| Seratus anterior | 1 | .1 |
| Suboccipitals | 2 | .1 |
| Subscapularis | 1 | .1 |
| Supraspinatus | 1 | .1 |
| Supraspinatus | 1 | .1 |
| Tensor fascia lata | 3 | .2 |
| Thoracic paraspinals | 59 | 3.9 |
| Trapezius | 1 | .1 |
| Trapezius | 230 | 15.3 |
| Triceps | 2 | .1 |
| Whole left side of body | 1 | .1 |
| Total | 1499 | 100.0 |

## Table 4.49: Frequency distribution by muscle2 (Massage)

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Anterior tibialis | 1 | .1 |
| | Biceps | 1 | .1 |
| | Quadratus lumborum | 1 | .1 |
| | Deltoid | 1 | .1 |
| | Extensor carpi radialis brevis | 1 | .1 |
| | Erector spinae | 15 | 1.0 |
| | Gastrocnemius | 3 | .2 |
| | Gluteus maximus | 2 | .1 |
| | Gluteus medius | 4 | .3 |
| | Gluteus medius | 10 | .7 |
| | Gluteus minimus | 1 | .1 |
| | Gluteal muscles | 9 | .6 |
| | Hamstrings | 8 | .5 |
| | Iliopsoas | 2 | .1 |
| | Infraspinatus | 4 | .3 |
| | Iliotibial band | 2 | .1 |
| | Latissmus dorsi | 1 | .1 |
| | Latissmus dorsi | 4 | .3 |
| | Left anterior talofibular ligament | 1 | .1 |
| | Left biceps | 3 | .2 |
| | Left gastrocnemius | 4 | .3 |
| | Left gluteus medius | 4 | .3 |
| | Left hamstring | 4 | .3 |
| | Left infraspinatus | 1 | .1 |
| | Left Iliotibial band | 3 | .2 |
| | Left levator scapulae | 5 | .3 |
| | Left pectoralis major | 1 | .1 |
| | Left peroneii | 1 | .1 |
| | Left piriformis | 2 | .1 |
| | Left plantar fascia | 1 | .1 |
| | Left popliteus | 2 | .1 |
| | Left quadratus lumborum | 6 | .4 |
| | Left quadriceps | 1 | .1 |
| | Left rhomboid | 4 | .3 |
| | Left supraspinatus | 7 | .5 |
| | Left tensor fascia lata | 1 | .1 |
| | Left trapezius | 6 | .4 |
| | Left tricep | 1 | .1 |
| | Levator scapulae | 4 | .3 |
| | Levator scapulae | 13 | .9 |
| | Lumbar paraspinals | 47 | 3.1 |

## Table 4.49: Frequency distribution by muscle2 (Massage) cont…

| | Frequency | Percent |
|---|---|---|
| N/A | 829 | 55.3 |
| Paraspinals | 2 | .1 |
| Pectoralis | 1 | .1 |
| Piriformis | 4 | .3 |
| Piriformis | 1 | .1 |
| Posterior cervicals | 44 | 2.9 |
| Quadratus lumborum | 63 | 4.2 |
| Quadratus lumborum | 7 | .5 |
| Quadriceps | 1 | .1 |
| Rhomboids | 3 | .2 |
| Rhomboids | 109 | 7.3 |
| Right ankle | 1 | .1 |
| Right bicep | 1 | .1 |
| Right gastrocnemius | 1 | .1 |
| Right gluteus medius | 10 | .7 |
| Right hamstring | 2 | .1 |
| Right infraspinatus | 2 | .1 |
| Right iliotibial band | 2 | .1 |
| Right latissmus dorsi | 2 | .1 |
| Right levator scapulae | 9 | .6 |
| Right lumbar paraspinals | 1 | .1 |
| Right paraspinals | 1 | .1 |
| Right peroneii | 1 | .1 |
| Right piriformis | 4 | .3 |
| Right popliteus | 1 | .1 |
| Right posterior cervicals | 5 | .3 |
| Right posterior cervicals | 2 | .1 |
| Right quadratus lumborum | 6 | .4 |
| Right quadriceps | 1 | .1 |
| Right rectus femoris | 2 | .1 |
| Right rhomboid | 5 | .3 |
| Right scalene | 1 | .1 |
| Right supraspinatus | 5 | .3 |
| Right teres major | 1 | .1 |
| Right teres minor | 3 | .2 |
| Right tensor fascia lata | 1 | .1 |
| Right trapezius | 8 | .5 |
| Right tricep | 1 | .1 |
| Scalenes | 1 | .1 |
| Sternocleidomastoid | 1 | .1 |
| Sternocleidomastoid | 1 | .1 |
| Soleus | 1 | .1 |
| Suboccipitals | 1 | .1 |

## Table 4.49: Frequency distribution by muscle2 (Massage)

| | Frequency | Percent |
|---|---|---|
| Supraspinatus | 2 | .1 |
| Teres minor | 1 | .1 |
| Tensor fascia lata | 1 | .1 |
| Thoracic paraspinals | 33 | 2.2 |
| Trapezius | 122 | 8.1 |
| Total | 1499 | 100.0 |

## Table 4.50: Frequency distribution by muscle3 (Massage)

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Adductors | 1 | .1 |
| | Gastrocnemius | 1 | .1 |
| | Deltoids | 2 | .1 |
| | Extensor carpi ulnaris | 1 | .1 |
| | Erector spinae | 5 | .3 |
| | Gastrocnemius | 3 | .2 |
| | Gluteus maximus | 1 | .1 |
| | Gluteus medius | 3 | .2 |
| | Gluteus medius | 3 | .2 |
| | Gluteal muscles | 5 | .3 |
| | Hamstrings | 3 | .2 |
| | Iliopsoas | 1 | .1 |
| | Infraspinatus | 2 | .1 |
| | Latissmus dorsi | 2 | .1 |
| | Left gluteus medius | 1 | .1 |
| | Left hamstring | 1 | .1 |
| | Left iliotibial band | 2 | .1 |
| | Left levator scapulae | 1 | .1 |
| | Left quadratus lumborum | 3 | .2 |
| | Left quadriceps | 2 | .1 |
| | Left supraspinatus | 2 | .1 |
| | Left teres minor | 2 | .1 |
| | Left thoracic paraspinals | 1 | .1 |
| | Left trapezius | 1 | .1 |
| | Levator scapulae | 1 | .1 |
| | Levator scapulae | 12 | .8 |
| | Lumbar paraspinals | 15 | 1.0 |
| | N/A | 1222 | 81.5 |
| | Occipitals | 1 | .1 |
| | Paraspinal | 1 | .1 |
| | Pectoralis | 1 | .1 |
| | Piriformis | 2 | .1 |
| | Piriformis | 1 | .1 |
| | Posterior cervicals | 23 | 1.5 |
| | Quadratus lumborum | 45 | 3.0 |
| | Quadratus lumborum | 2 | .1 |
| | Rhomboids | 35 | 2.3 |
| | Right deltoid | 2 | .1 |
| | Right gluteus medius | 4 | .3 |
| | Right gluteus minimus | 3 | .2 |
| | Right iliopsoas | 1 | .1 |
| | Right infraspinatus | 1 | .1 |

## Table 4.50: Frequency distribution by muscle3 (Massage) cont…

| | Frequency | Percent |
|---|---|---|
| Right piriformis | 2 | .1 |
| Right post cervical | 2 | .1 |
| Right post cervical | 1 | .1 |
| Right quadratus lumborum | 1 | .1 |
| Right rhomboid | 1 | .1 |
| Right scalene | 1 | .1 |
| Right sternocleidomastoid | 1 | .1 |
| Right soleus | 1 | .1 |
| Right subscapularis | 1 | .1 |
| Right supraspinatus | 1 | .1 |
| Right teres major | 1 | .1 |
| Right teres minor | 1 | .1 |
| Right tensor fascia lata | 1 | .1 |
| Right trapezius | 2 | .1 |
| Scalenes | 5 | .3 |
| Sternocleidomastoid | 1 | .1 |
| Sternocleidomastoid | 1 | .1 |
| Seratus anterior | 1 | .1 |
| Suboccipitals | 1 | .1 |
| Supraspinatus | 1 | .1 |
| Thoracic paraspinals | 19 | 1.3 |
| Trapezius | 31 | 2.1 |
| Triceps | 1 | .1 |
| Total | 1499 | 100.0 |

## Table 4.51: Frequency distribution by muscle4 (Massage)

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Erector spinae | 1 | .1 |
| | Gluteus maximus | 1 | .1 |
| | Gluteus medius | 1 | .1 |
| | Levator scapulae | 8 | .5 |
| | Lumbar paraspinals | 5 | .3 |
| | N/A | 1426 | 95.1 |
| | Pectoralis | 1 | .1 |
| | Posterior cervicals | 7 | .5 |
| | Quadratus lumborum | 9 | .6 |
| | Quadratus lumborum | 1 | .1 |
| | Quads | 1 | .1 |
| | Rhomboids | 3 | .2 |
| | Right adductors | 1 | .1 |
| | Right glut max | 1 | .1 |
| | Right iliopsoas | 1 | .1 |
| | Right infraspinatus | 1 | .1 |
| | Right levator scapulae | 1 | .1 |
| | Right posterior cervical | 1 | .1 |
| | Right scalene | 2 | .1 |
| | Scalenes | 3 | .2 |
| | Subscapularis | 1 | .1 |
| | Supraspinatus | 1 | .1 |
| | Teres minor | 1 | .1 |
| | Thoracic paraspinals | 12 | .8 |
| | Trapezius | 9 | .6 |
| | Total | 1499 | 100.0 |

## 4.5.1.2.6 Dry needling

Only 8.8% of surfers received dry needling.

**Table 4.52: Frequency distribution by needle**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | No | 1365 | 91.2 |
| | Yes | 132 | 8.8 |
| | Total | 1497 | 100.0 |
| Missing | System | 2 | |
| Total | | 1499 | |

Table 4.53 – 4.55 below, shows the muscles that were most commonly dry needled. The Trapezius (3.5%) and Quadratus Lumborum (2.3%) were most the most common, followed by the Rhomboids (0.9%).

**Table 4.53: Frequency distribution by muscle1 (needle)**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Erector spinae | 1 | .1 |
| | Gastrocnemius | 1 | .1 |
| | Gluteus medius | 2 | .1 |
| | Hamstrings | 1 | .1 |
| | Infraspinatus | 1 | .1 |
| | Iliotibial band | 1 | .1 |
| | Iliotibial band | 1 | .1 |
| | Left anterior tibialis | 1 | .1 |
| | Left deltoid | 1 | .1 |
| | Left Gastrocnemius | 1 | .1 |
| | Left infraspinatus | 1 | .1 |
| | Left Iliotibial band | 2 | .1 |
| | Left levator scapulae | 2 | .1 |
| | Left quadratus lumborum | 4 | .3 |
| | Left quadriceps | 1 | .1 |
| | Left rhomboid | 1 | .1 |
| | Left teres minor | 1 | .1 |
| | Left trapezius | 1 | .1 |
| | Levator scapulae | 1 | .1 |
| | Lumbar paraspinals | 1 | .1 |
| | N/A | 1376 | 91.8 |
| | Peroneii | 1 | .1 |
| | Peroneus longus | 1 | .1 |
| | Posterior cervicals | 1 | .1 |
| | Quadratus lumborum | 18 | 1.2 |
| | Quadriceps | 1 | .1 |
| | Rhomboids | 4 | .3 |
| | Right gluteus medius | 2 | .1 |
| | Right infraspinatus | 1 | .1 |
| | Right iliotibial band | 1 | .1 |
| | Right levator scapulae | 4 | .3 |
| | Right quadratus lumborum | 8 | .5 |
| | Right quadriceps | 2 | .1 |
| | Right rhomboid | 2 | .1 |
| | Right supraspinatus | 1 | .1 |
| | Right trapezius | 9 | .6 |
| | Supraspinatus | 1 | .1 |

## Table 4.53: Frequency distribution by muscle1 (needle) cont…

| | | Frequency | Percent |
|---|---|---|---|
| | Tensor fascia lata | 1 | .1 |
| | Thoracic paraspinals | 1 | .1 |
| | Trapezius | 38 | 2.5 |
| | Total | 1499 | 100.0 |

## Table 4.54: Frequency distribution by muscle2 (needle)

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Gluteus medius | 1 | .1 |
| | Gluteal muscles | 1 | .1 |
| | Iliotibial band | 1 | .1 |
| | Left gastrocnemius | 1 | .1 |
| | Left iliotibial band | 1 | .1 |
| | Left quadratus lumborum | 1 | .1 |
| | Lumbar paraspinals | 2 | .1 |
| | N/A | 1471 | 98.1 |
| | Quadratus lumborum | 2 | .1 |
| | Quadriceps | 1 | .1 |
| | Rhomboids | 6 | .4 |
| | Right levator scapulae | 1 | .1 |
| | Right paraspinals | 1 | .1 |
| | Right quadratus lumborum | 1 | .1 |
| | Right trapezius | 1 | .1 |
| | Supraspinatus | 1 | .1 |
| | Tensor fascia lata | 1 | .1 |
| | Trapezius | 5 | .3 |
| | Total | 1499 | 100.0 |

## Table 4.55: Frequency distribution by muscle3 (needle)

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Latissmus dorsi | 1 | .1 |
| | Levator scapulae | 1 | .1 |
| | N/A | 1497 | 99.9 |
| | Total | 1499 | 100.0 |

## 4.5.1.2.7 Ischaemic compression

Only 15.6% of surfers received ischaemic compression to their muscles.

**Table 4.56: Frequency distribution by ischaemic compression**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | No | 1264 | 84.4 |
| | Yes | 233 | 15.6 |
| | Total | 1497 | 100.0 |
| Missing | System | 2 | |
| Total | | 1499 | |

Tables 4.57 – 4.60 show the muscles that ischaemic compression was most commonly performed on. The Quadratus Lumborum (5.8%) muscles were most common, followed by the Trapezius (4.5%) and Gluteal (3.8%) muscles.

**Table 4.57: Frequency distribution by muscle1 (ischaemic compression)**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Bilateral suboccipitals | 1 | .1 |
| | Erector spinae | 1 | .1 |
| | Gastrocnemius | 1 | .1 |
| | Gluteus maximus | 2 | .1 |
| | Gluteus medius | 2 | .1 |
| | Gluteus medius | 9 | .6 |
| | Gluteus minimus | 1 | .1 |
| | Gluteal muscles | 5 | .3 |
| | Hamstring | 4 | .3 |
| | Infraspinatus | 2 | .1 |
| | Iliotibial band | 2 | .1 |
| | Iliotibial band | 1 | .1 |
| | Left gluteus medius | 2 | .1 |
| | Left Gluteal muscles | 2 | .1 |
| | Left infraspinatus | 1 | .1 |
| | Left Iliotibial band | 3 | .2 |
| | Left Latissmus dorsi | 1 | .1 |
| | Left levator scapulae | 1 | .1 |
| | Left popliteus | 1 | .1 |
| | Left pterygoid | 1 | .1 |
| | Left quadratus lumborum | 4 | .3 |
| | Left trapezius | 2 | .1 |
| | Levator scapulae | 2 | .1 |
| | Lumbar paraspinals | 6 | .4 |
| | N/A | 1279 | 85.3 |
| | Occipitals | 1 | .1 |
| | Posterior cervicals | 7 | .5 |
| | Quadratus lumborum | 55 | 3.7 |
| | Quadratus lumborum | 1 | .1 |
| | Rhomboids | 7 | .5 |
| | Right adductor | 1 | .1 |
| | Right bicep | 1 | .1 |
| | Right gastrocnemius | 1 | .1 |
| | Right gluteus maximus | 1 | .1 |
| | Right gluteus medius | 6 | .4 |
| | Right Gluteal muscles | 1 | .1 |

**Table 4.57: Frequency distribution by muscle1 (ischaemic compression) cont…**

| | Frequency | Percent |
|---|---|---|
| Right infraspinatus | 1 | .1 |
| Right peroneii | 1 | .1 |
| Right posterior cervical | 1 | .1 |
| Right quadratus lumborum | 12 | .8 |
| Right quadriceps | 1 | .1 |
| Right rhomboid | 3 | .2 |
| Right scalene | 1 | .1 |
| Right supraspinatus | 2 | .1 |
| Right trapezius | 5 | .3 |
| Right tricep | 3 | .2 |
| Right vastus medialis | 1 | .1 |
| Sternocleidomastoid | 1 | .1 |
| Supraspinatus | 1 | .1 |
| Thoracic paraspinals | 4 | .3 |
| Trapezius | 44 | 2.9 |
| Total | 1499 | 100.0 |

## Table 4.58: Frequency distribution by muscle2 (ischaemic compression)

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Erector spinae | 2 | .1 |
| | Gluteus maximus | 1 | .1 |
| | Gluteus maximus | 1 | .1 |
| | Gluteus medius | 6 | .4 |
| | Gluteus medius | 5 | .3 |
| | Gluteal muscles | 3 | .2 |
| | Hamstring | 1 | .1 |
| | Iliopsoas | 1 | .1 |
| | Iliopsoas | 2 | .1 |
| | Infraspinatus | 1 | .1 |
| | Left gastrocnemius | 1 | .1 |
| | Left iliopsoas | 1 | .1 |
| | Left levator scapulae | 1 | .1 |
| | Left quadratus lumborum | 1 | .1 |
| | Left quadriceps | 1 | .1 |
| | Left trapezius | 1 | .1 |
| | Levator scapulae | 3 | .2 |
| | Levator scapulae | 1 | .1 |
| | Lumbar paraspinals | 5 | .3 |
| | N/A | 1393 | 92.9 |
| | Paraspinals | 1 | .1 |
| | Piriformis | 1 | .1 |
| | Posterior cervicals | 10 | .7 |
| | Quadratus lumborum | 1 | .1 |
| | Quadratus lumborum | 3 | .2 |
| | Quadratus lumborum | 1 | .1 |
| | Quadriceps | 2 | .1 |
| | Rhomboids | 1 | .1 |
| | Rhomboids | 19 | 1.3 |
| | Right gluteus medius | 4 | .3 |
| | Right gluteus minimus | 1 | .1 |
| | Right iliopsoas | 1 | .1 |
| | Right lumbar paraspinals | 1 | .1 |
| | Right lumbar paraspinals | 1 | .1 |
| | Right paraspinals | 1 | .1 |
| | Right quadratus lumborum | 2 | .1 |
| | Right rhomboid | 2 | .1 |
| | Right sternocleidomastoid | 1 | .1 |
| | Right trapezius | 1 | .1 |
| | Scalenes | 1 | .1 |
| | Thoracic paraspinals | 1 | .1 |

## Table 4.58: Frequency distribution by muscle2 (ischaemic compression) cont…

| | | Frequency | Percent |
|---|---|---|---|
| | Trapezius | 12 | .8 |
| | Total | 1499 | 100.0 |

## Table 4.59: Frequency distribution by muscle3 (ischaemic compression)

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Gluteus maximus | 2 | .1 |
| | Gluteus medius | 1 | .1 |
| | Gluteus minimus | 1 | .1 |
| | Left gastrocnemius | 1 | .1 |
| | Left teres minor | 1 | .1 |
| | Levator scapulae | 2 | .1 |
| | N/A | 1458 | 97.3 |
| | Piriformis | 1 | .1 |
| | Piriformis | 1 | .1 |
| | Posterior cervicals | 6 | .4 |
| | Quadratus lumborum | 3 | .2 |
| | Quadratus lumborum | 1 | .1 |
| | Rhomboids | 5 | .3 |
| | Right gluteus maximus | 1 | .1 |
| | Right hamstring | 1 | .1 |
| | Right piriformis | 1 | .1 |
| | Right thoracic paraspinals | 1 | .1 |
| | Suboccipitals | 1 | .1 |
| | Supraspinatus | 1 | .1 |
| | Thoracic paraspinals | 4 | .3 |
| | Tibialis posterior | 1 | .1 |
| | Trapezius | 5 | .3 |
| | Total | 1499 | 100.0 |

**Table 4.60: Frequency distribution by muscle4 (ischaemic compression) cont…**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Gastrocnemius | 1 | .1 |
| | Gastrocnemius | 1 | .1 |
| | Gluteus medius | 1 | .1 |
| | N/A | 1486 | 99.1 |
| | Posterior cervicals | 2 | .1 |
| | Quadratus lumborum | 4 | .3 |
| | Right Latissmus dorsi | 1 | .1 |
| | Right piriformis | 1 | .1 |
| | Right posterior cervical | 1 | .1 |
| | Scalenes | 1 | .1 |
| | Total | 1499 | 100.0 |

## 4.5.1.2.8 Other forms of treatment

Tables 4.61 – 4.62 show the frequency of treatment by any other form not listed in the CSSA Questionnaire. Cryotherapy, cross friction massage and strapping were the most common other forms of treatments.

**Table 4.61: Frequency distribution by other treatment 1**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Cervical traction | 1 | .1 |
| | Cross friction | 43 | 2.9 |
| | Cryotherapy | 70 | 4.7 |
| | Grip and rip | 9 | .6 |
| | N/A | 1334 | 89.0 |
| | Quadriceps setting exercises | 1 | .1 |
| | Strap right hand | 1 | .1 |
| | Strapping | 34 | 2.3 |
| | Strapping of left foot | 1 | .1 |
| | Strengthening exercises | 2 | .1 |
| | Traction | 3 | .2 |
| | Total | 1499 | 100.0 |

## Table 4.62: Frequency distribution by other treatment 2

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Cross friction | 10 | .7 |
| | Cryotherapy | 14 | .9 |
| | Disinfectant | 1 | .1 |
| | Elastic strapping | 2 | .1 |
| | Grip and rip | 4 | .3 |
| | Ice | 4 | .3 |
| | N/A | 1460 | 97.4 |
| | Quadriceps setting exercises | 1 | .1 |
| | Strapping | 3 | .2 |
| | Total | 1499 | 100.0 |

Table 4.63 – 4.64 show the muscles that these other forms of treatment were most commonly applied to. The knee was most common, followed by the shoulder and ankle / foot region respectively.

**Table 4.63: Frequency distribution by muscle (Other 1)**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Achilles tendon | 1 | .1 |
| | Ankle | 1 | .1 |
| | Anterior capsule of left ankle | 1 | .1 |
| | Anterior capsule of left shoulder | 2 | .1 |
| | Cervical spine | 4 | .3 |
| | Deltoids of left ankle | 1 | .1 |
| | Foot | 1 | .1 |
| | Gluteal muscles | 1 | .1 |
| | Hamstrings | 2 | .1 |
| | Infrapatella tendon | 4 | .3 |
| | Iliotibial band | 3 | .2 |
| | Lumbar spine | 3 | .2 |
| | Left ankle | 7 | .5 |
| | Left calcaneus | 2 | .1 |
| | Left deltoid | 1 | .1 |
| | Left extensor hallicus longus | 1 | .1 |
| | Left foot | 1 | .1 |
| | Left gastrocnemius | 1 | .1 |
| | Left hamstring | 2 | .1 |
| | Left hamstring | 2 | .1 |
| | Left hand | 1 | .1 |
| | Left infrapatella tendon | 2 | .1 |
| | Left infraspinatus | 1 | .1 |
| | Left Iliotibial band | 2 | .1 |
| | Left knee | 11 | .7 |
| | Left latissmus dorsi | 1 | .1 |
| | Left lateral collateral ligament | 1 | .1 |
| | Left levator scapulae | 1 | .1 |
| | Left medial collateral ligament | 2 | .1 |
| | Left quadratus lumborum | 4 | .3 |
| | Left quadriceps | 2 | .1 |
| | Left rhomboid | 1 | .1 |
| | Left shoulder | 2 | .1 |
| | Left supraspinatus | 2 | .1 |
| | Left tricep | 1 | .1 |

## Table 4.63: Frequency distribution by muscle (Other 1) cont…

| | Frequency | Percent |
|---|---|---|
| Lumbar paraspinals | 4 | .3 |
| Medial collateral ligament | 5 | .3 |
| Medial collateral ligament | 1 | .1 |
| N/A | 1348 | 89.9 |
| Patella tendons bilateral | 1 | .1 |
| Quadratus lumborum | 3 | .2 |
| Quadratus lumborum | 1 | .1 |
| Quadriceps | 2 | .1 |
| Rhomboids | 1 | .1 |
| Right anterior cruciate ligament | 1 | .1 |
| Right ankle | 6 | .4 |
| Right bicep | 1 | .1 |
| Right biceps tendon | 2 | .1 |
| Right gastrocnemius | 2 | .1 |
| Right collateral ligament of elbow | 1 | .1 |
| Right extensor hallicus longus | 1 | .1 |
| Right gastrocnemius | 1 | .1 |
| Right hamstring | 1 | .1 |
| Right hip | 1 | .1 |
| Right infraspinatus | 2 | .1 |
| Right Iliotibial band | 1 | .1 |
| Right Iliotibial band | 1 | .1 |
| Right knee | 5 | .3 |
| Right lateral collateral ligament | 1 | .1 |
| Right levator scapulae | 1 | .1 |
| Right medial collateral ligament | 6 | .4 |
| Right soleus | 1 | .1 |
| Right patella tendon | 1 | .1 |
| Right popliteus | 2 | .1 |
| Right quadratus lumborum | 1 | .1 |
| Right gluteus medius | 1 | .1 |
| Right quadriceps | 2 | .1 |
| Right rotator cuff | 1 | .1 |
| Right shoulder | 5 | .3 |
| Right wrist | 1 | .1 |
| Supraspinatus | 3 | .2 |
| Tensor fascia lata | 1 | .1 |
| Thoracic paraspinals | 1 | .1 |
| Traps | 4 | .3 |
| Total | 1499 | 100.0 |

## Table 4.64: Frequency distribution by muscle (Other 2)

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Gastrocnemius | 1 | .1 |
| | Knee | 2 | .1 |
| | Lumbar spine | 2 | .1 |
| | Left ankle | 1 | .1 |
| | Left calcaneus | 1 | .1 |
| | Left foot | 1 | .1 |
| | Left hand | 1 | .1 |
| | Left infrapatella tendon | 1 | .1 |
| | Left medial collateral ligament | 5 | .3 |
| | Left supraspinatus tendon | 1 | .1 |
| | Left tricep | 1 | .1 |
| | Medial aspect of knee | 2 | .1 |
| | N/A | 1461 | 97.5 |
| | Quadriceps | 1 | .1 |
| | Right ankle | 3 | .2 |
| | Right gastrocnemius | 1 | .1 |
| | Right infraspinatus | 2 | .1 |
| | Right iliotibial band | 1 | .1 |
| | Right knee | 2 | .1 |
| | Right levator scapulae | 2 | .1 |
| | Right medial collateral ligament | 2 | .1 |
| | Right patella tendon | 1 | .1 |
| | Right shoulder | 2 | .1 |
| | Right supraspinatus | 1 | .1 |
| | Supraspinatus | 1 | .1 |
| | Total | 1499 | 100.0 |

***The first objective was a profile of internationally competitive surfers attending the Mr. Price Pro in Durban, KwaZulu-Natal, South Africa with respect to the data obtained from a previously validated sports questionnaire,***

### *4.5.2 INJURY PROFILE - PART TWO:*

On average, the chiropractic students at the Mr. Price Pro treatment facility treat approximately 150 surfers each year. The data that was available was from the year 2000 – 2008. Thus 1499 questionnaires were available from the Chiropractic Student Sports Association's (CSSA) Mr. Price Pro questionnaires. All 1499 questionnaires were used for the purpose of this study, thus N=1499.

Table 4.65 reflects a significant relationship between Hip, Thigh, wrist and Foot/ankle as the regions of clinical impression and age group at the 95% level ($p<0.05$). Lumbar spine complaints were the most frequent in the under 21, 21-25, 26-30 and 31-35 age groups. Neck complaints was the most common complaint in the over 35 age group. Chisquare could not be computed for Abdomen since all subjects with valid ages had no problems in this region.

**Table 4.65: Crosstabulation of Region of complaint and Age**

| | | Under 21 | | 21-25 | | 26-30 | | 31-35 | | Over 35 | | Total | | Chisquare | df | p |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | Count | % | Count | % | Count | % | | | |
| Head | No | 422 | 99.3% | 649 | 99.5% | 301 | 99.0% | 93 | 97.9% | 11 | 100.0 % | 1476 | 99.3% | 3.448 | 4 | 0.486 |
| | Yes | 3 | .7% | 3 | .5% | 3 | 1.0% | 2 | 2.1% | 0 | .0% | 11 | .7% | | | |
| Shoulder | No | 367 | 86.4% | 551 | 84.5% | 267 | 87.8% | 86 | 90.5% | 9 | 81.8% | 1280 | 86.1% | 3.879 | 4 | 0.423 |
| | Yes | 58 | 13.6% | 101 | 15.5% | 37 | 12.2% | 9 | 9.5% | 2 | 18.2% | 207 | 13.9% | | | |
| Upper arm | No | 424 | 99.8% | 642 | 98.5% | 301 | 99.0% | 95 | 100.0 % | 11 | 100.0 % | 1473 | 99.1% | 5.739 | 4 | 0.220 |
| | Yes | 1 | .2% | 10 | 1.5% | 3 | 1.0% | 0 | .0% | 0 | .0% | 14 | .9% | | | |
| Shin/calf | No | 414 | 97.4% | 630 | 96.6% | 297 | 97.7% | 94 | 98.9% | 10 | 90.9% | 1445 | 97.2% | 3.766 | 4 | 0.439 |
| | Yes | 11 | 2.6% | 22 | 3.4% | 7 | 2.3% | 1 | 1.1% | 1 | 9.1% | 42 | 2.8% | | | |
| Neck | No | 275 | 64.7% | 406 | 62.3% | 202 | 66.4% | 51 | 53.7% | 6 | 54.5% | 940 | 63.2% | 6.089 | 4 | 0.193 |
| | Yes | 150 | 35.3% | 246 | 37.7% | 102 | 33.6% | 44 | 46.3% | 5 | 45.5% | 547 | 36.8% | | | |
| Elbow | No | 423 | 99.5% | 650 | 99.7% | 303 | 99.7% | 95 | 100.0 % | 11 | 100.0 % | 1482 | 99.7% | 0.604 | 4 | 0.963 |
| | Yes | 2 | .5% | 2 | .3% | 1 | .3% | 0 | .0% | 0 | .0% | 5 | .3% | | | |
| Hip | No | 421 | 99.1% | 603 | 92.6% | 277 | 91.1% | 89 | 93.7% | 9 | 81.8% | 1399 | 94.1% | 29.462 | 4 | <0.001 |
| | Yes | 4 | .9% | 48 | 7.4% | 27 | 8.9% | 6 | 6.3% | 2 | 18.2% | 87 | 5.9% | | | |
| Thigh | No | 412 | 96.9% | 601 | 92.2% | 277 | 91.1% | 85 | 89.5% | 10 | 90.9% | 1385 | 93.1% | 14.585 | 4 | 0.006 |
| | Yes | 13 | 3.1% | 51 | 7.8% | 27 | 8.9% | 10 | 10.5% | 1 | 9.1% | 102 | 6.9% | | | |
| Thorax | No | 241 | 56.7% | 381 | 58.4% | 173 | 56.9% | 57 | 60.0% | 9 | 81.8% | 861 | 57.9% | 3.202 | 4 | 0.525 |

| | | Under 21 | | 21-25 | | 26-30 | | 31-35 | | Over 35 | | Total | | Chisquare | df | p |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | Count | % | Count | % | Count | % | | | |
| | Yes | 184 | 43.3% | 271 | 41.6% | 131 | 43.1% | 38 | 40.0% | 2 | 18.2% | 626 | 42.1% | | | |
| Wrist/Hand | No | 420 | 98.8% | 651 | 99.8% | 304 | 100.0 % | 94 | 98.9% | 10 | 90.9% | 1479 | 99.5% | 22.193 | 4 | <0.001 |
| | Yes | 5 | 1.2% | 1 | .2% | 0 | .0% | 1 | 1.1% | 1 | 9.1% | 8 | .5% | | | |
| Knee | No | 395 | 92.9% | 608 | 93.3% | 279 | 91.8% | 84 | 88.4% | 10 | 90.9% | 1376 | 92.5% | 3.209 | 4 | . 0.523 |
| | Yes | 30 | 7.1% | 44 | 6.7% | 25 | 8.2% | 11 | 11.6% | 1 | 9.1% | 111 | 7.5% | | | |
| Chest | No | 424 | 99.8% | 650 | 99.7% | 304 | 100.0 % | 94 | 98.9% | 11 | 100.0 % | 1483 | 99.7% | 3.077 | 4 | . 0.545 |
| | Yes | 1 | .2% | 2 | .3% | 0 | .0% | 1 | 1.1% | 0 | .0% | 4 | .3% | | | |
| Lumbar | No | 177 | 41.6% | 303 | 46.5% | 131 | 43.1% | 45 | 47.4% | 9 | 81.8% | 665 | 44.7% | 9.153 | 4 | 0.057 |
| | Yes | 248 | 58.4% | 349 | 53.5% | 173 | 56.9% | 50 | 52.6% | 2 | 18.2% | 822 | 55.3% | | | |
| Forearm | No | 425 | 100.0 % | 651 | 99.8% | 304 | 100.0 % | 95 | 100.0 % | 11 | 100.0 % | 1486 | 99.9% | 1.282 | 4 | 0.865 |
| | Yes | 0 | .0% | 1 | .2% | 0 | .0% | 0 | .0% | 0 | .0% | 1 | .1% | | | |
| Foot/ankle | No | 410 | 96.5% | 618 | 94.9% | 290 | 95.4% | 94 | 98.9% | 7 | 63.6% | 1419 | 95.5% | 29.989 | 4 | <0.001 |
| | Yes | 15 | 3.5% | 33 | 5.1% | 14 | 4.6% | 1 | 1.1% | 4 | 36.4% | 67 | 4.5% | | | |
| Abdomen | No | 425 | 100.0 % | 652 | 100.0 % | 304 | 100.0 % | 95 | 100.0 % | 11 | 100.0 % | 1487 | 100.0% | | | |
| | Yes | 0 | .0% | 0 | .0% | 0 | .0% | 0 | .0% | 0 | .0% | 0 | .0% | | | |

In table 4.66, neck, wrist and lumbar regions were significantly associated with gender at the 95% level ($p<0.05$). Lumbar spine complaints were the most frequent complaints in both male and female surfers. In both genders, neck and thorax complaints followed closely behind lumbar spine complaints.

**Table 4.66: Crosstabulation of Region of complaint and Gender**

| | | Male | | Female | | Total | | Chisquare | df | p |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | | | |
| Head | No | 1152 | 99.2% | 331 | 99.4% | 1483 | 99.3% | 0.108 | 1 | 0.743 |
| | Yes | 9 | .8% | 2 | .6% | 11 | .7% | | | |
| Shoulder | No | 1000 | 86.1% | 286 | 85.9% | 1286 | 86.1% | 0.013 | 1 | 0.909 |
| | Yes | 161 | 13.9% | 47 | 14.1% | 208 | 13.9% | | | |
| Upper arm | No | 1152 | 99.2% | 328 | 98.5% | 1480 | 99.1% | 1.471 | 1 | 0.225 |
| | Yes | 9 | .8% | 5 | 1.5% | 14 | .9% | | | |
| Shin/calf | No | 1127 | 97.1% | 325 | 97.6% | 1452 | 97.2% | 0.262 | 1 | 0.609 |
| | Yes | 34 | 2.9% | 8 | 2.4% | 42 | 2.8% | | | |
| Neck | No | 775 | 66.8% | 167 | 50.2% | 942 | 63.1% | 30.619 | 1 | 0.000 |
| | Yes | 386 | 33.2% | 166 | 49.8% | 552 | 36.9% | | | |
| Elbow | No | 1156 | 99.6% | 333 | 100.0 % | 1489 | 99.7% | 1.439 | 1 | 0.230 |
| | Yes | 5 | .4% | 0 | .0% | 5 | .3% | | | |
| Hip | No | 1087 | 93.7% | 319 | 95.8% | 1406 | 94.2% | 2.057 | 1 | 0.151 |
| | Yes | 73 | 6.3% | 14 | 4.2% | 87 | 5.8% | | | |
| Thigh | No | 1077 | 92.8% | 315 | 94.6% | 1392 | 93.2% | 1.362 | 1 | 0.243 |
| | Yes | 84 | 7.2% | 18 | 5.4% | 102 | 6.8% | | | |
| Thorax | No | 688 | 59.3% | 178 | 53.5% | 866 | 58.0% | 3.580 | 1 | 0.058 |
| | Yes | 473 | 40.7% | 155 | 46.5% | 628 | 42.0% | | | |
| Wrist/Hand | No | 1159 | 99.8% | 327 | 98.2% | 1486 | 99.5% | 12.902 | 1 | 0.000 |
| | Yes | 2 | .2% | 6 | 1.8% | 8 | .5% | | | |
| Knee | No | 1076 | 92.7% | 307 | 92.2% | 1383 | 92.6% | 0.089 | 1 | 0.765 |

| | | Male | | Female | | Total | | Chisquare | df | p |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | | | |
| | Yes | 85 | 7.3% | 26 | 7.8% | 111 | 7.4% | | | |
| Chest | No | 1157 | 99.7% | 333 | 100.0 % | 1490 | 99.7% | 1.150 | 1 | 0.283 |
| | Yes | 4 | .3% | 0 | .0% | 4 | .3% | | | |
| Lumbar | No | 493 | 42.5% | 176 | 52.9% | 669 | 44.8% | 11.296 | 1 | 0.001 |
| | Yes | 668 | 57.5% | 157 | 47.1% | 825 | 55.2% | | | |
| Forearm | No | 1160 | 99.9% | 333 | 100.0 % | 1493 | 99.9% | 0.287 | | 0.592 |
| | Yes | 1 | .1% | 0 | .0% | 1 | .1% | | | |
| Foot/ankle | No | 1108 | 95.4% | 319 | 96.1% | 1427 | 95.6% | 0.258 | 1 | 0.612 |
| | Yes | 53 | 4.6% | 13 | 3.9% | 66 | 4.4% | | | |
| Abdomen | No | 1160 | 99.9% | 333 | 100.0 % | 1493 | 99.9% | 0.287 | 1 | 0.592 |
| | Yes | 1 | .1% | 0 | .0% | 1 | .1% | | | |

Table 4.67 reflects a significant relationship between Thigh as the region of complaint and type of patient at the 95% level ($p<0.05$). Thorax and lumbar complaints were the most common complaints in both new and repeat care patients.

**Table 4.67: Crosstabulation of Region of complaint and Type of patient**

| | | New patient | | Repeat care | | Total | | Chisquare | df | p |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | | | |
| Head | No | 813 | 99.3% | 671 | 99.3% | 1484 | 99.3% | 0.000 | 1 | 0.987 |
| | Yes | 6 | .7% | 5 | .7% | 11 | .7% | | | |
| Shoulder | No | 697 | 85.1% | 591 | 87.4% | 1288 | 86.2% | 1.674 | 1 | 0.196 |
| | Yes | 122 | 14.9% | 85 | 12.6% | 207 | 13.8% | | | |
| Upper arm | No | 810 | 98.9% | 671 | 99.3% | 1481 | 99.1% | 0.515 | 1 | 0.473 |
| | Yes | 9 | 1.1% | 5 | .7% | 14 | .9% | | | |
| Shin/calf | No | 801 | 97.8% | 652 | 96.4% | 1453 | 97.2% | 2.481 | 1 | 0.115 |
| | Yes | 18 | 2.2% | 24 | 3.6% | 42 | 2.8% | | | |
| Neck | No | 507 | 61.9% | 438 | 64.8% | 945 | 63.2% | 1.328 | 1 | 0.249 |
| | Yes | 312 | 38.1% | 238 | 35.2% | 550 | 36.8% | | | |
| Elbow | No | 816 | 99.6% | 674 | 99.7% | 1490 | 99.7% | 0.055 | 1 | 0.814 |
| | Yes | 3 | .4% | 2 | .3% | 5 | .3% | | | |
| Hip | No | 773 | 94.5% | 634 | 93.8% | 1407 | 94.2% | 0.324 | 1 | 0.559 |
| | Yes | 45 | 5.5% | 42 | 6.2% | 87 | 5.8% | | | |
| Thigh | No | 773 | 94.4% | 620 | 91.7% | 1393 | 93.2% | 4.145 | 1 | 0.042 |
| | Yes | 46 | 5.6% | 56 | 8.3% | 102 | 6.8% | | | |
| Thorax | No | 477 | 58.2% | 387 | 57.2% | 864 | 57.8% | 0.150 | 1 | 0.699 |
| | Yes | 342 | 41.8% | 289 | 42.8% | 631 | 42.2% | | | |
| Wrist/Hand | No | 814 | 99.4% | 673 | 99.6% | 1487 | 99.5% | 0.193 | 1 | 0.660 |
| | Yes | 5 | .6% | 3 | .4% | 8 | .5% | | | |
| Knee | No | 760 | 92.8% | 624 | 92.3% | 1384 | 92.6% | 0.129 | 1 | 0.720 |

| | | New patient | | Repeat care | | Total | | Chisquare | df | p |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | | | |
| | Yes | 59 | 7.2% | 52 | 7.7% | 111 | 7.4% | | | |
| Chest | No | 817 | 99.8% | 674 | 99.7% | 1491 | 99.7% | 0.037 | 1 | 0.847 |
| | Yes | 2 | .2% | 2 | .3% | 4 | .3% | | | |
| Lumbar | No | 358 | 43.7% | 312 | 46.2% | 670 | 44.8% | 0.893 | 1 | 0.345 |
| | Yes | 461 | 56.3% | 364 | 53.8% | 825 | 55.2% | | | |
| Forearm | No | 818 | 99.9% | 676 | 100.0 % | 1494 | 99.9% | 0.826 | 1 | 0.363 |
| | Yes | 1 | .1% | 0 | .0% | 1 | .1% | | | |
| Foot/ankle | No | 783 | 95.6% | 643 | 95.3% | 1426 | 95.4% | 0.101 | 1 | 0.750 |
| | Yes | 36 | 4.4% | 32 | 4.7% | 68 | 4.6% | | | |
| Abdomen | No | 819 | 100.0 % | 675 | 99.9% | 1494 | 99.9% | 1.212 | 1 | 0.271 |
| | Yes | 0 | .0% | 1 | .1% | 1 | .1% | | | |

Table 4.68 reflects no significant relationships between region of complaint and type of complaint at the 95% level (P<0.05). Lumbar spine complaints were the most common complaints recorded by both new and continuation of care patients.

**Table 4.68: Crosstabulation of Region of complaint and Type of complaint**

| | | New complaint | | Continuation of care | | Total | | Chisquare | df | p |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | | | |
| Head | No | 813 | 99.3% | 670 | 99.3% | 1483 | 99.3% | 0.00 | 1 | 0.985 |
| | Yes | 6 | .7% | 5 | .7% | 11 | .7% | | | |
| Shoulder | No | 697 | 85.1% | 590 | 87.4% | 1287 | 86.1% | 1.645 | 1 | 0.200 |
| | Yes | 122 | 14.9% | 85 | 12.6% | 207 | 13.9% | | | |
| Upper arm | No | 810 | 98.9% | 670 | 99.3% | 1480 | 99.1% | 0.511 | 1 | 0.475 |
| | Yes | 9 | 1.1% | 5 | .7% | 14 | .9% | | | |
| Shin/calf | No | 801 | 97.8% | 651 | 96.4% | 1452 | 97.2% | 2.497 | 1 | 0.114 |
| | Yes | 18 | 2.2% | 24 | 3.6% | 42 | 2.8% | | | |
| Neck | No | 508 | 62.0% | 436 | 64.6% | 944 | 63.2% | 1.047 | 1 | 0.306 |
| | Yes | 311 | 38.0% | 239 | 35.4% | 550 | 36.8% | | | |
| Elbow | No | 816 | 99.6% | 673 | 99.7% | 1489 | 99.7% | 0.054 | 1 | 0.816 |
| | Yes | 3 | .4% | 2 | .3% | 5 | .3% | | | |
| Hip | No | 773 | 94.5% | 633 | 93.8% | 1406 | 94.2% | 0.350 | 1 | 0.554 |
| | Yes | 45 | 5.5% | 42 | 6.2% | 87 | 5.8% | | | |
| Thigh | No | 772 | 94.3% | 620 | 91.9% | 1392 | 93.2% | 3.377 | 1 | 0.066 |
| | Yes | 47 | 5.7% | 55 | 8.1% | 102 | 6.8% | | | |
| Thorax | No | 477 | 58.2% | 386 | 57.2% | 863 | 57.8% | 0.169 | 1 | 0.861 |
| | Yes | 342 | 41.8% | 289 | 42.8% | 631 | 42.2% | | | |
| Wrist/Hand | No | 814 | 99.4% | 672 | 99.6% | 1486 | 99.5% | 0.192 | 1 | 0.662 |
| | Yes | 5 | .6% | 3 | .4% | 8 | .5% | | | |

| | | New complaint | | Continuation of care | | Total | | Chisquare | df | p |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | | | |
| Knee | No | 760 | 92.8% | 623 | 92.3% | 1383 | 92.6% | 0.134 | 1 | 0.714 |
| | Yes | 59 | 7.2% | 52 | 7.7% | 111 | 7.4% | | | |
| Chest | No | 817 | 99.8% | 673 | 99.7% | 1490 | 99.7% | 0.038 | 1 | 0.846 |
| | Yes | 2 | .2% | 2 | .3% | 4 | .3% | | | |
| Lumbar | No | 358 | 43.7% | 312 | 46.2% | 670 | 44.8% | 0.943 | 1 | 0.332 |
| | Yes | 461 | 56.3% | 363 | 53.8% | 824 | 55.2% | | | |
| Forearm | No | 818 | 99.9% | 675 | 100.0 % | 1493 | 99.9% | 0.825 | 1 | 0.364 |
| | Yes | 1 | .1% | 0 | .0% | 1 | .1% | | | |
| Foot/ankle | No | 782 | 95.5% | 643 | 95.4% | 1425 | 95.4% | 0.006 | 1 | 0.940 |
| | Yes | 37 | 4.5% | 31 | 4.6% | 68 | 4.6% | | | |
| Abdomen | No | 819 | 100.0 % | 674 | 99.9% | 1493 | 99.9% | 1.214 | 1 | 0.271 |
| | Yes | 0 | .0% | 1 | .1% | 1 | .1% | | | |

Table 4.69 reflects a significant relationship between tendonitis as the clinical impression and Age at the 95% level ($p<0.05$). A total of 54.5% of the over 35 age group had tendonitis. There are no chisquare results for heat exhaustion and Laceration since all participants had no complaints. Myofascial complaints were the most common throughout the different age groups.

**Table 4.69: Crosstabulation of Clinical impressions and Age**

| | | Under 21 | | 21-25 | | 26-30 | | 31-35 | | Over 35 | | Total | | Chisquare | df | p |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | Count | % | Count | % | Count | % | | | |
| Head/Concussion | No | 424 | 100.0% | 647 | 100.0% | 302 | 99.3% | 95 | 100.0% | 11 | 100.0% | 1479 | 99.9% | 7.754 | 4 | 0.101 |
| | Yes | 0 | .0% | 0 | .0% | 2 | .7% | 0 | .0% | 0 | .0% | 2 | .1% | | | |
| Heat exhaustion | No | 424 | 100.0% | 647 | 100.0% | 304 | 100.0% | 95 | 100.0% | 11 | 100.0% | 1481 | 100.0% | | | |
| | Yes | 0 | .0% | 0 | .0% | 0 | .0% | 0 | .0% | 0 | .0% | 0 | .0% | | | |
| Cervical facet | No | 315 | 74.3% | 482 | 74.5% | 234 | 77.0% | 69 | 72.6% | 9 | 81.8% | 1109 | 74.9% | 1.373 | 4 | 0.849 |
| | Yes | 109 | 25.7% | 165 | 25.5% | 70 | 23.0% | 26 | 27.4% | 2 | 18.2% | 372 | 25.1% | | | |
| Tendonitis | No | 412 | 97.2% | 631 | 97.5% | 297 | 97.7% | 95 | 100.0% | 5 | 45.5% | 1440 | 97.2% | 112.72 | 4 | <0.001 |
| | Yes | 12 | 2.8% | 16 | 2.5% | 7 | 2.3% | 0 | .0% | 6 | 54.5% | 41 | 2.8% | | | |
| Joint sprain | No | 376 | 88.7% | 587 | 90.7% | 275 | 90.5% | 88 | 92.6% | 10 | 90.9% | 1336 | 90.2% | 1.979 | 4 | 0.740 |
| | Yes | 48 | 11.3% | 60 | 9.3% | 29 | 9.5% | 7 | 7.4% | 1 | 9.1% | 145 | 9.8% | | | |
| Abrasion | No | 424 | 100.0% | 647 | 100.0% | 303 | 99.7% | 95 | 100.0% | 11 | 100.0% | 1480 | 99.9% | 3.874 | 4 | 0.423 |
| | Yes | 0 | .0% | 0 | .0% | 1 | .3% | 0 | .0% | 0 | .0% | 1 | .1% | | | |
| Thoracic facet | No | 246 | 58.0% | 376 | 58.1% | 166 | 54.6% | 65 | 68.4% | 10 | 90.9% | 863 | 58.3% | 10.524 | 4 | 0.023 |
| | Yes | 178 | 42.0% | 271 | 41.9% | 138 | 45.4% | 30 | 31.6% | 1 | 9.1% | 618 | 41.7% | | | |
| Muscle strain | No | 373 | 88.0% | 550 | 85.0% | 264 | 86.8% | 80 | 84.2% | 9 | 81.8% | 1276 | 86.2% | 2.482 | 4 | 0.648 |
| | Yes | 51 | 12.0% | 97 | 15.0% | 40 | 13.2% | 15 | 15.8% | 2 | 18.2% | 205 | 13.8% | | | |
| Confusion | No | 424 | 100.0% | 646 | 99.8% | 303 | 99.7% | 95 | 100.0% | 11 | 100.0% | 1479 | 99.9% | 1.583 | 4 | 0.812 |
| | Yes | 0 | .0% | 1 | .2% | 1 | .3% | 0 | .0% | 0 | .0% | 2 | .1% | | | |

| | | Under 21 | | 21-25 | | 26-30 | | 31-35 | | Over 35 | | Total | | Chisquare | df | p |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | Count | % | Count | % | Count | % | | | |
| Sacroiliac syndrome | No | 329 | 77.6% | 477 | 73.8% | 216 | 71.1% | 74 | 77.9% | 11 | 100.0% | 1107 | 74.8% | 8.526 | 4 | 0.074 |
| | Yes | 95 | 22.4% | 169 | 26.2% | 88 | 28.9% | 21 | 22.1% | 0 | .0% | 373 | 25.2% | | | |
| Patellofemoral pain syndrome | No | 421 | 99.3% | 646 | 99.8% | 304 | 100.0% | 95 | 100.0% | 11 | 100.0% | 1477 | 99.7% | 4.443 | 4 | 0.349 |
| | Yes | 3 | .7% | 1 | .2% | 0 | .0% | 0 | .0% | 0 | .0% | 4 | .3% | | | |
| Laceration | No | 424 | 100.0% | 647 | 100.0% | 304 | 100.0% | 95 | 100.0% | 11 | 100.0% | 1481 | 100.0% | | | |
| | Yes | 0 | .0% | 0 | .0% | 0 | .0% | 0 | .0% | 0 | .0% | 0 | .0% | | | |
| Lumbar facet | No | 329 | 77.6% | 526 | 81.3% | 231 | 76.0% | 78 | 82.1% | 11 | 100.0% | 1175 | 79.3% | 7.694 | 4 | 0.103 |
| | Yes | 95 | 22.4% | 121 | 18.7% | 73 | 24.0% | 17 | 17.9% | 0 | .0% | 306 | 20.7% | | | |
| Myofascial | No | 24 | 5.7% | 36 | 5.5% | 21 | 6.9% | 2 | 2.1% | 2 | 18.2% | 85 | 5.7% | 6.307 | 4 | 0.177 |
| | Yes | 400 | 94.3% | 615 | 94.5% | 283 | 93.1% | 93 | 97.9% | 9 | 81.8% | 1400 | 94.3% | | | |

Table 4.70 reflects a significant relationship between C Facet as the clinical impression and Gender at the 95% level ($p<0.05$). A total of 22.2% of C Facet injuries were from males and 36% from females. There are no chisquare results for heat exhaustion and laceration since all participants had no complaints. Myofascial complaints were the most common complaints received from both genders.

**Table 4.70: Crosstabulation of Clinical impression and Gender**

| | | Male | | Female | | Total | | Chisquare | df | P |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | | | |
| Head/Concussion | No | 1153 | 99.8% | 333 | 100.0% | 1486 | 99.9% | 0.577 | 1 | 0.447 |
| | Yes | 2 | .2% | 0 | .0% | 2 | .1% | | | |
| Heat exhaustion | No | 1155 | 100.0% | 333 | 100.0% | 1488 | 100.0% | | | |
| | Yes | 0 | .0% | 0 | .0% | 0 | .0% | | | |
| Cervical facet | No | 899 | 77.8% | 213 | 64.0% | 1112 | 74.7% | 26.338 | 1 | <0.001 |
| | Yes | 256 | 22.2% | 120 | 36.0% | 376 | 25.3% | | | |
| Tendonitis | No | 1123 | 97.2% | 324 | 97.3% | 1447 | 97.2% | 0.004 | 1 | 0.947 |
| | Yes | 32 | 2.8% | 9 | 2.7% | 41 | 2.8% | | | |
| Joint sprain | No | 1042 | 90.2% | 302 | 90.7% | 1344 | 90.3% | 0.067 | 1 | 0.796 |
| | Yes | 113 | 9.8% | 31 | 9.3% | 144 | 9.7% | | | |
| Abrasion | No | 1154 | 99.9% | 333 | 100.0% | 1487 | 99.9% | 0.289 | 1 | 0.591 |
| | Yes | 1 | .1% | 0 | .0% | 1 | .1% | | | |
| Thoracic facet | No | 669 | 57.9% | 195 | 58.6% | 864 | 58.1% | 0.043 | 1 | 0.836 |
| | Yes | 486 | 42.1% | 138 | 41.4% | 624 | 41.9% | | | |
| Muscle strain | No | 997 | 86.3% | 285 | 85.6% | 1282 | 86.2% | 0.117 | 1 | 0.732 |
| | Yes | 158 | 13.7% | 48 | 14.4% | 206 | 13.8% | | | |
| Confusion | No | 1153 | 99.8% | 333 | 100.0% | 1486 | 99.9% | 0.577 | 1 | 0.447 |

| | | Male | | Female | | Total | | Chisquare | df | P |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | | | |
| | Yes | 2 | .2% | 0 | .0% | 2 | .1% | | | |
| Sacroiliac syndrome | No | 845 | 73.2% | 267 | 80.4% | 1112 | 74.8% | 7.210 | 1 | 0.007 |
| | Yes | 310 | 26.8% | 65 | 19.6% | 375 | 25.2% | | | |
| Patellofemoral pain syndrome | No | 1151 | 99.7% | 333 | 100.0% | 1484 | 99.7% | 1.156 | 1 | 0.282 |
| | Yes | 4 | .3% | 0 | .0% | 4 | .3% | | | |
| Laceration | No | 1155 | 100.0% | 333 | 100.0% | 1488 | 100.0% | | | |
| | Yes | 0 | .0% | 0 | .0% | 0 | .0% | | | |
| Lumbar facet | No | 905 | 78.4% | 274 | 82.3% | 1179 | 79.2% | 2.432 | 1 | 0.120 |
| | Yes | 250 | 21.6% | 59 | 17.7% | 309 | 20.8% | | | |
| Myofascial | No | 65 | 5.6% | 20 | 6.0% | 85 | 5.7% | 0.076 | 1 | 0.783 |
| | Yes | 1094 | 94.4% | 313 | 94.0% | 1407 | 94.3% | | | |

Table 4.71 reflects a significant relationship between C Facet as the clinical impression and type of complaint at the 95% level ($p<0.05$). A total of 29.4% were new complaints and 20.1% were continuation of care. There are no chisquare results for heat exhaustion and laceration since all participants had no complaints. Myofascial complaints were the most common complaints for both new and continuation of care patients.

**Table 4.71: Crosstabulation of Clinical impression and Type of complaint**

| | | New complaint | | Continuation of care | | Total | | Chisquare | df | P |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | | | |
| Head/Concussion | No | 816 | 100.0% | 670 | 99.7% | 1486 | 99.9% | 2.432 | 1 | 0.119 |
| | Yes | 0 | .0% | 2 | .3% | 2 | .1% | | | |
| Heat exhaustion | No | 816 | 100.0% | 672 | 100.0% | 1488 | 100.0% | | | |
| | Yes | 0 | .0% | 0 | .0% | 0 | .0% | | | |
| Cervical facet | No | 576 | 70.6% | 537 | 79.9% | 1113 | 74.8% | 16.990 | 1 | <0.001 |
| | Yes | 240 | 29.4% | 135 | 20.1% | 375 | 25.2% | | | |
| Tendonitis | No | 797 | 97.7% | 650 | 96.7% | 1447 | 97.2% | 1.229 | 1 | 0.268 |
| | Yes | 19 | 2.3% | 22 | 3.3% | 41 | 2.8% | | | |
| Joint sprain | No | 745 | 91.3% | 598 | 89.0% | 1343 | 90.3% | 2.238 | 1 | 0.135 |
| | Yes | 71 | 8.7% | 74 | 11.0% | 145 | 9.7% | | | |
| Abrasion | No | 815 | 99.9% | 672 | 100.0% | 1487 | 99.9% | 0.824 | 1 | 0.364 |
| | Yes | 1 | .1% | 0 | .0% | 1 | .1% | | | |
| Thoracic facet | No | 457 | 56.0% | 406 | 60.4% | 863 | 58.0% | 2.944 | 1 | 0.086 |
| | Yes | 359 | 44.0% | 266 | 39.6% | 625 | 42.0% | | | |
| Muscle strain | No | 713 | 87.4% | 572 | 85.1% | 1285 | 86.4% | 1.595 | 1 | 0.207 |
| | Yes | 103 | 12.6% | 100 | 14.9% | 203 | 13.6% | | | |
| Confusion | No | 815 | 99.9% | 671 | 99.9% | 1486 | 99.9% | 0.019 | 1 | 0.891 |
| | Yes | 1 | .1% | 1 | .1% | 2 | .1% | | | |

| | | New complaint | | Continuation of care | | Total | | Chisquare | df | P |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | | | |
| Sacroiliac syndrome | No | 603 | 73.9% | 510 | 76.0% | 1113 | 74.8% | 0.870 | 1 | 0.351 |
| | Yes | 213 | 26.1% | 161 | 24.0% | 374 | 25.2% | | | |
| Patellofemoral pain syndrome | No | 812 | 99.5% | 672 | 100.0% | 1484 | 99.7% | 3.303 | 1 | 0.069 |
| | Yes | 4 | .5% | 0 | .0% | 4 | .3% | | | |
| Laceration | No | 816 | 100.0% | 672 | 100.0% | 1488 | 100.0% | | | |
| | Yes | 0 | .0% | 0 | .0% | 0 | .0% | | | |
| Lumbar facet | No | 640 | 78.4% | 539 | 80.2% | 1179 | 79.2% | 0.707 | 1 | 0.400 |
| | Yes | 176 | 21.6% | 133 | 19.8% | 309 | 20.8% | | | |
| Myofascial | No | 55 | 6.7% | 30 | 4.5% | 85 | 5.7% | 3.553 | 1 | 0.059 |
| | Yes | 763 | 93.3% | 644 | 95.5% | 1407 | 94.3% | | | |

Table 4.72 reflects a significant relationship between C Facet as clinical impression and type of patient at the 95% level ($p<0.05$). A total of 29.5% were new patients and 19.9% were repeat care. Similarly, there was a significant relationship between myofascial complaints and type of patient ($p=0.047$), where those with myofascial complaints tended to be repeat patients. There are no chisquare results for heat exhaustion and laceration since all participants had no complaints. Myofascial complaints were the most common complaints reported by both new and repeat patients.

**Table 4.72: Crosstabulation of Clinical impression and Type of patient**

| | | New patient | | Repeat care | | Total | | Chisquare | df | P |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | | | |
| Head/Concussion | No | 816 | 100.0% | 671 | 99.7% | 1487 | 99.9% | 2.428 | 1 | 0.119 |
| | Yes | 0 | .0% | 2 | .3% | 2 | .1% | | | |
| Heat exhaustion | No | 816 | 100.0% | 673 | 100.0% | 1489 | 100.0% | | | |
| | Yes | 0 | .0% | 0 | .0% | 0 | .0% | | | |
| Cervical facet | No | 575 | 70.5% | 539 | 80.1% | 1114 | 74.8% | 18.128 | 1 | <0.001 |
| | Yes | 241 | 29.5% | 134 | 19.9% | 375 | 25.2% | | | |
| Tendonitis | No | 797 | 97.7% | 651 | 96.7% | 1448 | 97.2% | 1.218 | 1 | 0.270 |
| | Yes | 19 | 2.3% | 22 | 3.3% | 41 | 2.8% | | | |
| Joint sprain | No | 745 | 91.3% | 599 | 89.0% | 1344 | 90.3% | 2.209 | 1 | 0.137 |
| | Yes | 71 | 8.7% | 74 | 11.0% | 145 | 9.7% | | | |
| Abrasion | No | 815 | 99.9% | 673 | 100.0% | 1488 | 99.9% | 0.825 | 1 | 0.364 |
| | Yes | 1 | .1% | 0 | .0% | 1 | .1% | | | |
| Thoracic facet | No | 457 | 56.0% | 407 | 60.5% | 864 | 58.0% | 3.026 | 1 | 0.082 |
| | Yes | 359 | 44.0% | 266 | 39.5% | 625 | 42.0% | | | |
| Muscle strain | No | 712 | 87.3% | 573 | 85.1% | 1285 | 86.3% | 1.394 | 1 | 0.238 |
| | Yes | 104 | 12.7% | 100 | 14.9% | 204 | 13.7% | | | |
| Confusion | No | 815 | 99.9% | 672 | 99.9% | 1487 | 99.9% | 0.019 | | 0.891 |

| | | New patient | | Repeat care | | Total | | Chisquare | df | P |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | | | |
| | Yes | 1 | .1% | 1 | .1% | 2 | .1% | | | |
| Sacroiliac syndrome | No | 602 | 73.8% | 511 | 76.0% | 1113 | 74.8% | 1.005 | 1 | 0.316 |
| | Yes | 214 | 26.2% | 161 | 24.0% | 375 | 25.2% | | | |
| Patellofemoral pain syndrome | No | 812 | 99.5% | 673 | 100.0% | 1485 | 99.7% | 3.308 | 1 | 0.069 |
| | Yes | 4 | .5% | 0 | .0% | 4 | .3% | | | |
| Laceration | No | 816 | 100.0% | 673 | 100.0% | 1489 | 100.0% | | | |
| | Yes | 0 | .0% | 0 | .0% | 0 | .0% | | | |
| Lumbar facet | No | 640 | 78.4% | 540 | 80.2% | 1180 | 79.2% | 0.732 | 1 | 0.392 |
| | Yes | 176 | 21.6% | 133 | 19.8% | 309 | 20.8% | | | |
| Myofascial | No | 56 | 6.8% | 30 | 4.4% | 86 | 5.8% | 3.929 | 1 | 0.047 |
| | Yes | 762 | 93.2% | 645 | 95.6% | 1407 | 94.2% | | | |

Table 4.73 reflects a significant relationship between manipulation and age at the 95% level (p>0.05). Predominantly those in the younger age groups tended to receive this treatment. There was also an association between stretch (PNF) and age group (p=0.002). Massage therapy was the most common treatment received throughout all the age groups.

**Table 4.73: Crosstabulation of Treatment and Age**

| | | Under 21 | | 21-25 | | 26-30 | | 31-35 | | Over 35 | | Total | | Chisquare | df | p |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | Count | % | Count | Count | % | Count | | | |
| Manipulation | No | 121 | 28.5% | 187 | 28.7% | 87 | 28.7% | 38 | 40.0% | 7 | 63.6% | 440 | 29.6% | 11.616 | 4 | 0.020 |
| | Yes | 303 | 71.5% | 464 | 71.3% | 216 | 71.3% | 57 | 60.0% | 4 | 36.4% | 1044 | 70.4% | | | |
| Stretch(Static) | No | 266 | 62.7% | 412 | 63.2% | 185 | 61.1% | 66 | 69.5% | 10 | 90.9% | 939 | 63.2% | 5.879 | 4 | 0.208 |
| | Yes | 158 | 37.3% | 240 | 36.8% | 118 | 38.9% | 29 | 30.5% | 1 | 9.1% | 546 | 36.8% | | | |
| Voltaren | No | 412 | 97.2% | 637 | 97.7% | 292 | 96.4% | 94 | 98.9% | 11 | 100.0 % | 1446 | 97.4% | 2.751 | 4 | 0.600 |
| | Yes | 12 | 2.8% | 15 | 2.3% | 11 | 3.6% | 1 | 1.1% | 0 | .0% | 39 | 2.6% | | | |
| Mobilization | No | 388 | 91.5% | 595 | 91.3% | 272 | 89.8% | 80 | 84.2% | 9 | 81.8% | 1344 | 90.5% | 6.465 | 4 | 0.167 |
| | Yes | 36 | 8.5% | 57 | 8.7% | 31 | 10.2% | 15 | 15.8% | 2 | 18.2% | 141 | 9.5% | | | |
| Transact | No | 422 | 99.5% | 651 | 99.8% | 301 | 99.3% | 95 | 100.0 % | 11 | 100.0 % | 1480 | 99.7% | 2.168 | 4 | 0.702 |
| | Yes | 2 | .5% | 1 | .2% | 2 | .7% | 0 | .0% | 0 | .0% | 5 | .3% | | | |
| Massage | No | 83 | 19.6% | 107 | 16.5% | 51 | 16.8% | 13 | 13.8% | 3 | 27.3% | 257 | 17.4% | 3.425 | 4 | 0.489 |
| | Yes | 341 | 80.4% | 542 | 83.5% | 252 | 83.2% | 81 | 86.2% | 8 | 72.7% | 1224 | 82.6% | | | |
| Needle | No | 394 | 92.9% | 592 | 90.8% | 272 | 89.8% | 85 | 89.5% | 11 | 100.0 % | 1354 | 91.2% | 3.881 | 4 | 0.422 |
| | Yes | 30 | 7.1% | 60 | 9.2% | 31 | 10.2% | 10 | 10.5% | 0 | .0% | 131 | 8.8% | | | |
| Stretch (PNF) | No | 369 | 87.0% | 514 | 78.8% | 250 | 82.5% | 72 | 75.8% | 11 | 100.0 % | 1216 | 81.9% | 16.545 | 4 | 0.002 |
| | Yes | 55 | 13.0% | 138 | 21.2% | 53 | 17.5% | 23 | 24.2% | 0 | .0% | 269 | 18.1% | | | |
| Ischaemic compression | No | 367 | 86.6% | 534 | 81.9% | 265 | 87.5% | 79 | 83.2% | 9 | 81.8% | 1254 | 84.4% | 6.922 | 4 | 0.140 |
| | Yes | 57 | 13.4% | 118 | 18.1% | 38 | 12.5% | 16 | 16.8% | 2 | 18.2% | 231 | 15.6% | | | |

Table 4.74 reflects no significant relationship between treatment and gender at the 95% level (p>0.05). In both gender groups, massage therapy, followed closely by manipulation, were the most common treatments recorded.

**Table 4.74: Crosstabulation of Treatment and Gender**

| | | Male | | Female | | Total | | Chisquare | df | P |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | | | |
| Manipulation | No | 334 | 28.8% | 107 | 32.1% | 441 | 29.6% | 1.343 | 1 | 0.246 |
| | Yes | 824 | 71.2% | 226 | 67.9% | 1050 | 70.4% | | | |
| Stretch (Static) | No | 723 | 62.4% | 222 | 66.7% | 945 | 63.3% | 2.046 | 1 | 0.153 |
| | Yes | 436 | 37.6% | 111 | 33.3% | 547 | 36.7% | | | |
| Voltaren | No | 1127 | 97.2% | 327 | 98.2% | 1454 | 97.5% | 0.595 | 1 | 0.327 |
| | Yes | 32 | 2.8% | 6 | 1.8% | 38 | 2.5% | | | |
| Mobilization | No | 1052 | 90.8% | 299 | 89.8% | 1351 | 90.5% | 0.289 | 1 | 0.591 |
| | Yes | 107 | 9.2% | 34 | 10.2% | 141 | 9.5% | | | |
| Transact | No | 1154 | 99.6% | 333 | 100.0% | 1487 | 99.7% | 1.441 | 1 | 0.230 |
| | Yes | 5 | .4% | 0 | .0% | 5 | .3% | | | |
| Massage | No | 211 | 18.3% | 48 | 14.4% | 259 | 17.4% | 2.651 | 1 | 0.104 |
| | Yes | 945 | 81.7% | 285 | 85.6% | 1230 | 82.6% | | | |
| Needle | No | 1055 | 91.0% | 305 | 91.6% | 1360 | 91.2% | 0.102 | 1 | 0.749 |
| | Yes | 104 | 9.0% | 28 | 8.4% | 132 | 8.8% | | | |
| Stretch (PNF) | No | 946 | 81.6% | 274 | 82.3% | 1220 | 81.8% | 0.076 | 1 | 0.783 |
| | Yes | 213 | 18.4% | 59 | 17.7% | 272 | 18.2% | | | |
| Ischaemic compression | No | 981 | 84.6% | 278 | 83.5% | 1259 | 84.4% | 0.263 | 1 | 0.608 |
| | Yes | 178 | 15.4% | 55 | 16.5% | 233 | 15.6% | | | |

Table 4.75 reflects a significant relationship between manipulation and type of patient at the 95% level (p>0.05). New patients tended to get manipulated. In both new and repeat care patients, massage therapy, followed closely by manipulation, were the most common treatments recorded.

**Table 4.75: Crosstabulation of Treatment and Type of patient**

| | | New patient | | Repeat care | | Total | | Chisquare | df | P |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | | | |
| Manipulation | No | 207 | 25.4% | 235 | 34.8% | 442 | 29.6% | 15.655 | 1 | <0.001 |
| | Yes | 609 | 74.6% | 441 | 65.2% | 1050 | 70.4% | | | |
| Stretch (Static) | No | 527 | 64.5% | 418 | 61.8% | 945 | 63.3% | 1.135 | 1 | 0.287 |
| | Yes | 290 | 35.5% | 258 | 38.2% | 548 | 36.7% | | | |
| Voltaren | No | 797 | 97.6% | 657 | 97.2% | 1454 | 97.4% | 0.191 | 1 | 0.662 |
| | Yes | 20 | 2.4% | 19 | 2.8% | 39 | 2.6% | | | |
| Mobilization | No | 739 | 90.5% | 612 | 90.5% | 1351 | 90.5% | 0.003 | 1 | 0.958 |
| | Yes | 78 | 9.5% | 64 | 9.5% | 142 | 9.5% | | | |
| Transact | No | 815 | 99.8% | 673 | 99.6% | 1488 | 99.7% | 0.439 | 1 | 0.508 |
| | Yes | 2 | .2% | 3 | .4% | 5 | .3% | | | |
| Massage | No | 154 | 18.9% | 104 | 15.4% | 258 | 17.3% | 3.176 | 1 | 0.075 |
| | Yes | 660 | 81.1% | 571 | 84.6% | 1231 | 82.7% | | | |
| Needle | No | 742 | 90.8% | 619 | 91.6% | 1361 | 91.2% | 0.257 | 1 | 0.612 |
| | Yes | 75 | 9.2% | 57 | 8.4% | 132 | 8.8% | | | |
| Stretch (PNF) | No | 665 | 81.4% | 556 | 82.2% | 1221 | 81.8% | 0.181 | 1 | 0.671 |
| | Yes | 152 | 18.6% | 120 | 17.8% | 272 | 18.2% | | | |
| Ischaemic compression | No | 697 | 85.3% | 565 | 83.6% | 1262 | 84.5% | 0.849 | 1 | 0.357 |
| | Yes | 120 | 14.7% | 111 | 16.4% | 231 | 15.5% | | | |

Table 4.76 reflects a significant relationship between manipulation and type of complaint at the 95% level (p>0.05). The new complaints were most likely to get manipulation. In both new complaint and continuation of care patients, massage therapy, followed closely by manipulation, were the most common treatments recorded.

**Table 4.76: Crosstabulation of Treatment and Type of complaint**

| | | New complaint | | Continuation of care | | Total | | Chisquare | df | P |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % | Count | % | Count | % | | | |
| Manipulation | No | 208 | 25.5% | 234 | 34.7% | 442 | 29.6% | 14.915 | 1 | <0.001 |
| | Yes | 608 | 74.5% | 441 | 65.3% | 1049 | 70.4% | | | |
| Stretch (Static) | No | 526 | 64.4% | 418 | 61.9% | 944 | 63.3% | 0.959 | 1 | 0.327 |
| | Yes | 291 | 35.6% | 257 | 38.1% | 548 | 36.7% | | | |
| Voltaren | No | 797 | 97.6% | 656 | 97.2% | 1453 | 97.4% | 0.195 | 1 | 0.658 |
| | Yes | 20 | 2.4% | 19 | 2.8% | 39 | 2.6% | | | |
| Mobilization | No | 739 | 90.5% | 611 | 90.5% | 1350 | 90.5% | 0.002 | 1 | 0.966 |
| | Yes | 78 | 9.5% | 64 | 9.5% | 142 | 9.5% | | | |
| Transact | No | 815 | 99.8% | 672 | 99.6% | 1487 | 99.7% | 0.441 | 1 | 0.507 |
| | Yes | 2 | .2% | 3 | .4% | 5 | .3% | | | |
| Massage | No | 154 | 18.9% | 104 | 15.4% | 258 | 17.3% | 3.131 | 1 | 0.077 |
| | Yes | 660 | 81.1% | 570 | 84.6% | 1230 | 82.7% | | | |
| Needle | No | 742 | 90.8% | 618 | 91.6% | 1360 | 91.2% | 0.248 | 1 | 0.619 |
| | Yes | 75 | 9.2% | 57 | 8.4% | 132 | 8.8% | | | |
| Stretch (PNF) | No | 665 | 81.4% | 555 | 82.2% | 1220 | 81.8% | 0.170 | 1 | 0.681 |
| | Yes | 152 | 18.6% | 120 | 17.8% | 272 | 18.2% | | | |
| Ischaemic compression | No | 697 | 85.3% | 564 | 83.6% | 1261 | 84.5% | 0.872 | 1 | 0.351 |
| | Yes | 120 | 14.7% | 111 | 16.4% | 231 | 15.5% | | | |

***The second objective was to implement cohort tracking when a surfer had attended the treatment facility at the Mr. Price Pro for a number of years.***

## 4.5.3 COHORT TRACKING

Two hundred and seventy individuals returned for more than one treatment, totaling 1326 treatments over the years from 2000-2008. One hundred and sixty five patients attended the Chiropractic treatment facility at the Mr. Price Pro for more than one year.

Table 4.77 shows that surfers attended the Chiropractic treatment facility as many as eight times between the years 2000-2008. Visits over the period of two or three years between 2000 and 2008 were the most common.

**Table 4.77: Number of repeat visits by surfer and year**

| No. of years surfer attended the chiropractic treatment facility | No. of surfers |
|---|---|
| 2 | 82 |
| 3 | 39 |
| 4 | 16 |
| 5 | 12 |
| 6 | 8 |
| 7 | 5 |
| 8 | 2 |

Table 4.78 and 4.79 show that lumbar spine complaints (67%) were the most common among those surfers coming back for repeat treatments between the year 2000 and 2008. Thorax (51%) and neck (44%) were also fairly common. No head, forearm, chest or abdominal complaints were treated during repeat visits.

**Table 4.78: Number of treatments for each repeat individual by affected area and year**

| no | Year | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 |
| 2 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| 3 | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| 4 | 2007 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | .00 |
| 5 | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 4.00 | .00 |
| 6 | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 7 | 2000 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | 3.00 | .00 | 1.00 | .00 | 3.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | 4.00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| 8 | 2006 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 |
| 9 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 10 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 11 | 2004 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2006 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 12 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 |
| | 2004 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | 1.00 | .00 | .00 | 4.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 13 | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 14 | 2007 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 15 | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 16 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 17 | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 18 | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 |
| | 2004 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 19 | 2000 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 20 | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 |
| 21 | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 22 | 2005 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 23 | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 24 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 2007 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| 26 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 27 | 2004 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 |
| 28 | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| 29 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2003 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 30 | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2005 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 31 | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 32 | 2000 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 33 | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 34 | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 35 | 2008 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 36 | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 37 | 2002 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| | 2007 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 4.00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 38 | 2005 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 39 | 2006 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | 3.00 | .00 |
| | 2008 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 |
| 40 | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 41 | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 |
| 42 | 2002 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 43 | 2000 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 44 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 45 | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | 2.00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2003 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2005 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 46 | 2001 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 47 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 48 | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 49 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 50 | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 51 | 2002 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2008 | .00 | 1.00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 52 | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 53 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 |
| | 2006 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 54 | 2002 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 55 | 2000 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 4.00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 56 | 2003 | .00 | .00 | .00 | 3.00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 57 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 58 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2001 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 59 | 2003 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2004 | .00 | 3.00 | .00 | 1.00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2006 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2008 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 60 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 |
| | 2004 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61 | 2001 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | 1.00 | .00 |
| 62 | 2004 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 63 | 2000 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 64 | 2003 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | 4.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 1.00 | .00 | 3.00 | 1.00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 65 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| | 2001 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 66 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 67 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| 68 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2002 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2003 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 69 | 2005 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 70 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 71 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 |
| 72 | 2006 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| 73 | 2004 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 74 | 2004 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| 75 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2002 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 76 | 2001 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 77 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 78 | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 79 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 80 | 2003 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2004 | .00 | 4.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2006 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | 2.00 | .00 |
| 81 | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2008 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 82 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 |
| 83 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 |
| 84 | 2001 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2003 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 85 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2002 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 86 | 2003 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | 4.00 | .00 | 3.00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | 1.00 | .00 | 1.00 | .00 | 3.00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 |
| 87 | 2004 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 88 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 89 | 2007 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| 90 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 91 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | 1.00 | .00 |
| | 2002 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 92 | 2006 | .00 | 2.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 |
| 93 | 2008 | .00 | 6.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 94 | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 95 | 2002 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | 4.00 | .00 | 3.00 | .00 | 2.00 | .00 |
| | 2003 | .00 | .00 | .00 | 2.00 | 3.00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2007 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 2.00 | .00 | 3.00 | .00 | 1.00 | .00 |
| 96 | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2007 | .00 | 1.00 | .00 | 4.00 | 2.00 | .00 | .00 | 3.00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2008 | .00 | 1.00 | 1.00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 97 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 98 | 2006 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 99 | 2000 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| 100 | 2004 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 101 | 2005 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 102 | 2001 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 103 | 2007 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 104 | 2000 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 105 | 2002 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 106 | 2000 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 |
| 107 | 2007 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 108 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| | 2005 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2006 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2007 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2008 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 109 | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 110 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 111 | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 112 | 2003 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 113 | 2005 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 114 | 2003 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 115 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 116 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 117 | 2000 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| 118 | 2003 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 119 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | 4.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 120 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2007 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 |
| 121 | 2001 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 122 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 3.00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 |
| 123 | 2002 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | 2.00 | .00 | 2.00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2003 | .00 | 1.00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | 1.00 | .00 | 2.00 | 3.00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2006 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2007 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| | 2008 | .00 | 3.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 5.00 | .00 | .00 | .00 |
| 124 | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 125 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 126 | 2000 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 | .00 | 4.00 | .00 | 3.00 | .00 | .00 | .00 |
| 127 | 2004 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 |
| 128 | 2002 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | 1.00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 |
| 129 | 2003 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 130 | 2005 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 131 | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 | 1.00 | .00 |
| 132 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| 133 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 134 | 2006 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 135 | 2007 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 136 | 2003 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 137 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2003 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 138 | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 139 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | 2.00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 140 | 2001 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 141 | 2006 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 142 | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 |
| 143 | 2008 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 144 | 2001 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 145 | 2005 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2008 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 146 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 147 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 148 | 2002 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2003 | .00 | 4.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2004 | .00 | 2.00 | .00 | .00 | 4.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | 1.00 | 3.00 | .00 | 2.00 | 2.00 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 |
| 149 | 2000 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 150 | 2004 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 |
| 151 | 2007 | .00 | 1.00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 152 | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 153 | 2000 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 154 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2006 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2008 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 155 | 2001 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 156 | 2006 | .00 | 1.00 | .00 | 2.00 | 1.00 | .00 | .00 | 1.00 | 1.00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 |
| 157 | 2000 | .00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 | 3.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2003 | .00 | 3.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 158 | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2008 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 159 | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 160 | 2006 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 161 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 162 | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 163 | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 164 | 2000 | .00 | 2.00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 165 | 2006 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | 2.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 166 | 2002 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 3.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 167 | 2006 | .00 | 1.00 | 1.00 | 3.00 | 3.00 | .00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 |
| 168 | 2000 | .00 | 1.00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 169 | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 170 | 2002 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| 171 | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 172 | 2001 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 173 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2004 | .00 | 1.00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 |
| 174 | 2006 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 175 | 2008 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| 176 | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 |
| 177 | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 178 | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 |
| 179 | 2006 | .00 | 1.00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 4.00 | .00 | 2.00 | .00 |
| 180 | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 181 | 2000 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2001 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 182 | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2003 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | 6.00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2008 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 183 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 | .00 | .00 |
| 184 | 2006 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 |
| 185 | 2002 | .00 | 1.00 | .00 | 1.00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 186 | 2001 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | 1.00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | 1.00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 2.00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 187 | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 188 | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 189 | 2006 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 190 | 2000 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 191 | 2000 | .00 | 1.00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2003 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 192 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 5.00 | .00 | .00 | .00 | 5.00 | .00 | .00 | .00 |
| 193 | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 |
| 194 | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 195 | 2006 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2007 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 196 | 2003 | .00 | .00 | .00 | 1.00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 197 | 2002 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 198 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | 1.00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2005 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 199 | 2003 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 200 | 2005 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 5.00 | .00 | .00 | .00 |
| 201 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 202 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 203 | 2006 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 204 | 2001 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 205 | 2000 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 206 | 2001 | .00 | 1.00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2007 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 3.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| 207 | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 208 | 2006 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 209 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | 1.00 | 1.00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2006 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2008 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 210 | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 |
| 211 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 212 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 213 | 2005 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 214 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 215 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 |
| 216 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 217 | 2000 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | 2.00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| 218 | 2004 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 219 | 2006 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | 2.00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 |
| | 2008 | .00 | 1.00 | 1.00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | .00 |
| 220 | 2008 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 221 | 2008 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 222 | 2004 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2007 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 223 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 224 | 2008 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 225 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 226 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2003 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 227 | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| 228 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2004 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 229 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 230 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 231 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 232 | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2005 | .00 | 1.00 | .00 | 1.00 | 1.00 | .00 | .00 | 4.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2007 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 3.00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 233 | 2001 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 234 | 2003 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 235 | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 |
| | 2007 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 236 | 2007 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| 237 | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2008 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 238 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2002 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 |
| 239 | 2001 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 240 | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | 2.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2007 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 241 | 2006 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 242 | 2002 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 243 | 2007 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 244 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| 245 | 2007 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 246 | 2008 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 247 | 2008 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 248 | 2001 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2003 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 |
| 249 | 2000 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 250 | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2002 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 251 | 2005 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 252 | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 253 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| | 2003 | .00 | 2.00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2004 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 3.00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2006 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 254 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 255 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 256 | 2000 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2006 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2007 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 |
| 257 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | 2.00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 258 | 2000 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2001 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 259 | 2000 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2001 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2003 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| | 2004 | 1.00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2005 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 |
| 260 | 2000 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 261 | 2003 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| | 2004 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 262 | 2008 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 |
| 263 | 2001 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 264 | 2000 | .00 | 5.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 265 | 2008 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 |
| 266 | 2005 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 |
| | 2006 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | 2.00 | 1.00 | .00 | 4.00 | .00 | .00 | .00 | .00 | .00 |
| 267 | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 |
| 268 | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 269 | 2002 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |
| 270 | 2001 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 |
| | 2007 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

## Table 4.81: Number of treatments for each repeat individual by affected area and year cont…

| | head | shoulder | Upper arm | shin | neck | elbow | hip | thigh | thorax | wrist | knee | chest | lumbar | forearm | foot | abdomen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2008 | .00 | .00 | .00 | .00 | 5.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 |

## Table 4.79: Summary of number of treatments for each repeat individual (n=165) by affected area

| Region of complaint | Frequency | Percent |
|---|---|---|
| Head | 0 | 0% |
| Shoulder | 21 | 13% |
| Upper arm | 2 | 1% |
| Shin | 3 | 2% |
| Neck | 73 | 44% |
| Elbow | 1 | 1% |
| Hip | 8 | 4% |
| Thigh | 10 | 6% |
| Thorax | 84 | 51% |
| Wrist | 1 | 1% |
| Knee | 12 | 7% |
| Chest | 0 | 0% |
| Lumbar | 110 | 67% |
| Forearm | 0 | 0% |
| Foot | 5 | 3% |
| Abdomen | 0 | 0% |

Table 4.80 and 4.81 reflect that myofascial complaints (86%) were the most common among those surfers coming back for repeat treatments between the year 2000 and 2008. Lower back and thoracic spine complaints were also very common. No complaints of head/concussion, heat exhaustion, tendonitis, abrasion, confusion, patellofemoral pain syndrome (PFPS) or lacerations were treated during repeat visits.

**Table 4.80: Number of treatments for each repeat individual by clinical impression and year**

| no | year | Number visits per year | Head/ Concussion | Heat exhaustion | C Facet | Tendonitis | Joint Sprain | Abrasion | T Facet | Muscle Strain | Confusion | SI Syndrome | PFPS | Laceration | L Facet | Myofascial |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2007 | 2 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 2 | 2001 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 3.00 | 4.00 |
| 3 | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2005 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| 4 | 2007 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | 1.00 | 3.00 |
| 5 | 2008 | 4 | .00 | .00 | .00 | 4.00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 6 | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2007 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 7 | 2000 | 3 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2001 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| | 2002 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 |
| | 2003 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 3.00 |
| | 2004 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 4.00 |
| 8 | 2006 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 9 | 2000 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 4.00 |
| | 2002 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 4.00 |
| | 2003 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2007 | 2 | 1.00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 10 | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| 11 | 2004 | 2 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2005 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| | 2006 | 3 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2007 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 12 | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 2.00 |
| | 2002 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2003 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 |
| | 2004 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2005 | 2 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2006 | 4 | .00 | .00 | 2.00 | .00 | 3.00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 4.00 |
| | 2007 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2008 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 13 | 2005 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | 3.00 | 3.00 |
| | 2006 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 14 | 2007 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 15 | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| | 2004 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| 16 | 2000 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| | 2007 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 17 | 2002 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2006 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 18 | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2004 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 19 | 2000 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| 20 | 2007 | 3 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| 21 | 2006 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 3.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22 | 2005 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 23 | 2008 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 |
| 24 | 2000 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2002 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| 25 | 2007 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | 3.00 | .00 | .00 | .00 | .00 | 2.00 | 3.00 |
| 26 | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 2.00 |
| 27 | 2004 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2006 | 2 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 28 | 2002 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | 3.00 |
| 29 | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 1.00 |
| | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2004 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2007 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2008 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 |
| 30 | 2003 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2004 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 31 | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| | 2005 | 3 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2006 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2007 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2008 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 32 | 2000 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 4.00 |
| | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| 33 | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2006 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 34 | 2004 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2006 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 35 | 2008 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| 36 | 2007 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| 37 | 2002 | 2 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| | 2004 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| | 2005 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2006 | 4 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | 2.00 | 4.00 |
| | 2007 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| | 2008 | 5 | .00 | .00 | 4.00 | .00 | .00 | .00 | 5.00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | 5.00 |
| 38 | 2005 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 2.00 |
| | 2006 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| | 2007 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| | 2008 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 39 | 2006 | 4 | .00 | .00 | 1.00 | .00 | 2.00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | 4.00 |
| | 2008 | 3 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 40 | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| | 2007 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 41 | 2008 | 2 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 42 | 2002 | 3 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 3.00 |
| | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2005 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | 3.00 | 3.00 |
| 43 | 2000 | 3 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| 44 | 2001 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 3.00 |
| | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 45 | 2002 | 4 | .00 | .00 | .00 | 1.00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 4.00 |
| | 2003 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2005 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2008 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 46 | 2001 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 47 | 2000 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 1.00 |
| | 2002 | 4 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 4.00 |
| 48 | 2008 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 2.00 |
| 49 | 2000 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| 50 | 2004 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 51 | 2002 | 3 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | 2.00 | .00 | .00 | 3.00 | 3.00 |
| | 2003 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2004 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| | 2008 | 4 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | 3.00 | 4.00 |
| 52 | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 1.00 |
| 53 | 2000 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| | 2006 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 54 | 2002 | 2 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| | 2006 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 1.00 |
| 55 | 2000 | 2 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2003 | 4 | .00 | .00 | 1.00 | 2.00 | 4.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 4.00 |
| | 2004 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 56 | 2003 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 3.00 |
| 57 | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| 58 | 2000 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 59 | 2003 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 4.00 |
| | 2004 | 3 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2005 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 3.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2006 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 |
| | 2007 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2008 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 60 | 2000 | 1 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2004 | 1 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 61 | 2001 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 3.00 |
| 62 | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2006 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 63 | 2000 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 64 | 2003 | 4 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 4.00 |
| | 2005 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2006 | 4 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | 3.00 | .00 | .00 | 1.00 | 4.00 |
| 65 | 2000 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | 4.00 |
| | 2001 | 3 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 3.00 |
| 66 | 2000 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2003 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 3.00 |
| 67 | 2001 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | 4.00 | .00 | .00 | 2.00 | 4.00 |
| 68 | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2002 | 1 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 69 | 2005 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 70 | 2000 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2005 | 1 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2006 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 71 | 2000 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2002 | 4 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 4.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72 | 2006 | 5 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 5.00 |
| 73 | 2004 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 74 | 2004 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 2.00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 |
| 75 | 2000 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2002 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2003 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 76 | 2001 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2007 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 77 | 2000 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| | 2002 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 4.00 |
| | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 78 | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2007 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 1.00 |
| 79 | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 80 | 2003 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 |
| | 2004 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 4.00 |
| | 2005 | 4 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | 4.00 |
| | 2006 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| | 2008 | 3 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | 3.00 |
| 81 | 2007 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 |
| | 2008 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 82 | 2000 | 2 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 83 | 2000 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2002 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2003 | 1 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2004 | 2 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2005 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| | 2007 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 84 | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2002 | 3 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2003 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 85 | 2000 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| | 2002 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 86 | 2003 | 4 | .00 | .00 | .00 | .00 | 1.00 | .00 | 3.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 4.00 |
| | 2004 | 5 | .00 | .00 | 1.00 | .00 | 3.00 | .00 | 3.00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 5.00 |
| | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2006 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 87 | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 88 | 2000 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 2.00 |
| 89 | 2007 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2008 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | 2.00 | .00 | 2.00 | .00 | .00 | 1.00 | 3.00 |
| 90 | 2000 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 1.00 |
| | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 |
| 91 | 2000 | 5 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 4.00 |
| | 2002 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | 4.00 |
| | 2003 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| | 2004 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | 4.00 |
| | 2005 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| | 2007 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 |
| | 2008 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 |
| 92 | 2006 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 93 | 2008 | 6 | .00 | .00 | .00 | 6.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 5.00 |
| 94 | 2003 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2008 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 95 | 2002 | 4 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | 2.00 | .00 | 1.00 | .00 | .00 | 1.00 | 4.00 |
| | 2003 | 4 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2005 | 3 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2006 | 3 | .00 | .00 | .00 | .00 | 1.00 | .00 | 2.00 | 1.00 | .00 | 1.00 | .00 | .00 | 1.00 | 3.00 |
| | 2007 | 4 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2008 | 3 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | 3.00 |
| 96 | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2007 | 5 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 4.00 | .00 | 1.00 | .00 | .00 | 1.00 | 5.00 |
| | 2008 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 97 | 2000 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2001 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 98 | 2006 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| 99 | 2000 | 2 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 2.00 |
| | 2001 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | 3.00 | 4.00 |
| 100 | 2004 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2006 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 101 | 2005 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| 102 | 2001 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 103 | 2007 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| 104 | 2000 | 3 | .00 | .00 | 2.00 | .00 | 2.00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 3.00 |
| 105 | 2002 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 106 | 2000 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 107 | 2007 | 3 | .00 | .00 | 1.00 | .00 | 2.00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2008 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 108 | 2000 | 2 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2002 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 2.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2003 | 4 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 |
| | 2004 | 4 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 4.00 |
| | 2005 | 4 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 4.00 |
| | 2006 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 |
| | 2007 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | 2.00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| | 2008 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 1.00 |
| 109 | 2005 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 3.00 |
| | 2006 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| 110 | 2000 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| | 2002 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 111 | 2002 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 |
| 112 | 2003 | 3 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 3.00 |
| | 2006 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 113 | 2005 | 3 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2006 | 2 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2007 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 114 | 2003 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2004 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 |
| 115 | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2003 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 116 | 2000 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| 117 | 2000 | 4 | .00 | .00 | 3.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 4.00 |
| | 2002 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 3.00 | .00 | .00 | 1.00 | 4.00 |
| 118 | 2003 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| 119 | 2000 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2001 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | 4.00 | .00 | .00 | .00 | 4.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2003 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 120 | 2000 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2006 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2007 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| 121 | 2001 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 122 | 2000 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2003 | 5 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 3.00 | .00 | .00 | 1.00 | 5.00 |
| | 2005 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 3.00 |
| | 2006 | 4 | .00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 | .00 | 1.00 | 4.00 |
| 123 | 2002 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 4.00 |
| | 2003 | 4 | .00 | .00 | 2.00 | .00 | 1.00 | .00 | 3.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 |
| | 2004 | 4 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 4.00 |
| | 2005 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2006 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2007 | 4 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | 1.00 | .00 | 1.00 | .00 | .00 | 1.00 | 4.00 |
| | 2008 | 5 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | 2.00 | .00 | .00 | 1.00 | 5.00 |
| 124 | 2007 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2008 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 125 | 2000 | 1 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2001 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 126 | 2000 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 |
| | 2002 | 6 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | 6.00 |
| 127 | 2004 | 2 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2006 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 128 | 2002 | 3 | .00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 3.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2003 | 1 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 129 | 2003 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| 130 | 2005 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2008 | 1 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 131 | 2006 | 4 | .00 | .00 | 1.00 | 1.00 | 4.00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 4.00 |
| 132 | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2004 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2006 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 |
| | 2007 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | 1.00 | .00 | 1.00 | .00 | .00 | 1.00 | 3.00 |
| 133 | 2000 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | 2.00 |
| | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 134 | 2006 | 3 | .00 | .00 | 1.00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2008 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| 135 | 2007 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 136 | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2004 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2005 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 3.00 |
| 137 | 2000 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| | 2002 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 |
| | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| | 2004 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| | 2008 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| 138 | 2006 | 1 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2007 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 139 | 2000 | 3 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 3.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 140 | 2001 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| 141 | 2006 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 142 | 2005 | 1 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 143 | 2008 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 144 | 2001 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2002 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2005 | 3 | .00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2007 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| 145 | 2005 | 4 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 4.00 |
| | 2006 | 3 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | 1.00 | .00 | 2.00 | .00 | .00 | 1.00 | 3.00 |
| | 2008 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 |
| 146 | 2000 | 1 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2004 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 |
| 147 | 2000 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | 2.00 |
| 148 | 2002 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| | 2003 | 4 | .00 | .00 | .00 | .00 | 4.00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2004 | 4 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | 1.00 | .00 | 2.00 | .00 | .00 | .00 | 4.00 |
| | 2006 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2007 | 4 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | 2.00 | .00 | 4.00 | .00 | .00 | .00 | 4.00 |
| | 2008 | 3 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 |
| 149 | 2000 | 3 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 3.00 |
| 150 | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2005 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2006 | 2 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 151 | 2007 | 3 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | 1.00 | .00 | 1.00 | .00 | .00 | 1.00 | 3.00 |
| 152 | 2004 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 153 | 2000 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 154 | 2000 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 |
| | 2003 | 1 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2005 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2006 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2007 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| | 2008 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 155 | 2001 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | 2.00 | .00 | .00 | 1.00 | 2.00 |
| | 2002 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2006 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 156 | 2006 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 157 | 2000 | 3 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 3.00 |
| | 2001 | 3 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 3.00 |
| | 2003 | 3 | .00 | .00 | 1.00 | .00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| 158 | 2002 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2007 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2008 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 159 | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2007 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 160 | 2006 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 161 | 2000 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 1.00 | .00 | .00 | .00 | .00 | 2.00 | 2.00 |
| 162 | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2006 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 163 | 2002 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2007 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 164 | 2000 | 2 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 165 | 2006 | 4 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 4.00 |
| | 2007 | 1 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2008 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 |
| 166 | 2002 | 3 | .00 | .00 | 2.00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | 3.00 | .00 | .00 | 3.00 | 3.00 |
| 167 | 2006 | 5 | .00 | .00 | 2.00 | .00 | 1.00 | .00 | 3.00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | 5.00 |
| 168 | 2000 | 3 | .00 | .00 | 3.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| 169 | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2006 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| 170 | 2002 | 4 | .00 | .00 | 4.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 4.00 |
| 171 | 2006 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2008 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 172 | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2006 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 173 | 2000 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 |
| | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 174 | 2006 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| | 2007 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 1.00 |
| 175 | 2008 | 3 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| 176 | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 177 | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| 178 | 2006 | 2 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 179 | 2006 | 5 | .00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | 3.00 | .00 | .00 | .00 | .00 | .00 | 5.00 |
| 180 | 2003 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 181 | 2000 | 2 | .00 | .00 | .00 | .00 | 2.00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2002 | 4 | .00 | .00 | 4.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 4.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 182 | 2002 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2003 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2006 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| | 2007 | 8 | .00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | 3.00 | .00 | 1.00 | .00 | .00 | 4.00 | 5.00 |
| | 2008 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 |
| 183 | 2000 | 4 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 184 | 2006 | 3 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| 185 | 2002 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 2.00 |
| 186 | 2001 | 3 | .00 | .00 | 3.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 3.00 |
| | 2002 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | 3.00 |
| | 2004 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2005 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2006 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 187 | 2003 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 188 | 2007 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2008 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 189 | 2006 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| 190 | 2000 | 2 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2001 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 4.00 |
| | 2002 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 191 | 2000 | 3 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 3.00 |
| | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 192 | 2000 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2002 | 5 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 3.00 | .00 | .00 | .00 | 5.00 |
| 193 | 2003 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2004 | 2 | .00 | .00 | 2.00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2006 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 194 | 2004 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| 195 | 2006 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2007 | 1 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 196 | 2003 | 3 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 |
| 197 | 2002 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 198 | 2000 | 4 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | 3.00 | .00 | .00 | 2.00 | 3.00 |
| | 2001 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 3.00 |
| | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 199 | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2008 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 |
| 200 | 2005 | 3 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 3.00 |
| | 2006 | 6 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | 2.00 | .00 | 1.00 | .00 | .00 | 2.00 | 6.00 |
| 201 | 2000 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 202 | 2000 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | 2.00 |
| | 2001 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 1.00 |
| 203 | 2006 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 3.00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| 204 | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 205 | 2000 | 2 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 1.00 |
| | 2006 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2007 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2008 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 206 | 2001 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2006 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2007 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 4.00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2008 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 4.00 |
| 207 | 2003 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 3.00 |
| 208 | 2006 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 209 | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 |
| | 2003 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | 3.00 |
| | 2004 | 4 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 | 4.00 |
| | 2005 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 3.00 |
| | 2006 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 |
| | 2008 | 2 | 1.00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 210 | 2003 | 3 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| 211 | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| | 2006 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2007 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 212 | 2001 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| 213 | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2006 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 214 | 2000 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 215 | 2000 | 1 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2002 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | 1.00 | 3.00 |
| | 2004 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 216 | 2000 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 3.00 |
| | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 217 | 2000 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2001 | 2 | .00 | .00 | 2.00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| | 2007 | 4 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | 1.00 | .00 | 3.00 | .00 | .00 | 2.00 | 2.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 218 | 2004 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 2.00 |
| 219 | 2006 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2007 | 2 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2008 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| 220 | 2008 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 221 | 2008 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 222 | 2004 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2006 | 3 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 |
| | 2007 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| 223 | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | 1.00 | 1.00 |
| 224 | 2008 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 225 | 2001 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2003 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2006 | 3 | .00 | .00 | .00 | .00 | 2.00 | .00 | 1.00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 |
| | 2007 | 3 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | 1.00 | .00 | 1.00 | .00 | .00 | 1.00 | 3.00 |
| 226 | 2000 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2007 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 1.00 |
| 227 | 2002 | 3 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | 3.00 |
| 228 | 2000 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 4.00 |
| | 2003 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2004 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 |
| | 2005 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 229 | 2000 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 1.00 |
| | 2002 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 230 | 2000 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2005 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 231 | 2000 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| 232 | 2002 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2004 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2005 | 5 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 3.00 | .00 | .00 | .00 | .00 | .00 | 5.00 |
| | 2007 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | 1.00 | .00 | .00 | 1.00 | 3.00 |
| | 2008 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 233 | 2001 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 234 | 2003 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 235 | 2003 | 2 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2007 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 236 | 2007 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 |
| 237 | 2005 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 3.00 |
| | 2006 | 2 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2008 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 238 | 2000 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2002 | 2 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| 239 | 2001 | 2 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 2.00 |
| 240 | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2006 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2007 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| 241 | 2006 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2008 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| 242 | 2002 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| | 2003 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2004 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| 243 | 2007 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 244 | 2000 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 3.00 |
| | 2002 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 3.00 |
| | 2003 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | 3.00 |
| 245 | 2007 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 246 | 2008 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 3.00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| 247 | 2008 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | 2.00 | 1.00 |
| 248 | 2001 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2003 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 249 | 2000 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 250 | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2002 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 251 | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2006 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 1.00 |
| | 2008 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| 252 | 2004 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 |
| | 2006 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 2.00 |
| | 2008 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 253 | 2000 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2002 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 3.00 |
| | 2003 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2004 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 |
| | 2005 | 3 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 3.00 |
| | 2006 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 254 | 2000 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 2.00 |
| 255 | 2000 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 |
| | 2001 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2004 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 256 | 2000 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | 2002 | 3 | .00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 |
| | 2003 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2006 | 2 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | 2.00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2007 | 2 | .00 | .00 | 2.00 | .00 | 1.00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| 257 | 2000 | 2 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2001 | 2 | .00 | .00 | .00 | .00 | 2.00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| | 2004 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 258 | 2000 | 2 | .00 | .00 | 2.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 |
| | 2001 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | 2.00 | 2.00 |
| 259 | 2000 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | 1.00 | 2.00 |
| | 2001 | 3 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 |
| | 2003 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 3.00 |
| | 2004 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| | 2005 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2006 | 3 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| 260 | 2000 | 2 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 261 | 2003 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2004 | 4 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 4.00 |
| | 2006 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| | 2008 | 1 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 |
| 262 | 2008 | 3 | .00 | .00 | 2.00 | .00 | 2.00 | .00 | 2.00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 |
| 263 | 2001 | 2 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 264 | 2000 | 5 | .00 | .00 | 1.00 | .00 | 5.00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 5.00 |
| 265 | 2008 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 266 | 2005 | 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 |
| | 2006 | 6 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | 5.00 | .00 | .00 | .00 | .00 | .00 | 6.00 |

## Table 4.83: Number of treatments for each repeat individual by clinical impression and year cont…

| No | Year | | Head | Heat | CF | Tend | Jnt Sprain | Abr | TF | MS | Conf | SI | PFPS | Lacer | LF | Myo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 267 | 2002 | 2 | .00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | .00 | .00 | 1.00 | 2.00 |
| 268 | 2002 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 2.00 |
| 269 | 2002 | 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | 2.00 |
| 270 | 2001 | 4 | .00 | .00 | 2.00 | .00 | .00 | .00 | 2.00 | .00 | .00 | 3.00 | .00 | .00 | 1.00 | 4.00 |
| | 2007 | 4 | .00 | .00 | 1.00 | .00 | .00 | .00 | 1.00 | .00 | .00 | .00 | .00 | .00 | .00 | 3.00 |
| | 2008 | 5 | .00 | .00 | 2.00 | .00 | .00 | .00 | 3.00 | .00 | .00 | 1.00 | .00 | .00 | 2.00 | 5.00 |

## Table 4.81: Summary of number of treatments for each repeat individual (n=165) by clinical impression

| Clinical impression | Frequency | Percent |
|---|---|---|
| Head/concussion | 0 | 0% |
| Heat exhaustion | 0 | 0% |
| Cervical facet | 50 | 30% |
| Tendonitis | 0 | 0% |
| Joint sprain | 13 | 8% |
| Abrasion | 0 | 0% |
| Thoracic facet | 91 | 55% |
| Muscle strain | 18 | 11% |
| Confusion | 0 | 0% |
| Sacroiliac syndrome | 55 | 33% |
| Patellofemoral pain syndrome | 0 | 0% |
| Laceration | 0 | 0% |
| Lumbar facet | 51 | 31% |
| Myofascial | 142 | 86% |

# Chapter 5
# Discussion of Results

## 5.1 Introduction

In this chapter we discuss the results of the statistical analysis in Chapter 4.

## 5.2 Outline of the Objectives of the Study

The first objective was a profile of internationally competitive surfers attending the Mr. Price Pro in Durban, KwaZulu-Natal, South Africa with respect to the data obtained from a previously validated sports questionnaire.

The second objective was to implement cohort tracking when a surfer attended the treatment facility at the Mr. Price Pro numerous times.

## 5.3 Results and comparison of results for this study with other studies

### 5.3.1 Objective 1 – Injury profile: Part One

A profile of internationally competitive surfers attending the Mr. Price Pro in Durban, KwaZulu-Natal, South Africa with respect to the data obtained from a previously validated sports questionnaire.

## 5.3.1.1 Demographics

### 5.3.1.1.1 Nationality

In this study, the vast majority of surfers (37.2%) were from Australia. According to Nathanson (2007), modern surfing dates as far back as the 1960's, with some of the very first surfing competitions being held in Australia. Taking into consideration the strong roots of surfing in Australia, as well as them having an ideal climate for the sport, it is not surprising that Australians made up the vast majority of the surfers at the Mr. Price Pro.

South Africa also had a strong representation (28.8%) of surfers at the Mr. Price Pro. As the Mr. Price Pro is based in Durban, KwaZulu Natal, South Africa, it is more accessible to South African surfers than most other ASP or WQS contests, which are situated worldwide. The affordability and convenience of having the Mr. Price Pro in their own country would have led to the large percentage that the South Africans make up at the Mr. Price Pro.

### 5.3.1.1.2 Race

The racial makeup of surfers that were treated at the Mr. Price Pro was fairly one sided. White surfers made up the overwhelming majority of 92.9%, with only 5 black surfers (0.3%) and 3 Indian surfers (0.2%), having been treated. 'Other' races made up 3.4% of the total surfers treated, with unknown races making up the remaining 3.1%. The high percentage for unknown races would have been due to the fact that the race question on the CSSA's questionnaire was often left blank.

Similar comparisons to international literature were limited as statistical comparisons were not possible.

### 5.3.1.1.3 Age

The vast majority of surfers treated at the Mr. Price Pro were between the ages of under 21 and 30. With regard to the 21-25 age group, 43.5% of surfers treated fell within this bracket. This is consistent with the study by Nathanson (2007), where the results showed that the mean age for injury was 23.6 years. There were very few surfers (7%) over the age of 30 years that were treated.

### 5.3.1.1.4 Gender

The gender distribution in this study was favourable towards the male sex, with 77.5% of surfers treated being male and only 22.2% being female. When one looks at the makeup of the World Championship Tour, it consists of 45 men and only 17 women (http://www.aspworldtour.com/, 2007). Thus, the gender distribution in this study is consistent with the gender distribution in world surfing.

## 5.3.1.2 Prevalence of surfing injuries

### 5.3.1.2.1 Region of complaint

The most common region of complaint by surfers at the Mr. Price Pro was the lumbar spine (55.2%). This was followed closely by the thoracic spine (42.2%) and the neck / cervical spine (36.8%). This is not consistent with the findings of Nathanson (2007), who stated that only 13% of acute injuries occurred in the trunk region. Nathanson (2007) also stated, along with McDonald Taylor *et al.* (2004) that lower extremity injuries were the most common acute injuries suffered by surfers. McDonald Taylor *et al.* (2004) reported that lower extremity injuries accounted for 50% of injuries in surfers. In this study, shoulder and knee complaints accounted for 13.9% and 7.5% of regional complaints respectively.

The reasons for the above differences are multifactoral. Firstly, the treatment facility at the Mr. Price Pro is run by chiropractors and chiropractic interns. This is in total contrast to the studies conducted by Nathanson (2007), McDonald Taylor *et al.* (2004) and Lowdon *et al.* (1990) where data was collected from first aiders at surfing contests, hospitals nearby popular surfing venues and self-reported internet based questionnaires. Chiropractors are musculoskeletal specialists, who have a vast amount of knowledge with regard to spine related disorders. Thus it stands to reason that spinal complaints were the vast majority of complaints by the surfers.

Secondly, the surfers' perception of Chiropractic will influence their region of complaint. Most of them are aware of who Chiropractors are and what Chiropractic is. Thus it was highly unlikely that a surfer would report to the Chiropractic treatment facility with a laceration. They were much more likely to present with some kind of joint or spinal dysfunction.

Thirdly, one must bear in mind, that the joints of the lower extremity and the pelvis can be likened to a chain (the kinematic chain theory). Each joint represents a link in the chain. Gatterman (1990), states that the motion of one link in the chain will have significant effects on every other link in the chain. Thus, all forces acting on the lower extremities whilst surfing will ultimately be transferred to the pelvis, which is closely related to the lumbar spine. Thus lumbar complaints were more prevalent than knee complaints. There is also a separate first aid facility available at the Mr. Price Pro. All acute injuries such as lacerations and contusions are treated there. As most of these kinds of injuries occur to the extremities, the percentage of extremity complaints in this study was obviously less than in previous studies (Mendez-Villanueva *et al.*, 2005; Nathanson, 2007; Everline, 2007).

Lastly, the thoracic spine is the least mobile segment in the spine. This is due to the attachment of the rib cage (Schafer and Faye, 1990), as well as the girdle muscles of the shoulder using the thoracic spine as an anchor which

allows powerful strokes in the paddling phase (Gatterman, 1990). The hypomobility of the thoracic spine makes it more susceptible to fixations (loss of segmental mobility). When one region of the spine becomes fixated, there is compensatory hypermobility in the adjacent segment of that region (Gatterman, 1990). In this case, the lumbar spine becomes hypermobile. Schafer and Faye (1990) state that the sight of the fixation is often asymptomatic, whilst the compensating hypermobile segment is 'highly expressive'. This is a possible reason for the lumbar spine being the most common region of complaint in surfers.

It is suggested that an integrated approach be taken with regards to research on surfing injuries. Thus the data accumulated from the acute injuries seen by the first aiders and the chronic injuries seen by the Chiropractors can be combined. This will lead to more accurate and realistic findings.

#### 5.3.1.2.2 Perceived mechanism of injury

In this study, surfing (47.5%) and paddling (10.9%) accounted for the vast majority of the perceived mechanism of injury. Travelling and trauma from a surfboard / wave / sandbank accounted for an equal 5.3% portion of the perceived mechanisms of injury. However, in a study conducted by Nathanson *et al.* (2002), it was found that 72% of lacerations and 66% of contusions were caused by the surfer's own surfboard. Kim *et al*. (1998) also stated that a large proportion of surfing injuries were caused by surfboards. A possible reason for the difference in findings in this study is that the Mr. Price Pro is a surfing contest, where only four surfers are in the water at a time. Thus the water was not overcrowded, leading to very few injuries caused by a surfboard. Adding to this, one could state that Durban beaches are relatively safer as the size of waves and sandy ocean floor cannot be compared to other popular surfing destinations such as Hawaii. Thus fewer injuries are caused by the hydraulic force of the wave and hard ocean floors such as reefs.

This is unlike previous studies, where data was not always collected in a surfing contest environment, but rather a recreational one, where overcrowded surfing venues were common. Some studies were also conducted at venues known for big surf and for reefs such as in Hawaii.
This would then increase the likelihood of injury from a wave or surfboard, as well as the ocean floor.

It makes sense that 5.3% of injuries were caused by travel as the Mr. Price Pro is the first stop in the South African leg of the World Championship Tour. This means that most surfers would have endured long flights in order to compete in South Africa.

Unknown mechanisms of injury accounted for 16.5%. As most injuries reported to the Chiropractic facility were chronic in nature, problems of recall will pose an inherent problem in determining the exact mechanism of injury (Mouton, 1996). Peterson and Renstrom (2001) back this up by stating that the cause – effect relationship of acute injuries are usually obvious and can easily be measured as the athlete often experiences a rapid onset of pain, and swelling begins to develop in the region of the injury (Peterson and Renstrom, 2001).

The type of injuries reported to the Chiropractic facility will directly affect the perceived mechanism of injury. In this case, chronic injuries made up the majority of injuries reported, and repetitive strain type activities such as surfing and paddling were the dominant factors.

Throughout the year surfers are exposed to many different surfing environments. They experience the smaller waves and soft sand of Durban, as well as larger waves and reefs at other surfing destinations. Sometimes they surf in crowded surfing venues, and other times they are one of four in the water.

### 5.3.1.2.3 Severity of injury

It was reported in this study that only 1.2% of surfers sustained injuries severe enough that post treatment, they were unable to participate further in the Mr. Price Pro. This finding may be significantly lower than that of other studies (Nathanson, 2007; Zoltan *et al.*, 2005). The reason for this is studies like Nathanson (2007) and Zoltan *et al.* (2005) reported mainly on acute injuries. Peterson and Renstrom (2001), state that the severity of acute injuries is usually obvious and can be easily measured. Thus severity percentages would be higher in these studies. The finding in this study does however support statements made by Mendez-Villanueva *et al.* (2005) and Everline (2007) who stated that despite the amount of surfing injuries reported, surfing remains a relatively safe sport.

### 5.3.1.2.4 History and clinical impression of injury

It was reported in this study that 52.7% of injuries were chronic injuries. In 48.4% of the cases reported, it was acknowledged by the surfer that the region of complaint had in fact been injured previously. This concurs with Schafer and Faye (1990) who state that when an area has been injured the first time, acute inflammation will occur. This inflammation serves to localize the products of the injured tissue. If the injury is not treated efficiently and correctly, the acute inflammation eventually turns into scar tissue which is harmful to the joint as the normal tissue, which is soft, elastic and possesses a rich vascular supply is replaced by stiff, unyielding and poorly vasculated scar tissue.

It is for this reason that re-injured joints that were not correctly attended to in the past, will be slow to heal and left vulnerable to further trauma. Injuries to adjacent sites are also likely to occur due to the compensatory mechanism described in section 5.3.1.2.1.

Generally speaking, surfers do not follow any specific training or conditioning programs. They do however spend between 2 and 7 hours a day surfing, at least 5 days a week (Mendez-Villanueva and Bishop, 2005). This amount of surfing could make them vulnerable to overuse injuries. It is therefore recommended that surfers follow appropriate supportive training programmes that are responsible for maintaining cardiovascular fitness as well as general and specific muscle tone, in order to prevent injuries from occurring. Secondly, a programme that is rehabilitative in nature should be followed for injuries previously encountered in order to prevent secondary injuries from occurring and to promote correct healing of the present injury (Everline, 2007; Mendez-Villanueva *et al.*, 2005; Nathanson, 2007).

### 5.3.1.2.5 Most common muscles involved in injury

The Quadratus Lumborum (34.6%) and the Trapezius (34.6%) muscles were the muscles that were most commonly involved in injury. The Paraspinal (18.4%) and Rhomboid (18.1%) muscles also represented a significant portion of muscles commonly involved in injury.

Although previous studies (Nathanson, 2007; Mendez-Villanueva *et al.*, 2005; Everline, 2007; Zoltan *et al.*, 2005) do not mention the specific muscle groups that are involved in surfing injuries, the findings in this study correlate with the regions of complaint mentioned in 5.3.1.2.1. The Quadratus lumborum (QL) muscle's main attachment is to the lumbar spine (Moore and Dalley, 1999). Schafer and Faye (1990) state that joint function and muscle cannot be functionally separated. Due to the lumbar spine being in a state of hypermobility, the QL will become hypertonic (spasm), as muscle function depends on normal joint function. As well as muscle spasm being indirectly caused by injury to associated articular (bone) structures, it is also directly caused by injury or overuse of that specific muscle. The QL muscle's main action is extension (Moore and Dalley, 1999). Everline (2007) states that the spine is hyperextended during the paddling phase of surfing, which accounts

for 51% of the surfer's total time in the water. Therefore there is a significant amount of strain put on the QL muscles which will eventually lead to muscle fatigue and injury, thus accounting for 34.6% of muscles involved in injury.

The Trapezius muscle is a flat, triangular muscle extending across the back of the neck and upper part of the thorax (Moore and Dalley, 1999).
Gatterman (1990) states that the Trapezius muscle is most frequently affected by trigger points, which are areas of hyperirritability in the muscle. This is due to its function as the stabilizer of the upper extremities. This muscle is frequently loaded during the paddling phase of surfing, as the neck is extended and protruded forward, whilst the arms move in a repetitive motion above and in front of the head. This repeated strain and overuse of the Trapezius muscle makes it vulnerable to chronic muscle pain (Gatterman, 1990), thus accounting for the 34.6% of muscles involved in injury.

The Paraspinal and Rhomboid muscles are closely related to the thoracic spine. The hypomobility of the thoracic spine as previously mentioned in 5.3.1.2.1, will cause hypertonicity in the Paraspinal and Rhomboid muscles as Schafer and Faye (1990) state that joint function and muscle cannot be functionally separated.

## 5.3.1.3 Treatment of surfing injuries

### 5.3.1.3.1 Manipulation – Level of manipulation

A Chiropractic manipulation is a small-amplitude, high-velocity movement at the end of a subject's available range of motion in a joint, in order to restore mobility of that segment (Stedman's Medical Dictionary for the Health Professions and Nursing, 2005). A hypomobile segment is referred to in Chiropractic terms as a "fixation" (Schafer and Faye, 1990; Gatterman, 1990). In this study, 70.4% of surfers were manipulated.

Although lumbar spine complaints made up 55.2% of the total number of complaints by surfers, the thoracic spine was the most commonly manipulated region of the spine (42.8%). This is consistent with the literature of Gatterman (1990), Schafer and Faye (1990) and Bergman (1993). The hypermobility of the lumbar spine is secondary to the hypomobility of the thoracic spine. Hypermobile joints should not be manipulated, even if they are the focal point of symptoms, as this will only aggravate the patient's pain. The hypomobile joint should be manipulated, which is in this case the thoracic spine. Schafer and Faye (1990) state that correction in any part of the spine will, to a certain degree, help the whole spine to correct itself.

The kinematic chain theory (Gatterman, 1990) has already been explained in section 5.3.1.2.1. This theory however, does not only apply to the lower extremity and pelvis, which accounts for the sacroiliac joint being manipulated 24.9% of the time, but also to the upper extremity and the neck / cervical spine, which accounts for the cervical spine being manipulated 27.1% of the time.

### 5.3.1.3.2 Manipulation – Direction of manipulation

Posterior to anterior (35.2%) was the most common direction of manipulation. Two reasons or proposed for this finding. As has been previously mentioned, the QL muscles are in a hypertonic state due to the hypermobility of the lumbar spine. The strain and overuse inflicted on the QL muscle is not equal bilaterally. There are two different stances that surfers assume on the surfboard when riding a wave. Either the left or right foot is used as the rear foot. It is all dependant on what is most comfortable for the surfer. The rear foot however, takes the most strain during wave riding, as it is the control foot for direction and enables the surfer to perform different manoeuvres.
The QL muscle corresponding with the side of the rear foot will undergo more strain than its opposite counterpart. Schafer and Faye (1990), state that if the hypertonicity is sufficient enough, the motion unit involved (the lumbar spine in

this case) will tend to be pulled into a sustained position of action. Thus, posterior to anterior manipulations will most benefit the surfer at this point.

It should also be recognised, that the surfer will always have a dominant side. If for example the dominant side is the right side, the surfer will naturally pull harder with that side whilst paddling, as well as turn harder with that side whilst performing manoeuvres on the wave. This dominant side is obviously more prone to fixations than the dominant side, leading to one sided posterior to anterior manipulations.

Extension manipulations accounted for 28.5% of manipulations performed in this study. The thoracic spine, due to its hypomobility, was the most commonly adjusted region of the spine (see section 5.3.1.3.1).
This region of the spine has a natural kyphotic curve which keeps the spine in chronic flexion. It therefore stands to reason that extension manipulations would be fairly common (Gatterman, 1990).

### 5.3.1.3.3 Mobilisation

Mobilisation techniques include stretching of the muscle and ligaments of a joint, as well as moving the joint through its direction of motion but without a thrust, as would be applied in a Chiropractic manipulation (Haldeman, 2005). In this study, only 9.6% of surfers received mobilisation techniques as treatment. The highest percentage was the knee, which made up 2.5% of all documented mobilisation techniques. It must be added however, that almost 92% of regions that received mobilisation techniques were left blank on the CSSA's questionnaire, thus making the knee value (2.5%) highly inaccurate.

If one takes into account studies conducted by Nathanson (2007), Everline (2007) and Mendez-Villanueva *et al.* (2005), it is expected that the knee value may increase, as previous literature sites the lower extremity as the most common site of injury.

### 5.3.1.3.4 Stretches – Static and PNF

The Trapezius (11.9%) and QL (11.6%) muscles were the most common statically stretched muscles. They were also the most common Proprioceptive Neuromuscular Facilitation (PNF) stretched muscles, with the QL muscle making up 11.9% and the Trapezius muscle 11.6% of muscles stretched by PNF. This is consistent with the findings in 5.3.1.2.5, where the QL and Trapezius muscles were the most commonly affected muscles in surfing injuries. It should be noted that 36.7% of surfers received static stretching, compared to 18.2% receiving PNF stretching.

### 5.3.1.3.5 Voltaren and Transact

Voltaren and Transact are both topical nonsteroidal anti-inflammatory drugs which are used for the treatment of acute inflammation. As 52.7% of conditions treated were chronic, it is understandable that the usage of Voltaren and Transact was as little as 2.6% and 0.3% respectively.

### 5.3.1.3.6 Massage and dry needling

Massage therapy was an extremely popular form of treatment applied to the surfers at the Mr. Price Pro, with 82.3% of surfers being treated receiving some sort of massage therapy. The QL (31.3%) and the Trapezius (29.8%) were once again the most frequently treated muscles. It is thought that amongst all forms of Chiropractic treatment, massage therapy is the most popular because there is a common understanding of what massage therapy is amongst surfers, as well as it being extremely pleasurable. Unlike certain forms of treatment, massage therapy is not contra-indicated during competitive surfing.

Dry needling on the other hand is less pleasurable than massage, as it is an invasive procedure whereby a needle is inserted directly into the muscle to

relieve trigger points (areas of hyperirritability) that have formed within the muscle. Whilst the success of this therapy cannot be denied, it may lead to post needle soreness on some occasions and is therefore contraindicated during competitive surfing. This may account for only 8.8% of surfers being treated receiving the dry needling technique.

It must also be added, that South African Chiropractors are the only Chiropractors in the world that use dry needling as a form of treatment, thus this small percentage may also be due to lack of knowledge of what dry needling actually is and the benefits thereof.

### 5.3.1.3.7 Other forms of treatment

Only 11% of surfers treated at the Mr. Price Pro received treatment not listed on the CSSA's questionnaire. Cryotherapy (ice) and strapping were the most common forms of 'other' treatment used. Cryotherapy and strapping are predominantly used in acute cases to reduce swelling and inflammation, as well as provide stability to an area (Schafer and Faye, 1990). As 52.6% of injuries treated were chronic in nature, the low percentage of these forms of treatment is understandable.

As previously mentioned in studies on acute injuries (Zoltan *et al.* 2005; Sunshine 2003), the lower extremities, followed by the upper extremities, were the most common sites of injury. This is consistent with the findings in this study where the most common regions these 'other' forms of treatment were applied to were the knee and shoulder.

## 5.3.2 Objective 1 – Injury profile: Part Two

A profile of internationally competitive surfers attending the Mr. Price Pro in Durban, KwaZulu-Natal, South Africa with respect to the data obtained from a previously validated sports questionnaire.

### 5.3.2.1 Crosstabulation of Region of complaint and Age

Upon crosstabulation of clinical impressions and age, lumbar spine complaints were the most frequent from the under 21 age group all the way through to the 31 – 35 year age group, however neck complaints were the most common complaint in the over 35 age group.

The reason for these results conflicting with studies conducted by Nathanson (2007), Everline (2007), Mendez-Villanueva *et al.* (2005), Zoltan (2005) and Sunshine (2003) has already been discussed in part one of this chapter. It will therefore not be discussed again in part two.

As has been previously mentioned in section 2.7 of Chapter Two, Kirkaldy-Willis (1992), suggest that there are three phases of degenerative disease in the spine. They are dysfunction, instability and stabilization. We can apply this theory to the results found in this study. The reason that the under 21 age group through to the 31 – 35 year age group all had lumbar spine complaints, was because they are the younger age groups and are still in the dysfunction phase and possibly the beginning stages of the instability phase. Their main symptom, according Kirkaldy-Willis (1992) will be lower back pain.

However, when we look at the over 35 year age group, they have more than likely reached the third phase, which is the stabilization phase. In this phase there is hardening of the supporting structures of the spine, in order to compensate for the instability of the spine found in phase two. These surfers will have a history of severe lower back pain over the years, but at present their lower back pain will be less, and they will only experience episodes of

lower back pain. Their pain is also usually muscular in origin, due to the muscles becoming hypertonic in order to 'guard' the spine (Kirkaldy-Willis, 1992). Due to the stabilization of the spine, the lumbar spine becomes hypomobile, like the thoracic spine that has previously been discussed (section 5.3.1.2.1). When one region of the spine becomes hypomobile, there is compensatory hypermobility in the adjacent segment of that region (Gatterman, 1990), thus leading to hypermobility and pain in the neck region for surfers over the age of 35 years.

### 5.3.2.2 Crosstabulation of Region of complaint, Clinical impression and Treatment with Gender

The Lumbar spine was the most frequent region of complaint, myofascial problems presented the most clinically and massage therapy followed by manipulation were the most common treatments received in both male and female surfers. These results show that the injuries sustained by surfers are not gender specific, and that the biomechanics of surfing affects both genders equally.

### 5.3.2.3 Crosstabulation of Region of complaint with Type of patient and complaint

Thorax and lumbar complaints were the most common complaints in both new and repeat care patients, as well as new and continuation of care complaints. The surfers present initially with a region of complaint, in this case the thoracic and lumbar spine, and then visit the Chiropractic treatment facility repeatedly to get that region treated. This statistic highlights the chronicity of injuries sustained by surfers.

## 5.3.2.4 Crosstabulation of Clinical impressions and Age

Myofascial problems were the most common clinical impressions throughout the different age groups. Schafer and Faye (1990) state that joint function and muscle cannot be functionally separated. Due to the hypomobility of the thoracic spine and hypermobility of the cervical and lumbar spine, the muscles that attach to these regions of the spine will be affected, as muscle function depends on normal joint function. As well as muscle spasm being indirectly caused by injury to associated articular (bone) structures, it is also directly caused by injury or overuse of that specific muscle. There are many muscles that are repeatedly targeted and overused during surfing.

A total of 54.5% of the over 35 age group had tendonitis. As previously mentioned in section 5.3.2.1, this age group is in the stabilisation phase. This means that there is almost no movement in that particular joint. Thus, due to the abnormal joint function, there is increased strain on surrounding soft tissues such as muscles, tendons and ligaments (Schafer and Faye, 1990; Gatterman, 1990). This accounts for the high percentage of tendonitis (inflammation of the tendon) in the over 35 age group.

It has been mentioned in other studies, that due to prolonged exposure to the sun and water, surfers often suffer from bony exostosis of the external auditory canal, otitis externa, sinusitis, pinguecula and pterygium (Wong *et al*., 1999; Dhingra, 1999; Sunshine, 2003; Kroon *et al.*, 2002; Zoltan *et al.,* 2005).The above statement is not consistent with the findings in this study, as the surfer's perception of Chiropractic will prevent them from presenting symptoms of the above conditions to a Chiropractor.
This is unless the symptoms were associated with a particular Chiropractic condition, for example headaches.

## 5.3.2.5 Crosstabulation of Treatment and Age

Massage therapy was the most common treatment received throughout all age groups. Manipulation was also a very common form of treatment, however it was performed predominantly on those in the younger age groups. The high percentage of surfers receiving massage therapy over other forms of chiropractic treatment has been discussed in 5.3.1.3.6. The reason for manipulation being performed predominantly on the younger age groups is that these age groups are in the dysfunction phase, where manipulation of the joint will have great success. However, the over 35 year age group is in the stabilization phase, and Bergman (1993) states that manipulation is unlikely to reverse marked bony structural changes found in this phase, and that treatment should rather be aimed at decreasing symptoms and maximizing function. As myofascial problems were the most common clinical impressions in all age groups (see section 5.3.2.5), massage therapy applied to these myofascial problems will alleviate the over 35 surfer's symptoms somewhat.

## 5.3.3 Objective 2 – Cohort tracking

The second objective was to implement cohort tracking when a surfer had attended the treatment facility at the Mr. Price Pro for a number of years.

## 5.3.3.1 Number of repeat visits by surfer and year

Two hundred and seventy surfers returned for more than one treatment, totalling 1326 treatments between the years of 2000 and 2008. One hundred and sixty five (61%) surfers attended the Chiropractic treatment facility at the Mr. Price Pro for more than one year out of the nine years analyzed in this study, with some surfers attending as many as eight times between the years 2000 and 2008. Visits over the period of two or three years between 2000 and 2008 were the most common. The above mentioned statistics highlight the fact that a large majority of surfers understand and either consciously or subconsciously recognise the fact that they have chronic injuries present.

## 5.3.3.2Number of treatments for each repeat individual by region of complaint and year

Lumbar spine complaints (67%) were the most common among those surfers coming back for repeat treatments between the year 2000 and 2008. Thorax (51%) and neck (44%) were also fairly common.
No head, forearm, chest or abdominal complaints were treated during repeat visits. The results of the above statistics have already been discussed in section 5.3.1.2.1.

## 5.3.3.3 Number of treatments for each repeat individual by clinical impression and year

Table 4.83 and 4.84 reflect that myofascial complaints (86%) were the most common among those surfers coming back for repeat treatments between the year 2000 and 2008. Lower back and thoracic spine complaints were also very common.
No complaints of head/concussion, heat exhaustion, tendonitis, abrasion, confusion, patellofemoral pain syndrome (PFPS) or lacerations were treated during repeat visits. The results of the above statistics have already been discussed in section 5.3.1.2.4.

## 5.4 Objectives and Hypotheses

The first objective was a profile of internationally competitive surfers attending the Mr. Price Pro in Durban, KwaZulu-Natal, South Africa with respect to the data obtained from a previously validated sports questionnaire. Data collection was with respect to the following factors:

- Demographics of internationally competitive surfers,
- The surfers' diagnostic history,
- The surfers' treatment history and
- The cohort tracking of surfers over 10 years.

Hypothesis One: The surfers profile would be dissimilar to the literature.

**ACCEPTED**

The statistics from previous literature with regards to surfing injuries (Sunshine, 2003; Zoltan *et al.*, 2005; Mendez-Villanueva *et al.*, 2005; Nathanson, 2007; Everline, 2007) differs somewhat from the results in this study.

The second objective was to implement cohort tracking when a participant had attended the treatment facility at the Mr. Price Pro for a number of years. This included tracking the diagnostic and treatment history of the participant, any correlations between the two and the regression/progression of the injury.

Hypothesis Two: Injuries were not of a repetitive nature.

**REJECTED**

Many of the results in this study confirmed that surfing injuries were of a repetitive nature.

# Chapter 6

# Conclusion and Recommendations

## 6.1 Introduction

This Chapter incorporates a summary of the results of the study. Conclusions about the results are drawn, and recommendations are provided for future studies based on the results as well as the limitations of this study.

## 6.2 Conclusions

There was an overwhelmingly larger percentage of male surfers (77.5%) compared to female surfers (22.2%) that were treated at the Chiropractic treatment facility at the Mr. Price Pro. The surfers ranged between the ages of under 21 years of age right through to over 35 years of age. The majority (43.5%) of surfers however, were between the ages of 21 and 25 years of age, with only 7% of surfers being over the age of 35 years of age. Australian surfers (37.2%) and South African surfers (28.8%) made up a large proportion of the surfers in this study, with 92.9% of surfers being white, and as little as 0.3% being black and 0.2% being Indian surfers.

When considering the prevalence of surfing injuries, 52.7% of which were chronic, the lumbar spine (55.2%) was the most common region of complaint by surfers, followed fairly closely by the thoracic spine (42.2%) and cervical spine (36.8%). Shoulder (13.9%) and knee (7.5%) complaints were in the vast minority.

Surfing (47.5%) and paddling (10.9%) accounted for most of the surfers' perceived mechanisms of injury, whilst travel (5.3%) and trauma from a surfboard

/ wave / sandbank (5.3%) were far less. Of the above reported injuries, only 1.2% of injuries were severe enough to prevent the surfer from participating further in the Mr. Price Pro.

The most commonly affected muscles were the Quadratus Lumborum (34.6%) and Trapezius (34.6%) muscles. The Paraspinal (18.4%) and Rhomboid (18.1%) muscles followed as the next most affected muscle.

Treatment of the surfers at the Chiropractic treatment facility at the Mr. Price Pro varied somewhat. The most popular form of treatment by far, was manipulation (70.4%) and massage therapy (82.3%). Stretching, both static (36.7%) and PNF (proprioceptive neuromuscular facilitation) stretches (18.2%) were the next most common forms of treatment. Mobilisation techniques (9.6%) and dry needling (8.8%) made up a far lower percentage of treatments, with Transact and Voltaren making up as little as 0.3% and 2.6% respectively. Other forms of treatment such as cryotherapy (ice) and strapping, collectively accounted for 11% of treatments.

Crosstabulations were applied to the following statistics in order to reflect the comparison between variables relating to region of complaint, clinical impressions and treatment and the biographical variables such as age, gender, type of patient and type of complaint.

The lumbar spine was the most common region of complaint between the under 21 age group through to the 31-35 year old age group. Myofascial conditions were the most common clinical impression within these age groups. The over 35 year old age group differed somewhat, as the cervical spine was the most common region of complaint, and tendonitis was the most common clinical

impression. Thoracic and lumbar spine complaints were the most common complaints amongst new and repeat care patients, as well as new and continuation of care patients.

Massage and manipulation were the most common treatments amongst type of patient and complaint; however, manipulations were performed on predominant younger age groups. All of the above crosstabulated statistics were gender non-specific.

When cohort tracking was applied, it was found that 61% of surfers attended the Chiropractic treatment facility at the Mr. Price Pro for more than one year out of the nine years analyzed in this study, with some surfers attending as many as eight times between the years 2000 and 2008. Visits over the period of two or three years between 2000 and 2008 were the most common. Lumbar spine complaints (67%) were the most common among those surfers coming back for repeat treatments between the year 2000 and 2008. Thorax (51%) and neck (44%) were also fairly common. Myofascial complaints (86%) were the most common among those surfers coming back for repeat treatments between the year 2000 and 2008. Lower back and thoracic spine complaints were also very common. No lacerations were reported.

Chronic injuries made up for 52.7% of surfing injuries, with the spine and surrounding musculature being the most commonly affected regions. The independently significant risk factors associated with injury were the repetitive nature of certain aspects of surfing and the age of the surfer.

## 6.3 Recommendations

• It is suggested that an integrated approach be taken with regards to research on surfing injuries. Thus the acute injuries that first aiders are more likely to treat, and the chronic injuries that Chiropractors are more likely to treat, can be combined. This will lead to more accurate findings.

• Throughout the year surfers are exposed to many different surfing environments. They experience the smaller waves and soft sand of Durban, as well as larger waves and reefs at other surfing destinations. Sometimes they surf in crowded surfing venues, and other times they are one of four in the water. It is therefore recommended that studies like the one conducted at the Mr. Price Pro be combined with studies conducted in other surfing venues with different environments. Thus all risk factors can be taken into account when creating an injury profile.

• Generally speaking, surfers do not follow any specific training or conditioning programs. They do however spend between 2 and 7 hours a day surfing, at least 5 days a week (Mendez-Villanueva and Bishop, 2005). This amount of surfing could make them vulnerable to overuse injuries. It is therefore recommended that surfers follow appropriate supportive training programmes that are responsible for maintaining cardiovascular fitness as well as general and specific muscle tone, in order to prevent injuries from occurring. Secondly, a programme that is rehabilitative in nature should be followed for injuries previously encountered in order to prevent secondary injuries from occurring and to promote correct healing of the present injury (Everline, 2007; Mendez-Villanueva *et al.*, 2005; Nathanson, 2007).

• It is recommended that more studies focusing on the specific muscle groups that are commonly used by surfers be carried out. This will provide a more

accurate view of what muscles are most prone to be affected by injury, and thus help with prevention strategies to prevent overuse injuries of these muscles.

• No other chiropractic based studies on surfing injuries could be found to compare data with. Thus, it is recommended that more studies of this nature be done.

• It is recommended that the Chiropractic interns responsible for filling out these questionnaires, before treating the surfers, be taught the importance of filling out the entire questionnaire. As leaving blank spaces on the questionnaire lets inaccuracies creep into the research process.

• It is suggested that more studies of this nature be done, where surfers are tracked over a number of years, and not just involved in one off studies. This would lead to vaster amounts of knowledge with regard to chronic injuries, rather than focusing on acute injuries.

## References


Association of Surfing Professionals [online]. Available from: http://www.aspworldtour.com/2007/faq.asp [Accessed 2 April 2007]

Bankes, J.L.K. 1987. Clinical ophthalmology: a text and colour atlas. 2nd ed. United Kingdom: Churchill Livingstone

Bergman, T.F., Peterson, DH. and Lawrence, D.J. 1993.Chiropractic technique: Principles and procedures. New York: Churchill Livingstone

Bernard, R.H. 2000. Social research methods. California: Sage Publications.

Brukner, P. and Khan, K. 2006. Clinical sports medicine. 3rd ed. Australia: McGraw-Hill.

Definition of Profile, [online]. Available from: (www.answers.com/library/dictionary-cid-65066) [Accessed 2 April 2008]

Definition of Surfing, [online]. Available from: http://www.thefreedictionary.com/surfing [Accessed 20 April 2007]

Definition of Surfing terms, [online]. Available from: http://en.wikipedia.org/wiki/surfing. [Accessed 25 March 2008]

Dhingra, P.L. 1998. Diseases of ear, nose and throat. 2nd ed. New Delhi: Churchill Livingston.

Esterhuizen,T. 11 February 2009. Personal communications with T.Murgatroyd. Durban University of Technology.

Everline, C.A. 2007. Shortboard Performance Surfing: A qualitative Assessment of Maneuvers and a Sample Periodized Strength and Conditioning Program In and Out of the Water. Strength and Conditioning Journal. 29(3);32-40.

Kwa-Zulu Natal, Faculty of Health, 18 August 2007, 08.00.

Fitch, C. (aspafrica@mweb.co.za), 20 April 2007. Request for information Mr. Price Pro. E-mail to T.L. Murgatroyd (**tazomurgatroyd@hotmail.com**).

Fink, A. and Kosecoff, J. 1985. How to conduct surveys: A step by step guide. California: Sage Publications.

Fyfe,S. 2006. Surfing injuries and surfing training [online]. Available from : http://www.sportsinjurybulletin.com/archive/surfing-injuries.html [Accessed 12 April 2007]

Gatterman, M.I. 1990. Chiropractic management of spine related disorders. USA: Williams & Wilkins

Haldeman, S (ed). 2005. Principles and practice of chiropractic. 3rd ed. New York: McGraw – Hill.

Haslett, C., Chilvers, E.R., Boon, N.A. and Colledge, N.R. (editors). 2002. Davidson's principles and practice of medicine. 19th ed. United Kingdom: Churchill Livingstone.

Hershman, E.B. and Nicholas, J.A. 1995. The upper extremity in sports. 2nd ed. USA:Mosby

Heyward, V.H. 1997. Advanced fitness assessment and Exercise prescription. 3rd ed. USA: Human Kinetics.

Kim, J.W., McDonald, H.R., Rubsamen, P.E., *et al.* 1998. Surfing related ocular injuries. Retina. 18:424-9.

Kirkaldy-Willis, W.H. (ed). 1992. Pathology and pathogenesis of low back pain and the three phases of the spectrum of degenerative disease. 3rd ed. New York: Churchill Livingstone.

Korporaal, C.M. 2002. A retrospective epidemiological investigation of the Chiropractic Students' Sports Questionnaire, with reference to field hockey : a methodological perspective. MTech Dissertation, Durban Institute of Technology.

Korporaal, C.M. 2008. Interviewed by T.Murgatroyd. Durban University of Technology, 1 April 10.00.

Lachmann, S.L., and Jenner, J.R. 1994. Soft tissue injuries in sport. 2nd ed. London;Blackwell Scientific Publications

Maglischo, E.W. 1982. Swimming faster. 1st ed. USA: Mayfield Publishing Company.

McDonald Taylor, D., Bennet, D., Carter, M., Garewal, D., and Finch, C. 2005. Perceptions of Surfboard Riders Regarding the Need for Protective Headgear. Wilderness and Environmental Medicine. 16:75-80.

McDonald Taylor, D., Bennet, D., Carter, M., Garewal, D., and Finch, C. 2004. Acute injury and chronic disability resulting from surfboard riding. J Sci Med Sport. 2004;7:4:429-437.

Meir, R.A., Lowdon, B.J., and Davie, A.J. 1991. Heart rates and estimated energy expenditure during recreational surfing. *Aust. J. Sci. Med. Sport. 23:70-74.*

Mendez-Villanueva, A., Bishop,D., and Hamer,P. 2006. Activity Profile of World-Class Professional Surfers during competition:A case study. *Journal of strength and conditioning research*, 20(3):477.

Moore, K.L. and Dalley, A.F. 1999. Clinically orientated anatomy. 4th ed. USA: Lippincott Williams & Wilkins.

Morgan, J. 1996. Understanding social research. California: Sage Publications

Mouton, J. 1996. *Understanding social research*. 1st ed. Pretoria:J.L.van Schaik Publishers.

Mr. Price Pro 2006 [online]. 2006. Available from: http://www.mrpricepro.com/. [Accessed 1 May 2007]

Nathanson, A., Haynes, P., and Galanis, D. 2002. Surfing Injuries. American Journal of Emergency Medicine, 20(3):155-160.
Nathanson, A. 2007. Competitive Surfing Injuries:A retrospective study of surfing- related injuries among contest surfers. *The American Journal of Sports*, 35(1):113-117.

Peterson, L., and Renstrom, P. 2001. Sports Injuries, Their Prevention and Treatment. 3rd ed. UK;Martin Dunitz

Rachlin, E.S. 1994. Myofascial Pain and Fibromyalgia. London: Mosby

Renstrom, P.A.F.H (editor). 1993. Sports injuries-Basic principles of prevention and care. Vol.IV of The Encyclopedia of Sports Medicine, an IOC medical commission publication in collaboration with the international federation of sports medicine. London:Blackwell Scientific Publications.

Schafer, R.C. and Faye, L.J. 1990.Motion palpation and chiropractic technic: Principles of dynamic chiropractic. 2nd ed. California: The motion palpation institute.

Shamus, E., and Shamus, J. 2001. *Sports Injury Prevention and Rehabilitation.* USA:McGraw-Hill.

South Africa. 1982. Allied Health Professions Act 63, 1982. Government Gazette no. 1746: 1 August.

Stedman's Medical Dictionary for the Health Professions and Nursing at a glance. 2005. 5th ed. London: Lippincott Williams & Wilkins.

Sunshine, S. 2003. Surfing injuries. Current Sports Medicine Reports. 2(3):136-141.

Sutherland, K.M. 2008. A profile of musculoskeletal injuries in competitive swimmers in the greater Durban area. Masters' Degree in Chiropractic Dissertation, Durban University of Technology, Durban.

Travell, J.G., Simons, D.G. and Simons, L.S. 1998. Myofascial pain and dysfunction: the trigger point manual. 2nd ed. USA: Lippincott Williams & Wilkins.

Williams, J.G.P. 1980. *A Colour Atlas of Injury in Sport.* London:Wolfe Medical Publications.

Wong, B.J.F., Cervantes, W., Doyle , *et al.* 1999. Prevalence of External Auditory Canal Exostoses in Surfers. Archives of Otolaryngology.- Head and Neck Surgery. 125(9);969-972

Zoltan,T., Taylor,K., and Achar,S. 2005. Health Issues for Surfers. *American Family Physician*, 71(12):2313.