

# ICSC Cultural Diversity Module

Sports Demographic Module

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1

## COURSE OUTLINE

- This module is to present the top sports per region to highlight the similarities, the diversity and the links between the different regions where we as Sports Chiropractors are in touch with.
- Sports Chiropractors need to be able to work across regions, adapt to diversity and unify our approaches to accommodate any sport on any playing field.
- Our passion is sport and our belief is to give sports athletes the best advantage by boosting their performance by understanding their biomechanics and their needs in the sport they are participating in.
- We as FICS have set roots in 9 prominent regions in the world.
- Building insight into sporting diversity and the bridge across nations:
  - Latin America
  - Asia
  - Middle East
  - Europe
  - Scandanavia
  - United States of America
  - Canada
  - Australia
  - South Africa



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2

## INTRODUCTION

- Dr Steven Smilkstein
  - Qualified Chiropractor in 2010
  - ICCSP 2016
  - ICSC 2019
  - Lecturer and moderator for Department of Chiropractic at University of Johannesburg (UJ) since 2013
    - Biomechanics
    - Myofascial Technique



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3

## INTRODUCTION

Sports has been a constant tie in between nations, cultures and groups. It has broken Boundaries, promoted peace and encouraged friendship between groups around the world.

FICS has been in the background of the sporting world.

We as FICS have set roots in 9 prominent regions in the world.

We are always growing and reaching new regions and sports every day.

These 9 regions gives us the insight into sporting diversity and the bridge across nations:

1. Latin America
2. Asia
3. Middle East
4. Europe
5. Scandanavia
6. United States of America
7. Canada
8. Australia
9. South Africa



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4

## Top Sports per Region

- This module is to present the top rated sports per region to highlight the similarities, the diversity and the links between the different regions.
- It educates us as Sports Chiropractors to be able to work across regions, adapt to diversity and unify our approaches to accommodate any sport on any playing field.
- Our passion is sport and our belief is to give sports athletes the best advantage by boosting their performance by understanding their biomechanics and their needs in the sport they are participating in.
- This is achieved by learning and understanding the sports around the world.



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5

## Top Sports in the 9 Regions -

- The following regions have their specific top sports:
- The following lists are the top sports per region.
- This will give us insight into the region specific preferences in sport, Historical influence and current links to other regions:



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6

## REGION 1 - Latin America

1. Football (Soccer)
2. Rugby (Argentina, Paraguay and Uruguay)
3. Golf
4. Tennis
5. Basketball
6. Volleyball
7. Baseball
8. Motorsports such as Rally, Formula 1 and Moto GP.
9. Beach Volleyball (Colombia, Brazil, Panama, Chile)
10. Surfing (Brazil)



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7

## Common Injuries found in the top 3 sports in Latin America region:

### 1. Football

- The lower extremity was involved in 84%
- 66% traumatic
- 34% overuse injuries.
- Ankle sprains were most common 36%
- Contact injuries during tackling 45%
- More than half of the 20% knee injuries were caused by tackling.
- Players participating at high levels had only 30% of the injuries during tackling and 54% during running.



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8

## Common Injuries found in the top 3 sports in Latin America region:

### 2. Rugby Union

- Thigh haematomas were the most common injury for forwards and backs.
- ACL injuries for forwards.
- hamstring injuries affected backs more than forwards.
- Contact mechanisms accounted for 72% of injuries, but foul play was only implicated in 6% of injuries.
- The ruck and maul elements of the game caused most injuries to forwards,
- Being tackled caused most injuries to backs.
- Due to the High impact nature of the sport, Head and Neck injuries, Though not common via active prevention measures, do occur.



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9

## Common Injuries found in the top 3 sports in Latin America region:

### 3. Golf

- Excessive time spent golfing and technical deficiencies lead to overuse injuries.
- These are the 2 main causes of injuries among golfers, and each has specific differences in the pattern in which they occur in professional and amateur golfers.
- Golf injuries originate from:
  - overuse
  - traumatic origin
- Primarily affect the elbow (TE>GE), wrist, shoulder and the Thoraco-lumbar sites.
- Golfers, although showing overall common anatomical distribution of injuries by body segment, present differences injury occurrence by playing habits and biomechanical characteristics of their golf swing.



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## REGION 2 - Asia

1. Football. Association football (FIFA) is the most popular and played sport in most Asian countries.
2. Cricket. The most played sport in the Indian subcontinent is cricket.
3. Baseball. In Japan, baseball takes center stage.
4. Table Tennis.
5. Basketball.
6. Gymnastics (China and Russia)
7. Athletics and IOC based sports (Russia and China)
8. Competitive Martial arts such as Judo, Karate, Tai-Kwando, Kickboxing (Mue Thai).
9. Field Hockey (Indian and sub-continent).
10. Precision Sports such as Archery, Shooting (Chinese Taipei, S. Korea, Japan, China, Singapore, India).



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11

## Common Injuries found in the top 3 sports in Asia region:

### 1. Football

- The lower extremity was involved in 84%
- 66% traumatic
- 34% overuse injuries.
- Ankle sprains were most common 36%
- Contact injuries during tackling 45%
- More than half of the 20% knee injuries were caused by tackling.
- Players participating at high levels had only 30% of the injuries during tackling and 54% during running.



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12

## Common Injuries found in the top 3 sports in Asia region:

### 2. Cricket

- Acute injuries are most common (64%-76%), followed by acute-on-chronic (16%-22.8%) and chronic ones (8%-22%).
- The most common modern-day cricket injury is hamstring strain,
- and the most severe is lumbar stress fracture in young fast bowlers.
- Concussion and severe contact injury does tend to happen to Batsmen when hit with the ball.



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13

## Common Injuries found in the top 3 sports in Asia region:

### 3. Baseball

- Rotator cuff and ligamentous capsule injuries.
- Injuries involving the hip and groin.
- Traumatic finger and foot injuries also occur such as Mallet finger and avulsion due to impact on the plates.



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14

## REGION 3 – Middle East

1. Football: Football or soccer is one of the most popular sports played in the UAE, Israel, Lebanon.
2. Cricket (UAE, SAUDI ARABIA)
3. Horse Racing
4. Tennis (Israel, Uae)
5. Motor Sports (Lebanon, Jordan, Bahrain, UAE, SAUDI ARABIA)
6. Camel Racing (SAUDI ARABIA, UAE, Bahrain)
7. Golf (Israel, UAE)
8. Basketball (Israel)
9. Rugby (UAE, SAUDI ARABIA, ISRAEL)
10. Falconry



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15

## Common Injuries found in the top 3 sports in Middle East region:

### 1. Football

- The lower extremity was involved in 84%
- 66% traumatic
- 34% overuse injuries.
- Ankle sprains were most common 36%
- Contact injuries during tackling 45%
- More than half of the 20% knee injuries were caused by tackling.
- Players participating at high levels had only 30% of the injuries during tackling and 54% during running.



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16



## Common Injuries found in the top 3 sports in Middle East region:

### 2. Cricket

- Acute injuries are most common (64%-76%), followed by acute-on-chronic (16%-22.8%) and chronic ones (8%-22%).
- The most common modern-day cricket injury is hamstring strain,
- and the most severe is lumbar stress fracture in young fast bowlers.
- Concussion and severe contact injury does tend to happen to Batsmen when hit with the ball.



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17

## Common Injuries found in the top 3 sports in Middle East region:

### 3. Horse Riding

- Due to the unpredictable nature of horses, their height, and potential high speeds involved, equestrian athletes are at risk of head and spinal injuries.
- Traumatic brain injuries, including concussions, are more common than spinal injuries. Both injury types are most commonly related to a rider fall from a horse.
- Spinal injuries are less common but are associated with potentially significant neurological morbidity when spinal cord injury occurs.
- Most equestrian-related injuries occur during schooling or non-competitive riding, and a large proportion of the injuries involve children and teenagers, with one study finding that 39% of horse-related injuries occurred in patients under the age of 19 years of age.



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18

## REGION 4 - Europe

- 1.Soccer/Football
- 2.Golf
- 3.Rugby Union
- 4.Boxing
- 5.Tennis
- 6.Motorsport
- 7.Cycling
- 8.Field Hockey
- 9.Cricket (UK)
- 10.Handball



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19

## Common Injuries found in the top 3 sports in European region:

### 1. Football

- The lower extremity was involved in 84%
- 66% traumatic
- 34% overuse injuries.
- Ankle sprains were most common 36%
- Contact injuries during tackling 45%
- More than half of the 20% knee injuries were caused by tackling.
- Players participating at high levels had only 30% of the injuries during tackling and 54% during running.



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20

## Common Injuries found in the top 3 sports in European region:

### 2. Golf

- Excessive time spent golfing and technical deficiencies lead to overuse injuries.
- These are the 2 main causes of injuries among golfers, and each has specific differences in the pattern in which they occur in professional and amateur golfers.
- Golf injuries originate from:
  - overuse
  - traumatic origin
- Primarily affect the elbow (TE>GE), wrist, shoulder and the Thoraco-lumbar sites.
- Golfers, although showing overall common anatomical distribution of injuries by body segment, present differences injury occurrence by playing habits and biomechanical characteristics of their golf swing.



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21

## Common Injuries found in the top 3 sports in European region:

### 3. Rugby

- Thigh haematomas were the most common injury for forwards and backs.
- ACL injuries for forwards.
- hamstring injuries affected backs more than forwards.
- Contact mechanisms accounted for 72% of injuries, but foul play was only implicated in 6% of injuries.
- The ruck and maul elements of the game caused most injuries to forwards,
- Being tackled caused most injuries to backs.
- Head and neck injuries do rarely occur due to prevention measures in place.



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22

## REGION 5 - Scandanavia

1. Football
2. Floorball
3. Equestrian Sports
4. Handball
5. Golf
6. Gymnastics
7. Athletics
8. Ice Hockey
9. Winter Sports (Skiing, Bob Sled, Cross Country, Curling)
10. Korfball



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23

## Common Injuries found in the top 3 sports in Scandanavia region:

### 1. Football

- The lower extremity was involved in 84%
- 66% traumatic
- 34% overuse injuries.
- Ankle sprains were most common 36%
- Contact injuries during tackling 45%
- More than half of the 20% knee injuries were caused by tackling.
- Players participating at high levels had only 30% of the injuries during tackling and 54% during running.



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24

## Common Injuries found in the top 3 sports in Scandanavia region:

### 2. Floorball

- Overuse injuries were more common among men and were primarily back problems.
- The thigh was the most common injury location in male players. The ankle in female players.
- Traumatic injuries were more common in women—mainly knee and ankle injuries.
- The injury incidence was significantly greater in female floorball players throughout the entire floorball year. Male players sustained mostly overuse injuries while female players suffered traumatic injuries. The majority of injuries in floorball were mild, irrespective of player sex.



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25

## Common Injuries found in the top 3 sports in Scandanavia region:

### 3. Equestrian Sports

- Due to the unpredictable nature of horses, their height, and potential high speeds involved, equestrian athletes are at risk of head and spinal injuries. Traumatic brain injuries, including concussions, are more common than spinal injuries. Both injury types are most commonly related to a rider fall from a horse.
- Spinal injuries are less common but are associated with potentially significant neurological morbidity when spinal cord injury occurs.
- Most equestrian-related injuries occur during schooling or non-competitive riding, and a large proportion of the injuries involve children and teenagers, with one study finding that 39% of horse-related injuries occurred in patients under the age of 19 years of age.



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26

## REGION 6 - United States of America

- 1.American Football (NFL) American Football is the most popular sport in America.
- 2.Baseball (MLB)
- 3.Basketball (NBA)
- 4.Ice Hockey (NHL)
- 5.Soccer/Football/Association Football (MLS)
- 6.Tennis
- 7.Golf
- 8.Wrestling/Grapple and Sport entertainment (WWE)
- 9.Rugby
- 10.Motorsport



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27

Common Injuries found in the top 3 sports in USA region:

### 1. NFL American Football

- Knee Injuries (ACL, PCL and MCL)
- Head Injuries: Highest incidence of concussion in world sports.
- Upper limb, Shoulder, hand and digital injuries in receivers.



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28

Common Injuries found in the top 3 sports in USA region:

## 2. MLB Baseball

- Rotator cuff and ligamentous capsule injuries.
- Injuries involving the hip and groin.
- Traumatic finger and foot injuries also occur such as Mallet finger and avulsion due to impact on the plates.



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29

Common Injuries found in the top 3 sports in USA region:

## 3. NBA Basketball

- Professional athletes in the NBA experience a high rate of game-related injuries.
- Ankle sprains are the most common injury.
- Patellofemoral inflammation is the most significant problem in terms of days lost in competition.
- Hip and Groin injuries were considered fairly common.
- True ligamentous injuries of the knee were surprisingly rare.



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30

## REGION 7 - Canada

1. Ice Hockey
2. Lacrosse
3. Canadian Football
4. Baseball
5. Cricket
6. Soccer
7. Rugby
8. IOC Winter Sports (Skiing, Bob Sled, Luge, Ski Jump, Figure skating, Speed Skating)
9. Cycling. Host to the largest endurance mountain bike challenges (BC Bike race) start and finishes at Vancouver covering the whole BC territory over 3 weeks of racing.
10. Watersports



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31

## Common Injuries found in the top 3 sports in CANADA region:

### 1. Ice Hockey

- Injuries are related to direct trauma (80%) and overuse (20%),
- High puck velocities, aggressive stick use, and body checking (collisions) accounting for most of these.
- A participant can anticipate an injury after playing 7 to 100 hours of hockey, depending on his age, and most injuries are caused during the actual game rather than during practice.
- Although facial injuries are common, they are decreasing because of adequate use of helmets and masks. Conversely, cervical spine injuries are being reported more frequently.
- Injuries to the upper extremity include acromioclavicular joint dislocations, scaphoid fractures, and 'gamekeeper's thumb'.
- Injuries to the lower extremity predominantly involve soft tissue, with strains of the hip adductor, tears of the medial collateral ligament of the knee, and contusions of the thigh are common.



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32



Common Injuries found in the top 3 sports in Canada region:

## 2. Lacrosse

- The primary injury mechanism was by contact, either with another player, a stick or a ball.
- In women, body-to-body and stick-to-body, and no contact were the most common injury mechanisms.
- Most Injuries noted were Contusions, Rib and chest injuries and Shoulder injuries.



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33

Common Injuries found in the top 3 sports in Canada region:

## 3. Canadian Football (See NFL/American Football)

- Knee Injuries (ACL, PCL and MCL)
- Head Injuries: Highest incidence of concussion in world sports.
- Upper limb, Shoulder, hand and digital injuries in receivers.



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34

## REGION 8 - Australia

1. Swimming –
  - Due to the fair to hot weather, most cities located close to the coastlines and good recreational sporting infrastructures, this lends to most of the Australian population doing swimming and aquatics as regular basis and it is Australia's most popular sport.
  - Australia is rated the greatest Olympic achieving nation in aquatics at present.
2. Rugby.
3. Soccer.
4. Dancing.
5. Basketball.
6. Australian Football League (Auzzie rules).
7. Tennis.
8. Cricket.
  - Surprisingly as Australia has been ranked one of the top cricket playing nations with an influential contribution of the sport in both ICC and Test Cricket.
  - Australia hosts a continuous rivalry against England in the Ashes Series which is alternated between both nations.
9. Hockey.
10. Golf.



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35

## Common Injuries found in the top 3 sports in Australian region:

### 1. Swimming

- It has been reported that 90% of complaints by swimmers, of sufficient magnitude to seek a physician's advice, pertain to the shoulder.
- Problems with the hand and elbow occur less frequently and often can be attributed to causes other than swimming.
- Epidemiologic studies report prevalence rates of shoulder pain in swimmers ranging from 3% to 80%
- The pain varies in location about the shoulder, including anteriorly, anterolaterally, superiorly, posteriorly, and at the insertion of the deltoid. It has been estimated that the average collegiate swimmer performs more than 1 million strokes annually with each arm.
- It is generally agreed that this repetition or overuse is a major factor in the development of shoulder pain, and that because not all swimmers develop shoulder pain, the overuse must be combined with a second insult. These include supraspinatus avascular tendinitis, biceps avascular tendinosis, impingement syndrome, labral damage, instability secondary to ligamentous laxity, and instability secondary to muscle dysfunction.
- In swimmers, however, we believe that most shoulder pain is caused by instability stemming from demands that are specific to the sport of swimming.



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36

## Common Injuries found in the top 3 sports in Australian region:

### 2. Rugby Union

- Thigh haematomas were the most common injury for forwards and backs.
- ACL injuries for forwards.
- hamstring injuries affected backs more than forwards.
- Contact mechanisms accounted for 72% of injuries, but foul play was only implicated in 6% of injuries.
- The ruck and maul elements of the game caused most injuries to forwards,
- Being tackled caused most injuries to backs.
- Due to the High impact nature of the sport, Head and Neck injuries, Though not common via active prevention measures, do occur.



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37

## Common Injuries found in the top 3 sports in Australian region:

### 3. Soccer/Football

- The lower extremity was involved in 84%
- 66% traumatic
- 34% overuse injuries.
- Ankle sprains were most common 36%
- Contact injuries during tackling 45%
- More than half of the 20% knee injuries were caused by tackling.
- Players participating at high levels had only 30% of the injuries during tackling and 54% during running.



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38

## REGION 9 - South Africa

1. Football (Soccer)
2. Rugby
3. Cricket
4. Long Distance Running (Marathon and Ultramarathon)
5. Golf
6. Boxing
7. Powerlifting (IPF) and Weightlifting sports
8. Triathlon Sports, Iron Man and Olympic sprint events
9. Tennis and associated Racquet sports
10. Cycling



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39

## Common Injuries found in the top 3 sports in South African region:

### 1. Football/Soccer

- The lower extremity was involved in 84%
- 66% traumatic
- 34% overuse injuries.
- Ankle sprains were most common 36%
- Contact injuries during tackling 45%
- More than half of the 20% knee injuries were caused by tackling.
- Players participating at high levels had only 30% of the injuries during tackling and 54% during running.



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40

## Common Injuries found in the top 3 sports in South African region:

### 2. Rugby Union

- Thigh haematomas were the most common injury for forwards and backs.
- ACL injuries for forwards.
- hamstring injuries affected backs more than forwards.
- Contact mechanisms accounted for 72% of injuries, but foul play was only implicated in 6% of injuries.
- The ruck and maul elements of the game caused most injuries to forwards,
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41

## Common Injuries found in the top 3 sports in South African region:

### 3. Cricket

- Acute injuries are most common (64%-76%), followed by acute-on-chronic (16%-22.8%) and chronic ones (8%-22%).
- The most common modern-day cricket injury is hamstring strain, and the most severe is lumbar stress fracture in young fast bowlers.
- Concussion and severe contact injury does tend to happen to Batsmen when hit with the ball.
- Overuse injury does occur due to the nature and force from bowling.



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42



Amongst the 9 Regions, the following common sports were of most interest:

1. Football (FIFA) / Soccer
2. Rugby Union
3. Golf
4. Cricket
5. Baseball (MLB)
6. Equestrian Sports
7. Floorball
8. Football (NFL)
9. Basketball
10. Ice Hockey
11. Lacrosse
12. Swimming

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43

## CONCLUSIONS- SOCCER/FOOTBALL:

- Investigation of soccer injuries among 123 players participating at various competition levels was undertaken in a Danish soccer club.
- The injury incidence during games was highest at division level (18.5/1000 hours) and lowest at series level (11.9/1000 hours),
  - Lower extremity was involved in 84% of the injuries of which 34% of overuse injuries.
  - Ankle sprains were most common (36%) and equally found at all levels.
  - Contact injuries during tackling occurred most often in lower series and youths (45%).
  - Players participating at high levels had only 30% of the injuries during tackling and 54% during running.
  - More than half of the 20% knee injuries were caused by tackling.
  - Most serious injuries presented with a 65% RTP ratio in the same season and a 35% season ender.



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44

## CONCLUSIONS – RUGBY UNION<sub>1</sub>

- Large scale epidemiological study of match injuries sustained by professional rugby union players in order to define their incidence, nature, severity, and causes.
- **Methods:** A two season prospective design was used to study match injuries associated with 546 rugby union players at 12 English Premiership clubs.
- Team clinicians reported all match injuries on a weekly basis and provided details of the location, diagnosis, severity, and mechanism of each injury.
- Match exposures for individual players were recorded on a weekly basis. Loss of time from training and match play was used as the definition of an injury.



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45



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## CONCLUSIONS – RUGBY UNION<sub>2</sub>

- **Results:**
  - incidence of injury was 91 injuries/1000 player-hours
  - each injury resulted on average in 18 days lost time.
  - Recurrences, which accounted for 18% of injuries, were significantly more severe (27 days) than new injuries (16 days).
  - Thigh haematomas were the most common injury for forwards and backs (CB),
  - ACL injuries for forwards (NCB),
  - HS injuries for backs caused the greatest number of days absence (NCB).
  - Contact mechanisms accounted for 72% of injuries, but foul play was only implicated in 6% of injuries.
  - The ruck and maul elements of the game caused most injuries to forwards, and being tackled caused most injuries to backs.
  - The hooker (2) and outside centre (13) were the playing positions at greatest risk of injury.

46

## CONCLUSIONS – GOLF

- Over the years, golf has become an increasingly popular sport, attracting new players of almost all ages and socioeconomic groups.
  - Golf is practised by up to 10 to 20% of the overall adult population in many countries.
  - Beyond the enjoyment of the sport itself, the health-related benefits of the exercise involved in walking up to 10km and of relaxing in a pleasant natural environment are often reported to be the main motives for adhering to this activity by recreational golfers.
- Moderate risk activity for sports injury; however, excessive time spent golfing and technical deficiencies lead to overuse injuries.
- These are the 2 main causes of injuries among golfers, and each has specific differences in the pattern in which they occur in professional and amateur golfers.
- Golf injuries originate from:
  - overuse
  - traumatic origin
- Primarily affect the elbow, wrist, shoulder and the Thoraco-lumbar sites.



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47

## CONCLUSIONS – GOLF



- Professional and weekend golfers, although showing a similar overall anatomical distribution of injuries by body segment, tend to present differences in the ranking of injury occurrence by anatomical site;
  - these differences can be explained by their playing habits and the biomechanical characteristics of their golf swing.
- Many of these injuries can be prevented by a pre-season, and year-round, sport-specific conditioning programme including:
  - I. Muscular strengthening, flexibility and aerobic exercise components;
  - II. Short, practical, pre-game warm-up routine;
  - III. The adjustment of an individual's golf swing to meet their physical capacities and limitations through properly supervised golf lessons.
  - IV. The correct selection of golf equipment and an awareness of the environmental conditions and etiquette of golf can also contribute to making golf a safe and enjoyable lifetime activity.



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48



## CONCLUSIONS – CRICKET

- Cricket was one of the first sports to publish recommended methods for injury surveillance in 2005 from England, South Africa, Australia, the West Indies, and India (ICC).
- While the incidence of injuries is about the same, the prevalence of injuries has increased due to game format changes, increasing number of matches played, and decreased rest between matches.
- Bowling (41.3%), fielding, and wicket keeping (28.6%) account for most injuries.
- Acute injuries are most common (64%-76%), followed by acute-on-chronic (16%-22.8%) and chronic ones (8%-22%).
  - The most common modern-day cricket injury is hamstring strain,
  - The most severe is lumbar stress fracture in young fast bowlers.
  - Instances of bone injury to the hand, chest, face and head have been recorded due to injury from impact by the ball.



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49

## CONCLUSIONS – BASEBALL

- Rotator cuff and ligamentous capsule injuries are common in the young baseball player.
- It is important to understand shoulder mobility and stability as well as the biomechanics of throwing.
- This background information makes it easy to see how shoulder injuries are really part of a progressive continuum beginning with instability leading to subluxation, and later impingement which can result in a rotator cuff tear.
- Precise history taking and physical assessments are crucial in determining where a patient might be on the continuum.



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50

## CONCLUSIONS – BASEBALL

- Accurate evaluation places a patient in one of the following 4 groups:
  - Pure impingement,
  - Anterior instability due to trauma with secondary impingement,
  - Anterior stability due to a hyperelasticity with secondary impingement,
  - Pure anterior instability.
- A kinesiological repair is the initial treatment of choice. It is the best preventative or early treatment available, and includes a specific strengthening programme.
- If this fails (as in only 5 to 10% of the cases), an anatomical repair is instituted.
- There are 4 basic guidelines when doing this surgery:
  - Maintain muscle attachments and proprioceptive fibres;
  - Do not shorten the capsule significantly;
  - Build up the anterior labrum; and
  - Regain full range of motion quickly through abduction splinting and rehabilitation.
- A postoperative rehabilitation programme is then diligently adhered to (STAGE 4 REHAB)



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51



## CONCLUSIONS – BASEBALL

- Injuries involving the hip and groin are relatively common in baseball players.
- Our knowledge of the mechanics of overhead throwing continues to evolve, as does our understanding of the contribution of power from the lower extremities and core.
- It is paramount that the team physician be able to accurately diagnose and treat injuries involving the hip/groin, as they may lead to significant disability and inability to return to elite levels of play.
- This review focuses on hip- and groin-related injuries in the baseball player, including femoroacetabular impingement, core muscle injury, and osteitis pubis.



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52

## CONCLUSIONS – EQUESTRIAN SPORTS

- Equestrian sports represent a variety of activities involving a horse and rider.
- Due to the unpredictable nature of horses, their height, and potential high speeds involved, equestrian athletes are at risk of head and spinal injuries.
- Traumatic brain injuries, including concussions, are more common than spinal injuries.
  - Both injury types are most commonly related to a rider fall from a horse.
- Spinal injuries are less common but are associated with potentially significant neurological morbidity when spinal cord injury occurs.
- An improved understanding of preventable injury mechanisms, increased certified helmet use, improved helmet technologies, and educational outreach may help to address the risk of head and spinal injuries in equestrian sports.



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53

## CONCLUSIONS – EQUESTRIAN SPORTS

- Most equestrian-related injuries occur during schooling or noncompetitive riding.
- Large proportion of the injuries involve children and teenagers, 39% of horse-related injuries occurred in patients under the age of 19 yrs.
- In contrast to many other contact and high-risk sports, participants in equestrian activities are predominantly female, particularly at the recreational level.
- Horse-related injury is the eighth leading cause of emergency department presentation for sports and recreation-related injuries in females.
- While the rate of overall injury from riding is rather low ( $2 \cdot 1000 \text{ h}^{-1}$  riding) compared with other sports such as wrestling ( $10.7 \cdot 1000^{-1}$  exposures), football ( $6.1 \cdot 1000^{-1}$  exposures), and track and field ( $5.7 \cdot 1000 \text{ h}^{-1}$ ), the risk of severe injury from equestrian activities is considered to be higher than that for American football, motorcycle, and automobile racing.



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54

## CONCLUSIONS – EQUESTRIAN SPORTS

- Despite the high incidence of fractures reported in the literature, head injuries have been found to be the most common cause of prolonged hospitalizations and deaths due to horseback riding.
- In Australia, studies have reported an estimated mortality of 1 out of 10,000 riders, with 60% of these deaths from head injuries.



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55

## CONCLUSIONS – FLOORBALL

- Results:
  - The injury incidence was greater in female players during preseason (22.9 vs 7.4,  $P = 0.01$ ), game season (39.5 vs 28.3,  $P = 0.002$ ), as well as the whole year combined (33.9 vs 20.8,  $P = 0.02$ ).
  - The thigh was the most common injury location in male players and the ankle in female players. Overuse injuries were more common among men and were primarily back problems.
  - Traumatic injuries were more common in women—mainly knee and ankle injuries. Most injuries were of mild severity. A greater number of anterior cruciate ligament injuries occurred in women ( $n = 11$ ) than in men ( $n = 2$ ).
- Conclusion:
  - The injury incidence was significantly greater in female floorball players throughout the entire floorball year.
  - Male players sustained mostly overuse injuries while female players suffered traumatic injuries.
  - The majority of injuries in floorball were mild, irrespective of player sex.



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56

## CONCLUSIONS – NFL<sub>1</sub>



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- Knee injuries are among the most common musculoskeletal injuries in US football players. The literature includes little information about the role of player position and risk for knee injury.
- Knee injury in elite collegiate US football players is high and that type of injury varies by player position.
- 332 elite collegiate US football players at the 2005 National Football League Evaluated. 54% (178) of the players had a history of previous knee injury; current knee injuries totalled 233.
- All players underwent radiographic examinations, including plain x-rays and/or magnetic resonance imaging when necessary.
- All knee pathologic conditions and surgical procedures were recorded. Data were analyzed by player position to detect any trends.

57

## CONCLUSIONS – NFL



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- Eighty-six players (25.9%) had a total of 114 surgeries. The most common injuries were:
  - Medial collateral ligament injury (n = 79), meniscal injury (n = 51),
  - Anterior cruciate ligament (ACL) injury (n = 40).
- The most common surgeries were arthroscopic meniscectomy (n = 39), ACL reconstruction (n = 35), and arthroscopic meniscal repair (n = 13).
- A history of knee injury was most common in defensive linemen (68% of players), tight ends (57%), and offensive linemen (57%).
- Knee surgery was more commonly performed on running backs (36%) and linebackers (34%). There were no significant associations between type or frequency of specific injuries with regard to player position.
- Knee injuries are common injuries in elite collegiate football players, and one fourth of these players undergo surgical procedures. However, there were no statistically significant differences in type or frequency of injuries by player position.

58

## CONCLUSIONS – NFL3

- American football is a collision sport played by athletes at high speeds.
- Despite the padding and conditioning in these athletes, the shoulder is a vulnerable joint, and injuries to the shoulder girdle are common at all levels of competitive football.
- Some of the most common injuries in these athletes include
  - anterior and posterior glenohumeral instability,
  - acromioclavicular pathology (including separation, osteolysis, and osteoarthritis),
  - rotator cuff pathology (including contusions, partial thickness, and full thickness tears),
  - pectoralis major and minor tears.



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59

## CONCLUSIONS – NFL

- A total of 1385 injuries occurred to the hand, first ray, and fingers over the 10 seasons studied.
- Of these injuries, 48% involved the fingers, 30% involved the first ray, and 22% involved the hand, with game injuries more common than practice injuries at each location.
- Metacarpal fractures and proximal interphalangeal joint dislocations were the 2 most common injuries.
- Offensive and defensive linemen were the most likely to sustain a hand injury; 80% of hand injuries were metacarpal fractures.
  - The most common injuries to the first ray were fractures (48%) and sprains (36%), which occurred most often in athletes playing a defensive secondary position.
  - Finger injuries were most commonly dislocations at the level of the proximal interphalangeal joint, typically involving the ulnar 2 digits.
  - Finger injuries were most common in wide receivers and defensive secondary players. The act of tackling produced the most injuries (28%).



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60

## CONCLUSIONS – BASKETBALL



- A total of 1094 players appeared in the database 3843 times ( $3.3 \pm 2.6$  seasons).
  - Lateral ankle sprains were the most frequent orthopaedic injury (n, 1658; 13.2%),
  - followed by patellofemoral inflammation (n, 1493; 11.9%),
  - lumbar strains (n, 999; 7.9%), and
  - hamstring strains (n, 413; 3.3%).
- The most games missed were related to patellofemoral inflammation (n, 10 370; 17.5%), lateral ankle sprains (n, 5223; 8.8%), knee sprains (n, 4369; 7.4%), and lumbar strains (n, 3933; 6.6%).
- Conclusion:
  - Professional athletes in the NBA experience a high rate of game-related injuries.
  - Patellofemoral inflammation is the most significant problem in terms of days lost in competition, whereas ankle sprains are the most common injury.
  - True ligamentous injuries of the knee were surprisingly rare.
  - Importantly, player demographics were not correlated with injury rates.
- Further investigation is necessary regarding the consequences and sport-specific treatment of various injuries in NBA players.



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61

## CONCLUSIONS – ICE HOCKEY



- Injuries are related to direct trauma (80%) and overuse (20%), most commonly caused by:
  - High puck velocities,
  - Aggressive stick use,
  - Body checking (collisions)
- A participant can anticipate an injury after playing 7 to 100 hours of hockey, depending on age,
- Although facial injuries are common, they are decreasing because of adequate use of helmets and masks.
- Conversely, cervical spine injuries are being reported more frequently.
- Injuries to the upper extremity include;
  - acromioclavicular joint dislocations,
  - scaphoid fractures,
  - and 'gamekeeper's thumb'.
- Injuries to the lower extremity predominantly involve soft tissue, with strains of the hip adductor, tears of the medial collateral ligament of the knee, and contusions of the thigh.
- Scientific studies have reduced injury by providing improved protective equipment, stricter rules and their enforcement, and effective training and conditioning.



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62



## CONCLUSIONS – LACROSSE

- Previous research has found that the location, type and mechanisms of injuries in lacrosse players vary by gender.
- The patterns and risk factors of injuries in lacrosse players are still not well known.
- The study population consists of lacrosse players who utilised the accident medical insurance provided to US Lacrosse members. Cluster analysis was used to explore the aetiology of lacrosse-related injuries.
- Between 2002 and 2006 there were 593 game injuries,
  - 496 in men.
  - 97 in women.
- Play scenarios resulting in injury differed by the position played.
  - In males, the primary injury mechanism was by contact, either with another player, a stick or a ball.
  - In women, body-to-body and stick-to-body, and no contact were the most common injury mechanisms.
  - In both genders, the majority of injuries occurred during legal play.

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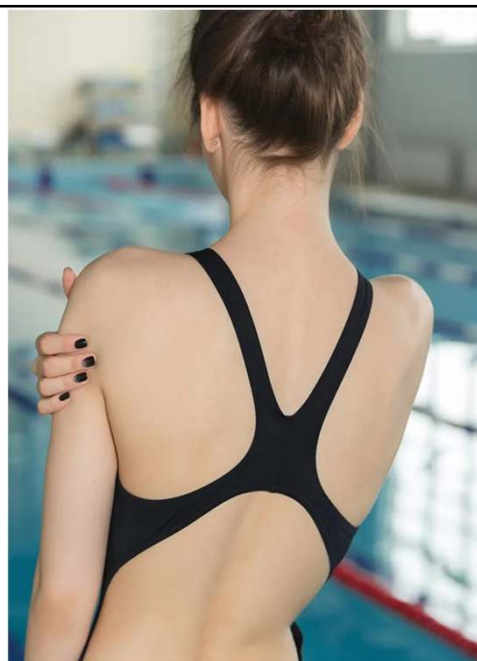
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63

## CONCLUSIONS – SWIMMING

- It has been reported that 90% of complaints by swimmers, of sufficient magnitude to seek a physician's advice, pertain to the shoulder.
  - Problems with the hand and elbow occur less frequently and often can be attributed to causes other than swimming.
- Epidemiologic studies report prevalence rates of shoulder pain in swimmers ranging from 3% to 80%
- The pain varies in location about the shoulder, including anteriorly, anterolaterally, superiorly, posteriorly, and at the insertion of the deltoid.
- It has been estimated that the average collegiate swimmer performs more than 1 million strokes annually with each arm.
  - It is generally agreed that this repetition or overuse is a major factor in the development of shoulder pain, and that because not all swimmers develop shoulder pain, the overuse must be combined with a second insult.



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64



## CONCLUSIONS – SWIMMING

These include:

- supraspinatus avascular tendinitis,
- biceps avascular tendinosis,
- impingement syndrome,
- labral damage,
- instability secondary to ligamentous laxity,
- and instability secondary to muscle dysfunction.



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65

## CONCLUSIONS – SWIMMING

- Given the varied and pervasive nature of shoulder pain in swimmers, it is unlikely that any one cause can adequately explain its prevalence.
- Shoulder pain in swimmers has multiple causes, including those mentioned above along with recognized causes of shoulder pain in the older population, such as;
  - rotator cuff tears,
  - calcific tendinitis,
  - adhesive capsulitis,
  - glenohumeral arthritis,
  - acromioclavicular arthritis,
  - scapulothoracic inflammation,
  - and cervical disease.



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66

## CONCLUSIONS – SWIMMING

- In swimmers, however, we believe that most shoulder pain is caused by instability stemming from demands that are specific to the sport of swimming.
- The inflammation can lead to swelling and scarring, which can result in further inflammation and perpetuation of symptoms.
- By understanding how these demands contribute to reduced stability of the shoulder, a rational plan can be formulated for treating and preventing swimmer's shoulder.



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69

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70

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71

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72