Health Services

Injury Prevention in Basketball
Background

**Anousith Bouaaphone**

Sports physiotherapy & Sports Medicine – private practice on the North Shore, Auckland

Auckland City Football Club

Blacksticks NZ Mens Hockey

NZ Breakers – Health & Conditioning Manager

Tall Blacks

BBNZ Health Services Manager
Objectives

• Reduce the incidence of basketball related injuries

• Make basketball a safe and attractive sport for participants

• Prolong participation and enjoyment in basketball with minimal injuries

• High Performance programme that benefits from increased numbers of athletes with low injury risk profile – Better athletes
### Accident Compensation Corporation (ACC) summary of claims

<table>
<thead>
<tr>
<th>Year</th>
<th>No. new</th>
<th>No. active</th>
<th>Active cost</th>
<th>Avg cost</th>
<th>No. new</th>
<th>No. active</th>
<th>Active cost</th>
<th>Avg cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>10,662</td>
<td>11,375</td>
<td>$6,089,507</td>
<td>$282</td>
<td>523</td>
<td>673</td>
<td>$3,201,385</td>
<td>$3,749</td>
</tr>
<tr>
<td>2011</td>
<td>10,825</td>
<td>11,507</td>
<td>$6,032,383</td>
<td>$275</td>
<td>532</td>
<td>628</td>
<td>$3,024,451</td>
<td>$3,776</td>
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<tr>
<td>2012</td>
<td>12,913</td>
<td>13,569</td>
<td>$7,346,249</td>
<td>$280</td>
<td>571</td>
<td>715</td>
<td>$3,729,897</td>
<td>$4,158</td>
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<tr>
<td>2013</td>
<td>15,407</td>
<td>16,318</td>
<td>$9,282,686</td>
<td>$294</td>
<td>659</td>
<td>814</td>
<td>$4,877,507</td>
<td>$4,558</td>
</tr>
<tr>
<td>2014</td>
<td>16,204</td>
<td>17,397</td>
<td>$10,226,762</td>
<td>$301</td>
<td>668</td>
<td>923</td>
<td>$5,509,656</td>
<td>$4,415</td>
</tr>
</tbody>
</table>

*entitlements

costs beyond treatment – loss of earnings, attendant care, support equipment, home modifications etc
• Total number of claims and costs have increased during the period 2010-2014

• Total cost of claims in 2014 was $10.2 million

• $5.5 million or 54% for entitlement claims

• 56% of claims were for participants aged from 10 – 19 years of age

• Male participants account for the majority of costs at approximately $7.7 million with a peak between 15-19 years of age of $2.2 million

• Soft tissue injuries accounted for 81% of active claims in 2014

• Knee and ankle injury accounts for 52% of all claim costs in 2014 at $5.3 million

• Nearly 50% of the claims were from injuries caused by a loss of balance or twisting movement.
• Basketball has a large participation base in NZ, which continues to grow reflecting the global popularity of the sport

• Increasing participation numbers, has seen an increase in the number of injuries

• Injuries inhibit participation, enjoyment, and longevity in basketball

• Injuries are costly
ACC SportSmart

- ACC SportSmart is an injury prevention framework that provides advice on improving sports performance by reducing the risk of injury.

- The development of the framework was a collaboration between experts in the field from New Zealand and Australia. The programme continues to be updated with the latest evidence based practices.

- The ACC SportSmart programme have been successfully adapted to sports specific injury prevention programmes e.g RugbySmart and NetballSmart
The ACC SportSmart principles

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<thead>
<tr>
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<tbody>
<tr>
<td><strong>1</strong></td>
<td><strong>2</strong></td>
<td><strong>3</strong></td>
</tr>
<tr>
<td><strong>Player profiling</strong></td>
<td><strong>Physical conditioning</strong></td>
<td><strong>Psychology</strong></td>
</tr>
<tr>
<td>Identifying an athlete’s existing physical and behavioural composition.</td>
<td>Preparing the body’s musculoskeletal and neural systems for sport.</td>
<td>The holistic preparation of an athlete’s mind for sport.</td>
</tr>
<tr>
<td><strong>4</strong></td>
<td><strong>5</strong></td>
<td><strong>6</strong></td>
</tr>
<tr>
<td><strong>Skill and technique</strong></td>
<td><strong>Food and fluid</strong></td>
<td><strong>Player wear</strong></td>
</tr>
<tr>
<td>Considering ways in which a specific sport skill is performed.</td>
<td>The importance of nutrition and food and fluid intake.</td>
<td>Preparing the body for sport through material and external items.</td>
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<tr>
<td><strong>7</strong></td>
<td><strong>8</strong></td>
<td><strong>9</strong></td>
</tr>
<tr>
<td><strong>Athlete environment</strong></td>
<td><strong>Injuries</strong></td>
<td><strong>Target populations</strong></td>
</tr>
<tr>
<td>The role a sport’s physical and social-behaviour environments play.</td>
<td>How to prevent, assess, manage and report injuries appropriately.</td>
<td>Accommodating athletes who need special consideration.</td>
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</tbody>
</table>
• ACC has indicated an interest to work with BBNZ to develop injury prevention strategies in basketball

• Injury rates in basketball will continue to grow significantly without a collaborative intervention from BBNZ and ACC

• BBNZ have attended several ACC collaboration group meetings with other NSOs

• BBNZ is developing an Injury Prevention in Basketball framework (Currently in its 1st draft)

• This framework outlines key injury causations in basketball, and how injury prevention strategies can be aligned with ACC (best practice)

• From this document it is hoped that an action plan can be developed and funding can be secured to deliver it to all of basketball

• BasketballSmart
Key Considerations

(a) Injury causations in basketball based on feedback from associations, and personnel involved in high performance teams.

(b) Countermeasures to the injury causations from ACC SportsSmart principles.

(c) The current BBNZ initiatives

(d) The final product (BasketballSmart) and strategies to help address the injury causations.

(e) How BasketballSmart can be delivered to all of Basketball and the resources that may be required.
### Injury Causations in Basketball

- Inadequate warm up specific to basketball. Lack of knowledge from coaches and players
- Lack of strength & conditioning specific to basketball. -power, endurance, agility, footwork

### ACC SportSmart Countermeasures

- Physical Conditioning - FIFA 11+

### BBNZ Current Initiatives

- Basketball warm up based on the principles of FIFA 11+.
- Pilot the basketball warm up with NZ U16 & U17 at their national camps in 2016

### Final Product (Basketball Smart)

- Warm up programme for all of basketball based on the validated FIFA 11+ programme. Using basketball imagery (video + stills).

### Delivery

- Basketball warm up package.
- Training ‘Coach trainers’ to deliver the package to BBNZ coach pathways
- Workshops for associations / regions
- Resources and collaterals out to schools and associations
- Accessible to public via online resources

- S&C guidelines and recommendations specific to basketball athletes to improve performance and limit injury risks

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<table>
<thead>
<tr>
<th>Injury Causations in Basketball</th>
<th>ACC SportSmart Countermeasures</th>
<th>BBNZ Current Initiatives</th>
<th>Final Product (Basketball Smart)</th>
<th>Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate warm up specific to basketball. Lack of knowledge from coaches and players</td>
<td>Physical Conditioning - FIFA 11+</td>
<td>Basketball warm up based on the principles of FIFA 11+. Pilot the basketball warm up with NZ U16 &amp; U17 at their national camps in 2016</td>
<td>Warm up programme for all of basketball based on the validated FIFA 11+ programme. Using basketball imagery (video + stills).</td>
<td>Basketball warm up package. Training ‘Coach trainers’ to deliver the package to BBNZ coach pathways Workshops for associations / regions Resources and collaterals out to schools and associations Accessible to public via online resources</td>
</tr>
<tr>
<td>Lack of strength &amp; conditioning specific to basketball. -power, endurance, agility, footwork</td>
<td>Physical Conditioning Skill and Technique</td>
<td>Basketball specific S&amp;C guidelines and recommendations Pilot programmes with NZ U16 &amp; U17</td>
<td>S&amp;C guidelines and recommendations specific to basketball athletes to improve performance and limit injury risks</td>
<td>- coaches manual - workshops to associations / regions - online resources (video tutorials and clips)</td>
</tr>
</tbody>
</table>
| Poor movement patterns | • Skill and Technique  
Jumping, landing, turning, cutting, acceleration, deceleration, rebounding, boxing out, screening, in air contact, posting up, slides | ✓ Education seminars and workshops with NZ U16 & 17 teams  
✓ Practical sessions with S&C coach | -Guidelines for assessing and improving movement patterns in basketball athletes.  
-Player profiling tools to identify at risk athletes (Movement Competency assessment tool) | Guidelines presented with access to resources for  
-coaches  
-S&C personnel  
-health / medical personnel  
-parents  
-athletes |
| --- | --- | --- | --- | --- |
| Knee injuries in female basketball athletes | • Target Population  
• Skill and Technique  
• Physical Conditioning | ✓ Workshop on correct movement patterns, technique and conditioning principles at NZ U16 girls camps | -Guidelines for preventing knee injuries in the target population  
-Player profiling tools to identify at risk athletes (Movement Competency assessment tool) | - education materials for schools and associations  
-regional injury prevention trainers to deliver |
### Knee injuries in female basketball athletes

- **Target Population**
- **Skill and Technique**
- **Physical Conditioning**

- Workshop on correct movement patterns, technique and conditioning principles at NZ U16 girls camps

- Guidelines for preventing knee injuries in the target population
  - Player profiling tools to identify at risk athletes (Movement Competency assessment tool)

- Education materials for schools and associations
  - Regional injury prevention trainers to deliver

### Over training in young athletes (13-18 years old)

- **Athlete Environment**
- **Psychology**
- **Target Population**

- Some HP coaches at age group level require players to complete training diaries to monitor workload and training programmes.

- Develop recommendations & guidelines for load management.
  - Training diary template for Basketball Smart
  - Educate coaches, parents, athletes on managing load and over training
  - Changing attitudes to over training in adolescent athletes

- Coach education
  - Coaching manuals
  - Online resources for parents and athletes
| Poor injury management. Lack of rehabilitation and return to sport knowledge | Injuries  
- Player Profiling  
- Physical conditioning | Education seminars and workshops with NZ U16 & 17 teams  
Education resources sent to coaches, athletes, parents | Injury management guidelines.  
- Understanding and rehabbing common basketball injuries (ankles, knees, backs, fingers etc)  
- Injury reporting for high performance team  
- National network of BBNZ endorsed health providers | Online resources  
- Printed resources  
- Injury reporting system for high performance teams. (National database)  
- BBNZ endorsed providers |
| --- | --- | --- | --- | --- |
| Lack of protective equipment | Player Wear | Education seminars and workshops with NZ U16 & 17 teams  
- Ankle braces  
- Footwear  
- Compression  
Sponsorship from McDavid to provide protective braces for national mens and womens team | Guidelines for use of protective equipment in basketball | Online resources  
- Supplier agreements for purchase of protective gear |
<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategory</th>
<th>Action</th>
<th>Example</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental Injuries</td>
<td>Player Wear</td>
<td>BBNZ mouthguard policy</td>
<td>- compulsory for all 19 years and under players participating in competitions, leagues, tournaments run by BBNZ</td>
<td>- Recommendations on appropriate mouthguards - Subsidised mouthguards through relationships with dental providers - Schools to adopt mouthguard policy</td>
</tr>
<tr>
<td></td>
<td>Injuries</td>
<td></td>
<td></td>
<td>- Resources on selecting appropriate mouthguards - mouthguard policy to be enforced by officials at BBNZ tournaments - mouthguard policy adopted and enforced by schools</td>
</tr>
<tr>
<td>Head Injuries (concussion)</td>
<td>Injuries</td>
<td>nil</td>
<td></td>
<td>- BBNZ concussion policy - Referee with power to bench a suspected concussion for sideline assessment - Sideline assessment tools / education for coaches &amp; Parents</td>
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<td></td>
<td>- ACC/BBNZ resources on recognising and managing head injuries - content in coach education pathways - content in referee education pathways</td>
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<tr>
<td>Nutrition</td>
<td>Food and Fluid</td>
<td>Education seminars and workshops with NZ U16 &amp; 17 teams</td>
<td></td>
<td>- Contract a nutritionist to help develop nutrition guidelines for basketball athletes - Nutritionist input in all HP programmes</td>
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<td>- Seek assistance from Sport NZ / HPSNZ - ACC resourcing as part of Basketball Smart product</td>
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</tbody>
</table>

**BBNZ** - Basketball New Zealand

**HP** - High Performance