A Sports Medicine Approach to Decision Making in Sports Participation for People With Haemophilia – Not Everybody Likes Swimming!

Gold medal for guts: As a little boy, Alex's haemophilia meant even a cuddle left him covered in bruises. Now he's a cycling champ

- Alex Dowsett won a gold medal at the Glasgow Commonwealth Games in 2014
- The cyclist, 26, couldn't take part in sport as a child as it was too 'dangerous'

New York City Marathon: a challenge for hemophilic patient

Colorado mountaineer Chris Bombardier becomes first hemophiliac to summit Mount Everest

Bombardier: "Standing on the top of the world was a surreal experience"
Benefits of Physical Activity

Participation in athletic activities is extremely important in maintaining a healthy lifestyle and preventing numerous adverse health outcomes.

- Cardiovascular Disease
- Obesity
- Type 2 Diabetes
- Osteoporosis
- Mental Health Conditions

(Howell 2017; Manco-Johnson 2012)

Various guidelines are available to assist in decision making regarding sports participation for people with haemophilia (PWH). These are often based upon perceived risk.

- The probability of contact or collision
- The frequency of recorded injury
- The incidence of injury
- The potential for catastrophic injury
American Pediatric Society Committee on Sports Medicine and Fitness

Classification of sports based upon the likelihood of contact

<table>
<thead>
<tr>
<th>Sport</th>
<th>Contact or collision</th>
<th>Limited contact</th>
<th>Non-contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basketball</td>
<td>Baseball</td>
<td>Archery</td>
<td>Golf</td>
</tr>
<tr>
<td>Boxing</td>
<td>Bicycling</td>
<td>Badminton</td>
<td>Orienteering</td>
</tr>
<tr>
<td>Diving</td>
<td>Cheerleading</td>
<td>Body building</td>
<td>Power lifting</td>
</tr>
<tr>
<td>Field hockey</td>
<td>Canoeing or kayaking</td>
<td>Bowling</td>
<td>Race walking</td>
</tr>
<tr>
<td>Football: tackle</td>
<td>Fencing</td>
<td>Crew and rowing</td>
<td>Riffery</td>
</tr>
<tr>
<td>Ice hockey</td>
<td>Field events: high jump, pole vault</td>
<td>Curling</td>
<td>Golf</td>
</tr>
<tr>
<td>Lacrosse</td>
<td>Floor hockey</td>
<td>Dancing</td>
<td>Orienteering</td>
</tr>
<tr>
<td>Martial arts</td>
<td>Football: flag football</td>
<td>Field events: discus, javelin, shot put</td>
<td>Power lifting</td>
</tr>
<tr>
<td>Rodeo</td>
<td>Gymnastics</td>
<td>Field events: discus, javelin, shot put</td>
<td>Power lifting</td>
</tr>
<tr>
<td>Rugby</td>
<td>Handball</td>
<td>Golf</td>
<td>Riffery</td>
</tr>
<tr>
<td>Ski-jumping</td>
<td>Horseback riding</td>
<td>Orienteering</td>
<td>Riffery</td>
</tr>
<tr>
<td>Soccer</td>
<td>Racquetball</td>
<td>Power lifting</td>
<td>Riffery</td>
</tr>
<tr>
<td>Team handball</td>
<td>Skiing: ice, in-line, roller</td>
<td>Race walking</td>
<td>Riffery</td>
</tr>
<tr>
<td>Water polo</td>
<td>Skiing: cross-country, water, downhill</td>
<td>Rope walking</td>
<td>Riffery</td>
</tr>
<tr>
<td>Wrestling</td>
<td>Skateboarding</td>
<td>Running</td>
<td>Riffery</td>
</tr>
<tr>
<td></td>
<td>Snowboarding</td>
<td>Sailing</td>
<td>Riffery</td>
</tr>
<tr>
<td></td>
<td>Softball</td>
<td>Scuba diving</td>
<td>Riffery</td>
</tr>
<tr>
<td></td>
<td>Squash</td>
<td>Swimming</td>
<td>Riffery</td>
</tr>
<tr>
<td></td>
<td>Ultimate frisbee</td>
<td>Table tennis</td>
<td>Riffery</td>
</tr>
<tr>
<td></td>
<td>Volleyball</td>
<td>Tennis</td>
<td>Riffery</td>
</tr>
<tr>
<td></td>
<td>Windsurfing or surfing</td>
<td>Track</td>
<td>Weight lifting</td>
</tr>
</tbody>
</table>
A 5 point rating of sports / activities based upon perceived risk with 1 being safe and 3 dangerous.

(Anderson, 2005)
Are we being too simplistic?
Lessons from Sports Medicine

Sports Medicine Personnel are continually making ‘Return To Play’ Decisions with athletes

• Best Research Evidence
• Clinical Expertise
• Athlete Values and Circumstances

(Manske, 2012)
The Strategic Assessment of Risk and Risk Tolerance (StARRT) framework for return-to-play (RTP) decisions

(Shrier, 2015)
Modification for People With Haemophilia
The Strategic Assessment of Risk and Risk Tolerance (StARRT) framework for return-to-play (RTP) decisions, guiding participation in sport.
Step 1 of Risk Assessment - Assessment of Health Risk

- Presence of Inhibitors
- Bleeding History
- Joint Status
- Prophylaxis Regime
- Level of Physical Fitness
- Additional Medical Issues
- Geographical Location From HTC
- Compliance with Medical Regime
Step 2: Assessment of Activity Risk (Patient, HTC Team, Coach, Parent)

- Type of Sport
- Position Played
- Competitive Level
- Training Requirements / Workload
- Protective Equipment
- Rule Modifications
Risk Tolerance Modifiers – ‘Decision Modifiers’

- Implication of Injury / Potential Seriousness
- Psychological Wellbeing
- Socioeconomic Factors
Applying The Framework

Only if the risk assessment exceeds the risk tolerance then the activity should be avoided (consider short and long term outcomes and the potential for serious injury – eg head bleed)

There is no ‘one size fits all’ – Individualisation is the key.

Discuss your plans with your HTC team –
  ◦ Are there factors that can be manipulated to further reduce the risk?
    ◦ Timing of Prophylaxis (Broderick, 2012)
    ◦ Compliance / Adherence
    ◦ Individual training program
  ◦ Coach education
  ◦ Athlete education

Step 1 of Risk Assessment - Assessment of Health Risk

Factor Level

Presence of Inhibitors
- Inhibitors never detected

Bleeding History
- 2 ankle bleeds, 1 quadriceps bleed

Joint Status
- HJHS 2 (Crepitus Knees)

Prophylaxis Regime
- Twice / week

Level of Physical Fitness
- Poor

Additional Medical Issues
- High BMI

Geographical Location From HTC
- Metropolitan (<15km to HTC)

Compliance with Medical Regime
- Occasionally skips doses
Step 2: Assessment of Activity Risk (Patient, HTC Team, Coach, Parent)

<table>
<thead>
<tr>
<th>Type of Sport</th>
<th>Water Polo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position Played</td>
<td>Field Player</td>
</tr>
<tr>
<td>Competitive Level</td>
<td>Junior Competitive</td>
</tr>
<tr>
<td>Training Requirements / Workload</td>
<td>2 trainings / week plus 2 swim sessions plus 1 game</td>
</tr>
<tr>
<td>Protective Equipment</td>
<td>Compulsory mouthguards</td>
</tr>
<tr>
<td>Rule Modifications</td>
<td>Nil</td>
</tr>
</tbody>
</table>
Water Polo – safest sport alongside walking, cross country skiing, golf and ergometer.
The Epidemiology of Sports Related Head Injury and Concussion in Water Polo
(Blumenfeld, 2016)

• Postal survey sent to all 44,000 members of US Water Polo. 36% of respondents (540) reported a concussion. Frequency of concussion varied with age, level, field position with most frequently injured the goalkeeper being hit by the ball.

Sports Injury and Illness Incidence in the Rio de Janeiro 2016 Olympic Summer Games: A Prospective Study of 11,274 athletes from 207 countries
(Soligard, 2017)

• 5th highest injury incidence of all sports.

Shoulder Injury in Water Polo: A Systematic Review of Incidence and Intrinsic Risk Factors
(Miller, 2017)

• Reported injury rates 24-51% - predominantly overuse injuries
• Risk multifactorial including training loads / volumes, scapula kinematics, proprioception and strength
Water Polo Case Study

Allow To Play Under the Following Conditions

- Review prophylaxis regime – timing and frequency
- Ensure adherence with prophylaxis
- Avoid playing as goalkeeper
- In conjunction with coaching / management team develop an emergency medical plan in case of injury
- Discuss medical condition with team mates
- Commence a graduated training program prior to season commencing
- Monitor load during training
Take Home Message

• Understand the nature of the activity you wish to undertake.
• Discuss the activity with your Haemophilia Treatment Centre
• Develop and implement a plan.
References


Blumenfeld RS, Winsell JC, Hicks JW et al The epidemiology of sports-related head injury and concussion in water polo. Front Neurology 2016; 24(7)96


Manco-Johnson MJ, Collision sports and risk of bleeding in children with haemophilia, JAMA 2012;308(14):1480-1481
References (Cont)


Shrier I, Strategic assessment of risk and risk tolerance (StARRT) framework for return-to-play decision-making. BJSM. 2015;39: 1311-1315

Thank You

For every child who has been told no due to their bleeding disorder.
For every patient wondering when his next dose of life-saving clotting factor will be.
For every family who has plans derailed by hemophilia.
For every parent who goes to bed in agony not understanding how to treat their child’s disorder.
For every hemophiliac athlete who waits in quiet hesitation out of fear of injury.
For all of us overcoming the impossible.

This mountain is for you.

(Bombardier, 2017)