In the office / clinical space:

The million dollar question...
In the office / clinical space:

When can I play?
Strategies for Return to Play

David L. Marshall, MD
Medical Director, Sports Medicine
Questions Raised

• What is a concussion?
• How common are they?
• What happens inside the brain with concussion?  
  – Structural injury? Inflammation? Bleeding?
• How do I know? What do I / we do?
• When can he/she return to school?
• What about headaches at school?
Questions Raised

• When is it safe to return to play?

• Can we predict who? Genetics? Biomarkers?

• How many is too many?

• Do subclinical blows matter?

• Can concussions be prevented?
  – Helmets, mouthguards, headbands, neck strengthening, rule changes, etc?
Return to Play (RTP)

• No same day return to play in kids!!!
  (10 – 38% still do)

• Must be individualized as recovery rates differ from kid to kid

• Graduated, stepwise approach

• Similar to return to school progression
<table>
<thead>
<tr>
<th>Stage</th>
<th>Activity</th>
<th>Sport specific exercise</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No physical activity</td>
<td>none</td>
<td>Recovery and elimination of symptoms</td>
</tr>
<tr>
<td>2</td>
<td>Light aerobic activity</td>
<td>Walk, stationary bike,</td>
<td>Increase heart rate</td>
</tr>
<tr>
<td>3</td>
<td>Moderate activity</td>
<td>Jogging, slow change in speed and direction</td>
<td>Increase aerobic activity</td>
</tr>
<tr>
<td>4</td>
<td>Non contact sports specific drills</td>
<td>Dribbling, passing, catching, jumping, tracking objects</td>
<td>Maximize aerobic activity, introduce sport activity, thinking</td>
</tr>
<tr>
<td>5</td>
<td>Limited contact</td>
<td>Sleds, pads, 1v1 Controlled setting</td>
<td>Add deceleration, rotation movements,</td>
</tr>
<tr>
<td>6</td>
<td>Full practice</td>
<td>Resume training activities</td>
<td>Frequent assessments, restore confidence</td>
</tr>
<tr>
<td>7</td>
<td>Return to play</td>
<td>Normal game play</td>
<td>Frequent assessments</td>
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### Return to Play

**Return to physical activity following concussion**

#### Football

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<th>Football-specific exercises</th>
<th>Objective of stage</th>
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<tr>
<td>4</td>
<td>No contact football drills</td>
<td>-</td>
<td>Monitor for symptoms return</td>
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<tr>
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#### Lacrosse (Boys)

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**Activities:**
- Baseball/softball
- Basketball
- Cheerleading
- Football
- Gymnastics
- Ice hockey
- Lacrosse boys
- Lacrosse girls
- Soccer
- Swimming
- Wrestling
# Return to physical activity following concussion

## Lacrosse (Boys)

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| 1     | • No physical activity  
       | • Complete physical and cognitive rest | • No activity | • Recovery and elimination of symptoms |
| 2     | • Light aerobic activity | 10 to 15 minutes of walking at home or at field, or stationary bike | • Add light aerobic activity and monitor for symptom return |
| 3     | • Moderate aerobic activity  
       | • Light resistance training | 20 to 30 minutes of jogging with helmet and gloves  
       | • Light weight lifting (one set of 10 reps) | • Increase aerobic activity and monitor for symptom return |
| 4     | • Noncontact lacrosse-specific drills |  
       | • Cradling, catching, scooping, fielding ground balls, shooting, change of direction, give and go, waterfall drill, hamster drill, pinwheel drill, eagle eye drill  
       | • Start with helmet and gloves, progress to full pads if symptom-free | • Maximize aerobic activity  
       | • Accelerate to full speed with change of directions (cuts)  
       | • Introduce rotational head movements | • Monitor for symptoms |
| 5     | • Limited contact lacrosse drills | • Riding after the shot, riding off the end line, pick and roll, 1 v 1 scramble, 3 v 2, 3 v 4  
       | • Full pads | • Maximize aerobic activity  
       | • Add deceleration/rotational forces in controlled setting  
       | • Monitor for symptoms |
| 6     | • Full practice  
       | (after medical clearance) | • Normal training activities | • Frequent assessments throughout the practice  
       | • Assess frequently during line changes  
       | • Monitor for symptoms |
| 7     | Return to play | • Normal game play | • Assess frequently  
       | • Monitor for symptoms |

May begin Stage 2 when symptoms are markedly diminished, and can tolerate a partial school day.

May begin Stage 3 when a full school day is tolerated.

May progress to the next stage every 24 hours as long as symptoms do not worsen.

[choa.org/concussion](http://choa.org/concussion)
Stage 1

- Lots of symptoms
- Usually 1-3 days

Goal: Get back in school and improve symptoms
Stage 2

- As symptoms improve, add light aerobic activity that does not worsen symptoms
  - Walking, stationary bike

Goal: Increase HR to 30-40% max
(max HR is 220-age)
Stage 3

- Moderate aerobic activity
  - 20-30 min jogging
  - Light weight or resistance training
  - Slowly change speed and direction
  - Dribble, throw/catch ball

Goal: Increase HR to 40-60% max

  Add resistance, vestibular stress
  Track moving objects
Stage 4

• Should be symptom free and tolerating full school day with minimal accommodations

• Intense aerobic activity/supervised play
  – 40-60 min running, accelerate to full speed
  – Increase resistance training
  – Non contact sport-specific drills
  – Pre-competition warm-up
  – No head contact

Goal: Increase HR 60-80% max, mimic the sport
Stage 5

• Symptom free, no academic accommodations

• Controlled contact / training drills
  – Normal practice session
  – Limited contact if part of the sport
  – Frequent assessments

Goal: 60-90 max HR
  Mimic sport without risk or re-injury
Stage 6

- Full school day
- Normal training activities
  - Frequent assessments

Goal: Resume full training activity without restriction
    Restore confidence
Stage 7

• Clear for game play
  – Must be in writing by qualified medical professional trained in concussions
  – Frequent assessments
Return to Play (RTP) Summary

• Allow **at least** 24 hours per stage
  – If symptoms worsen, wait 24 hours and resume at the previous stage

• Ok to start light activity (stage 2) even with minimal symptoms

• Symptom free for stage 3-4

• If RTL and RTP overlap, RTL takes precedence