Concussion in road cycling

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  • Clinical Lecturer
  • Team Physician, Team Ineos
Sports-related concussion (SRC)

- SRC gaining wider public recognition
- Decock, BJSM – 7.8 - 9.1% of all injuries reported
- Road cycling - no sport-specific SRC diagnosis and management protocols
- High-profile cases of professional road cyclists who likely suffered SRC in a race but continued to participate
  - Particularly highlighted the lack of a roadside screening (“go/no go”) assessment protocol
- Propose a Roadside heaD injury AssEssment (RIDE) protocol, consistent with other sports
Tom Skujins Tour of California 2017 - crash
PRACTICAL CONSIDERATIONS IN ROAD CYCLING....
ROMAIN BARDET, STAGE 13 - CRASH - TOUR DE FRANCE, 2020
WHAT’S THE EVIDENCE BASE FOR CONCUSSION IN ROAD CYCLING?

Sports-related concussion (SRC) assessment in road cycling: a systematic review and call to action

What are the new findings

▸ This is the first systematic review of SRC assessment within road cycling.
▸ Only two articles were identified for the systematic review, highlighting the lack of studies and evidence addressing SRC within road cycling.
▸ We call on the Union Cycliste Internationale to hold a consensus meeting with road cycling medical teams to develop the SCAT-5 for use in road cycling, including an appropriate return-to-play protocol.
SPORTS-RELATED CONCUSSION (SRC) IN ROAD CYCLING: THE ROADSIDE HEAD INJURY ASSESSMENT (RIDE) FOR ELITE ROAD CYCLING
Evaluation

• Serial clinical evaluations by a health professional
• Within a three-stage process
  • RIDE 1 - Assess the cyclist immediately road-side after the head impact event;
  • RIDE 2 - Re-assess the cyclist immediately after the race is complete on the same day of the injury;
  • RIDE 3 - Re-assess the cyclist the day following the initial injury.
CYCLING ROADSIDE HEAD INJURY ASSESSMENT (RIDE) PROTOCOL

Head Impact Event
- Head impact event observed by key team staff, team doctor or race doctor
  - Head impact event with the potential for concussion
  - Head impact event with the potential for concussion (high-risk features)

RIDE 1
- Road-side assessment including symptom checklist, medical evaluation and cognitive tests performed by team doctor
  - Normal
    - Concussion not suspected, return to play
  - Abnormal
    - Suspected concussion, removal from play
    - RIDE 1 immediate and permanent removal criteria (high-risk features) indicate confirmed concussion

RIDE 2
- RIDE 2: immediately after stage
  - Clinical assessment using formatted SCATS tool, neuro-cognitive tools such as Digit Symbol Substitution Testing and conducting a full neurological examination
  - Abnormal result confirms early diagnosis of concussion supported by clinical opinion

RIDE 3
- RIDE 3: after one night's rest
  - Clinical assessment using formatted SCATS tool, neuro-cognitive tools such as Digit Symbol Substitution Testing and conducting a full neurological examination
  - Abnormal result confirms later diagnosis of concussion supported by clinical opinion

Shift to Return to Riding Protocol
Failed RIDE 1
Failed RIDE 2
Failed RIDE 3
Post-race presentation with symptoms suggestive of concussion
RIDE 1

The three components of RIDE 1 are:

• Presence/absence of 12 Immediate and Permanent Removal features;
• Presence/absence of 11 high risk features;
• A standardised road side screening assessment performed by the race and/or team doctor including:
  — symptom checklist,
  — medical evaluation,
  — balance assessment and
  — cognitive tests;
• Clinical evaluation/discussion by the race doctor and/or team doctor.
<table>
<thead>
<tr>
<th>Removal Features</th>
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<tbody>
<tr>
<td>- Convulsion</td>
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<tr>
<td>- Tonic posturing</td>
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<tr>
<td>- Suspected loss of consciousness</td>
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<tr>
<td>- Confirmed loss of consciousness</td>
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<tr>
<td>- Clearly dazed</td>
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<tr>
<td>- Ataxia</td>
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<tr>
<td>- Oculomotor signs</td>
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<tr>
<td>- Rider not orientated in TPP/fails</td>
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<tr>
<td>orientation questions</td>
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<tr>
<td>- Definite confusion</td>
</tr>
<tr>
<td>- Definite behaviour change</td>
</tr>
<tr>
<td>- Identification of any sign or symptom</td>
</tr>
<tr>
<td>of concussion</td>
</tr>
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<td>- High risk features</td>
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</table>
Withdraw for medical evaluation with full spinal precautions (c-spine cannot be cleared)
After a crash with the potential to result in head/C-spine injury, follow the standard principles of ABCDE structured trauma assessment and specifically assess the following:

Is the rider alert and talking spontaneously? (i.e., A on the AVPU scale)

- No: Withdraw for medical evaluation with full spinal precautions (c-spine cannot be cleared)
- Yes: Determine if concussion is a possibility and remove rider from race for a more detailed assessment

Are there any ‘Immediate and Permanent’ Removal Features?

- No: Complete RIDE 1
- Yes: 1) Withdraw from race 2) Refer to ‘Return to Riding’ guidelines
RIDE 1

Immediate and Permanent
Removal Features

Conclusion
RIDE 2 and 3

As soon as possible once the rider has finished the race, stage:

- Complete full neuropsychological testing (SCAT5 and DSST)
- Monitor (All tests within 24h)
- Investigate if indicated: Monitored mandatory recall

RIDE 2

SCAT5a and DSST:
- Baseline SCAT5 and DSST must be administered before the race and the next day.
- Any change in performance is shown by the Neuropsychological Tests.
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- All participants who complete the race will have a follow-up test the following morning.

RIDE 3

Following morning, prior to start of next stage:

- Complete full neuropsychological testing (SCAT5 and DSST)
- Monitor (All tests within 24h)
- Investigate if indicated: Monitored mandatory recall

Alert to race: Mandatory throughout ride.

Contradictory to the previous instruction: Withdraw from race if not fit to ride

Refer to ‘return to race’ guidelines.
Diagnosing SRC

• The RIDE protocol - SRC diagnosis is made immediately on identification of any of the 12 Immediate and Permanent Removal features following a head impact event.

• In the absence of any of the 12 Immediate and Permanent Removal features, SRC diagnosis cannot be excluded until both RIDE 2 and RIDE 3 assessments are completed and deemed to be normal.
## Return to Riding Guidelines

A rider with a diagnosis of concussion will not return to riding until the return to ride protocol has been completed.

### Rest the body and brain
- Riders should avoid physical and cognitive activities whilst their concussion improves.
  - This includes not exercising, reading, watching TV, driving or playing video games.
  - Alcohol should also not be consumed during this time.
- Rest is the cornerstone of concussion treatment, and strictly adhering to the rest period can significantly reduce recovery time.

All riders will follow the below staged return to training and racing. Rider should update their Doctor and Coach daily on their progress.

<table>
<thead>
<tr>
<th>Stage 1</th>
<th>Stage 1B</th>
<th>Stage 2</th>
<th>Stage 3</th>
<th>Stage 4</th>
<th>Stage 5</th>
<th>Stage 6</th>
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<tr>
<td>Rest Period</td>
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<td>Light exercise</td>
<td>Moderate Exercise</td>
<td>Back on the road</td>
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- Complete body and brain rest
  - Activities of daily living below symptom-provoking level
- Gentle ride on turbo trainer
- Increase intensity on turbo trainer
- Can do a short road ride (not in group)
- Return to normal training schedule
- Can return to race schedule

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<th>Minimum of 24 hours/day</th>
<th>Do not exceed 70%</th>
<th>Do not exceed 80%</th>
<th>Do not exceed 90%</th>
<th>No restriction</th>
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<td>Minimum of 10 mins</td>
<td>Do not exceed</td>
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<td>Each stage should last a minimum of 3 days</td>
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Rider should not progress to next stage until asymptomatic at current stage.
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<td></td>
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Each Stage should last a minimum of 24 hours. Rider should not progress to next stage until asymptomatic at current stage.
Practical Considerations for implementing the RIDE - UCI

- Who should perform the in-race RIDE1 and post-race RIDE 2 assessments?
- Multiple casualties?
- Time needed for the RIDE 1 assessment during the race and impact on individuals result/performance?
- Consistent application of RIDE across the road cycling geographical and medical landscapes
  - Challenge - language barriers
- Appropriate education programme for riders, management, race and team medical staff
  - Learn from rugby
- Briefing of the media and viewing public
- Baseline testing?
- UCI monitor the application of the RIDE to avoid any potential abuses of the system
- Role of non-medics
  - E.g. neutral service
- Other cycling disciplines?
Conclusion

• Recognise this is a ‘first step’ in this process of establishing a SRC protocol
• Encourage discussion and debate with the sporting community involved in road cycling and other sports
  • Experts in SRC management in other sports
• Encourage leadership from UCI
• Invitation to participate in SCAT guidelines…..
• RIDE protocol will be refined and updated with analysis of use and as new evidence emerges.