

When is an athlete psychologically ready to return to sport following concussion?

Jacque van Ierssel PT, PhD

Postdoctoral Fellow

Children's Hospital of Eastern Ontario Research Institute

Concussion in Sport Symposium (SIRC)

March 1, 2023



Hopes for today...

- ✓ Expand the idea of what it means to be ready to return to sport
- ✓ Starting point to advance clinical decision-making and research priorities

Bone Shaker...



Photo credit: Rob Jones/www.canadiancyclist.com

Brain Shaker?

Return to Sport

This tool is a guideline for managing an individual's return to sport following a concussion and does not replace medical advice. Timelines and activities may vary by direction of a health care professional.

STAGE 1:	STAGE 2:	STAGE 3:	STAGE 4:	STAGE 5:	STAGE 6:
No sporting activity Physical and cognitive rest until symptoms start to improve OR after resting for 2 days max.	Light aerobic exercise Walking, swimming, stationary cycling. No resistance training. The pace of these activities should be at the point where you are still able to have a conversation.	Sport-specific exercise Skating drills (ice hockey), running drills (soccer). No head-impact activities.	Non-contact drills Progress to complex training drills (e.g. passing drills). May start resistance training.	Full-contact practice Following medical clearance participate in normal training activities.	Back in the game Normal game play
Recovery	Increase heart rate	Add movement	Exercise, coordination, cognitive load	Confidence	
Symptoms improve or 2 days rest max? Yes: Move to stage 2 No: Continue resting Time & Date completed: _____	No new or worsening symptoms for 24 hours? Yes: Move to stage 3 No: Return to stage 1 Time & Date completed: _____	No new or worsening symptoms for 24 hours? Yes: Move to stage 4 No: Return to stage 2 Time & Date completed: _____	Symptom-free for 24 hours? Yes: Move to stage 5 No: Return to stage 3 Time & Date completed: _____	Symptom-free for 24 hours? Yes: Move to stage 6 No: Return to stage 4 Time & Date completed: _____	Note: Premature return to contact sports (full practice and game play) may cause a significant setback in recovery.

If new or worsening symptoms are experienced at any stage, go back to the previous stage for at least 24 hours. You may need to move back a stage more than once during the recovery process.

Medical clearance required before moving to stage 5

BOTH TOOLS CAN BE USED IN PARALLEL; HOWEVER, RETURN TO SCHOOL SHOULD BE COMPLETED BEFORE RETURN TO SPORT IS COMPLETED

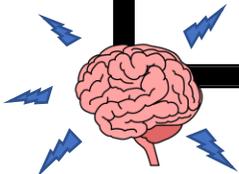
www.cattonline.com

©ATT | CONCUSSION AWARENESS TRAINING TOOL

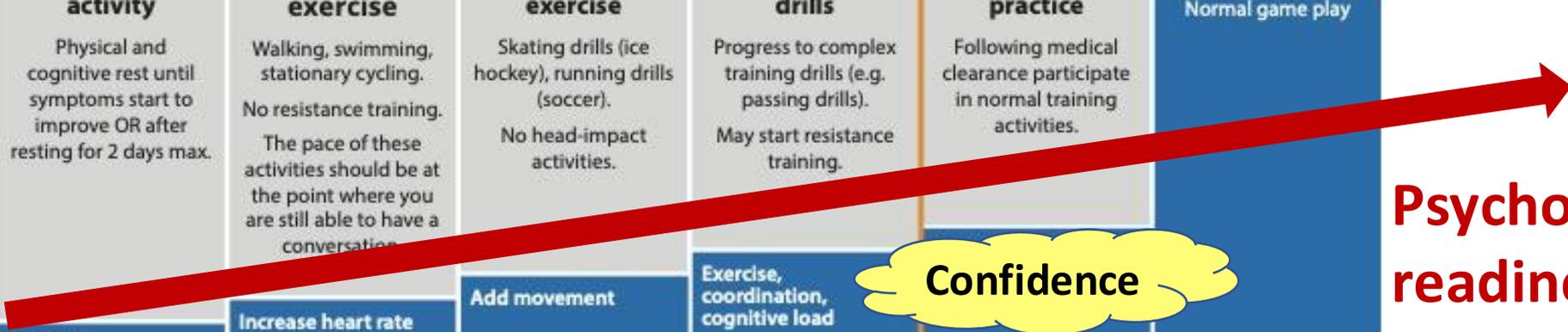
BC INJURY research and prevention unit
www.bcinjury.ca

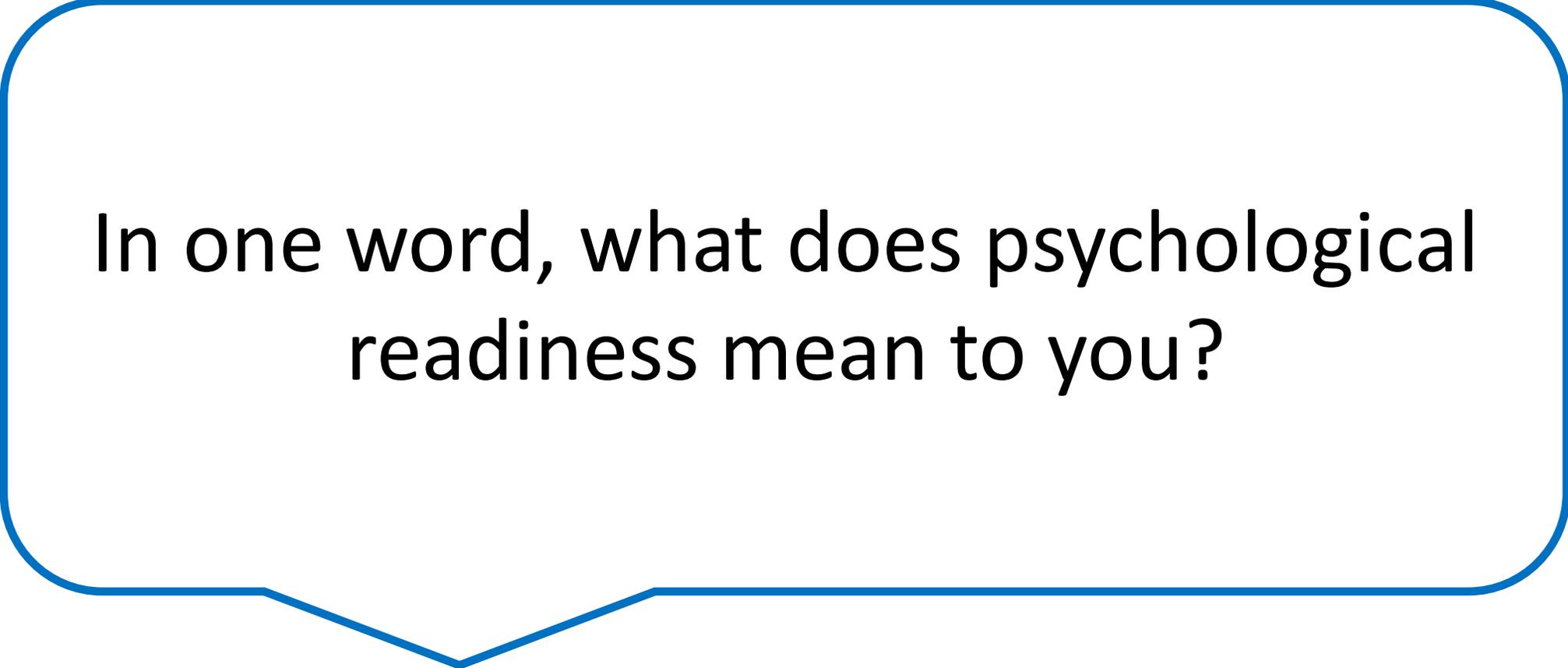
Readiness

Time



Psychological readiness





In one word, what does psychological readiness mean to you?

Confidence

Self-efficacy

Performance expectations

Fear

Recurrent injury

Hesitancy

Coping strategies

Anxiety Social support

Motivation

Background



- Athletes with greater fear are **4x more likely** to have lower levels of activity (*Paterno et al., 2018*)
- **Psychological readiness** most strongly associated with return to sports (*Ardern et al., 2014*)
- **Fear of reinjury main reason** for not returning to preinjury level of sports (24%) (*Ardern et al., 2014*)
- Psychological readiness is associated with a **second ACL injury** (*McPherson et al., 2019*)
- Athletes with great fear are **13x more likely** to have a second ACL injury (*Paterno et al., 2018*)



Which psychosocial factors are associated with return to sport following concussion? A systematic review

Jacqueline van Ierssel ^{a,*}, Kaleigh Ferdinand Pennock ^b, Margaret Sampson ^a,
Roger Zemek ^{a,c}, Jeffrey G. Caron ^{d,e}

^a Children's Hospital of Eastern Ontario Research Institute, Ottawa, ON K1H 8L1, Canada

^b Faculty of Kinesiology and Physical Education, University of Toronto, Toronto, ON M5S 2W6, Canada

^c Department of Pediatrics, Faculty of Medicine, University of Ottawa, Ottawa, ON K1H 8M5, Canada

^d Faculty of Medicine, University of Montreal, Montreal, QC H3T 1J4, Canada

^e Center for Interdisciplinary Research in Rehabilitation, Montreal, QC H3S 1M9, Canada

Received 27 August 2021; revised 2 November 2021; accepted 15 November 2021

Available online 10 January 2022

Rationale

Key differences in recovery between concussion and orthopaedic injury:

1. No objective diagnostic and recovery biomarkers
2. Symptoms are non-specific with wide ranging functional impacts
3. Return to sport before recovery is complete is a risk factor for recurrent concussion with possible serious consequences

Aim



Inform future return to sport guidelines



Identify knowledge gaps

Psychosocial factors



Fear: recurrent concussion, return to sport, losing playing status



Emotional factors: depression, anxiety, perceived stress, mental health, disturbance mood



Contextual factors: social support, pressure, sense of identity

Confidence?

How can we measure psychological readiness?



Tampa Scale of Kinesiophobia

Fear of movement



Re-Injury Anxiety Inventory

Anxiety during recovery and return to competition

FAB-TBI

Fear avoidance beliefs and behavior

ACL-RSI

Emotions, confidence, and risk appraisal

Injury-Psychological Readiness to Return to Sport (I-PRRS)

Confidence to perform sport-specific activities following an injury

Accelerate return to sport

Hinder return to sport



... of losing player status

...of reinjury



Education

Psychological interventions

e.g., goal setting, confidence building exercises



Return to Sport | This tool is a guideline for managing an individual's return to sport following a concussion and does not replace medical advice. Timelines and activities may vary by direction of a health care professional.

STAGE 1:	STAGE 2:	STAGE 3:	STAGE 4:	STAGE 5:	STAGE 6:
No sporting activity Physical and cognitive rest until symptoms start to improve OR after resting for 2 days max.	Light aerobic exercise Walking, swimming, stationary cycling. No resistance training. The pace of these activities should be at the point where you are still able to have a conversation.	Sport-specific exercise Skating drills (ice hockey), running drills (soccer). No head-impact activities.	Non-contact drills Progress to complex training drills (e.g. passing drills). May start resistance training.	Full-contact practice Following medical clearance participate in normal training activities.	Back in the game Normal game play
Recovery	Increase heart rate	Add movement	Exercise, coordination, cognitive load	Restore confidence; assess functional skills	
Symptoms improve or 2 days rest max?	No new or worsening symptoms for 24 hours?	No new or worsening symptoms for 24 hours?	Symptom-free for 24 hours?	Symptom-free for 24 hours?	Note: Premature return to contact sports (full practice and game play) may cause a significant setback in recovery.
Yes: Move to stage 2 No: Continue resting	Yes: Move to stage 3 No: Return to stage 1	Yes: Move to stage 4 No: Return to stage 2	Yes: Move to stage 5 No: Return to stage 3	Yes: Move to stage 6 No: Return to stage 4	
Time & Date completed:	Time & Date completed:	Time & Date completed:	Time & Date completed:	Time & Date completed:	
If new or worsening symptoms are experienced at any stage, go back to the previous stage for at least 24 hours. You may need to move back a stage more than once during the recovery process.				Medical clearance required before moving to stage 5	
BOTH TOOLS CAN BE USED IN PARALLEL; HOWEVER, RETURN TO SCHOOL SHOULD BE COMPLETED BEFORE RETURN TO SPORT IS COMPLETED					

Recovery and rehabilitation



Risk of reinjury



www.cattonline.com



CONCUSSION AWARENESS TRAINING TOOL

BC INJURY research and prevention unit
www.bccrashinjury.ca

Tampa Scale of Kinesiophobia

“Pain lets me know when to stop exercising so that I don’t injure myself”

Fear-Avoidance Behaviour after TBI

“I have avoided my usual activities”
“My head pain is telling me that I have something dangerously wrong”

“No measures of fear-avoidance following concussion can be recommended for use: a systematic review using COSMIN Criteria”

Sherwood et al. (2022). *Journal of Science and Medicine in Sport*, 25, S6.

How do we best measure psychological readiness to return to sport?

What is the association between psychological readiness and:

- Physical measures of recovery?
- Return to preinjury level of performance?
- Risk of reinjury?





Current medical clearance decisions prioritize physical measures of recovery, however, evidence suggests diverse psychosocial factors influence return to sport following concussion.

Hopes for today...

- ✓ Expand the idea of what it means to be ready to return to sport
- ✓ Starting point to advance clinical decision-making and research priorities

Thank you

Jacquie van Ierssel PT, PhD

jminn044@uottawa.ca

CHEO


CIHR IRSC
Canadian Institutes of Health Research / Instituts de recherche en santé du Canada