

## Appendix G) Considerations for a GRTS Program

Returning to sport following concussion involves a graduated process.

### PRINCIPLES

- The GRTS Framework stages are numbered to align with the framework outlined in the 6<sup>th</sup> CISG Consensus Statement, however there are often several steps within each stage which may take several days to work through. The rate of progression is determined by the individual's symptoms & tolerance, as well as clinical judgement. After each new progression, the athlete should be monitored for symptom exacerbation for 24 hours before progressing further in the GRTS.
- The exact return to sport timeframe will vary for each athlete and the GRTS Framework should be individualised to meet the needs of the athlete.
- Symptoms should be monitored prior to, during and 10 minutes after completing the components of GRTS Stages 1 – 6 using the Symptom Scale from the SCAT6.
- If symptoms at rest are provoked whilst progressing through the GRTS, an athlete should repeat the same session rather than progressing.

### GRTS Stage 0: Symptom-limited physical & mental activity

- Symptom exacerbation should be used to guide cognitive and physical activity levels for the first 24 – 48 hours.
- As a guide, participation in any activities (ADLs, physical or cognitive) should only cause a mild and brief exacerbation of symptoms. Symptoms can increase by two points on a 0 – 10-point symptom scale compared to their pre-activity resting value. Any increase in symptoms must settle within an hour.
- The provocative activity should be ceased if concussion symptom exacerbation is more than mild and brief. It may be resumed once symptoms have returned to the prior level.
- Resumption of activities of daily living should be encouraged.
- Light-intensity physical activity which avoids the risk of contact, collision or fall, such as walking is recommended.
- Athletes must produce a normal SCAT6 and Cognigram which aligns with their baseline data prior to progressing to Stage 1.

### GRTS Stage 1: Light aerobic activity

- 15 minutes of steady heart rate physical activity, at 60-70% maximum predicted heart rate.
  - The objective of continuous aerobic exercise is adaptation to controlled levels of heart rate and intracranial pressure.
- Suitable forms of cardio exercise include treadmill walking, stationary cycling, rowing ergometer, elliptical trainer, swimming, etc.

### GRTS Stage 2: Moderate aerobic exercise

- 30 minutes of steady heart rate activity where:
  - The first 15 minutes are at 60-70% maximum predicted HR
  - The next 15 minutes are at 70-85% maximum predicted HR.
- The cold winter environment is an additional stressor, physiologically and cognitively. Outdoor activity such as walking, running or cycling can be incorporated at GRTS Stage 2.

### GRTS Stage 3: Sport-specific functional activities & resumption of normal dryland training

- a) Sport-specific functional activities:



- A battery of dry land, sport-specific tasks should be completed which best replicates the demands of each discipline. This session should be designed to involve interval type training to increase intracranial pressure and challenge coordination, balance, cognitive function and the vestibular system.
  - It is recommended that heart rate is monitored to ensure sufficient intensity of work.
  - This session should also involve the athlete's typical warm-up which they complete prior to on-snow or ice training.
  - The HCP running an athlete through GRTS Stage 3 should collaborate with relevant parties regarding the design of this session and must be able to provide sufficient detail to the relevant doctor ahead of seeking clearance to progress to Stage 4.
- b) Resumption of normal dryland training:**
- The resumption of normal resistance training is also required throughout Stages 3 & 4. This should occur in a progressive manner, involving lower body exercises prior to upper body exercises.
  - The resumption of weight training should occur separately to the sport-specific functional movements.

#### **MEDICAL CLEARANCE:**

Medical clearance is required before an athlete can progress to Stage 4

- There is no form assigned to this medical clearance. The assessing physician may run this appointment as they wish.

#### **GRTS STAGES 4 – 6 PRINCIPLES:**

- Stages 4 – 6 of a GRTS Framework involve a progressive reloading of an athlete's typical on-snow/ice training, where they progress through low- to moderate- to high-risk scenarios and skills. The progression through these stages will look different for each athlete depending on their sport discipline and ability level.
- Coach input is required to determine the appropriate sport-specific activities for each stage based on their knowledge of the sport and the athlete undertaking rehabilitation.
- Developing athletes should expect a more conservative progression which aligns with their skill set and experience.
- Conditions should be considered when determining the appropriate sport-specific training completed in Stages 4 – 6.

#### **GRTS Stage 4: Low-risk, sport-specific on-snow/ice training**

- Activity should be non-contact, low impact with a low risk of falling.
- This can involve being on-snow/ice without performing aerial maneuvers/jumping.
- Athletes may be 'on-course' if the conditions and environment promote athlete safety.
- Safety considerations include:
  - Speed
  - The presence of other athletes
  - Snow/ice conditions
- Sport specific examples of potentially appropriate training:
  - Aerial skiing:
    - Groomed / flats skiing
    - In or outrun practice / speed checks
  - Mogul skiing:
    - Groomed / flats skiing



- Easy sections of moguls
- Snowboard cross:
  - Groomed / flats riding
  - Start practice
  - Easy features / technical practice at slower speed
- Park & Pipe:
  - Groomed / flats skiing / riding
  - Dropping in to halfpipe, no hits/air
  - Review of park features
- Alpine/Ski Cross:
  - Groomed / flats skiing
  - Start practice
  - Technical practice at slower speed
- Sliding sports:
  - Start practice
  - Walking course
- Ice skating sports:
  - Skating – individual practice
  - Technical practice with low risk of falling (ie – no jumps or racing).
  - Imitations

#### GRTS Stage 5: Moderate-risk sport-specific on-snow/ice training

- Activity should be moderate contact, moderate impact and moderate risk of falling.
- Athletes who perform aerial maneuverers/jumping can perform tricks with a lower degree of difficulty with a proven consistent execution percentage.
- Conditions should still consider athlete safety. Although progression is permitted, a review of the conditions is still warranted and may influence what constitutes moderate risk.
- Safety considerations include:
  - Speed
  - The degree of physical contact with other athletes
  - Snow/ice conditions
  - The degree of difficulty of aerial manoeuvres
  - Athlete capability & skill set (ie – developing vs podium capable).
- Sport specific examples of potentially appropriate training:
  - Aerial skiing:
    - Resumption of jumping – singles, up to easy doubles.
  - Mogul skiing:
    - Resumption of jumping – lower DD tricks.
    - Full sections of moguls
  - Snowboard cross:
    - Full course riding at slower speeds in ‘time-trial’ type scenarios, ie – no other riders on-course.
  - Park & Pipe:
    - Resumption of terrain & half-pipe riding, including hitting features & getting air.
    - Lower DD tricks
  - Alpine/Ski Cross:



- Full course skiing at slower speeds
- 'Time-trial' type scenario, ie – no other skiers on-course for ski cross.
- Sliding sports:
  - 'Rolling start' or commencing at a lower point in the course.
- Ice skating sports:
  - Resumption of aerial maneuverers of lower DD.
  - Resumption of being on-ice with other skaters at slower speeds.

#### GRTS Stage 6: High-risk / Unrestricted resumption of training & competition simulation

- Represents progression to unrestricted training and competition type activities, ie – high-risk scenarios and skills.
- This will include the usual practice of jumps, landings, technical maneuverers, tactical responses and potential for falling and/or physical contact with other athletes.
- This does not include competition but can include official training for a competition. It may also include competition simulation type training.

#### **MEDICAL CLEARANCE:**

##### Medical clearance is required before an athlete can return to competition

- This necessitates completion by a team doctor of HIA-4, and in some cases, an ICC consultation (see Appendix H).
- The AMS injury record can be closed after an athlete has successfully returned to competition and has achieved their expected level of performance.
- In some circumstances, the AMS injury record can be closed without a return to competition.



### Summary of GRTS Framework:

