# THE SNOW SPORTS RTP CONTINUUM: A PROFESSIONAL MATRIX FOR ATHLETES AND COACHES

## MEDICAL TEAM-DIRECTED

### MILESTONE 1: BACK TO FUNCTION

***Surgeons and Clinical Physicians, Team Doctors**, Physiotherapist, Mental Health Professional*



#### PHASE GOALS

**Biological healing and normalisation**
Promote wound healing, manage post-operative pain, reduce acute joint swelling (effusion), normalise gait and early mobilisation, and re-establish basic neuromuscular function.

#### REQUIREMENTS

**Mental health triage**
Early mental health screening, including assessment of kinesiophobia (fear of movement), builds a baseline for recovery and informs a joint decision on treatment options.

#### TARGET METRICS

**SMHAT-1 and clinical exit criteria**
IOC Sport Mental Health Assessment Tool 1 (SMHAT-1) screening post-injury and post-surgery. Exit when wounds have healed with no infection, swelling is largely resolved, basic joint mobility is restored and walking is limp-free.

## PHYSICAL THERAPY-DIRECTED

### MILESTONE 2: BACK TO ACTIVITY

***Physiotherapist,** Strength & Conditioning Coach, Nutritionist, Mental Health Professional*



#### PHASE GOALS

**Foundational fitness and load control**
Eliminate joint swelling, maximise passive and active unloaded motion, regain normal range of motion (ROM) and start progressive, restricted off-snow activities under strict load control.

#### REQUIREMENTS

**Trunk and uninjured limb strength**
Maintain general fitness (aerobic capacity, core and uninjured limb strength) to prevent detraining during early rehabilitation.

#### TARGET METRICS

**Basic functional benchmarks**
Full active ROM matching the uninjured limb, no trace of swelling or effusion, and initial off-snow loading milestones completed. Exit with clearance for modified dryland team sessions.

### MILESTONE 3: BACK TO SNOW

***Physiotherapist,** Strength & Conditioning, Nutritionist, Mental Health Professional*



#### PHASE GOALS

**Restricted on-snow reintroduction**
Prepare body and mind for on-snow loading, then start with the absolute basics (free skiing or riding) in controlled, supervised, graduated and progressive sessions.

#### REQUIREMENTS

**Concentric and eccentric capacity**
Build muscle strength up to the forces typical of snow sports, alongside proprioception, motor control, landing mechanics and neurocognitive training.

#### TARGET METRICS

**Clinical/functional criteria**
Enough strength for sport-specific loads and good landing mechanics (e.g., dynamic valgus control in drop jumps). Back-to-snow decisions are shared between the medical team and coach, based on predefined test batteries.

## FORMANCE TEAM-DIRECTED

### MILESTONE 4: BACK TO SPORT

***Strength & Conditioning Coach, Sports Scientists, Sports Psychologists,** On-Snow Coach*



#### PHASE GOALS

**Sport-specific training intensification**
Progress from supervised, modified free riding to technique-oriented training close to competition form, such as gates or snow parks, with increasing load and complexity.

#### REQUIREMENTS

**Power and plyometric mastery**
Maximise peak strength and power through plyometrics, challenging obstacle courses and sport-specific dryland movements (e.g., acrobatics for freestyle).

#### TARGET METRICS

**Strength, symmetry and readiness**
High isokinetic strength and single-leg/side hop scores, Limb Symmetry Index (LSI) >90%, confirmed dynamic valgus control, and passing thresholds on ACL-RSI, Tampa Scale or AFAQ.

### MILESTONE 5: BACK TO COMPETITION

***Strength & Conditioning Coach, Sports Scientists, Sports Psychologists,** On-Snow Coach*



#### PHASE GOALS

**Competition readiness**
Expose the athlete to unpredictable on-snow conditions (snow quality, visibility, terrain, temperature) and to competitive stressors, in a performance-oriented way.

#### REQUIREMENTS

**Load tolerance and symptom control**
Maintain strength and peak power during consistent training, with no flare-ups of joint pain or swelling and no altered movement patterns.

#### TARGET METRICS

**Stability under load**
Zero flare-ups after high-volume, multi-day training, no altered postures at high speed, residual deficits resolved, and mental readiness for the high-pressure competitive environment.

## COACH-DIRECTED

### MILESTONE 6: BACK TO PERFORMANCE

***On-Snow Coach,** Physiotherapist, Strength & Conditioning Coach*



#### PHASE GOALS

**Full competitive performance**
Regain the ability to perform at a high level with minimal or no physical or mental hesitation, and reach maximum on-snow speed and competitive output.

#### REQUIREMENTS

**Regular, unmodified team training**
Train with the team without restrictions, keep up strength, power and plyometric work, and address long-standing physical, technical and tactical weaknesses.

#### TARGET METRICS

**100% baseline recovery**
100% or more of pre-injury baseline values (or age-, sex- and level-appropriate reference values), confirmed by stable competitive performance at or above pre-injury level.

## KEY TESTING BATTERIES & SCREENERS

**IOC SMHAT-2**
Mental health screener used post-injury, post-surgery and at follow-ups (athletes aged 16+) to identify anxiety, depression or distress.

**ACL-RSI**
12-item questionnaire measuring psychological readiness, fear-avoidance and confidence before returning to sport.

**Tampa Scale of Kinesiophobia**
Assesses fear of movement and re-injury, helping to prevent compensatory, abnormal movement patterns.

**Limb Symmetry Index (LSI)**
Strength or hop performance of the injured leg as a percentage of the uninjured leg.

**Isokinetic Testing**
Concentric/eccentric lab testing of muscle torque, hamstring-to-quadriceps ratio and rate of force development.

**Drop-Jump Evaluation**
Assesses dynamic knee valgus control and thigh muscle co-activation to protect healing tissue.