The RAMP Protocol for Snow Sports Warm-Up

The **RAMP Protocol (Raise, Activate, Mobilise, Potentiate)** is the primary structural guideline for warm-up in competitive snow sports. Originally developed as a sport-independent framework, RAMP organises warm-up into four progressive phases, providing coaches, athletes, and support staff with a clear, evidence-informed structure to prepare for training and competition.

The RAMP Structure

Warm-up structures used by elite snow sport athletes follows the RAMP model. Each phase serves a distinct purpose in preparing the athlete for performance.

Raise

This opening phase uses low-intensity activities, such as light jogging, cycling, or dynamic movements, to elevate body temperature, heart rate, respiration rate, blood flow, and joint fluid viscosity. The goal is **to transition the body** from rest to a state that is physiologically primed for movement, gradually increasing in tempo.

Beyond immediate preparation, the Raise phase also offers an opportunity to contribute to **long-term athletic development**. By incorporating movement skills or strength and conditioning drills, athletes can use this phase not only to warm up for the session ahead but also to reinforce preparedness over time, making warm-up time more efficient and purposeful.

Activate

This phase focuses on recruiting the key muscle groups involved in snow sports performance. Activation exercises target muscles around the **hip, core, and knee**, areas essential for stability, power transfer, and injury prevention. The aim is **to "switch on"** these muscle groups so they are ready to fire efficiently when needed.

At its core, activation means increasing the mind-muscle connection by upregulating corticospinal excitability and lowering the activation thresholds of muscle fibres. The goal is to

achieve an **optimal individual balance of physical, mental, and emotional stimuli**, preparing the athlete not just physically, but holistically for the demands ahead.

Mobilise

This phase targets the key joints required for snow sports, using dynamic mobility exercises to ensure the body can achieve the positions demanded during competition. Mobilisation **prepares athletes to move through their full, sport-specific range of motion**, whether absorbing forces in a tuck position, landing jumps, or responding to variable terrain.

More precisely, mobilisation involves increasing or maintaining the ability to move a joint, either actively or passively, through its available range of motion. This ensures the athlete can **withstand the specific physical demands of snow sports**, such as absorbing external forces during landings and stabilising specific positions through variable terrain.

Potentiate

This concluding phase enhances the effectiveness of subsequent performance through sport-specific activities performed at increasing intensity. In snow sports, potentiation typically includes **jump landings, single-leg stability exercises, and warm-up runs on the slope**. These activities bridge the gap between off-snow preparation and on-snow performance, helping athletes connect their physical readiness with the specific demands of the day's conditions.

Readiness vs. Preparedness

An important distinction underpins the RAMP framework: the difference between **Readiness** and **Preparedness**. While sometimes used interchangeably, they refer to fundamentally different states, and an effective warm-up addresses both.

Readiness: The Immediate State

Readiness refers to the **immediate physiological and psychological state** that allows an athlete to perform at their maximum level; encompassing movement efficiency, awareness, responsiveness, and motivation. The **Potentiate phase** is critical here, utilising post-activation potentiation (PAP) to maximise immediate movement efficiency.

Readiness is also a **subjective feeling** with both physical and mental dimensions. Achieving it means attending to jump landing tasks, hamstring and core activation, dynamic postural control, proprioception, and, crucially, **adaptation to the day's specific conditions** (snow quality, weather, competition format).

Preparedness: The Cumulative State

Preparedness refers to the athlete's **short-, medium-, and long-term development** to meet the mental and physical demands of their sport. While readiness is about the here and now, preparedness is built over time through consistent training and skill development. As noted above, the Raise phase offers a practical opportunity to reinforce this cumulative development within the warm-up itself.

Application in Snow Sports

"It is preparing the whole body and mind for what you are going to be doing."

Physiotherapist

While RAMP provides the structure, its content must be **adapted to the specific context of snow sports**. The unique environment, cold temperatures, altitude, bulky equipment, and variable snow conditions, requires thoughtful implementation of each phase.

In practice, the **Activate and Mobilise phases are often performed off-snow** (for example, in a lodge or at the base area) because ski boots can hinder proper foot and ankle activation. Removing equipment constraints allows athletes to execute activation and mobility exercises with full range of motion and proper form.

"They are the steps we take to put athletes in positions to be ready to compete on the snow."

Strength & Conditioning Coach

The **Potentiate phase then transitions to on-snow activities**, typically utilising 2–3 warm-up runs on the slope. These runs serve a crucial purpose: they connect the mind, body, and environment, allowing athletes to calibrate their movement patterns to the specific conditions they will face in

competition. This final step transforms physiological readiness into true performance readiness, integrating everything that came before into the context that matters most.