

BUILDING THE ENGINE

Conditioning Principles & Planning
for **FIS athletes** 1996 born & older



Prepared by Books – September 2011



team
HOTHAM
Athletics Department

CONTENTS

Information that you need to know

Program overview & objectives	Page 3
Program structure	Page 4
Operating structure	Page 5
Dates & testing	Page 6
Annual Planning Summary	Page 7
Term programming overviews	Pages 8 – 11

Information that is good to know

Long Term Athlete Development & Windows of Trainability

Pages 13-22



Please refer to the information below for a brief overview of conditioning opportunities available for **FIS athletes** with the Victorian Alpine Committee conditioning program.

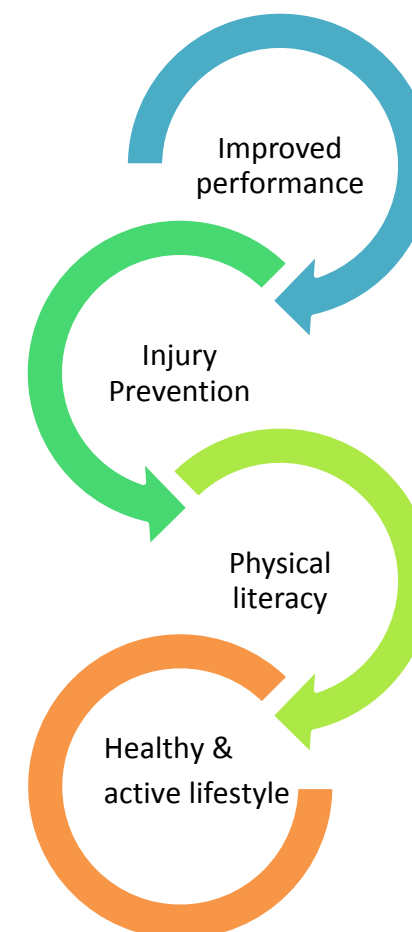
About the program:

- Three way partnership between the Falls Creek Race Club (FCRC) – Mt Buller Race Club (MBRC) and Mt Hotham Racing Squad (MHRS)
- Program run under the auspices of the Victorian Alpine Committee (VAC)
- Programming available through all terms

Program Objectives:

- To consolidate resources - human, equipment and financial
- To centralize the management of Victorian conditioning programs
- To enhance coordination opportunities between the Victorian race clubs
- To provide ski specific conditioning opportunities for athletes year round
- To enhance athlete management – consistent 12 month athlete management is the goal
- To educate athletes and families on the importance of physical conditioning and an active, healthy lifestyle
- To ensure that athletes are **doing the right things at the right times** and in the **right sequence**

The 1st phase of the program is intended to keep the programming as simple, practical and as affordable as possible. As the program progresses, we will see the increased use of specific activities, specific facilities and the possible increased use of sports science providers as needed.



PROGRAM STRUCTURE – General Overview

- Programs for all age groups
 - U10, U12, U14, U16, U18, U21
 - YOB 2003 & older
- Programs for terms 1, 2 & 4
 - Hours of contact time increase w. age, experience and specific nature of training requirements
- Supervised sessions on weekends
 - Programs a mix of supervised training and directed home program work
- Term 3 programming provided by club
 - Possibility of Melbourne based midweek sessions

PROGRAM DESIGN

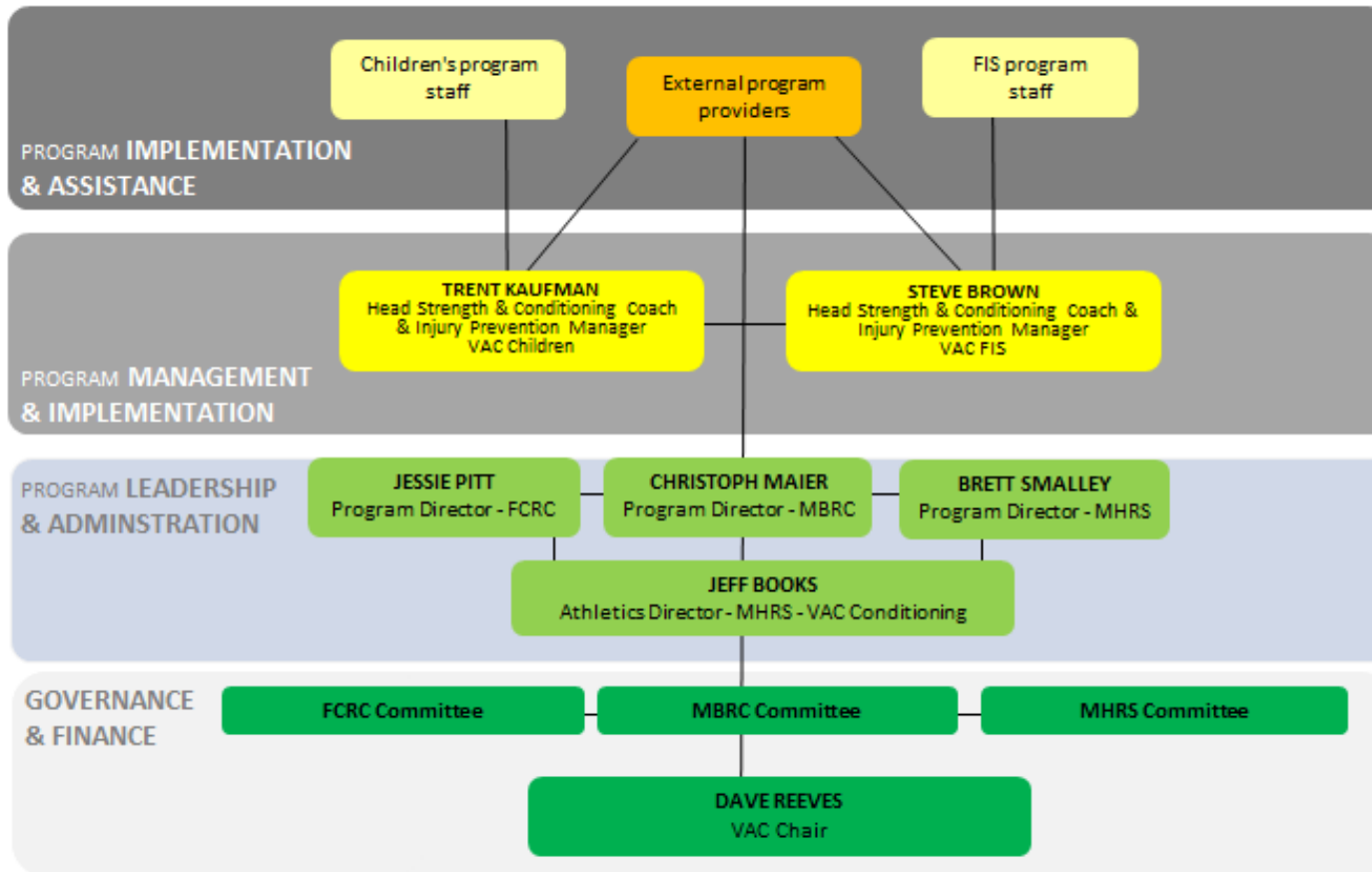
- Developmental age appropriate and relevant to critical training periods
- Sport specific, simple, relevant & cost effective - increasingly specific towards the latter phases
 - We must execute well on a simple – affordable plan first
 - Increased complexity can come later if necessary
- Base program underlies all critical training activities
- Base program provides the foundation for program delivery during supervised sessions
- Base program provides framework for unsupervised home program sessions
- Base program provides clear overview of:
 - Frequency of training
 - Volume of training
 - Intensity that the athletes should be working
- Athlete education – ancillary competency important. Provision of expert services during special projects
 - Sports Psychology - Physio (movement screening) - Sports Nutrition - Physical testing
- Victorian support network – Performance Enhancement Team
 - Physiotherapy
 - Sports Psychology
 - Sports Nutrition
 - Sports Medicine



OPERATING STRUCTURE

Please refer to the diagram below for an overview of the operating structure for the programs.

- The primary aim of this structure lies in centralized management, consolidated resources and enhanced athlete management.
- Programs are provided by VAC staff with assistance of external program providers where necessary

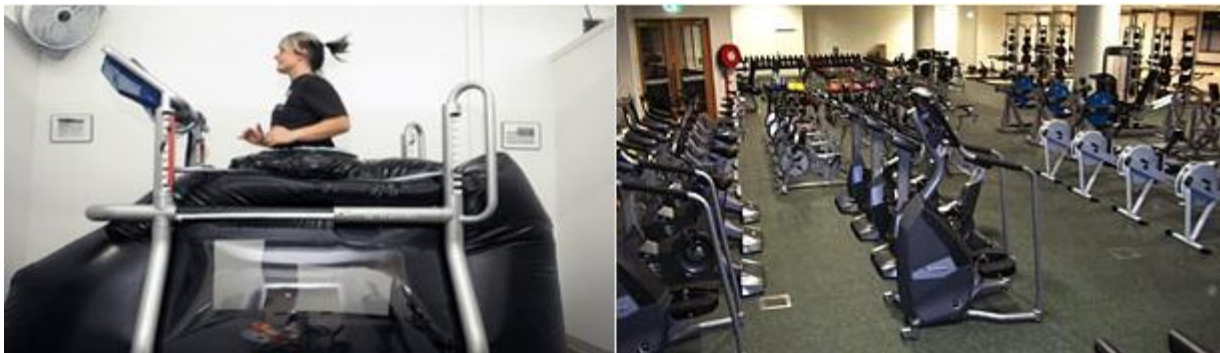


PROGRAM DATES

- Term 4 2011 – Monday, September 26-Sunday, November 27 - 9 weeks
- Term 1 2012 – Monday, February 13 – Sunday, March 25 - 5 weeks
- Term 2 2012 – Saturday, April 14 – Sunday, June 17 – 9 weeks
- Term 3 2012 – w. home club – possibility for Melbourne based midweek programming
- Term 4 2012 – Saturday, September 29 – Sunday, November 25 - 9 weeks

TESTING

- Field testing for FIS athletes – 4x year in September, November, April & June
 - Lab testing as necessary for select athletes
- With long term consistency in mind (equipment, surface, interpretation of protocol etc.) – we have chosen to engage the services of **ESS Performance** based at AAMI Park in Melbourne
- **SSA Protocol** will be used for all testing
- Testing will incorporate a movement screening component – details to be announced
- Testing delivered by **ESS Performance**
 - Based at **AAMI Park** – **ESS Performance** are full time strength and conditioning experts
 - We have come to an agreement with ESS on discounted testing services for a 2 year period



Testing process

1. Athletes do testing
2. Results are given back to athletes within 72 hours
3. Individual plans delivered to athletes participating in base program – plans designed & delivered by age group head coaches
 - a. Planning confirmed, or adjusted based on testing results

Results are accompanied w. base program w. individual volumes & intensities + variances as needed

ABOUT ESS PERFORMANCE

ESS Performance provide access to a range of training, recovery and rehabilitation services. Their integrative, multi disciplinary team of sports medicine clinicians, trainers and therapists work collaboratively in developing comprehensive programs. We will be working with **ESS Performance** for the next 2 years for the delivery of VAC Fitness Testing. **ESS Performance** also has a facility in **Richmond**, specializing in sports medicine, rehab and functional training. For more information, check out www.earthseasky.com

Melbourne Storm, Melbourne Victory and the **Melbourne Football Club** are all based at **ESS Performance – AAMI Park**.



ANNUAL PLANNING - PERIODIZATION

For planning purposes, the year is split into five manageable pieces, this is referred to as **periodization** – periodization at its simplest is time management. Each phase has a specific purpose and unique set of opportunities. Each phase of the conditioning programs is designed with these opportunities in mind.

- **GENERAL PREPARATION** Phase (GPP) Building general fitness and strength
- **SPECIFIC PREPARATION** Phase (SPP) Building specific fitness and strength
- **PRE COMPETITIVE** Phase (PCP) Turning physical gains into good mechanics (technique) – physical maintenance
- **COMPETITIVE** Phase (CP) Turning physical gains and good mechanics into speed and consistency
- **TRANSITION** Phase (TP) Active recovery – relaxing and unwinding

Check out the information below for an overview of suggested annual planning for FIS athletes who **won't be training during the northern winter**.

Month	May	June	July	August	Sept.	October	Nov.	Dec.	January	February	March	April
Phase	GPP	SPP	PCP	CP	Tr.	GPP	SPP	PCP	Tr.	GPP		
Physical	↑ ↑ ↑	↑ ↑	↑ ↑	↑ ↑	↑ ↓	↑ ↑ ↑ ↑	↑ ↑	↑ ↑	↑ ↑	↓	↑ ↑ ↑	↑ ↑
On snow		↑ ↑	↑ ↑	↑ ↑	↑			↑ ↑	↑ ↑			
School	Term 2		Hol.	Term 3		Hol.	Term 4		Summer	Term 1		Hol. T2
Training Focus	Physical training optimized - general and specific phases		Specific on snow development, physical recovery & rest periods, ski specific conditioning in low - moderate volumes		Transition	Physical training optimized - general prep. and specific phases		Summer - organized sport & unstructured play		School sport, unstructured play, specific conditioning in some cases		Physical training; specific prep.
Program Provider	VAC - school sport - independent sport		Home club - FCRC, MBRC, MHRS			VAC - school sport - independent sport		NW various		VAC - school sport - independent sport		

See the summary below for suggested annual planning for Victorian FIS athletes who **will be training & balancing school during the northern winter**.

Month	May	June	July	August	Sept.	October	Nov.	Dec.	January	February	March	April
Phase	GPP	SPP	PCP	CP	Tr.	GPP	SPP	PCP	Tr.	GPP		
Physical	↑ ↑ ↑	↗ ↘ ↘ ↘ ↘	↘ ↘ ↘ ↘ ↘	↓	↑ ↑ ↑ ↑ ↑	↑ ↑ ↑	↑ ↑ ↑	↑ ↗ ↘ ↘ ↘	↓	↑ ↑ ↑	↑ ↑	↑
On snow		↑	↑ ↑ ↑	↑ ↑ ↑	↑			↑ ↑ ↑	↑ ↑ ↑	↑	[Greyed out]	
School	Term 2		Hol.	Term 3		Hol.	Term 4		Summer	Term 1		Hol. T2
Training Focus	Physical training optimized - general and specific phases		Specific on snow development, physical recovery & rest periods, ski specific conditioning in low - moderate volumes		Transition	Physical training optimized - general prep. and specific phases		Northern winter training opportunities available Longer northern training phase in some cases		Transition	Physical training; general prep. Physical training; specific prep.	
Program Provider	VAC - school sport - independent sport		Home club - FCRC, MBRC, MHRS			VAC - school sport - independent sport		NW various		VAC - school sport - independent sport		

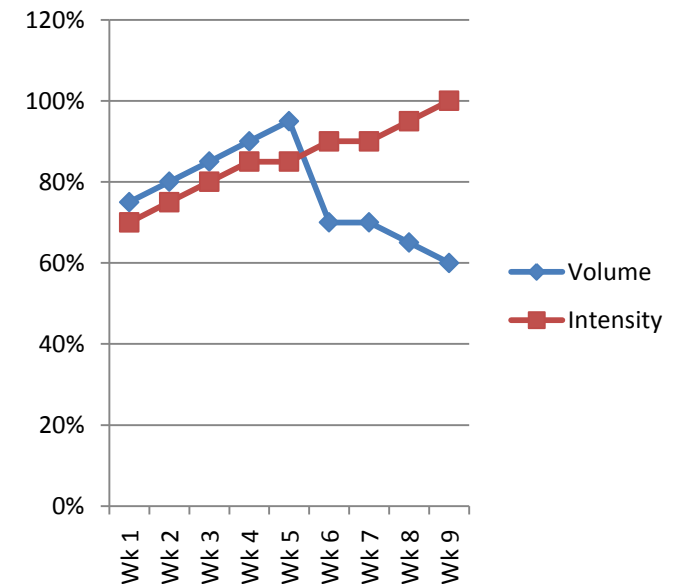
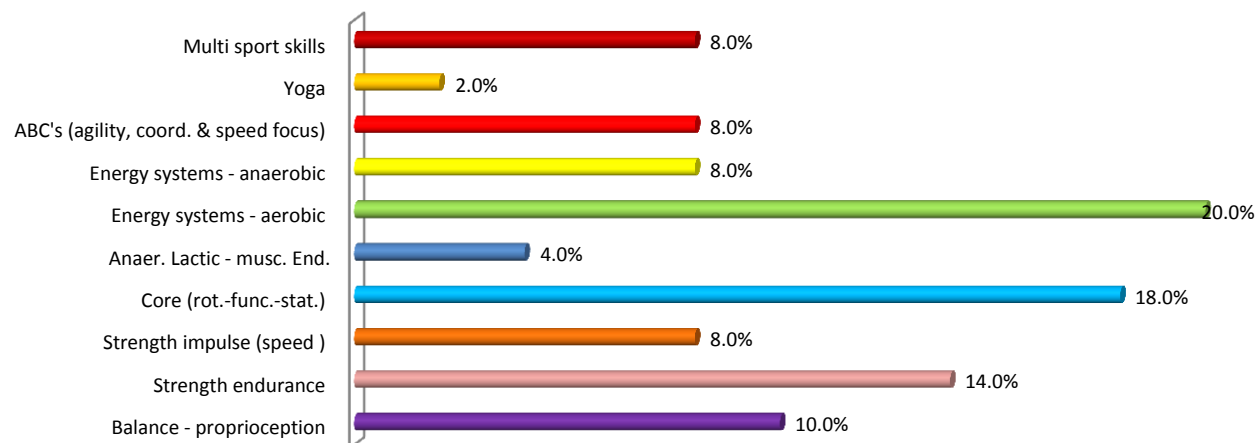
See the summary below for suggested annual planning for Victorian FIS athletes training full time over the northern winter.

Month	May	June	July	August	Sept.	October	Nov.	Dec.	January	February	March	April
Phase	GPP	SPP	PCP	CP	Tr.	GPP	SPP	PCP	Tr.	GPP		
Physical	↑ ↑ ↑	↗ ↘ ↘ ↘ ↘	↘ ↘ ↘ ↘ ↘	↓	↑ ↑ ↑ ↑ ↑	↑ ↑ ↑	↑ ↑ ↑	↑ ↗ ↘ ↘ ↘	↓	↑ ↑ ↑	↑ ↑	↑
On snow		↑	↑ ↑ ↑	↑ ↑ ↑	↑			↑ ↑ ↑	↑ ↑ ↑	↑	[Greyed out]	
School	Term 2		Hol.	Term 3		Hol.	Term 4		Summer	Term 1		Hol. T2
Physical training focus	Physical training optimized - general and specific phases		Specific on snow development, physical recovery & rest periods, ski specific conditioning in low - moderate volumes		Transition	Physical training optimized - general prep. and specific phases		Northern hemisphere training - specific development, pre competitive and competitive phases		Transition	Physical training	
Program Provider	VAC - school sport - independent sport		Home club - FCRC, MBRC, MHRS			VAC - school sport - independent sport		NW providers - SSA national team / other				

Term 4 2011 - Overview

- **Dates:** Saturday, September 24 to Sunday, November 26 – 9 weeks total
- **Cost:** to be announced in mid-September
- **Testing:**
 - Start of phase testing: Sunday, September 25 – ESS Performance, AAMI Park Melbourne
 - End phase testing: Saturday, November 19 – ESS Performance, AAMI Park Melbourne
- **Base program:**
 - Select Saturdays + testing and programming days – see training schedule for the specifics
- **Add on sessions:**
 - Sunday mornings from 1 – 3pm
 - Tuesdays & Thursdays from 5-6:30pm
- **Training focus:**
 - **General – Specific** Preparation Phases – energy systems, muscular endurance, multi-spot skills (athleticism), general strength – core
- **Special Projects:**
 - **Surf & Multi Sport Camp** at Anglesea: Thursday, October 6 to Saturday, October 8
 - **Ice Hockey Skills Camp** at the Icehouse, Docklands: Saturday, November 5 – Sunday, November 6
 - **Circus – Gymnastics Skills Camp:** Saturday, November 26 – Sunday, November 27

Refer to the respective camp information package for specific information on each project



Term 1 2012 - Overview

- **Dates:** Monday, February 13 – Sunday, March 25 – 5 weeks
- **Cost:** to be announced
- **Testing:** None
- **Base program:** 3x 2 day track & field camps
 - Saturdays & Sundays – every 2nd weekend – see training schedule for the specifics
- **Add on sessions:**
 - None
- **Training focus:**
 - General Preparation Phase – aerobic endurance, speed, track & field skills – technique, multi-sport skills
- **Location:** Melbourne – to be confirmed
- **Special Projects:**
 - None



Term 2 2012 - Overview

- **Dates:** Saturday, April 14 – Sunday, June 17 – 9 weeks
- **Cost:** to be announced
- **Testing:**
 - Start of phase: Saturday, April 14 – ESS Performance
 - End of phase: Sunday, June 16 – ESS Performance
- **Base program:**
 - Saturdays and Sundays
- **Add on sessions:**
 - Add on midweek training available – Tuesdays & Thursdays
- **Training focus:**
 - **General** Preparation Phases – aerobic endurance, muscular endurance, multi-spot skills (athleticism), general strength – core
 - **Specific** Preparation Phase – aerobic endurance – power, anaerobic endurance, muscular endurance, strength, core 3d, multi-sport skills – similar to general phase w. increase in intensity and specific nature of exercises & activities
- **Special Projects:**
 - **Ice Hockey Skills Camp** at the Icehouse, Docklands: Saturday, May 5 – Sunday, May 6 (3rd of 3 planned hockey camps)
 - **Snowplanet Slalom Camp** – New Zealand: Wednesday, May 23 to Sunday, May 27 (proposed annual camp – similar future timing)
 - **Footie Skills Camp** location to be announced Saturday, May 26 – Sunday, May 27
 - **VAC Boot Camp** at Mt Buller - Saturday, June 9 – Monday, June 11

Refer to the respective camp information package for specific information on each project

Term 4 2012 - Overview

- **Dates:** Saturday, September 29 to Sunday, November 25 – 9 weeks total
- **Cost:** to be announced
- **Testing:**
 - Start of phase testing: Saturday, September 29 – ESS Performance, AAMI Park Melbourne
 - End phase testing: Saturday, November 17 – ESS Performance, AAMI Park Melbourne
- **Base program:**
 - Saturdays + testing and programming days
- **Add on sessions:**
 - Sunday mornings from 1-3pm
 - Tuesdays & Thursdays from 5-6:30pm
- **Training focus:**
 - General – Specific Preparation Phases – energy systems, muscular endurance, multi-spot skills (athleticism), general strength – core
- **Special Projects:**
 - **Surf & Multi Sport Camp** at Anglesea: Thursday, October 6 to Saturday, October 8 – to be confirmed
 - **Ice Hockey Skills Camp** at the Icehouse, Docklands: Saturday, November 3 – Sunday, November 4 – to be confirmed
 - **Mixed Martial Arts Camp** location be confirmed: Saturday, November 26 – Sunday, November 27 – to be confirmed

STAFF

Trent Kaufman – VAC Strength & Conditioning Coach

- Masters of Exercise and Sport Science (Strength and Conditioning) – Edith Cowan University
- Bachelor of Exercise and Sport Science (major in Exercise Physiology & Sports Nutrition) – Deakin University
- Level 4 - Australian Professional Ski Instructors Association (APSI)
- Development Level Coach – Canadian Ski Coaches Federation (CSCF)
- Level 3 Telemark coach – Professional Ski Instructors of America (PSIA)
- Head Children's Coach – Mt Hotham Racing Squad
- 20 seasons of international coaching and teaching experience

Steve Brown – VAC Strength & Conditioning Coach

- Level 2 - ASCA Strength & Conditioning Coach
- Completed a Strength & Conditioning traineeship at the VIS
- Level 4 - Australian Professional Ski Instructor's Association (APSI)
- APSI Examiner, instructor trainer and demo team member
- High Performance Coach - Canadian Ski Coaches Federation (CSCF)
- Steve is currently completing a Masters in Strength & Conditioning at Edith Cowan University
- Steve recently completed a stint as physical preparation coach for the Australian Aerials Development Squad
- FIS Coach – Mt Buller Race Club

Jeff Books – VAC Sport Development Manager

- Level 2 - CSCA Strength & Conditioning Coach
- High Performance Coach – Canadian Ski Coaches Federation (CSCF)
- Level 3 – Canadian Ski Instructor's Alliance (CSIA)
- Level 3 – National Coaching Certification Program (NCCP)
- FIS Youth and Children's Committee
- Education in Exercise Physiology and Sports Science
- 15 years of coaching experience
- 12 years of program management experience



Thank you for your interest in the VAC Conditioning Programs.

Contact **Jeff Books** for questions, or further information

Jeff Books

Sport Development Manager – VAC

Athletics Director – Mt Hotham Racing Squad

Mobile: 0431 071 121

E mail: jeff@mhrs.org.au

Skype: jeff.books

The importance of year round athlete management – year round contact time and year round physical training focus should not be underestimated. Please refer to the next section entitled ‘Long Term Athlete Development’ for further information on physical training, athlete management and planning....worth a read if you’re so inclined.

Christoph Maier

Mt Buller Race Club

Program Director



Jessie Pitt

Falls Creek Race Club

Program Director



Brett Smalley

Mt Hotham Racing Squad

Program Director



“I run on the road, long before I dance under the lights.” - Muhammad Ali



DEFINITIONS

Adaptation refers to the changes in the body as a result of a stimulus that induces functional and / or morphological changes. The general trends and patterns of adaptation are identified by physiological research, and guidelines are clearly delineated of the various adaptation processes such as adaptation to agility training, aerobic training, muscular endurance, maximum strength etc.

Chronological age refers to the actual age of participants - chronological age has limited use as a barometer of individual development

Developmental age refers to your physical age based on your rate of growth & maturation.

Early specialization sport includes artistic and acrobatic sports such as gymnastics, diving and figure skating. These differ from late specialization sports in that very complex skills are learned before maturation since they cannot be fully mastered if taught after maturation.

Peak Height Velocity is the maximum rate of growth in stature during the growth spurt. The age of maximum velocity is called the age at PHV.

Specific Training Age refers to a participant's age in ski racing. The early years (Under 10) represent **general development** for ski racing, the specific training begins at age 11 (+/-)

10 year / 10,000 hour rule suggests that elite performance is a result of regular practice and a long term commitment. This applies to anyone...musicians, computer programmers, students, athletes etc.

Windows of Trainability refers to the period in an athlete's development where the five basic S's (speed, skill, stamina, strength & suppleness of training and performance are best trained.

LONG TERM DEVELOPMENT

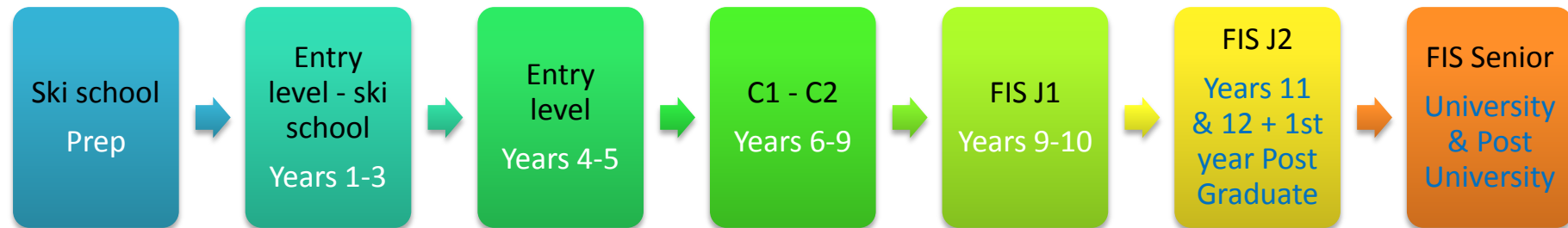
“It takes 10 years of specific and extensive training to excel at anything” – Herbert Simon, Nobel Laureate

There are no shortcuts to athletic success.

The curriculum at your school is designed to take 12 years (+/- 1 year) to learn the content of the curriculum and develop competency in key areas. Ski racing is no different...

- Skills and competencies necessary to succeed are developed on and off snow
- It takes time to build the skills & competencies required to achieve
- It is important that athletes stay in the system long enough to achieve success

For practical purposes, let us make a comparison between ski racing in Australia and the Australian school system. This comparison is intended for general purposes only, this is not 100% accurate based on differences in starting age for the school system



Early specializing and late specializing sports

In principle, sports can be classified as either “early specialization” or “late specialization” (Balyi and Hamilton 1999). The acquisition of expertise in sport is the result of complex interactions among biological, Psychological, and sociological constraints (Singer & Janelle, 1999). Successful negotiation of these constraints can lead to the highest levels of performance while unsuccessful negotiation can lead to burnout and/or dropout from sport (Wiersma, 2000). One issue of contention among researchers examining expertise from a developmental perspective (e.g. Baker, Co[^]te[´] & Abernethy, 2003; Ericsson, Krampe & Tesch-Ro[¨]mer, 1993) is whether aspiring expert athletes need to limit their childhood sport participation to a single sport, with a deliberate focus on training and development in that sport (i.e. early specialization—not to be confused with recreational participation in a single sport). The opposite perspective (i.e. early diversification) favours a focus on involvement in a number of different sports before specializing in later stages of development (Wiersma, 2000). The purpose of this review is to examine the evidence both for and against the early specialization perspective and to present the early diversification approach as another path leading to elite levels of performance. As well, directions for future research are presented in order to further our understanding of the requirements of learners in the early stages of expertise.

- **‘Early specialization’** sports require sport specialization in training from an early age.
- Examples of ‘early specialization’ sports include gymnastics, figure skating and diving.
- In contrast, research seems to consistently state that **‘late specialization’** sports are best served by a generalized approach to training in the early years.
- Examples of ‘late specialization’ sports include athletics, cycling, rowing, footie, rugby and, for our purposes here, ski racing.
- In **‘late specialization’** sports, the emphasis in training should be on the development of general, fundamental motor and technical/tactical skills. Success from training and performing well over time rather than winning in the short term should be the focus. Rushing the process will almost always result in shortcoming in athletic, sport specific, ancillary and cognitive abilities.

Implications: What does this mean for ski racers?

- Focus on a wide, varied base of skills and experiences in the early years – diversity, adaptability and versatility
- This varied base of experiences and competencies provide the foundations for specific training later on
- Foundation rich in functional movements & athletic fundamentals are essential
- Opportunities for success **will be severely limited** when base of athleticism and fitness are absent



Ten Year / 10,000 Hour Rule

Research has concluded that it takes **eight to twelve years of full time committed training** for talented athletes to reach elite levels (Bloom, 1985; Ericsson et al., 1993; Ericsson and Lehmann, 1996). This is often referred to as **the ten year or 10,000 hour rule**. For athletes, coaches and parents, this translates to slightly more than three hours of practice per day for approximately ten years to become elite (Salmela, 1998). Unfortunately, it is still all too common for parents and coaches in many sports to approach training with an attitude best characterized as the 'peaking by Friday' approach (Balyi and Hamilton, 1999). **We know that a long term commitment to training is required to produce elite athletes in all sports...ski racing is no different. A specific and well-planned training, competition, and recovery plan will ensure optimum development throughout an athlete's career.**

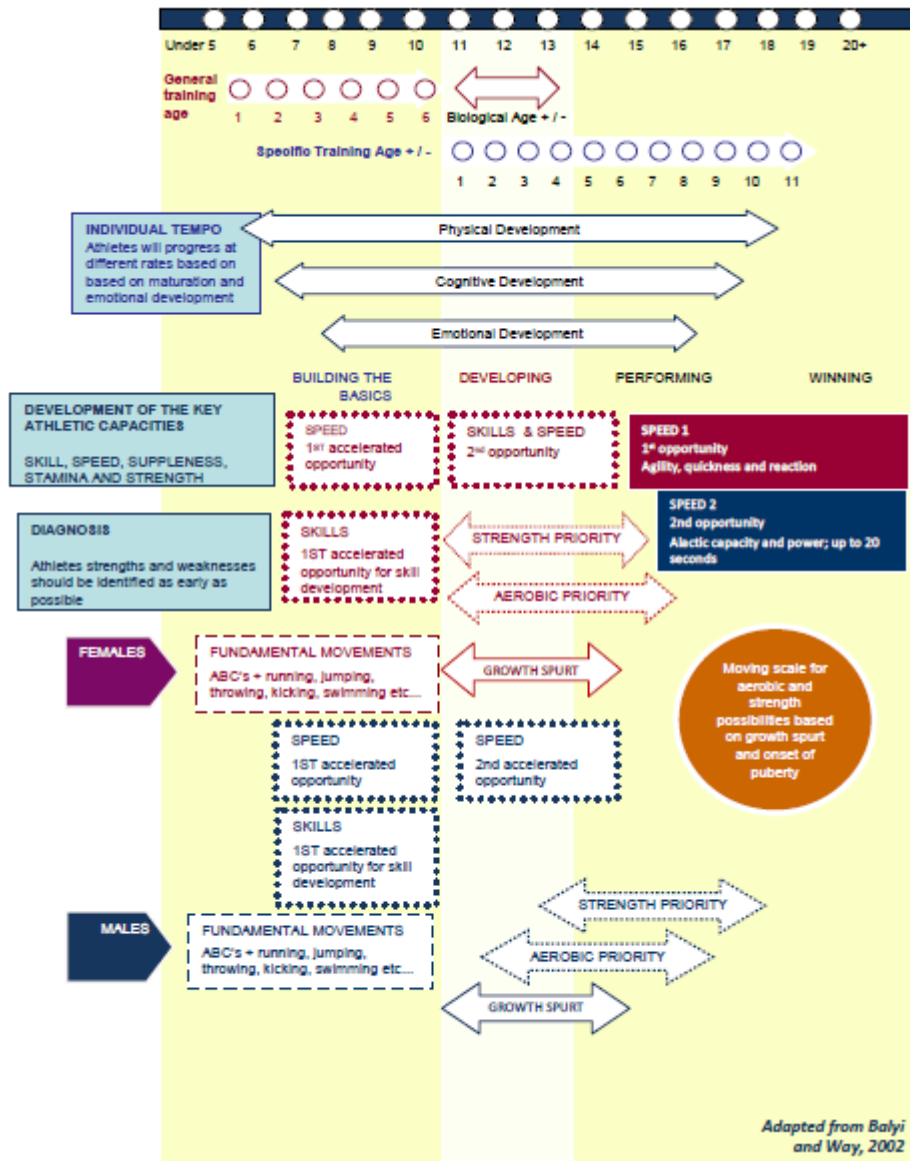
In our case – skiing and conditioning activities contribute towards the 10,000 hours

A good read...

Check out Malcolm Gladwell's book called *Outliers*, it is largely based around the 10,000 hour rule; w. case studies of the Beatles, Bill Gates and many more it is a must read for any parent w. children in sport.



PHYSICAL LITERACY and ATHLETIC SKILLS



This chart takes highlights the opportunities for accelerated and lasting physical development. The main areas of focus can be summarized by the 5 S's:

- **Stamina** - endurance (aerobic and anaerobic)
- **Strength**; general and specific
- **Speed**; agility, linear quickness, directional speed
- **Skill**; balance & coordination, precision of movements
- **Suppleness**; flexibility

The '5 S's' should be systematically trained at various stages of growth and development to ensure sustainable and long term success. All aspects are trainable, however this chart highlights the opportunities for accelerated development...providing a guide for doing the right things at the right times and in the right sequence.

Opportunities for accelerated development for U12's & U14's;

- **Strength** – functional – specific
- **Stamina** – aerobic power & anaerobic endurance
- **2nd accelerated opportunity for skill development**
- **2nd accelerated opportunity for speed**
- **Flexibility**

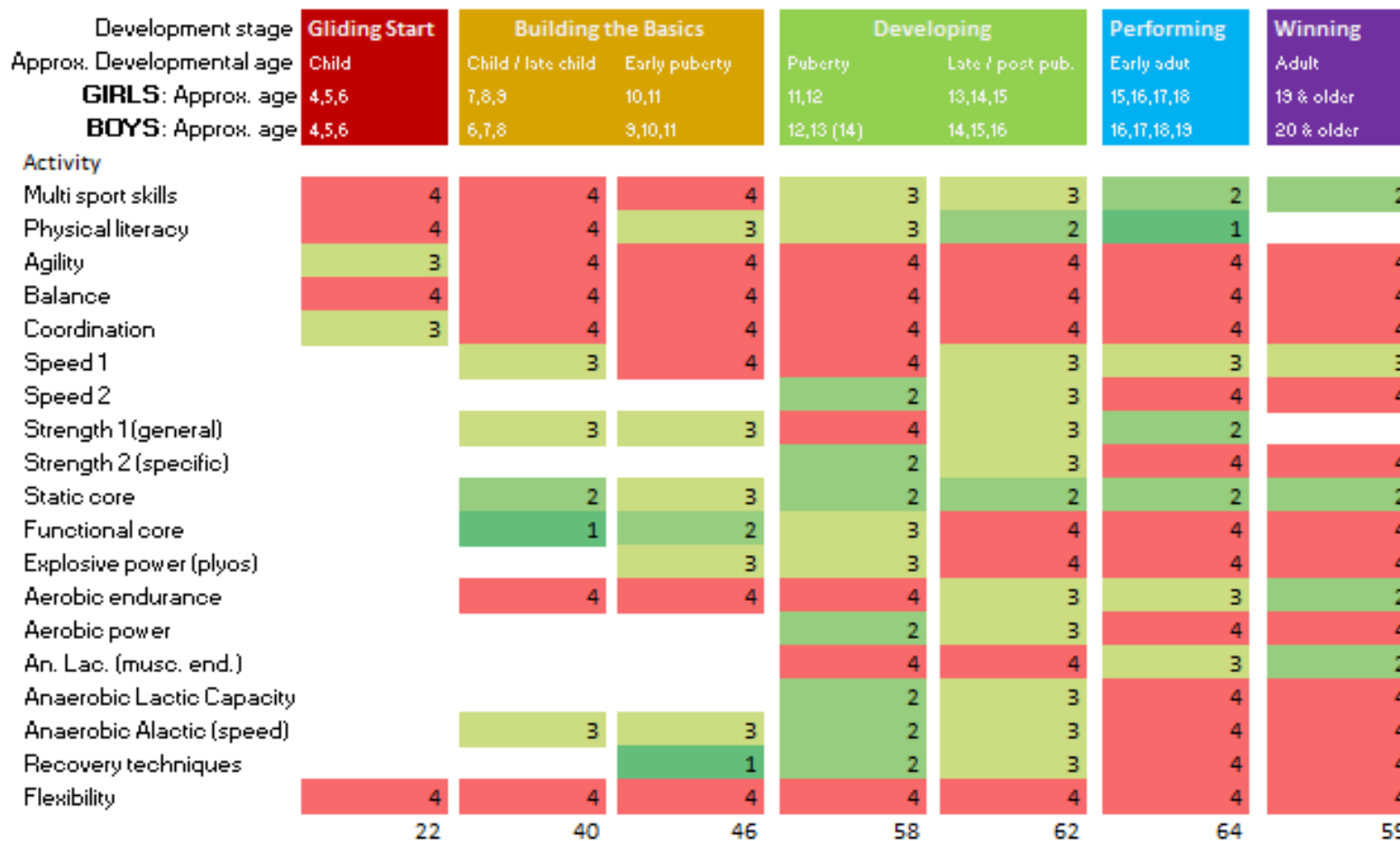
These themes are explained in more detail on the coming pages

BUILDING THE ENGINE – The Windows of Trainability

Commitment to physical training is essential...

- For quality training day in day out – injury prevention – success on snow

Check out the information below for a brief overview of the accelerated opportunities for development for U12's & U14's.



Graphic above courtesy of Team Hotham's Long Term Athlete Development Model.



PHYSICAL TRAINING - A STRONG FOUNDATION OF PHYSICAL LITERACY and ATHLETICISM IS ESSENTIAL

Please refer to the information below for a summary of what should be done and in what amounts

Development stage	PERFORMING		WINNING
	Early Adult 1	Early adult 2	Adult
Approx. Developmental age			
GIRLS: Approx. age	16,17	17,18, 19	20 & older
BOYS: Approx. age	15,16,17	17, 18,19,20	21 & older
Windows of optimal trainability	Refinement of general and sport specific motor skills, specific strength, speed strength, aerobic base, aerobic power and anaerobic capacities	Specific sport skills, speed 2 development, aerobic base (aerobic power post PHV), specific strength, joint stability & alignment, anaerobic capacity	Optimizing specific strength, injury prevention, efficiency, aerobic power, anaerobic power
# of sports	1 complimentary sport plus skiing. This sport should not interfere w. ski program	1 complimentary sport plus skiing. This sport cannot interfere w. ski program	Complimentary sports as practical. Should not pose risk of injury, cannot interfere w. specific ski program
Volume of physical training	30+ specific physical training days through the off seasons, 10-14 sessions per week (8-10 specific sessions) + other activities	40+ specific physical training days through the off season, 10 - 14+ specific sessions per week + other activities as appropriate	10 to 14 ski specific training sessions, individualized based on requirements and elite level periodization
In season	Min. 4 specific conditioning sessions per week	4+ specific conditioning sessions per week	Individualized focus and volume based on sports science, testing & need
Energy systems	Continue to develop aerobic capacity - aerobic power, maintain speed, agility, coordination with intervals of 5-20+ seconds, develop anaerobic power w. intervals of 30-60 seconds	Continue to develop aerobic capacity - aerobic power, maintain speed, agility, coordination with intervals of 5-20+ seconds, develop anaerobic power w. intervals of 60-120 seconds	Highly specific; individualized program based on sports science and elite level testing

Graphic above courtesy of Team Hotham's Long Term Athlete Development Model.

Development stage Approx. Developmental age	PERFORMING		WINNING
	Early Adult 1 GIRLS: Approx. age BOYS: Approx. age	Early adult 2	Adult
	16,17	17,18, 19	20 & older
	15,16,17	17, 18,19,20	21 & older
Athleticism	Continue to develop key athletic skills, refine motor skills, coordination, vertical and lateral direction changes	Refine key athletic skills, optimize specific motor skills, coordination and balance; overall focus on athelticism remains	Refinement of athletic skills via appropriate cross training activities
Strength	Solidify lifting technique, structured weight training program - hypertrophy, use of free weights & functional training methods (kettlebells, med balls, trx, sandbags, tires etc.); upper body development, be aware of PHV (early vs late maturity); optimal injury prevention	Refine lifting technique, structured weight training program - hypertrophy, strength power, use of olympic lifts, free weights & functional training methods (kettlebells, med balls, trx, sandbags, tires etc.); upper body development, optimal injury prevention	Highly specific; individualized program based on sports science and elite level testing
Flexibility (suppleness)	Dynamic mobility and specific flexibility, structured part of daily program	Dynamic mobility and specific flexibility, structured part of daily program	Individualized based on sports science application and testing
Preferred activities	Specific conditioning activities are becoming the priority; gymnastics (trampoline), footie, soccer, surfing, martial arts, basketball, school sport & yoga	Specific conditioning activities are the priority, Gymnastics (trampoline), footie, soccer, surfing, martial arts, basketball, school sport & yoga	Complimentary cross training activities to provide challenge, new decisions, fun etc.; should not pose risk for injury, cannot interfere w. skiing

Graphic above courtesy of Team Hotham's Long Term Athlete Development Model.