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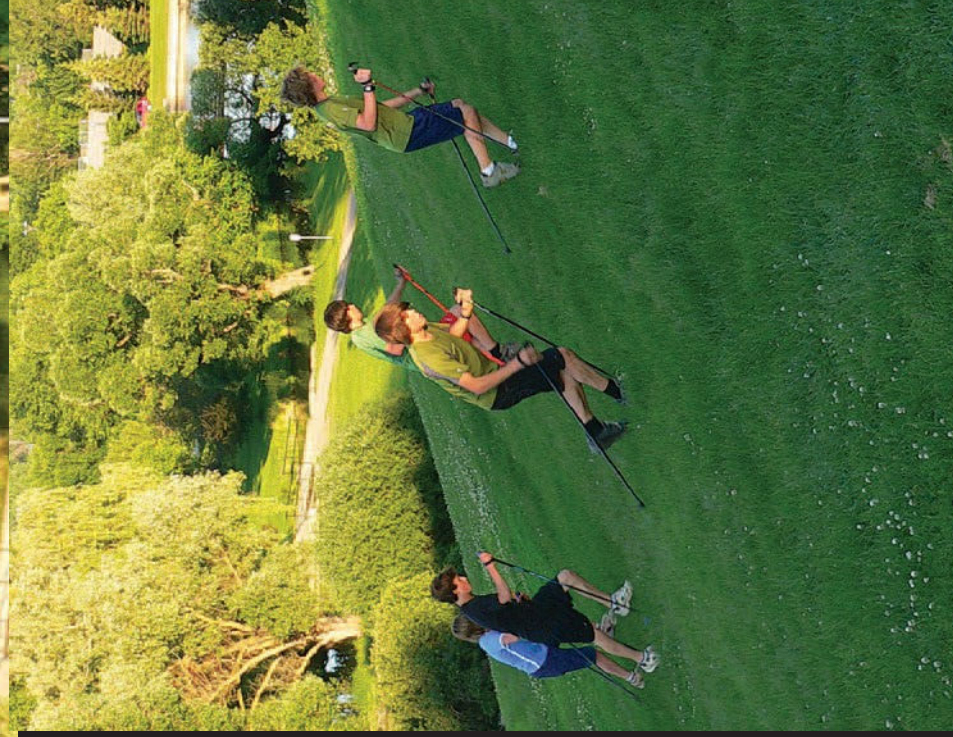
Coaching
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Competition Coaching Introduction
Learning to Train (Dryland) Cross-Country Skiing
REFERENCE MATERIAL



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Competition Coaching Introduction
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Cross-Country Skiing
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Competition Coaching Introduction

Learning to Train (Dryland)

Cross-Country Skiing

REFERENCE MATERIAL



Developmental age is highly individual and is an amalgam of a child or adolescent's physical development together with the incorporation of mental, cognitive and emotional maturity. Chronological age refers to the number of years and days since birth. Athletes of the same chronological age between 10 and 16 can differ by as much as four or five years in their developmental age.

Prepared under the authority of
Cross Country Canada's
Coach and Athlete Development Committee



The National Coaching Certification Program is a collaborative program of the Government of Canada, provincial/territorial governments, national/provincial/territorial sport organizations, and the Coaching Association of Canada.





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ATHLETE & COACH DEVELOPMENT PROGRESSION		
Athlete Age	LTAD Stage	NCCP Context
23 +/- males 23 +/- females	Training to Win (T2W)	Competition Coaching: High Performance (CCHP)
20 - 23 +/- males 19 - 23 +/- females	Training to Compete (T2C)	Competition Coaching: Development (CCD – T2C)
16 - 20 +/- males 15 - 19 +/- females	Learning to Compete (L2C)	Competition Coaching: Development (CCD – L2C)
12 - 16 males 11 - 15 females	Training to Train (T2T)	Competition Coaching: Introduction (CCI – T2T)
9 - 12 males 8 - 11 females	Learning to Train (L2T)	Competition Coaching: Introduction (CCI – L2T)
6 - 9 males 6 - 8 females	FUNDamentals	Community Coaching: (CC)
0 - 6	Active Start	Community Coaching: Introduction (ICC)





Illustration by barnstorm creative group

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SECTION 1 – INTRODUCTION AND SETTING THE SCENE





1.1 Introduction

1.1.1 Purpose of Document

This document, your Learning to Train (Dryland) Reference Material, has been developed to expand your knowledge of key coaching topics and is directed primarily at supporting you in your role as a coach working with children in the Learning to Train stage of development.

A copy of this document is provided along with your Learning to Train (Dryland) Coach Workbook when you register for a CCC Learning to Train (Dryland) workshop.

1.1.2 NCCP Core Competencies

As you progress through this workshop, you will work on developing *five core competencies* that will help you become a more effective coach and have a more meaningful impact on the experience of your athletes. The competencies are problem-solving, valuing, critical thinking, leadership and interaction. Here are just some of the ways these competencies come into play:

Problem-Solving

- Develop ways of dealing with common situations where nutrition before, during and after training or competition may affect performance.
- Provide basic answers to common questions athletes and parents have about sport nutrition.
- Develop strategies aimed at influencing parents and athletes about basic nutritional choices.
- Determine the structure of a program and the appropriate ratio of training to competition.
- Identify options to enhance a program.
- Develop an initial practice plan and progressively modify it as new knowledge is acquired.
- Determine an appropriate structure for a practice.
- Design activities that develop both technical skills and athletic abilities.

Valuing

- Appreciate the need for a long-term approach to athlete development.
- Appreciate how a structured and organized practice promotes learning.
- Appreciate the need to consider potential risk factors when planning practice activities.
- Ensure that activities respect growth and development characteristics.
- Ensure that the role of competitions is consistent with the long-term approach to athlete development.





- Consider and value the key role that parents play in influencing their child's nutritional choices and behaviours without passing judgement.

Critical Thinking

- Compare the structure and key features of a program with recommendations aimed at promoting athletes' long-term development.
- Identify specific actions needed to better align a program with the guidelines recommended for long-term athlete development.
- Establish linkages between program priorities and practice planning.
- Develop nutritional strategies and provide advice that reflects the realities of athletes' families.
- Compare current knowledge, skills, and attitudes with the information provided in the Reference Material.

Leadership

- Formulate a vision for a club program that promotes long-term athlete development.
- Develop strategies to manage time and resources, given the need for a long-term approach to athlete development.
- Develop strategies and key messages that influence the nutrition decisions that athletes and their parents make.

Interaction

- Brainstorm with other coaches to develop strategies and plans for having a positive effect on long-term athlete development.
- Brainstorm with other coaches to solve nutritional problems and develop plans.
- Work with other coaches to design activities that develop both technical skills and athletic abilities.

Learning Outcomes

After finishing this workshop:

- You will better understand your own motivation for coaching and others' expectations of you as a coach. This involves:
 - ✓ understanding your starting point,
 - ✓ understanding why people are involved in sport, and
 - ✓ understanding others' expectations of you as a coach.





- ❑ You will know how to design a basic sport program that meets the training and competition needs of your athletes. In particular, you will be able to:
 - ✓ develop a program structure based on opportunities for training and competition,
 - ✓ establish indicators of athlete development in your program, and
 - ✓ develop practice plans that reflect seasonal training priorities.
- ❑ You will have a better understanding of basic sport nutrition and the steps you can take to help your athletes maintain good dietary habits. In particular, you will be able to:
 - ✓ provide guidance to athletes or parents on pre-competition nutrition,
 - ✓ provide guidance to athletes or parents on post-competition nutrition,
 - ✓ take appropriate measures to ensure that athletes stay hydrated during training and competition, and
 - ✓ educate athletes about the use of nutritional supplements.
- ❑ You will know how to plan safe, fun practices that meet your athletes' needs and reflects CCC's Long-Term Athlete Development Model. In particular you will be able to:
 - ✓ explain the importance of logistics in the development of a practice plan,
 - ✓ establish an appropriate structure for your practices, and
 - ✓ identify appropriate activities for each part of the practice.





1.2 Coaching Tips for the Learning to Train (L2T) Stage of Development

The following sections (1.2 and 1.3) complement the information provided in section 8 of your Introduction to Community Coaching Reference Material and section 1 of your Community Coaching Reference Material.

1.2.1 Reasons for Athletes Being in Sport

Children come into a sport situation with their own needs, interests and reasons for being involved. Some athletes spend more time with their coach than they do with a teacher, or even their parents. Because of the significant influence coaches have on the development of athletes, both from an athletic and human point of view, they must seek to identify if the reasons why they are coaching are consistent with what athletes want or need.

This section provides an overview of the main reasons why children are involved in sport, and of certain expectations athletes and parents may have of sport and of coaches. Coaches must recognize and respect individual differences in this area because athletes drop out when programs do not match their reasons for being in sport. In other words, coaches need to be fair to athletes — *either work to give them the program they want OR recommend a program that will better meet their needs.*

In general, children participate in sport for one or more of the following four reasons:

- 1) **A desire for achievement** - a wish to improve, master new skills and pursue excellence.
- 2) **A need for affiliation** - a desire to have positive and friendly relations with others.
- 3) **A desire for sensation** - a desire to experience the sights, sounds and physical feelings surrounding a sport or the excitement in a sport.
- 4) **A desire for self-direction** - a wish to feel a sense of control, to feel in charge.

Achievement-Motivated Participants

You can enhance athletes' motivation to improve and to stay in sport programs by providing personal experiences of success. One way of doing this is to set realistic, progressive goals based on past performances. Athletes then see their progress as they strive to improve.

Here are a few more ideas for making sure that athletes' needs for achievement are fulfilled:

- Point out individual improvement.
- Keep written records of progress in diaries, logs, etc.
- Schedule games or meets with suitable opponents.
- Meet regularly to discuss progress and reevaluate goals.





Affiliation-Motivated Participants

The affiliation motive – the wish to be part of a group and feel accepted by it – is probably the strongest and most common motive for continued participation in sport. Working as a unit, setting goals together, having fun with others, feeling appreciated by a group and sharing with others can all help satisfy the desire for meaningful interaction.

Here are a few suggestions for making sure that the need for affiliation is satisfied:

- Make interaction with others a part of each practice; for example, have athletes do partner drills, encourage partner stretching or have athletes coach each other.
- Have team talks after each practice. Keep these talks informal, and encourage athletes to be open and honest.
- Provide opportunities for social get-togethers after games or meets.
- Encourage athletes to help one another and to do things together.
- Have team parties.
- Remind athletes that everyone is a valued member of the team.

Sensation-Motivated Participants

Experiences that excite the senses – for example, the sights and smells along a beautiful country trail, the feeling of being fit, the desire to move and be active and the excitement of sport itself – can be very important motivators. Here are a few tips on fulfilling athletes' needs in this area:

- Try to arrange workouts in areas with pleasant sights, sounds, smells and physical feelings.
- Have athletes warm up to music.
- Provide enough activity for everyone – not too much, not too little.
- Break monotony regularly with fun or novelty events.
- Vary workouts – change the normal routines.
- Let athletes work on exciting new moves.
- Set up games and interesting challenges.

Self-Direction-Motivated Participants

Sport gives children a rare opportunity to make decisions about what they are going to do – and to deal with the consequences in a non-threatening situation. There are many things you can do to assist those motivated by self-direction. For example, you can let athletes make up their own routines, moves or plays; assess their own progress; set and adjust their own goals; or decide what play to run in a game.





In general, letting athletes make their own decisions builds greater commitment – and so increases motivation. The following pointers should help you satisfy athletes' needs for self-direction:

- ❑ Put athletes in positions of leadership. Have them lead warm-ups, choose drills to develop certain skills, etc.
- ❑ Give athletes chances during practices or competitions to make their own decisions about what strategy to use (what warm-up routine to use, what wax to use, etc.).
- ❑ Above all, let athletes make decisions when it really matters – when decisions will affect outcomes or when parents and friends are observing, for example. This approach helps athletes learn to enjoy competition, and it encourages their development as true competitors.

1.2.2 Reasons for Athletes Being Involved in Cross-Country Skiing

During the 1999 Hovedlandsrennet (an open Norwegian cross-country ski championship for skiers fourteen and fifteen years of age), the organizing club, in cooperation with the Norwegian Ski Association, conducted a survey to see what the participants thought about the sport. 249 skiers responded to the questionnaire. Norway's large skier population permits meaningful studies on skier development, and the results of this survey make for interesting reading. Highlights from the study are summarized below.

What is Happening to Junior Skiers?

- ❑ Friends (one in three) and parents (one in six) were identified as the most important reasons why children begin cross-country skiing.
- ❑ A positive, fun club environment was identified as an important element if children are to continue skiing.
- ❑ Very few of the respondents lived near a ski area that had direct access to good snow conditions. Seven out of ten said they had to travel by car or train to get on snow. The average round-trip to get to snow took 46 minutes, and this was done an average of four times a week.
- ❑ Most on-snow training occurred on groomed tracks at a location that had lit trails and a club warming hut.
- ❑ Almost 55% trained together with others in their club, but 26.6% trained alone – especially those from smaller clubs/communities. 19% trained together with skiers from nearby clubs.
- ❑ Over half participated in their first race before they turned nine, and nine out of 10 had raced by the time they turned ten.
- ❑ Many children leave the sport beginning at 12 years of age.
- ❑ Most children quit the sport because (1) it takes too much time, or (2) they have not met the





goals they set for themselves – the gap between their own expectations and their results was too great! The study showed that most of the respondents (who were still skiing) had set realistic goals for themselves.

- According to the survey, over 80% of this age group participated in other sports in addition to cross-country skiing.
- 90% took part in more than 10 races each year, and an average of four races outside their home province.
- The total training volume averaged 248 hours/year, which is an average of 5.5 hours each week throughout the whole year, or 45 minutes a day.
- Most ski clubs provided two or three workouts per week for this age group during the fall. Skiers did an average of 2.7 workouts on their own.
- Almost 60% of the respondents kept a training log.
- The main reasons to continue skiing were:
 - ✓ To improve – 28.5%.
 - ✓ Belief that they could be successful – 18.6%.
 - ✓ Simply to push themselves to stay in good shape (they just liked training) – 15%.
- Most respondents (90%) were pleased with how their clubs supported their participation in the sport.

1.2.3 Functions and Tasks as a Coach

This section outlines key functions that coaches will likely be responsible for when they work with athletes in the L2T stage of development.

My Coaching Situation

- Coordinate with the other coaches in the club to ensure a vertically integrated and seamless progression of opportunities for all the athletes in the program.
- Coordinate with regional and/or provincial cross-country ski programs to ensure an integrated and seamless regional and provincial sport system.
- Determine a plan for the season for my group that reflects the vision and philosophy of the overall club program.
- Determine the objectives of the practice sessions and/or activities.
- Put together a plan for the practice sessions and special activities.
- Put together a plan for a series of practice sessions and special activities.
- Determine a plan for recruiting and mentoring developing coaches to work with L2T athletes.





- Plan for and lead parents meetings as appropriate.
- Plan for and lead meetings of the support team – coaches and other volunteers (my helpers!).
- Evaluate the impact and effectiveness of the program for which I am responsible.

Managing the Program: In My Coaching Situation, I...

- Arrange for appropriate grooming and tracksetting for practice sessions.
- Keep relevant medical information and emergency contact information for each athlete.
- Keep an inventory of team equipment and waxes.
- Ensure there is appropriate social time built into the program.
- Manage the equipment and waxes.
- Manage the team uniforms.
- Coordinate or oversee the coordination of transportation to/from competitions and special activities.
- Interact with parents.
- Interact with other coaches, volunteers and assistants.
- Interact with officials at competitions.
- Recruit athletes for the program.
- Recruit and train the support team (coaches and other volunteers).

Support to Athletes in Competitive Experiences: In My Coaching Situation, I...

- Determine appropriate competitive events for the development of each athlete.
- Ensure accommodations are booked or billets coordinated for my team if the location of the competition requires an overnight stay.
- Ensure my athletes are all registered correctly for their events before the registration deadline, and all requirements regarding waiver forms are met.
- Make sure facilities and equipment are safe.
- Supervise physical and mental preparation before competition (warm-up).
- Manage the athletes at the competition.
- Keep the athletes focused on the task.
- Manage the parents and assistant coaches involved with your team at the event.





- Make sure the athletes have appropriate equipment for the competition.
- Make sure the athletes have appropriate clothing for the weather conditions.
- Ensure the ski preparation support is appropriate for the event.
- Make frequent adjustments to meet the needs of unexpected situations.

Support to Athletes in Fitness and Skill Development: In My Coaching Situation, I ...

- Ensure the environment is safe and appropriate, and make adjustments as trail and weather conditions dictate.
- Get the ski area and any necessary equipment ready for the activity.
- Ensure that the athletes are notified of what is needed in advance so that they bring appropriate ski equipment and clothing.
- Assist with ski preparation as necessary.
- Motivate the athletes to practise and learn.
- Ensure the fitness and skill development activities are appropriate for the athletes.
- Adjust instructions to meet the needs of the athletes.
- Analyze technical errors/problems.
- Recommend corrective measures.
- Give feedback to athletes.
- Direct/supervise warm-up activities.
- Coordinate activities to develop team spirit.
- Teach basic techniques and technical progressions.
- Teach basic tactics for competitions.
- Demonstrate technical skills.
- Analyze and keep track of the athletes' performance (progress in learning a skill, etc).
- Teach the rules of cross-country skiing.
- Administer basic first aid as needed.





Social Support to Athletes: In My Coaching Situation, I...

- Teach values through sport.
- Develop activities to improve self-esteem.
- Speak to each athlete individually at least once during a practice.
- Listen to athletes.
- Motivate athletes to learn.
- Encourage athletes to develop an appropriate work ethic.
- Develop athlete self-reliance and independence.
- Help develop an athlete's self-esteem.
- Have a positive influence on team spirit.
- Promote and model ethical behaviour.
- Manage conflict.
- Encourage the athletes to persevere.
- Advise parents about their involvement.
- Promote further participation in sport.
- Ensure activities are fun.
- Ensure all participants are given the opportunity for equal involvement.
- Give equal time to all athletes.
- Organize/coordinate recognition/awards ceremonies/social activities.





1.3 The Parent/Coach Relationship

Parents play a key role in the sport experience of athletes. In many cases, it is the parents who initiate the child's involvement in sport. As a result, coach-parent relationships also have a major effect — positive and negative — on athletes' experience in sport. It is therefore important for you to:

- Develop positive and meaningful relationships with athletes' parents.
- Seek to influence parents and guide them so that they can have a positive and supportive influence on their child's sport experience.

Here are some suggestions for how to develop such relationships:

- Organize a formal meeting with parents to discuss the objectives of your program and your approach to coaching. Information to help you is provided in section 8 of your Introduction to Community Coaching Reference Material and at the end of this section.
- Describe to parents - in detail - the behaviour you will be reinforcing in athletes. For example, if you plan to emphasize self-reliance, or reward effort rather than performance, let parents know.
- Explain to parents the support you expect from them. For instance, make it clear that you expect them to bring their children to practice sessions on time and to provide their child with ski equipment that will allow them to learn sport skills that are appropriate for their age.
- Recognize the need for regular, open communication. Since misunderstandings between coaches and parents are usually the result of poor communication, it's important to figure out what works effectively with the parents of your athletes. Use as many different methods as you can, such as letters to parents at the beginning of the season (refer to section 1.3.1), parent meetings, parent questionnaires (refer to section 1.3.2), small group conversations, talks on the telephone, personal notes and club/team newsletters. If you depend on e-mail or your web site only, you may not be communicating as effectively as possible.
- Be positive and open about feedback – it will build parents' trust in you and lead to an even better program.

Why Educate Parents?

As you begin a season, plan how you are going to educate the parents of your athletes. This will add to your work load initially, but in the end it will make your job easier. The vast majority of parents will want to be supportive of their children and some of them will want to have a meaningful role in your club as well. They love and support their children, pay the bills, drive their athletes to practices/competitions, feed, clothe and house them. With some encouragement and guidance they may also become involved in governance, fundraising, social activities, organizing competitions and so on. In the end, investing time in educating the parents will increase support for you as a coach and for your program as a whole.

Without the support of parents it would be difficult to have a successful program!





1.3.1 Sample Letter to Parents

Example of a letter to parents at the beginning of the season:

Dear Parents,

I am pleased to be contacting you for the first time this season. During the season, I will have the opportunity to spend many hours with your son/daughter and I hope that you and I will have the chance to meet on a regular basis also. On this occasion I am writing to invite you to an important parent information meeting that will take place at:

Location: _____ Date: _____

Time: _____ (indicate AM or PM).

This meeting will last approximately one hour. If you have any specific questions that are not covered during the meeting and that you wish to discuss with me, please feel welcome to talk to me immediately afterwards. The agenda for the meeting will be as follows:

- The objectives of the program:
 - ✓ Our philosophy and program objectives.
- The overall plan for this season:
 - ✓ What special activities (ski tournaments, races, backwoods tours) are scheduled, and the dates.
 - ✓ The clothing and equipment your child will need.
 - ✓ Transportation.
 - ✓ The cost per child/payment deadlines.
 - ✓ Christmas and other family vacations, anticipated absences, athlete involvement in other sports/activities.
 - ✓ Expectations of parents.
- Question period.

It is important for our team organizers and coaches to be aware of what your expectations are as parents. For that reason I am requesting that you take a few minutes with your son/daughter to complete the attached questionnaire. Your comments will help us build an honest and open relationship as well as help us align our goals and expectations for the program with the goals and expectations you and your child have.

Team Leaders:

Contacts:

The best time to reach me is:

SDP Programmer: name, phone, e-mail

Coach: name, phone, e-mail

Assistant Coach: name, phone, e-mail

If you are unable to attend I would encourage you to get in touch with me prior to the meeting.

Signature: _____





1.3.2 Sample Pre-Season Questionnaire for Parents

What are your reasons for enrolling your child in an organized cross-country ski program (i.e. Track Attack)?

What are your expectations of the program leaders, and specifically of the coaches?

In your opinion, what goals should be set for the team by the team leaders?

Identify values that you think should be promoted by the program.

List important facts about your child that team leaders should know about (e.g. allergies, health issues, previous injuries, etc.).

Please return the questionnaire to _____

at _____ by _____

(at least one week before the first parents' meeting).

Participant's name _____

Parent/guardian's name _____

Date ____/____/_____(dd/mm/yyyy)





1.3.3 Parents' Rights

To create an optimal environment for your program, you first need to make the decision that you will not view the parents as the enemy, but the “good guys.” You must be willing to work directly with them and be open in your interactions. Keep in mind that parents may not understand the sport, but they do have rights, and their questions may be reasonable and important from their perspective. Always take a professional position - even when you are being challenged. To help you do this you might want to keep in mind the following “Parents’ Rights”:

- 1) **To know your training, background and coaching experience.** Parents have a right to know your NCCP certification level, technical expertise and experience in the sport. They also have a right to know where you have been before and what other clubs/athletes you have coached.
- 2) **To know their child will be safe.** Parents have a right and an obligation to ensure that their child will be both physically and emotionally safe with you. They have a right to be reassured that their child will not suffer physical or emotional abuse, and questions along these lines must be handled sensitively by the coach.
- 3) **To know your coaching philosophy, views on competition and program structure.** Parents have a right to know what your program entails and how it will run. They also have a right to know your beliefs about teaching, competing, winning, what it takes to be successful, etc. The more clearly these positions are spelled out, the smoother your program will run.
- 4) **To know their child will be treated equally with the other athletes in the program.** Parents have a right to expect you to be equally interested in all the athletes enrolled in your program. Coaches who treat athletes preferentially according to their ability undermine the team environment and contribute to premature dropout from the sport.
- 5) **To know you will deal with them in an open and honest manner.** It is reasonable for parents to assume that you will be honest and trustworthy in your dealings with both the athletes and them. This is a reasonable expectation considering they are entrusting you with their children.
- 6) **To know you will conduct yourself in a professional manner.** Parents expect you to present yourself professionally when dealing with their children and themselves. They expect you to set appropriate standards for athlete behaviour, and to enforce appropriate boundaries. They also expect you to act professionally at practices, competitions and in all other coaching-related situations.
- 7) **To know you will listen to appropriate concerns and be responsive.** A parent should be able to approach you with a legitimate and appropriate complaint, have you listen considerately to their concerns, and have you take reasonable action to address the problem. They should receive an open and non-defensive response.





- 8) **To know you will make an effort to know your athletes individually and treat them with respect and dignity.** Good coaches do just this! Parents are delighted with coaches who take the time to get to know their child as an individual.
- 9) **To know their child will learn, improve and have fun cross-country skiing.** Sport is supposed to be rewarding and fun. Parents are investing their time and money for their child to grow and develop as a person and an athlete. These are appropriate expectations. If the athlete is unhappy, or is struggling to acquire a skill, it is reasonable for the parent to approach you about it.
- 10) **To know you will not collude with destructive peer group behaviour.** Parents expect that you will deal promptly with negative social interactions such as scapegoating, ostracism and other demeaning behaviors, and that you will not condone or turn your back on them.

1.3.4 Getting Parents to Work With You

As a coach you are in a position to give parents two things that they want very much, and that frequently causes them to say and do unhelpful things:

- They want their child to be happy; and
- They want their child to be successful.

Parents who cause problems for you may do so because they don't understand the sport (or sport in general), they don't know how to be helpful and they don't understand the effect their behaviour has on you and their child. Following is a list of strategies and ideas that can help you persuade all of your athletes' parents to work with you:

- Help parents redefine what it means to be a winner. Teach them that winning is not about coming in first. It is about the athlete pushing their OWN limits and constantly striving to do better than their best. They are winners if they give a full effort, even if they don't win the competition or achieve the goals their parents or others have set for them.
- Help parents to refocus. All too often parents influence their children to concern themselves with things that are beyond their control – such as the competition, their skis, the weather, the snow conditions, the officiating, etc. Teach parents that focusing on challenges the athlete cannot control will lead the athlete into problems with their performance. Instead the athletes should be encouraged to focus on what they can control, which is themselves.
- Help parents redefine competition. Teach them that it is not appropriate to distract the athlete with thoughts of beating someone else. The competition is the athletes' partner but their real challenge lies within themselves. Help the parents to understand that athletes focusing excessively on the competition usually results in performance problems. Educate them to encourage their children to compete against themselves
- Don't use a crisis intervention model when dealing with parents - don't wait for a situation where problems and emotions have surfaced before dealing with a problem. Use a PREVENTATIVE model and commit yourself to training parents from the first day they are involved with your program. Pro-actively educate them with verbal and written material.





- ❑ Communicate. Keep the lines of communication open between yourself and the parents of your athletes. Be approachable. Encourage them to bring their problems to you directly. Listen to them and give them the feeling that you hear them and can understand where they are coming from, even if you don't agree with them.
- ❑ Act professionally at all times. Do not become emotional when handling problem athletes, or responding to problem parents. Keep control of yourself when they push your buttons. If you are unable to maintain a professional approach, you will not be effective.
- ❑ Educate parents about the CCC Long-Term Athlete Development Model. Explain to them the long-term process their child is involved in and the proper way to measure their success.





1.4 Glossary of Terms

- ❑ **Adaptation** refers to a response to a stimulus or a series of stimuli that induces functional and/or morphological changes in the organism. Naturally, the level or degree of adaptation is dependent upon the genetic endowment of an individual.
- ❑ **Aerobic Capacity** (for the purposes of this document) may be thought of as synonymous with aerobic endurance. That is, the ability to perform without decrement in performance over tens of minutes with the energy contribution being almost exclusively aerobic as the time of the effort/performance increases.
- ❑ **Aerobic Endurance** is the body's ability to exercise whole muscle groups over an extended period of time at moderate intensity, using aerobic energy. Your aerobic system uses oxygen to break down carbohydrates and convert them into lasting energy.
- ❑ **Aerobic Stamina** is the ability to sustain a dynamic effort over an extended period of time (normally, efforts lasting several minutes or even hours). Note: intense efforts lasting between two and 10 minutes require a subset of this athletic ability referred to as maximum aerobic power.
 - ✓ **Aerobic Power** refers to the maximal rate at which the aerobic system can contribute to energy production. Therefore, this will tend to influence maximal effort events or repetitions lasting in the range of two to eight minutes. It should be realized that "anaerobic" processes are heavily involved in such power outputs/performance levels.
- ❑ **Agility** is the ability to execute movements or to move rapidly, with precision and with ease.
- ❑ **Anaerobic Capacity** (following the pattern of terms above) is concerned with the ability of the various anaerobic metabolic pathways (predominantly the anaerobic glycolytic or anaerobic lactate system) to produce high power outputs in the 45 second to two minute range.
- ❑ **Anaerobic Power** (for the purposes of this document) emphasizes the ability of the anaerobic glycolytic system to produce high, but short duration (approximately 8 – 45 seconds) power outputs. In addition to this aspect is the ability of the anaerobic alactate system (ATP-CP), which is able to utilize immediately available energy stores for explosive and/or ultimate speed (i.e. 0 – 8 second durations) actions.
- ❑ **Balance** is the ability to achieve and maintain stability. There are three types of balance: (1) **static balance** - adopting a controlled body position in a stable environment; (2) **dynamic balance** - maintaining control during movement or stabilizing the body by performing muscular contractions to offset the effect of an external force; and (3) the ability to keep an object or another body under control either in a static or a dynamic manner.
- ❑ **Chronological Age** refers to the number of years and days elapsed since birth. Growth, development and maturation operate in a time framework - that is, the child's chronological age. Children of the same chronological age can differ by several years in their level or biological maturation. The integrated nature of growth and maturation is achieved by the interaction of genes, hormones, nutrients and the physical and psychosocial environments





in which the individual lives. The complex interaction regulates the child's growth, neuromuscular maturation, sexual maturation and general physical metamorphosis during the first two decades of life.

- ❑ **Closed Skill** refers to a skill that takes place in a stable, predictable environment by a performer who knows exactly what to do and when. A closed skill is therefore not affected by the environment and tends to be habitual. Movements follow set patterns, have a clear beginning and end, and tend to be self-paced – e.g. a free throw in basketball or a serve in squash or tennis.
- ❑ **Continuous Skill** refers to a skill that has no particular beginning or end and lasts for many minutes - e.g. swimming or riding a bicycle.
- ❑ **Coordination** is the ability to perform movements in the correct order and with the right timing.
- ❑ **Cyclical Sport** is one in which a movement is repeated over and over - e.g. swimming or running.
- ❑ **Discrete Skill** refers to a skill that features an easily defined beginning and end, and is usually of brief duration - e.g. throwing a ball.
- ❑ **Developmental Age** refers to the interrelationship between growth and maturation in relation to the passage of time. The concept of development also includes the social, emotional, intellectual and motor realms of the child. Developmental age reflects the true overall situation of an individual's growth and maturation and may be thought of as an index of development stated as the age in years of an individual and determined by specified standardized measurements such as motor and mental tests and body measurements. The terms "growth" and "maturation" are often used together and sometimes synonymously. However, each refers to specific biological activities. Growth refers to observable, step-by-step, measurable changes in body size such as height, weight and percentage of body fat. Maturation refers to qualitative system changes, both structural and functional in nature, in the organism's progress toward maturity – e.g. the change of cartilage to bone in the skeleton.
- ❑ **Flexibility** is the ability to perform movements of large amplitude about a joint without sustaining injury.
- ❑ **Maximum Aerobic Power (MAP)** is the highest work rate or power output at which energy can be produced aerobically. MAP is determined by two factors: VO₂max and mechanical efficiency. Under normal conditions, an intensity of 100% of MAP can be sustained for approximately six to eight minutes.
- ❑ **Maximal Oxygen Consumption (VO₂max)** is the highest amount of oxygen that can be used by the body to produce energy when performing a particular form of exercise at maximal intensity.





- ❑ **Maximum Speed** is the highest rate at which a movement or a series of movements can be executed, or the ability to cover a given distance in the shortest possible time during an all-out effort of very short duration (eight seconds or less).
- ❑ **Maximum Strength** is the highest level of tension generated by a muscle or muscle group during a maximum contraction, regardless of the duration of the contraction.
- ❑ **Open Skill** refers to a skill that is performed in an environment that is constantly changing and in which movements must be continually adapted. An open skill is predominantly perceptual and mostly externally paced – e.g. a pass in football. Sports such as netball, football and hockey usually involve open skills.
- ❑ **Overload** is making the training harder than the body is used to. In doing so, the body adapts and becomes stronger, faster, etc.
- ❑ **Peak Height Velocity (PHV)** is the maximum rate of growth in stature during the adolescent growth spurt. The age of maximum velocity of growth is called the age at PHV. The rate of change in height varies through specific stages of growth and allows for “height cues” or rates of growth changes to be used as potential indicators of appropriate programming and evaluation content for developing athletes.
- ❑ **Physical Literacy** refers to the mastering of fundamental motor skills and fundamental sport skills.
- ❑ **Practice:**
 - ✓ **Part Practice** is a learning technique in which the task is broken down into parts for separate practice.
 - ✓ **Variable Practice** is a practice in which varying learning conditions are used - e.g. in baseball, hitting random pitches (fastball, curve, slider) versus hitting only fastballs.
 - ✓ **Massed Practice** is a sequence of practice and rest periods in which the rest time is much less than the practice time.
- ❑ **Readiness** refers to the child’s level of growth, maturity and development, which enables him/her to perform tasks and meet demands through training and competition.
- ❑ **Specificity** is a principle of training according to which adaptations are determined by the nature and magnitude of the training stimulus. This concept implies that, to maximize adaptation, the nature and the conditions of training activities must be designed to replicate closely those encountered in competition. Specificity therefore applies to variables such as type of activity, muscle masses involved, motor pattern, speed of movement, environmental conditions, power output, duration of effort and cognitive and perceptual demands
- ❑ **Speed** may be thought of as the ability to move a limb, limbs or the whole body at the greatest possible velocity. In addition, speed involves the capability to react to a stimulus or signal (such as a starting signal, stumble or fake/deke) in the shortest possible time. Speed may be incorporated as part of physical training and/or technical training depending upon the stage of development of the athlete or the sport specificity required.





- ❑ **Speed-Strength** is the ability to perform a muscle contraction or overcome a resistance as fast as possible (normally, very brief efforts of 1-2 second).
- ❑ **Strength-Endurance** is the ability to perform repeated muscle contractions at intensities below maximum strength (normally, 15-30 repetitions or more).
- ❑ **Training Age** refers to the age where athletes begin planned, regular, serious involvement in training. The tempo of a child's growth has significant implications for athletic training because children who mature at an early age have a major advantage during the Training to Train stage compared to average or later maturers. However, after all athletes have gone through their growth spurt, it is often later maturers who have greater potential to become top athletes provided they experience quality coaching throughout that period.
- ❑ **Window of Trainability** refers to a point in the development of a specific behaviour when an optimal effect on development can be derived from experience or training. The same experience, introduced at an earlier or later time, has no effect on or retards later skill acquisition.





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SECTION 2 – ATHLETES AND THEIR SPORT NEEDS



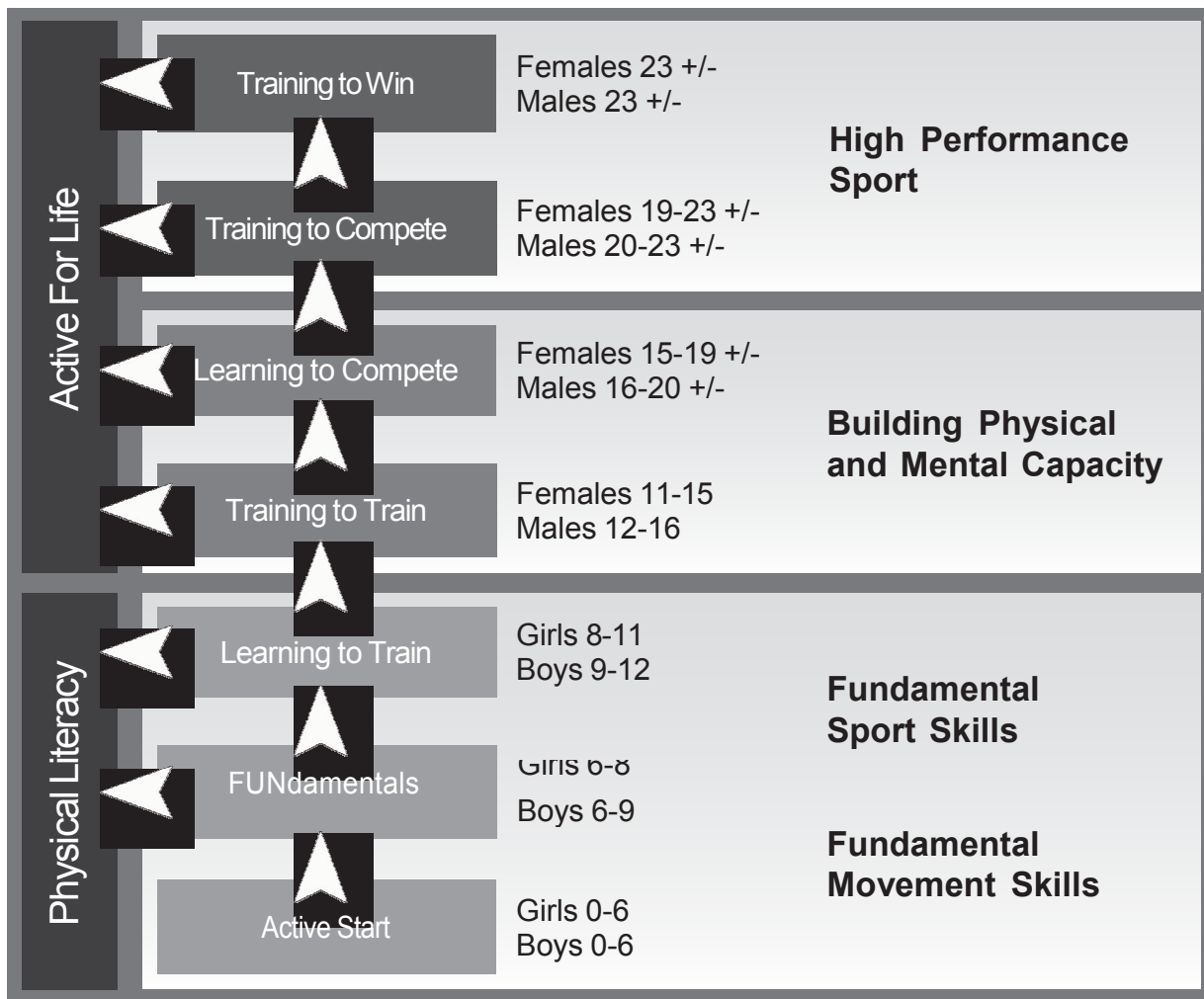


2.1 Stages of Long Term Athlete Development (LTAD)

Cross-country skiing is a late specialization sport. During the first three stages of Canada’s LTAD model, children grow and improve within the sport through programs permitting a broad exposure to activities that develop overall motor and sport skills. Following the first three stages, there is a transition to either further development and excellence in cross-country skiing or life-long participation in skiing and/or other sports at the recreational or less competitive level. For athletes who wish to pursue excellence, increasing specialization in cross-country skiing and an expanding focus on competition permit them to mature athletically and aspire to national and international podiums. Regardless of the level of excellence or sport-mastery achieved however, participation in cross-country skiing – a “sport for life” - can enhance the health, fitness and mental well-being of Canadians of all ages.

2.1.1 The LTAD Framework for Cross-Country Skiing

Figure 2.1





The first three stages encourage physical literacy and “Sport for All”:	The next four stages focus on development and competitive excellence:	The final stage encourages life-long physical activity:
1. Active Start 2. FUNdamentals 3. Learning to Train	4. Training to Train 5. Learning to Compete 6. Training to Compete 7. Training to Win	8. Active for Life

2.1.2 The LTAD Stages for Cross-Country Skiing

To promote a healthy and logical development for each athlete, the LTAD model identifies sequential stages for training and competition that respect his/her physical, mental and emotional development. This approach encourages lifelong physical activity for athletes of all levels of ability and disability. It also provides an effective route for athletes to pursue excellence up to and including the national and international levels of competition.

The following is an overview of the eight LTAD stages:

1. **Active Start** (Boys and Girls 0-6)

- This is an important period for acquiring the fundamental movement skills that lay the foundation for more complex movements, thereby preparing children for a physically active lifestyle.
- Young children should be physically active through active play, and encouraged to begin cross-country skiing at an early age.

2. **FUNdamentals** (Boys 6-9 and Girls 6-8)

- Fundamental movement skills are mastered, motor development emphasized and basic cross-country ski skills learned. For optimal sport specific acquisition, all basic ski skills, both classic and skating, should be learned before the end of this period.

3. **Learning to Train** (Boys 9-12 and Girls 8-11)

- This is an important period for motor development and ***window of optimal trainability for motor-coordination***. Children are developmentally ready to acquire the general sport skills that will be the cornerstone of their athletic development.
- Fitness becomes increasingly important.

4. **Training to Train** (Males 12-16 and Females 11-15)

- This is an important period for developing aerobic capacity, which is especially critical for cross-country skiing (a lot of skiing at low intensity!).





- Social and emotional considerations are very important. Team building, group interaction and social events should be emphasized.

5. **Learning to Compete** (Males 16-20 (+/-) and Females 15-19 (+/-))

- Fitness preparation, sport and individual specific skills are developed. The development of self-awareness and independence should be emphasized.
- Training and racing should be integrated gradually and seamlessly into the overall timetable and lifestyle of the aspiring competitive athlete.

6. **Training to Compete** (Males 20-23 (+/-) and Females 19-23 (+/-))

- This is an important period for individualized fitness preparation. Fitness and medical monitoring is increasingly sophisticated, and sport and individual specific skills are mastered.
- Self-awareness and independence become increasingly important.
- Athletes learn to compete internationally.

7. **Training to Win** (Males 23 (+/-) and Females 23 (+/-))

- During this stage athletes focus on high performance and undertake multi-year preparations for major events (i.e. Olympics, World Championships).
- High performance sport specialist support is optimized, as is fitness and medical monitoring.
- All aspects of training and performance are highly individualized.
- Podium performances are the goal.

8. **Active for Life** (This stage can be entered at any age)

- There is a better opportunity to be “Active for Life” if physical literacy is achieved before the “Training to Train” stage.

Children who do not develop their fundamental motor skills by 12 years of age are unlikely to reach their genetic athletic potential.





2.1.3 Learning to Train (L2T) Stage of Development

This is an important period for motor development, and an optimal window of trainability for motor-coordination. At this stage, children are developmentally ready to acquire the general sport skills that will be the cornerstone of their athletic development.

Objectives

- To further develop all fundamental movement skills and general overall sports skills. Otherwise, a significant window of opportunity is lost, compromising the ability of the young athlete to reach full potential.
- All basic cross-country ski skills will be refined by the end of this stage.

Optimal Windows of Trainability

- Motor skills and coordination should be developed.
- This is a major skill learning phase.

The Goals

The goals for this stage include:

- Developing all basic sport skills (physical literacy) before the athlete enters the “Training to Train” stage.
- Introducing hopping and bounding exercises or routines, or wheeling up gradients, to aid in strength development.
- Utilizing games to develop skills, speed, power and aerobic fitness.
- Further developing strength, using exercises that incorporate the child’s own body weight as well as medicine balls and Swiss balls.
- Further developing flexibility through exercises.
- Further developing good ski technique habits through repeated practice and the use of games that reinforce the technique being taught.
- Further developing speed by using specific activities that focus on agility, quickness and change of direction.
- Structuring competition to address differences in training age and abilities.
- Narrowing the focus to three sports while encouraging participation in a variety of other sports/activities such as canoeing, cycling, swimming, etc.
- Sport-specific practice sessions three times a week during the fall and ski season; participation in other sports three times a week during the ski season and more often in the off-season.





- Building adventure-based activities into the seasonal plan.
- Introducing dryland ski techniques – ski walking and ski striding.
- Emphasizing group interaction, team building and social activities.
- Integrating mental, cognitive and emotional development.
- Introducing ancillary capacities.
- Encouraging unstructured play.

Psychological Training

- Objectives:
 - ✓ To understand the importance of practising basic mental skills.
 - ✓ To develop an awareness of how performance unfolds from a mental perspective.
- To-do list:
 - ✓ Introduce pre-race preparation.
 - ✓ Introduce tactical skills.
 - ✓ Introduce the mental skills of:
 - Constructive self-talk.
 - Imagery.
 - Confident behaviour.

The “Learning to Train” and “Training to Train” stages are the most important stages of athletic preparation.





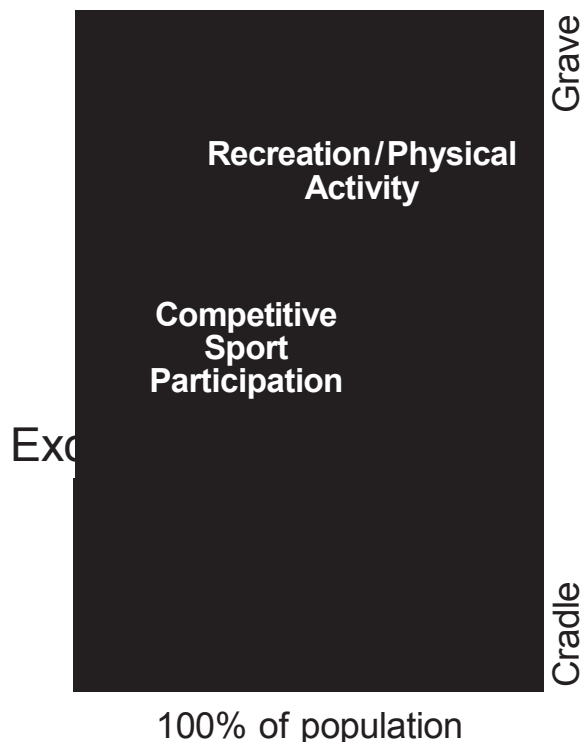
2.2 Physical Literacy

- ❑ FUNdamental movements skills plus FUNdamental sports skills = physical literacy.
- ❑ Physical literacy refers to competency in movement and sports skills.
- ❑ Physical literacy gives children the tools they need to take part in physical activity and sport, both for healthy life-long enjoyment and for sporting success.
- ❑ Physical literacy should be developed before the onset of the adolescent growth spurt.

Fundamental movements and skills that provide the base requirements for future advances in movement capacity and athletic skill should be introduced through fun and games at an early age. Without the basic movement skills, a child will have difficulty excelling in most sports. For example, to enjoy baseball, basketball, cricket, football, netball, handball, rugby and softball, the simple skill of catching must be mastered. The emphasis on “FUN” within “FUNdamentals” clearly recognizes fun as an extremely powerful motivating force for children.

FUNdamental movements and specific skills should follow and include basic universal elements such as (but not limited to) running, jumping and throwing. Furthermore, the aspect of an underlying “physical literacy” should be considered as a foundation concept that embraces the ability to execute a broad base of physical competencies.

Figure 2.2





2.2.1 Developing Physical Literacy

Physical Literacy: What Exactly Is It?

Physical literacy is the development of fundamental movement skills (section 2.2.2) and fundamental sport skills (section 2.2.3) that permit a child to move confidently and with control in a wide range of physical activity, rhythmic (dance) and sport situations. This includes the ability to “read” what is going on around them in an activity setting and react appropriately to those events.

For full physical literacy, children should learn fundamental movement skills and fundamental sport skills in each of the four basic environments:

- On the ground – as the basis for most games, sports, dance and physical activities.
- In the water – as the basis for all aquatic activities.
- On snow and ice – as the basis for all winter sliding activities.
- In the air – as the basis for gymnastics, diving and other aerial activities.

Physical literacy is developed during the first three stages of the LTAD progression, meaning the period of time from birth to the start of adolescence (section 2.1.1).

The Myth That It “Just Happens”

While it’s true that many children DO develop good physical skills on their own by trial-and-error, there are many who do not; and for those the consequences can be serious.

Children who are physically skilled often enjoy vigorous healthy play while the less skilled are left out. This creates a vicious cycle - those with the skills play, and through that play further develop fitness and skills. In contrast, those who are less skilled play less, have fewer opportunities to refine and develop their skills, and fall further and further behind their skilled peers. Eventually many of the less skilled children stop trying and withdraw from the activities that would help them become more fit and more skilled.

The Consequences of Missing Out

Children tell us that not having the skills to play is one major reason they drop out of physical activity and organized sport.

A child who misses out on developing physical literacy is at a great disadvantage. On the playground and in the park, children like to play with other children who have the same level of skill they do, and who can “keep the game going”. If a child can’t keep the game going, he/she generally won’t be asked to join in.





Missing out on fundamental movement skills also means that a child is unlikely to choose to take part in a formal sport activity that requires proficiency in that skill. This will restrict his/her choice of life-long health-promoting activities. It will also restrict opportunities for sporting excellence.

It is worth noting that the inability to perform even one fundamental movement skill can seriously restrict later opportunities for recreational or competitive activity.

2.2.2 Fundamental Movement Skills

To become physically literate, children need to master fundamental movement skills. However this mastery does not come all at once and coaches need to continually keep in mind that children are not miniature adults. To successfully learn most skills, a developing child needs to go through a series of developmental stages. The objective of a coach should therefore be to help each child move through an appropriate skill progression, rather than pushing him/her to perform the skill the way an adult would do it.

Although children mature and learn at different rates, almost all children learn their fundamental movement skills in the same sequence, and go through the same phases:

- ❑ **When can a child learn a skill?** As a child grows and develops (matures), the nerve cells make more connections. At the same time, the muscles of the body become stronger. When the brain is mature enough and the muscles are strong enough, a child can learn a skill. Before that point in time, trying to teach skills to a child does little good. What a child needs most during this period is many opportunities to explore all possible movements in a rich environment – which means that the child’s environment needs to be both safe AND challenging.
- ❑ **When is the child ready to learn a skill?** At a certain point in maturation, all the hardware – the muscles and nerves – will have developed sufficiently to allow the child to perform a particular skill (the readiness factor). When the skill begins to emerge naturally, learning can be dramatically improved through practice by using a variety of different equipment and materials. Providing children with simple instructions and plenty of opportunity to practise can help them develop confidence that will stay with them throughout their lives (although it may not actually “speed up” the learning process).
- ❑ **The optimal time to learn a skill.** For every emerging skill there is a “best” time for a child to learn. Again, providing the child with simple instructions and plenty of opportunity to practise can improve learning and pay great dividends. While the “best” time to teach a particular skill differs according to the child, there is a consistent pattern in the sequence in which they learn skills.
- ❑ **The time for remedial work.** If the child goes too long without learning a skill, then it may become more difficult to learn. However, the sooner the child starts to overcome the learning deficit the easier it will be to catch up – and develop the skill and confidence needed to be fully active with friends and peers.

2.2.3 Fundamental Sport Skills





Running, jumping, catching, kicking, throwing and hitting something with a stick, bat or racquet of some kind, are the basic building blocks of the many sports played by the vast majority of people. A person who can perform these fundamental sport skills well can easily learn to play many sports.

Making good decisions in sport situations is another skill that is fundamental to each sport (section 2.2.4).

The difference between fundamental movement skills and fundamental sport skills can be illustrated by the following examples:

- ❑ When children learn to throw a variety of balls of different sizes with one hand or both hands, and to throw the ball at different speeds - sometimes for accuracy using a variety of different targets, and sometimes for distance - they are learning a fundamental movement skill.
- ❑ When children learn to throw a softball using a softball pitching motion, and attempt to pass the ball over home plate, they have moved from learning a “fundamental movement skill” to learning a “fundamental sport skill”.

For children to have success in sport - either as a health-related recreational activity or a competitive activity - it is important that they master fundamental movement skills before learning fundamental sport skills, and it is important that they learn fundamental sport skills before being introduced to specific techniques.

Some further examples of this are:

❑ **Kicking Skills**

- ✓ In the “fundamental movement skill” stage, children should learn the basic kicking action with each foot. They should kick a wide variety of balls and try different things – e.g. kicking as far as they can, kicking to hit a target, kicking to keep the ball on the ground, kicking the ball as high in the air as they can.
- ✓ In the “fundamental sport skill” stage (e.g. soccer), children learn to kick a soccer ball without touching the ball with their hands, how hard they have to kick the ball in order to get it to another team member and how to kick the ball with the inside of the foot to increase passing accuracy.

❑ **Catching Skills**

- ✓ In the “fundamental movement skill” stage, children learn to catch - first with both hands together in a two handed catch, and then with one hand. They will learn to catch a wide variety of balls of different sizes and weights, to catch the ball while they are standing still and when to move towards the ball. These are skills that can later be transferred to any sport they take up.
- ✓ In the “fundamental sport skill” stage (e.g. baseball), children learn to catch a baseball using a baseball glove. As their skill level improves they learn to catch the baseball when it is thrown at them, and then when it is hit with the bat.





For more information on movement skills and sport skills refer to section 4.4 of this Reference Material.

2.2.4 Other Skills

Prediction and Interception

While it is easy to understand why physical literacy needs to include the skills of running, jumping, throwing, kicking, catching, etc., along with agility, balance, coordination and speed, there are other skills that are less obvious. The two most important of these are prediction and interception.

Take a moment to think about what it takes to catch a softball that has been hit high into the air. As the catcher, children need to be able to:

- see the ball leave the bat, and predict where it will land;
- move to where they think the ball will land, and do so before the ball arrives (this is the ability to intercept the ball, and is a physical literacy skill that needs to be learned); and
- catch the ball!

This ability to predict and intercept is critical to many stick, bat and racquet sports where children need to predict where the ball or puck is going, and then move their bat, racquet or stick so that the moving “stick” makes solid contact with the moving “ball”.

In order to learn a complicated skill of this kind two things are required:

- sufficient maturation of the brain and vision (which usually happens between the ages of four and seven); coupled with
- many opportunities to try to catch, intercept and hit a variety of different sized and shaped objects moving in many different directions at many different speeds (i.e. a lot of practice!).

Learning these kinds of skills can also be helped significantly by good coaching, particularly with respect to body position and what children should be seeking.

Rhythm

Basic rhythm skills are developed during the early years of life and, if developed well, open up later possibilities for lifelong involvement in dance, music and other artistic activities. Rhythm activities also help develop fluid movement patterns that can help children perform many fundamental movement and fundamental sport skills with greater ease and efficiency.

2.2.5 The Key to an Active, Healthy Life and Sporting Excellence

Being physically active is more important to health than just about any other part of life over which we have control. Recent research suggests that it is better for one’s health to be overweight and active than to be of normal weight and inactive. For this reason alone it is critical that children





develop the knowledge, skills and attitudes that give them the very best chance of staying active throughout their lives.

When children have confidence in their ability to take part in recreational and sporting activities without fear of showing themselves up, the probability that they will join in is high; and if they enjoy the activity they will likely continue with it. Children's movement confidence develops gradually as they grow and learn, and children are constantly comparing their own level of ability with the ability of the children with whom they play. Physically literate children who move with skillful purpose KNOW that they move well, and this confidence encourages them to try new and different activities without fear.

Physical literacy also provides a foundation from which sporting excellence can grow.

Physical literacy is therefore the key both to developing habits of life-long physical activity for enjoyment and health, and to the development of athletes who have the strong foundation that will permit them to reach the highest levels of international sporting excellence – to become world-class athletes.





2.3 CCC Athlete Development Grid

LTAD STAGE	COACH LEVEL	FACILITIES	TECHNIQUE	PHYSIOLOGY, STRENGTH, FLEXIBILITY	MENTAL SKILLS	COMPETITION	OTHER
<p>“Learning to Train” stage of athlete development. Boys 9 – 12 Girls 8 - 11</p>	<p>NCCP Coaching Introduction (CCI) – Learning to Train Minimum 58 hours training.</p>	<p>Varied terrain, including challenging technical trails. Groomed tracks for skating and classic techniques. Lit trail system. Day lodge in stadium area.</p>	<p>Window of optimal trainability for motor-coordination. Introduce dryland ski techniques – ski walking and ski striding. The focus on snow is balance, agility and rhythm. Good technique habits are developed through repeated practice. Use games that reinforce technique being taught. All basic cross-country ski skills (classic and skating) should be refined before the end of this stage. Encourage unstructured play time on snow.</p>	<p>Utilize games to develop skills, speed, power and aerobic fitness. Window of optimal trainability for flexibility. Basic dynamic and static flexibility training with an emphasis on proper technique. Develop strength using medicine balls, Swiss balls, exercises that incorporate the child’s own body weight. Include basic core strength exercises. Use ski-related hopping and bounding exercises for developing leg strength and movement skills. Include speed exercises in the practice sessions by using specific activities that focus on agility, quickness and change of direction. Aerobic fitness is increasingly important. Include general aerobic activities 3-4x/wk.</p>	<p>Develop an awareness of the importance of practising basic mental skills. Introduce pre-race preparation. Introduce tactical skills. Introduce the mental skills of constructive self-talk, imagery and confident behaviour. Introduce basic stress management. Introduce basic goal setting.</p>	<p>Racing Rocks! ✓ <i>Ski Tournaments</i> ✓ <i>Double Cross</i> ✓ <i>Team Sprints</i> Midget Championships. Club, regional (and Provincial/Territorial Cup races when held within region). 5-10 competitive experiences per season. Race distances: start with 1.0 km and progress to a maximum of 3 km. 5-10 min. max.). Sprints: 200m. Generally begin after Xmas. Introduce ancillary capacities. Competitive focus should be on personal improvement. Basic rules are learned.</p>	<p>Narrow the focus to three sports. Ensure appropriate ski equipment. Good nutrition; continued education on re-hydration Emphasize group interaction, team building and social activities. Group sessions begin Sept. 15. 1.25 to 1.5 hrs. 3x /wk during fall and ski season. Maximum 70 sessions including competitions and special activities (includes winter safety and ski care education). Ensure “adventure-based” activities are built into season plan. Make good use of snow season.</p>

Important note for all age groups re: race distances. Early season races should be at the shorter end of the range. The maximum distance should only be raced a few times towards the end of the season. When establishing a race distance or deciding which race skiers will enter, take into account: the ability and fitness of the skiers; the difficulty of terrain; the elevation (altitude) of the race site; and whether the skiers are in the first or second year of their age class. The objective is to have skiers race at high speed with good technique, rather than struggle to finish the distance.





2.4 Growth and Development Considerations

10-11 Years, Growth and Development of Athletes

General Remarks
<ul style="list-style-type: none"><input type="checkbox"/> Develops conscience, morality and values<input type="checkbox"/> May display a highly competitive attitude (wants to look like a competent performer)<input type="checkbox"/> Marked distinctions between boys and girls begin to be visible, particularly toward the end of this period<input type="checkbox"/> May want to break free from the authority of adults and may show a defiant attitude<input type="checkbox"/> Athletic background may be highly variable among athletes; participation in sport activities is usually done on a seasonal basis<input type="checkbox"/> Time devoted to general training and the acquisition of a variety of skills and motor patterns should be greater than time spent training for a specific activity, preparing for competition or being engaged in competition
Psychosocial
<ul style="list-style-type: none"><input type="checkbox"/> Is usually very interested in group activities and creates strong links with a few friends<input type="checkbox"/> Wants to enjoy a greater degree of autonomy and wants to help<input type="checkbox"/> Shows a high degree of loyalty to the group<input type="checkbox"/> Begins to be interested in individuals of the opposite sex, without showing it openly<input type="checkbox"/> Expresses his or her feelings easily (e.g. anger, sadness)<input type="checkbox"/> Boys and girls can be involved together in the same activities
Learning
<ul style="list-style-type: none"><input type="checkbox"/> Begins to show some ability to deal with abstract concepts, yet prefers concrete examples<input type="checkbox"/> Emphasis should still be on general motor development and the learning of skills in a variety of sports<input type="checkbox"/> Fine motor control improves during this period<input type="checkbox"/> It is possible to start teaching a few specialized techniques, as well as fundamental tactical principles; the rules of the games should be well understood<input type="checkbox"/> Capacity to concentrate increases (can stay focused for approximately 10 minutes at a time)





Physical
<ul style="list-style-type: none"> <input type="checkbox"/> Strength and endurance gains are possible as a result of fitness training, but improvements are also directly related to growth; very little potential for increased muscle mass (hypertrophy); strength gains result primarily from increased coordination and neural factors <input type="checkbox"/> Flexibility improves, but it should also be trained <input type="checkbox"/> Reaction time is relatively slow; however good visual acuity and depth perception allow for better performance in throwing/catching exercises <input type="checkbox"/> Sweating mechanism of children is not well developed, which reduces their capacity to dissipate heat during exercise; children are at an increased risk of heat injuries; children cool off rapidly and do not tolerate cold well <input type="checkbox"/> In girls, the second half of this period marks the beginning of a major growth spurt that will last approximately 3.5 years; some girls may have their first menstruation as early as 11 years of age. In some boys, puberty will begin at the end of this period
Preferences
<ul style="list-style-type: none"> <input type="checkbox"/> Enjoys games that feature some competition, team games, as well as activities that require some form of effort or that represent some sort of physical challenge
To Avoid
<ul style="list-style-type: none"> <input type="checkbox"/> Activities that feature repeated impacts or where there is a risk of collision; repetitive activities (to prevent boredom and overuse injuries); activities that feature too much structure; inappropriate exposure to a cold or hot environment <input type="checkbox"/> Use of equipment that is not designed for children; repetition of all-out efforts lasting between 20 and 60 seconds; work against a high resistance; prolonged aerobic endurance efforts <input type="checkbox"/> Specialization in a sport or in a position on a team <input type="checkbox"/> Emphasizing winning and creating pressure to perform <input type="checkbox"/> Comparisons with other children <input type="checkbox"/> Unpleasant or unsatisfying competitive experiences <input type="checkbox"/> Mechanical or highly repetitive approach to the teaching of fundamental techniques



**Suggestions**

- Participation in several sports/activities should be encouraged
- Rules should be adapted to encourage a high degree of interaction between athletes and to increase the probability of success during the activity; modified, scaled-down equipment should be used
- Demonstrations should be highly specific, simple and aimed at the achievement of a well-defined objective; duration of activities should be relatively short, and exercises should change frequently
- Time when athletes are actively involved in activities during practices should be maximized
- Children need to be praised and complimented generously and regularly for their efforts
- Feedback should focus on one point only; choose the most important one; emphasize the development of confidence, self-esteem, peer interaction, cooperation, having fun, putting winning and losing into perspective, and giving 100% effort
- Encourage children to drink water, and ensure plenty of drinks are available when exercising in the heat

12-15 Years, Growth and Development of Athletes**General Remarks**

- Period where major growth spurts occur; in each gender, large differences in physical maturation may be observed in individuals of the same chronological age; in general, girls develop earlier than boys
- During this period, there is often a large difference in maturity between boys and girls
- Acquires moral concepts, values and attitudes that make it possible to relate meaningfully to society; positive role models are important
- Opinion of friends tends to be more important than that of the coach; athletes want to look like or be perceived as competent performers
- This is a period of major change during which athletes are likely to challenge authority, be very critical, question decisions and ask for justification
- Competition becomes increasingly important to some athletes; time devoted to general training should be greater than time spent training specifically for a sport or time spent competing





Psychosocial

- It is important to separate boys and girls for activities and competition
- Emotional instability may be observed because of the rate at which physiological changes occur
- Shows a greater desire for independence; this can be a time of rejection of parental authority and, in general, a period when there is a high degree of confrontation with adults
- Develops close relations with individuals of both sexes; enjoys being more independent and having more responsibility; a great deal of interest in sexuality is observed toward the end of this period
- This period is important for the development of values such as respect for others, fair play and a work ethic

Learning

- Begins to think like an adult; it is important to take into account the different maturity level between boys and girls; interests and abilities differ between the genders; challenges can be very appealing
- Needs change on a regular basis; is highly curious; capacity to concentrate increases (can stay focused for 20 minutes or more at a time); increasingly capable of abstract thinking
- This is a good period to consolidate the development of fine motor skills, to teach more complex tactical notions, and to encourage decision making in specific situations

Physical

Girls:

The development of secondary sexual characteristics begins at approximately 11-11.5 years of age. On average, the growth spurt begins shortly after that. Maximal growth rate (or peak height velocity, PHV) is normally observed between 11.5 and 12.5 years, and menarche (first menstruation) occurs approximately one year after PHV. During this period, body fat content tends to increase progressively, and typical female body forms (hips) appear because of the effect of hormones. As a result of these changes, performance often plateaus or may even decline for a short period of time. In addition, for a period of several months following menarche, girls may have difficulty sustaining heavy training loads. Girls should be counselled that this phenomenon is normal and that their performance will continue to improve after this temporary phase.



**Boys:**

The development of secondary sexual characteristics occurs progressively at approximately 11 years of age. On average, the growth spurt begins at age 13, and PHV is reached at age 14-15. Significant gains in muscle mass and in strength typically occur one year after PHV (i.e. approximately ages 15-16) because of higher levels of testosterone. This is a good time to initiate strength training with heavier loads if this athletic ability is important in the sport.

Boys and Girls:

- During the growth spurt, feet and hands tend to grow first, followed by the legs and arms; long bones are fragile during this time; growth is accompanied by an increase in body weight throughout the period
- As a result of the rapid growth spurts that occur during PHV, body parts can be disproportionate; this can have a direct effect on coordination and the ability to perform certain skills that had already been well mastered
- This period is well suited for the development of aerobic fitness, as well as flexibility

Preferences

- Enjoys challenges and the opportunity to accomplish individual feats
- Accomplishment of actions that are likely to be looked at or admired by peers/friends
- Activities that contribute to the development of fine skills/dexterity and that do not require too much strength, team games, situations where some form of competition exists

To Avoid

- Repetition of all-out efforts lasting between 20 and 120 seconds before or during PHV; work against high resistance; prolonged aerobic endurance efforts that involve impact on the joints (i.e. running on a hard surface such as asphalt)
- High mechanical stress (compression forces) on the long bones and the backbone, e.g. lifting heavy weights
- Programs where the number of competitions is greater than the number of practices
- Pressure to perform
- Negative competitive experiences





Suggestions

- Time when athletes are actively involved in activities during a practice should be as high as possible
- Acquisition of more complex or sport-specific techniques; explanations can be more elaborate where appropriate; a high number of repetitions during drills is possible
- Give the opportunity to make decisions and to problem-solve
- Correct execution of movements must be emphasized if strength training is performed
- Appropriate supervision of training activities is important to prevent unnecessary risks that adolescents may take
- Games emphasizing skill and dexterity
- Opportunities to meet or interact with sport role models (athletes or coaches); competitions or tournaments that involve trips; social activities among the team/training group
- When an athlete who has reached puberty experiences pain in the joints (e.g. shoulders, elbows, knees) or if he/she now seems to have difficulty completing workouts that previously posed no difficulty, training loads (amount-frequency-intensity) may have to be decreased to avoid undue stress on the athlete's body
- Depending on the maturity level, involvement in roles such as officiating or leading certain activities (e.g. leading a warm-up or cool-down)





2.5 Developmental Age (Maturation)

It is important to understand the concept of “developmental age”. This refers to the degree of physical, mental, cognitive and emotional maturity as opposed to the well-understood notion of “chronological age”.

Developmental age is highly individualistic and is an amalgam of a child or adolescent’s physical development (assessed by skeletal maturity or bone age), together with the incorporation of mental, cognitive and emotional maturity. Chronological age refers to the number of years and days elapsed since birth. Athletes of the same chronological age between 10 and 16 can differ by as much as four or five years in their developmental age.

The beginning of the growth spurt and the peak of the growth spurt are very significant considerations in the application of LTAD to training and competition program design. For the most part, they are also relatively easy-to-obtain indications of the general developmental process that can be used to observe and monitor growth. As a result, LTAD requires the identification of early, average and late maturing individuals in order to help design appropriate training and competition programs in relation to the optimal trainability and readiness of an athlete.

Our sport system frequently selects athletes in the 10 to 16 age range to training camps, provincial teams and other programs offering educational and skill development advantages based on performance. Since early maturers typically have a significant biological advantage over their competitors, this selection process may create obstacles for late maturing athletes who, provided they experience quality coaching throughout that period, often have the potential to become the top athletes. It is therefore essential that administrators/programmers and coaches take developmental age-related considerations into account when designing their programs.

Figures 2.3 and 2.4 (below) show the rate of change in height in boys and girls through the key growth period.

Figure 2.3

Rate of Change in Height & Peak Velocity (PHV)
(Adapted from Tanner, 1978 & Kahn, 1999)

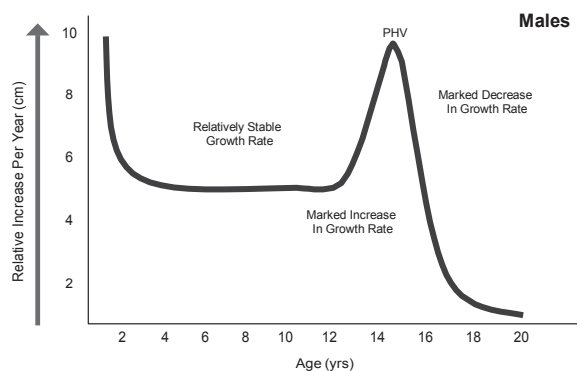
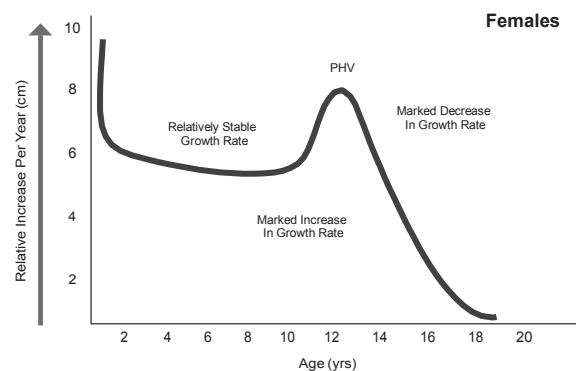


Figure 2.4

Rate of Change in Height & Peak Velocity (PHV)
(Adapted from Tanner, 1978 & Kahn, 1999)



2.5.1 Early Versus Late Developers

Adolescence is the period between childhood and becoming an adult. While both the start and end of this period are difficult to define, it is usually obvious when a youth is going through the





many physical, psychological, social and sporting changes that accompany it.

Not all children enter adolescence at the same age, and it takes different children different lengths of time to complete the process. In general, children who enter adolescence early pass through it faster than those who start later, and whether they start early or late partially depends on their body shape. Stockier, more muscular children usually enter adolescence earlier than their peers who are thinner and leaner.

The whole process starts at approximately age 10 - 11 for girls, and approximately two years later for boys. It usually takes three to four years to complete. This means that for girls aged 12, some will have almost completed the physical changes of puberty, while others have barely started. For boys the greatest range of development is found in 14 year olds.

Few sports recognize and make provisions for the difficulties faced by early and late developers, or understand that those difficulties are different for boys and girls. Because of this, in many Canadian sports there are disadvantages to being either an early or a late developer.

One advantage late developers have is that they have a longer period of time between learning fundamental movement skills and the onset of adolescence. This “Learning to Train” stage is a time when the human body is perfectly designed for the acquisition and refinement of sport skills, and the longer a child is in this stage, the better developed their skills can become.

The challenge in sport for late and early developers is explained as follows:

- ❑ **Males.** In reality, male late developers are often at a great disadvantage. This is especially true in sports where age group competitions are held. As their peers go through puberty, late developing males find themselves much smaller, less muscular and physically weaker. Training and competing against bigger, stronger and faster opponents is not always fun, particularly in contact sports, and late developers therefore tend to drop out, despite the fact that in the long run they have greater potential for success. There are also disadvantages to being an early developer. Early in adolescence, early developers (who go through a relatively rapid but short adolescence) are bigger, stronger and faster than their peers and this often translates into sporting success. However, as late developing competitors go through their longer, more sustained, growth spurt, they eventually catch up with and surpass the early developers. With their late developing peers now bigger, faster, stronger and more skilled than them, the early developers tend to drop out of their sport. This usually occurs towards the end of adolescence.
- ❑ **Females.** For females the situation is less clear, but appears to be reversed. Changes to their body along with social pressures to discontinue sport involvement can cause early developers to drop out early in their teen years, while late developing females who had success with their prepubescent bodies when their competitors developed before them face the same difficulty when older.





2.5.2 Measuring Growth

Coaches and parents can use stature measurements (height) before, during and after maturation as a guide for tracking the development age of children. Tracking allows coaches to address the critical or sensitive periods of physical development (endurance, strength, speed and flexibility) and skill development.

The age of an athlete can be examined from seven different perspectives:

1. Chronological age
2. Biological age
3. Developmental age
4. Sport-specific training age
5. Relative age
6. Skeletal age
7. Training age

How to Measure Growth Spurt

- Stand straight against a wall; no shoe; heels touching the wall.
- Measure from floor to top of head.
- Measurements should be taken at the same time of day (AM or PM).
- Phase 1: Age 0 to 6**
 - ✓ Very rapid growth.
 - ✓ Measure standing height and weight on birthday.
- Phase 2: Age 6 to the Onset of Growth Spurt**
 - ✓ Steady growth until the onset of growth spurt.
 - ✓ Measure standing height and weight every three months.
 - ✓ If measurement takes place outside of home, replace birthday with an annual starting point of measurements.
- Phase 3: From the Onset of Growth Spurt to Peak of Growth Spurt**
 - ✓ Rapid growth until peak is reached.
 - ✓ Measure standing height, sitting height and arm span every three months.
- Phase 4: Peak of Growth Spurt to Slow Deceleration**
 - ✓ Rapid deceleration.
 - ✓ Measure standing height, sitting heights and arm span every three months.





☐ **Phase 5: From Slow Deceleration to Cessation**

- ✓ Slow deceleration of growth until cessation of growth.
- ✓ Measure standing height every three months.

☐ **Phase 6: Cessation**

- ✓ Cessation of growth.
- ✓ Measure height and weight on birthday.





2.6 Trainability

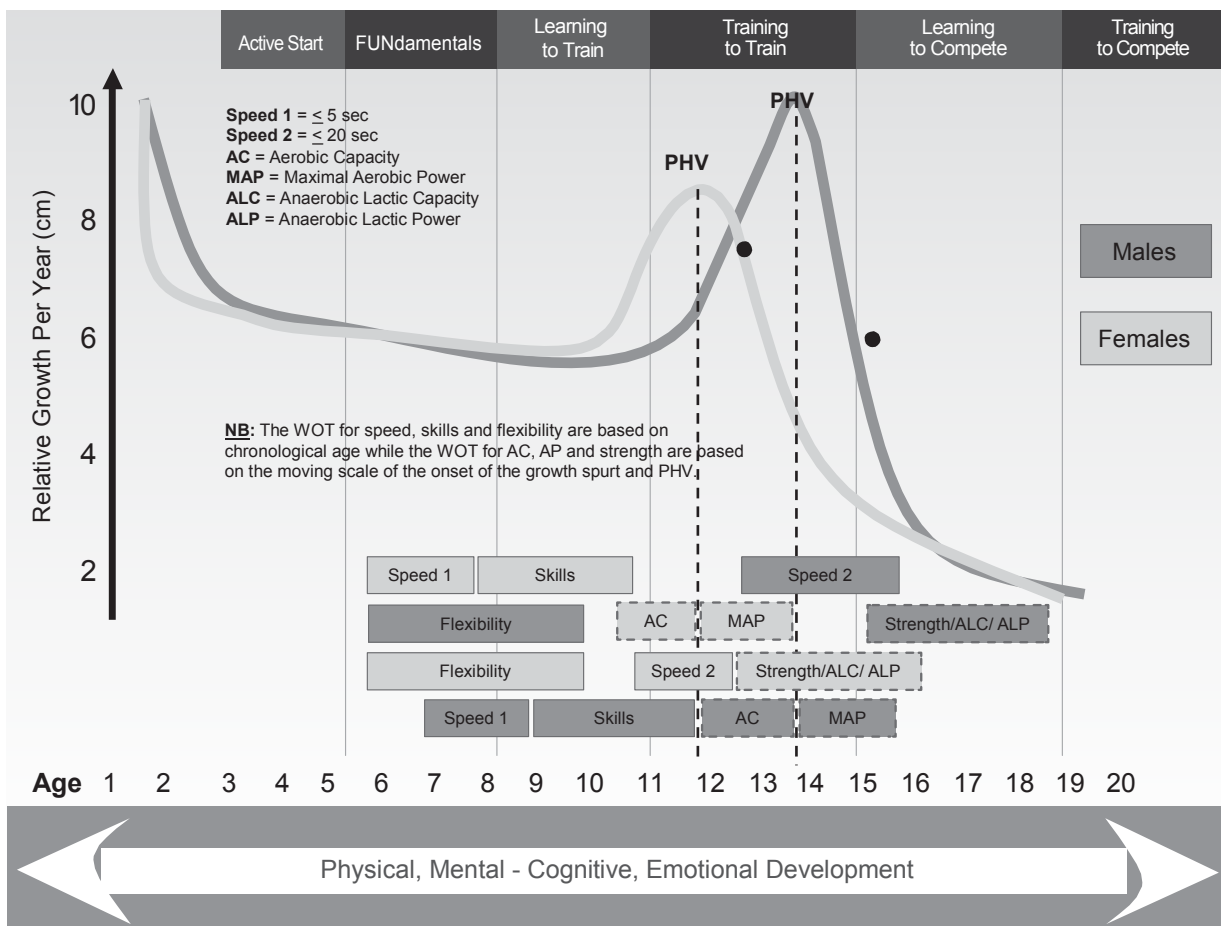
Trainability refers to the genetic endowment of athletes as they respond individually to specific training stimuli and adapt to it. Malina and Bouchard (1991) define trainability as “the responsiveness of developing individuals at different stages of growth and maturation to the training stimulus.”

The terms “adaptation” and “trainability” are often used interchangeably in coaching. However, the difference between them is significant. Adaptation refers to a change or changes in the body as a result of a stimulus that induces functional and/or morphological changes in the organism.

2.6.1 Windows of Optimal Trainability

Accordingly, periods of sensitivity to particular emphases of training, the so-called “windows of trainability” in the table below, are dependent on the maturation levels of the athlete. For this reason, the timing of training emphasis differs depending on whether athletes are early, average or late maturers. For example, the first of two windows of accelerated adaptation to strength training for females occurs immediately after Peak Height Velocity (PHV) and the second begins with the onset of menarche. For males, there is one window and it begins 12 to 18 months after PHV.

Figure 2.5: Pacific Sport Windows of Optimal Trainability (adapted from Balyi and Way, 2005)





2.6.2 Five Basic S's of Training and Performance

- ❑ **Stamina (Endurance).** The window of optimal trainability occurs at the onset of the growth spurt. Aerobic capacity training is recommended before children reach PHV. Aerobic power should be introduced progressively after the growth rate decelerates.
- ❑ **Strength.** The window for trainability for girls is immediately after PHV or at the onset of the menarche (first menstruation), while for boys it is 12 to 18 months after PHV.
- ❑ **Speed.** For boys, the first speed training window occurs between seven and nine years of age and the second window occurs between 13 and 16 years of age. For girls, the first speed training window occurs between six and eight years of age and the second window occurs between 11 and 13 years of age.
- ❑ **Skill.** The window for optimal skill training begins at nine years of age for boys and eight years of age for girls. This window ends at the onset of the growth spurt.
- ❑ **Suppleness (Flexibility).** The window of optimal trainability for suppleness in both boys and girls occurs between six and 10 years of age. Special attention should be paid to flexibility during PHV.

Refer to section 4 of this Reference Material for more information.





2.7 Mental, Cognitive and Emotional Development Characteristics

A major objective of your program - and one that reflects Canadian values - should be a holistic approach to athlete development. In addition to physical, technical and tactical development - including decision-making skills - the mental, cognitive and emotional development of athletes needs to be addressed. This includes an emphasis on ethics, fair play and character building. All programming should be designed to consider the athletes' cognitive ability to address these concepts throughout the various stages. In addition, coaches, parents and sport administrators need to understand that when programming for children and adolescents in the short-term, the longer term ramifications need to be taken into account so as to act in the participants' best interests.

Characteristics for the FUNDamentals and L2T Stages of Development

❑ Basic Characteristics

- ✓ The attention span gradually increases.
- ✓ Children are enthusiastic and often impatient.
- ✓ Children have very limited reasoning ability.
- ✓ Children enjoy the repetition of activities and improve through experience.
- ✓ Children establish their preferred learning style.
- ✓ Imagination is blossoming.
- ✓ Language skills may be limited but are improving.
- ✓ Children like to be the centre of attention.
- ✓ Children are developing their self concept.
- ✓ Children feel secure with a routine and structure to training.
- ✓ Children feel secure when coaching is consistent.

❑ General Impact on Performance

- ✓ Children cannot listen or stay still for long periods.
- ✓ Children want to move and not listen.
- ✓ Children love to be led.
- ✓ Skill learning must be directed; children do not learn correctly just by trial and error.
- ✓ Learning is through verbal, visual or manual means. Most children are doers!
- ✓ Creativity should be encouraged.
- ✓ Children can't make corrections to their performance unless they understand what is being asked of them.
- ✓ Children tend to evaluate their performance as a whole and in terms that may be black and white. (I was brilliant, or, I was useless.)
- ✓ Introduce change sensitively and gradually.
- ✓ Children like things to be fair.





❑ Implications for the Coach

- ✓ Provide short and precise instructions. Devise strategies to ensure children are listening. Children learn well by imitating and practising correctly-modeled movements.
- ✓ Do not bombard children with technical information. Give only sufficient detail for the activity to be undertaken. Keep the fun.
- ✓ Direct the training and give it a tight focus with activities that are fun and well planned.
- ✓ Introduce imaginative ways of achieving performance goals.
- ✓ Provide correct demonstrations of the basic sport skills. Personal demonstrations must be accurate.
- ✓ Use a variety of learning styles to suit individual needs.
- ✓ Allow the children to play and experiment. Use their ideas to create exciting sessions. Structure activities to encourage individuality and creativity. Sport provides an excellent vehicle for expression.
- ✓ Use terminology that can be easily understood. Gradually introduce technical terminology.
- ✓ Develop this characteristic. Plan activities that guarantee success.
- ✓ Always move from simple to more complex when teaching a skill movement.
- ✓ Allow children to show their skills.
- ✓ Provide positive reinforcement to build self-esteem. Children are likely to perform the actions again if they are successful and feel good about it. Build on success.
- ✓ Structure activities that are progressive in nature while maintaining continuity.
- ✓ Set and maintain high levels of expectancy, but be consistent with each child. Do not let mood swings or personal situations change coaching behaviours.





2.8 Developing Self-Reliant Athletes

Self-reliance is an essential skill for all cross-country skiers. Children should begin to take personal responsibility appropriate for their age, social and psychological development from the time they take their first steps on skis. Following are some ways in which you, as a coach, might encourage the development of good self-management skills in young skiers during the first three stages of the LTAD progression.

Active Start

- Teach and encourage good ski care habits - such as not leaving poles on the ground, not walking in the parking lot with skis on, wiping the snow off skis after skiing and putting away skis after each ski session.
- Teach and encourage good trail etiquette as outlined in your ICC Reference Material (section 6) - such as passing to the right when meeting another skier head on, and not taking pets on the trail.
- Teach basic winter safety skills as outlined in your ICC Reference Material (section 6) - such as never ski alone, and what to do if you become lost.
- Teach basic skills for keeping warm as outlined in your ICC Reference Material (section 3) - such as keeping a toque on, and wearing mitts, not gloves.

FUNDamentals

- Encourage athletes to prepare their own skis and teach them how to do it as explained in your CC Reference Material (section 5, Practice Plans L1-3, L2-3, L3-12 and L4-13). For example teach them to clean the base of a ski, and to apply grip wax.
- Teach and encourage good trail safety practices as outlined in the ICC Reference Material (section 6) – such as knowing which trails they are allowed to ski on, and carrying a map and staying on recognized trails when skiing in unfamiliar areas.
- Teach about and encourage the use of appropriate clothing for skiing as outlined in the ICC Reference Material (section 3).
- Teach and encourage winter safety skills as outlined in your CC Reference Material (section 5, Practice Plan 3-13) - such as how to avoid frostbite and hypothermia, how to recognize the symptoms and what steps they should take if this happens to them or a team mate. This would include teaching practice sessions L4-30 (Backwoods Adventure) and L3-35 (Orienteering Poker Ski).
- Encourage punctuality.
- Encourage athletes to pack their own ski clothing/equipment when leaving for or departing from the ski area.
- Introduce important nutrition and rehydration principles for cross-country skiing.





- ❑ Introduce athlete involvement in decision-making.
- ❑ Encourage leadership experiences (planning activities, being a role model).
- ❑ Establish expectations with respect to athlete assistance in setting up and taking down the “practice area”.
- ❑ Teach your athletes a stage-appropriate routine to follow at competitions, and to focus on appropriate objectives, as explained in your CC Reference Material (section 8). For example teach them:
 - ✓ how to evaluate their performance against their own goals for the event (e.g. did they ski a difficult turn without falling, etc.) rather than comparing themselves against other competitors;
 - ✓ an appropriate warm-up procedure (e.g. to become familiar with their course before the race); and
 - ✓ an appropriate warm-down procedure.
- ❑ Encourage contributing to some reflection on the practice sessions.

Learning to Train

- ❑ Encourage athletes to prepare their own skis and teach them how to do it as explained in your CCI-L2T (On-Snow) Reference Material (section 2). For example, teach them how to clean the base of a ski for glide waxing and how to apply glide waxes. This would include coaching your athletes to successfully complete Track Attack Target #11 (Ski Preparation).
- ❑ Teach and encourage good safety practices for dryland activities as outlined in the CCI-L2T (Dryland) Reference Material (section 8) - such as wearing a helmet when biking or roller skiing, and how much fluid they require (and when to take it) when they are exercising. This would include coaching your athletes to successfully complete Track Attack Target #12 (Roller Skiing).
- ❑ Teach and encourage winter safety skills as outlined in your CCI-L2T (Dryland) Reference Material (section 8) – such as wearing eyewear with UV protection, how to prepare for a competition in cold weather, and how to ski the backcountry safely (including avalanche awareness). This would include coaching your athletes to successfully complete Track Attack Targets #7 (Backcountry Adventure) and #9 (Ski Orienteering).
- ❑ Encourage punctuality.
- ❑ Encourage good nutritional and rehydration habits.
- ❑ Encourage athlete involvement in decision-making and leadership experiences (e.g. planning practice session/activities, preparing and cleaning up the practice area, being a role model).
- ❑ Teach your athletes the basic competition rules for the different types of events they will compete in during this stage of development.





- ❑ Teach your athletes how to prepare for and manage a competitive experience as explained in your CCI-L2T (ON-Snow) Reference Material (section 7) - such as developing a plan for race day, how to determine what to eat for breakfast on race day and how to determine what replacement fluids to use (and when to use them) following a race. This would include coaching your athletes to successfully complete Track Attack Targets #4 (Ski Tournament), #5 (Midget Championships), #6 (Provincial/Territorial Championships), #13 (Team Sprints) and #14 (Xtreme X-Country).
- ❑ Encourage self-analysis of ski situations, and contributing to reflections on practice sessions, camps, trips to competitions and other team activities.
- ❑ Encourage your athletes to adopt an athletic lifestyle specific to cross-country skiing. This would include coaching your athletes to successfully complete Track Attack Targets #8 (Snow Camp) and #15 (Off-season Camp).
- ❑ Encourage appropriate involvement in club activities (cleaning the daylodge, brushing the trails in the off-season, etc.), appreciation for what others are doing to make their sport experience possible, and loyalty to their club and program.

Encourage the education of the athlete. DO NOT do everything for them.





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SECTION 3 – EVALUATING YOUR SPORT PROGRAM





3.1 The Structure of Your Program

Planning is essential to successful sport programming. The Introduction to Community Coaching and Community Coaching Workshops introduced you to basic planning concepts and seasonal plans for children in the “Active Start” and “FUNdamentals” stages of athlete development. The CCI-L2T (Dryland) Workshop will expand upon previous material and help you organize your coaching sessions to effectively develop athletes in the “Learning to Train (L2T)” stage of development.

The first step in developing a successful plan is to reflect on and evaluate the program that your club currently offers for children at this stage in their development.

Evaluating Your Program

This section corresponds to the chart in section 3.1.1 in your Coach Workbook. Compare your answers with the information below, and then record your scores in the right hand column of the chart in your Workbook.

Question	Answer
a.	Review the Seasonal Plan Guidelines Chart in section 3.1.1 of this Reference Material. Determine the ideal start-up date for the oldest athlete in your group. Beginning with five, deduct one point for each week following that date that your program did not/has not started.
b.	Review the Seasonal Plan Guidelines Chart in section 3.1.1 of this Reference Material. Determine the ideal number of practice sessions and special activities (including competitions) for the oldest athlete in your group. Beginning with five, deduct one point for every three practices/special activities that fall short of the recommended number.
c.	Review the Seasonal Plan Guidelines Chart in section 3.1.1 of this Reference Material. Determine the ideal number of pre-ski season (dryland) practices/special activities for the oldest athlete in your group. Beginning with five, deduct one point for every two dryland practices/special activities that fall short of the recommended number.
d.	Review the Competition column on the CCC Athlete Development Grid in section 2.3 of this Reference Material. Determine the ideal number of “competitions” per season for the oldest athlete in your group (the ideal number per season based on a club offering the ideal number of practice sessions per season). Beginning with five, deduct one point for every competition that falls short of the recommended number.





e.	Review the Special Activities/Competitions Chart in section 3.1.2 of this Reference Material. Use columns three and four to determine the ideal number of special activities (do not include competitions in this total) per season for the oldest athlete in your group. Beginning with five, deduct one point for every activity that falls short of the recommended number.
f.	An emphasis on group interaction, team building and social activities is essential at this stage if your program is to be successful over the long term. Taking this into consideration, determine the score (out of a possible five points) you think is appropriate.
g.	If you offer a workshop on winter safety once every three years, give yourself two points. If you offer a workshop on ski preparation every year, add another three points – one for each year.
h.	A well-thought through approach to developing self-reliant athletes is an important consideration when planning your program. Determine the score (out of a possible five points) you think is appropriate.
i.	The recommended minimum standard for coaches leading a L2T program is NCCP CCI “in training”. This means a coach has successfully completed the L2T (Dryland) Workshop, L2T (On-Snow) Workshop and related tasks. The recommended minimum standard for assistant coaches is NCCP Community Coaching certified. For additional clarification refer to section 11 of this Reference Material. If the coach in charge of the program and the assistant coaches all meet the recommended minimum standards, you score five. For every step that is missing for any of the coaches involved, deduct a point.
j.	If your club has established minimum skill standards such as the successful completion of all the components of the Jackrabbit Level 4 program, score five points. If you don’t have minimum requirements other than age, your score is zero.
k.	If you have an official “catch up” program for athletes not meeting required standards, with one or more coaches dedicated to it, you can score five points. If you are providing additional support to these athletes – such as working with them in addition to regular practice sessions - determine the score you think is appropriate. If you do not offer any additional help, you do not get any points.





3.1.1 Seasonal Plan Guidelines Chart

Month	September		October			November			December			January			February			March								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Active Start Ages 0 to 6 years	REGISTRATION – ALL AGES																									
FUNDamentals Ages 6 to 7 years	YEAR END ACTIVITIES																									
FUNDamentals Ages 8 to 9 years	YEAR END ACTIVITIES																									
Learning to Train* Ages 9 to 12 years	YEAR END ACTIVITIES																									

Notes:

On this chart the number of recommended "special activities" includes competitions, but is in addition to the number of recommended practice sessions.

* These guidelines are the maximum numbers for the L2T stage, and must be adapted to reflect the developmental age, fitness and skill level of the individual athletes in your group. Group sessions begin September 15th; 3x/wk during fall and ski season; maximum 70 sessions including competitions and special activities.





3.1.2 Special Activities/Competitions Chart

	Total # Practice Sessions	Dryland Special Activities	On-Snow Special Activities	Competitions	Total # All Sessions
Year #1	52	Day Hike to Lookout Skill Development Camp Ski Preparation Clinic Fundraiser Intro to Kayaking Orienteering Game	SNOW CAMP Treasure Hunt Club Moonlit Ski Christmas Activity Mini Olympics Year End Activity	SKI TOURNAMENT DOUBLE CROSS Regional Cup Club Championships Club "Chocolate" Relays Club Time Trial	70
Year #2	52	OFF-SEASON CAMP Club Work Bee Canoeing on Lake Road Bike Tour Fundraiser Hike & Camp Out	SKI ORIENTEERING SKI PREPARATION CLINIC Snow Camp Backwoods Ski Christmas Activity Year End Activity	PROVINCIAL/TERRITORIAL MIDGET CHAMPIONSHIPS Ski Tournament Regional Cup Club Championships Club "Costume" Relays Club Time Trial	70
Year #3	52	Skill Development Camp Club Work Bee Winter Safety Clinic Club "Family Hike" Road Bike Tour Fundraiser	BACKCOUNTRY ADVENTURES Ski Prep Clinic Snow Camp Ski Orienteering Year End Activity	PROVINCIAL/TERRITORIAL CHAMPIONSHIPS TEAM SPRINTS Regional Cup Club Championships Double Cross Club Time Trial	70

Notes:

This chart provides an overview of what a three-year program of special activities for L2T athletes might look like. Note that this chart uses the maximum numbers of sessions for the L2T stage, and must be adapted to reflect the developmental age, fitness, skill level and experience of the individual athletes in your group.

Capitalized Activities/Competitions denote Track Attack targets.





3.2 What Is a Sport Program?

A sport program is a planned and progressive sequencing of activities. The nature, number, frequency, duration and content of these activities is adapted to the athletes' stage of development, skill level and sport experience. The goal of the program is to foster athletes' athletic development and sport form over time.

3.2.1 The Main Components of a Sport Program

The main components of a sport program are the following:

- ❑ **Time Dimension.** A program...
 - ✓ Usually has a well-defined beginning and end.
 - ✓ Is of varying length (ranging from a few weeks to many months).
 - ✓ Is part of the long-term development of the athletes: where they're starting; what they've done before; and what they should be able to do at the end of the program are all taken into account.
- ❑ **Events.** A program consists of different types of events...
 - ✓ Sport events (practices, preparatory competition, regular competition, trials, playoffs, championships, tournaments, tests, etc.).
 - ✓ Social events (suppers, parties, awards ceremonies, distribution of prizes, etc.).
 - ✓ Administrative events (registration, equipment purchase, fund raising, parent meetings, meetings with league/club administrators, etc.).
- ❑ **Intentions, Objectives and Priorities.** A program...
 - ✓ Takes into account athletes, their interests and their individual needs.
 - ✓ Takes into account the competitive demands of the sport.
 - ✓ Has a clear purpose and philosophy (why it exists), focus (participation, development, excellence), desired outcome (goals and objectives) and method of operating (rules, policies, procedures).
 - ✓ Prioritizes objectives, events, time devoted to certain activities, etc., given any constraints that apply.
 - ✓ Makes its intentions, objectives and priorities public, which helps justify choices and decisions.
 - ✓ Has intentions, objectives and priorities that are consistent with the values of the coach and the organization.
- ❑ **Structure.** A program...
 - ✓ Proposes activities that are organized and planned (level of detail and sophistication may vary).
 - ✓ Proposes a framework for providing certain services to athletes.





- ✓ Proposes links and ensures consistency among components (objectives, philosophy, priorities, athlete individual needs, activities, events).
- ❑ **Progression.** A program is characterized by...
 - ✓ Intentions, objectives and priorities that may change as the season progresses.
 - ✓ Evolving training activities and content, to reflect the intentions, objective and priorities that apply at a given time.
- ❑ **Adjustment and Evaluation.** Within a program...
 - ✓ Athletes progress from a given starting point. This progression may occur in different ways: group/team cohesion; technical/tactical mastery; physical condition and tolerance of fatigue; attitudes (work, athletes' behaviour, commitment, discipline); performance, etc.
 - ✓ The coach must assess the athletes' starting points to identify what can realistically be accomplished in the short, medium and long term and choose the appropriate methods for doing so. Such decisions normally require some form of evaluation.
 - ✓ It must be accepted that adjustments will probably be required en route, even if the initial plans were carefully laid out.

3.2.2 Types of Objectives in a Sport Program

The table below lists certain types of objectives that a coach can try to achieve in a sport program. Several objectives can be associated with the same activity. For example, athletes can try to improve while having fun, or experiment while trying to do their best or to win.

Objective	Comments
General	
Participate	Take part in the event; the performance and result are not important.
Gain experience	Experiment with new things; the performance and result are not important.
Have fun	Above all, make the experience enjoyable and pleasurable.
Athletic, Physical and Motor Abilities	
Develop/Improve	Try to raise the level of the athletic ability.
Maintain	When a given athletic ability is considered to be sufficiently developed, maintain it at that level and prevent it from declining.





Technical Elements Specific to the Sport	
Acquire new skills	Learn how to correctly perform new movements and skills.
Perform the skill correctly	Execute movements well and with correct form.
Consolidate the skill	While still maintaining good form in the movement, try to reach a high level of efficiency or precision under variable conditions, which are more difficult and unpredictable.
Increase the success rate of skills execution	Try to reach a high level of efficiency or precision while still maintaining good form in the movement; here, the outcome of the action becomes important.
Tactical Elements Specific to the Sport	
Read a situation and react appropriately	In a given situation, observe the right cues, analyze them, make a decision and carry out the appropriate motor response.
Vary motor responses according to the situation	Try to increase the number of motor responses in a given situation.
Performance	
Do one's best	Try to do as well as possible, whatever the outcome or result.
Personal best	Try to do something better than before.
Win	Try to win, to finish in first position.
Finish among the first "X" positions	Try to attain a particular ranking with respect to other athletes in the competition.





3.3 Athlete Development Considerations

3.3.1 Program Worksheet Instructions

- ❑ **Step 1:** On Program Worksheet #1 fill in the age range, gender breakdown and overall emphasis of your club's current program for athletes in the L2T stage of development.
- ❑ **Step 2:** Record what you feel is the overall emphasis for each of the five components of your program that are identified on the worksheet:
 - ✓ Technique Development. Write down which techniques you think should be emphasized with this group plus any key, related considerations that should be addressed (inadequate equipment, etc).
 - ✓ Physiology, Strength and Flexibility Development. Record what you feel the group should be working on in terms of fitness development. Include your thoughts on how sport specific these activities/exercises need to be.
 - ✓ Mental Skills Development. Record what you believe to be the most important mental skills the group should be working on.
 - ✓ Competitive Activities. Record the competitions you think the group should focus on this season. Be specific about the skills you are targeting for development.
 - ✓ Special Activities/Other. Keeping in mind the importance of both team building and the development of self reliance, write down what you think your program should emphasize that has not already been covered in the other columns.





3.3.2 Program Worksheet #1 (sample)

Age Range: _____ Gender: Boys: _____ Girls: _____

Overall Emphasis: _____

Technique Development	Physiology, Strength and Flexibility Development	Mental Skills Development	Competitive Activities	Special Activities/ Other
Example: Good, prolonged execution of the following: <input checked="" type="checkbox"/> One-step Double Poling <input checked="" type="checkbox"/> Free Skate <input checked="" type="checkbox"/> One Skate <input checked="" type="checkbox"/> Two Skate <input checked="" type="checkbox"/> Step Turn <input checked="" type="checkbox"/> Parallel Side Slipping Or <input checked="" type="checkbox"/> Diagonal Stride <input checked="" type="checkbox"/> Double Poling <input checked="" type="checkbox"/> One-step Double Poling <input checked="" type="checkbox"/> Free Skate <input checked="" type="checkbox"/> One Skate <input checked="" type="checkbox"/> Two Skate Or.....				







Program Worksheet #1 (working copy)

Age Range: _____ Gender: Boys: _____ Girls: _____

Overall Emphasis: _____

Technique Development	Physiology, Strength and Flexibility Development	Mental Skills Development	Competitive Activities	Special Activities/ Other







Program Worksheet #2 (working copy)

Age Range: _____ Gender: Boys: _____ Girls: _____

Overall Emphasis: _____

	Technique Development	Physiology, Strength and Flexibility Development	Mental Skills Development	Competitive Activities	Special Activities/ Other
Similarities					
Differences					







REFERENCES

Coaching Association of Canada, *Basic Sport Programming*, Version 1.1, 2007.





SECTION 4 – ATHLETIC COMPONENTS





This section on Athletic Components expands on the information on the five basic Ss of training and performance outlined in section 2.6, and is directed at supporting you in your role working with children in the first three stages of athlete development.

This section will also provide you with materials that will assist you if you choose to work with athletes in the Training to Train stage and beyond.

4.1 Aerobic Fitness (Stamina)

Aerobic fitness (stamina or endurance) is a global concept reflecting the ability to sustain a physical effort for a prolonged duration. More specifically, it is the body's ability to exercise whole muscle groups over an extended period of time at easy to vigorous intensities. While the development of stamina is a long and essential process for any endurance athlete, it is skill acquisition and refinement that are the focus of the Learning to Train (L2T) stage. During this period athletes should be supported by activities that promote general conditioning and games that emphasize creativity and excellent technical execution. Practice sessions structured in this way will naturally develop the full spectrum of athletic components (skill, speed, strength, stamina, suppleness) required for the successful development of an athlete.

During the L2T stage athletes should be encouraged to take an increasingly systematic approach towards the development of their own fitness. The objective is to establish habits that will lay the groundwork for a healthy, active lifestyle and help them enjoy the sport at whatever level they later choose to participate.

If athletes wish to pursue the competitive stream of the sport, they will need to take this a step further when they reach the Training to Train (T2T) stage, and begin following a structured training program.

Optimal aerobic trainability begins with the onset of Peak Height Velocity (PHV), the major growth spurt during maturation. In females, this can occur at the end of the L2T stage or at the beginning of the T2T stage. In males, it occurs at some point during the T2T stage. The T2T stage is therefore very important for developing the aerobic capacity that is especially critical for the sport of cross-country skiing. This means athletes at the T2T stage will do a lot of skiing at easy to moderate intensities.

Although developing aerobic capacity doesn't become a top priority until the T2T stage, the information that follows is important for coaches of L2T athletes because it provides a base of understanding for developing programs and practice/training sessions that are appropriate for the different levels of maturity you are likely to encounter.





For more detailed information refer to the CCI-T2T (Dryland) Reference Material.

Considerations for developing aerobic capacity during the first three stages of the LTAD progression are:

- ❑ **Active Start Stage** - organized physical activity and active play should be a part of a child's daily life.
- ❑ **FUNdamentals Stage** - aerobic fitness can be developed through the use of general aerobic activities two to three times a week. Introduce endurance-oriented activities through games and play.
- ❑ **L2T Stage** - aerobic fitness is increasingly important and by this stage athletes should be developing an active lifestyle and participating in aerobic activities three to four times a week. Utilize games, relays, etc. These sessions should involve a total of 30 minutes or more of easy to vigorous intensity exercise (with at least 10 -15 minutes of continuous effort during moderate exercise).

4.1.1 Guidelines for Developing Aerobic Fitness

Note: The following information on developing aerobic fitness is very general and must be adapted to the needs of the athletes you coach *according to their stage of development*.

- ❑ The effort should be dynamic and it should involve large muscle groups (e.g. running, hiking, cycling, swimming, cross-country skiing, etc.).
- ❑ To obtain benefit from the exercise, the effort must be sustained for at least 10 to 15 minutes, and the athletes have to be active for most of that time (e.g. moving as much as possible). At the same time there is an upper-limit that needs to be considered. Athletes at the L2T stage can sustain a vigorous effort for up to 20 minutes (activities such as running), and a low intensity (easy) effort for up to two to three hours (activities such as hiking).
- ❑ The speed of execution (i.e. the intensity) should vary, and the duration of the activity should depend on the speed at which it is done. For example, an athlete won't attain optimal health and fitness benefits during activities lasting less than 15 minutes unless the intensity is at least moderate (for the athlete).
- ❑ The same speed of execution may not result in the same intensity of effort for every athlete. It is important to recognize that the intensity of the effort may have to be individualized.
- ❑ The activity or exercise can be continuous (i.e. no rest periods) or intermittent (i.e. alternating periods of work and recovery).
- ❑ Fatigue may occur in the case of moderate to vigorous efforts (e.g. 30 minutes of cross-country skiing; 20 minutes of running). Therefore, activities lasting longer than 20 minutes need to include easy effort in order to be sustainable.





4.1.2 Introduction to Energy Systems - How the Body Performs Work

Energy for the body to perform work comes from different fuel sources. The three fuel sources that the human body uses for this purpose are fat, sugar (carbohydrate) and protein. Since an individual's capacity to store each of these fuel sources is limited, and each one requires time in order to be turned into energy, all of them are engaged to varying degrees during every type of activity.

Although there are only three main sources, the body uses a variety of different processes to convert fuel into energy. Some of these processes use oxygen to release the stored energy required for the body to do work. Collectively, they are called “aerobic” because they occur in the presence of oxygen. In this situation the aerobic processes use oxygen to break down fuel sources (i.e. fat and sugar) and convert them into energy, which is used for the body's work (i.e. muscle contraction).

Processes that do not require oxygen to convert fuel into energy are called “anaerobic”. As described below, each type of energy release has unique characteristics that will optimize its function in different circumstances. Working together, the aerobic and anaerobic processes provide a balanced and integrated energy supply for activities such as walking, sprinting and everything in between.

- ❑ Characteristics of the Aerobic Processes
- ❑ High capacity, because there is a large supply of the source materials - oxygen and stored fuel (i.e. fat). Aerobic work can continue as long as both are available.
- ❑ Low power (i.e. slow energy production), because there are many steps involved in getting the fuel out of storage and moving oxygen from the lungs to places where the energy is needed.

Characteristics of the Anaerobic Processes

- ❑ Low capacity, because there is a limited supply of usable fuel and the body produces waste products that are harmful to working muscles. As a result, these processes need to reduce their rate of energy production over time to allow for the waste products (such as lactic acid) to be cleared away.
- ❑ High power (i.e. fast energy production), because fuel is readily available where it is needed, and there are few steps required to convert the fuel to energy.

How Aerobic and Anaerobic Processes Work Together

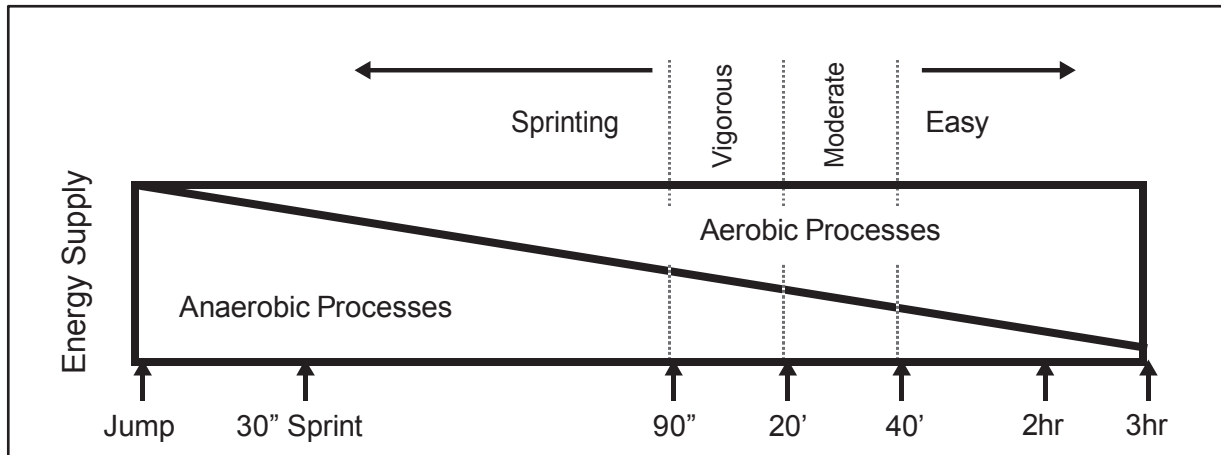
- ❑ Both types of energy conversion processes provide some energy for all the activities we do. Neither one is ever turned off completely. However the rate at which each one operates varies depending on the intensity and duration of the activity.
- ❑ All the different activities an individual does (e.g. jumping, sprinting, jogging, walking) can be placed on this continuum of energy supply.
- ❑ Whether energy is released through aerobic or anaerobic processes, it is used by the body to perform different kinds of work (e.g. breathing, heart function). In sport the most common use of energy is the contraction of major muscle groups in order to produce movement.





Figure 4.1

Schematic of the relative contribution of aerobic and anaerobic processes to total energy supply for maximal efforts of different lengths (adapted from Harre, 1982).



Muscle Structure and Function

- ❑ Every muscle in the body is composed of thousands of tiny fibres, each of which has aerobic and anaerobic processes constantly occurring inside of it.
- ❑ Some fibres, called Type I fibres, prefer to use aerobic processes and take a relatively long time to fatigue. These fibres are sometimes referred to as “slow twitch” because they prefer a slower energy supply and tend to produce low power in each contraction.
- ❑ Other fibres prefer to use anaerobic processes. These fibres are called Type II fibres and they fatigue more quickly than Type I fibres. Type II fibres are sometimes called “fast twitch” because they prefer a faster energy supply and tend to produce higher power in each contraction.
- ❑ Every major muscle (e.g. quadriceps, biceps) is composed of both Type I and Type II fibres, but each muscle contraction does not result in the contraction of every fibre in that muscle. The number and type of muscle fibres that contract depends on the force and power of the desired movement (see Figure 4.2).
- ❑ Low power output activities, like jogging, require a small proportion of the available muscle fibres for one contraction in a large muscle group. The nervous system signals different fibres for each contraction, using a cyclic recruitment pattern. Therefore each fibre has plenty of time to produce energy and clear waste products before it must contract again.





Figure 4.2

Characteristics of Muscle Fibres	
Type I / Slow Twitch	Type II / Fast Twitch
Slower contraction	Faster contraction
Prefers aerobic processes and shares their characteristics	Prefers anaerobic processes and shares their characteristics
Fatigues slowly	Fatigues quickly
Used preferentially when repetitive contractions or low speed is needed	Used preferentially when high force and/or high speed is needed

Different exercise/training intensities reflect the recruitment of different muscle fibre types and different fuel systems. It is important for all athletes to train at a variety of intensities so that they train the proper recruitment patterns and energy systems and allow for proper recovery of the muscle fibres and energy stores.

4.1.3 Introduction to Exercise/Training Intensities

The following is intended to help coaches relate the above guidelines and theory to ski-specific situations. These four examples represent the different levels of effort or intensity that are common in cross-country skiing and each one relates to one of the four categories of exercise intensity shown in Figure 4.1 (“easy”, “moderate”, “vigorous” and “sprinting”). Moving at each of these intensities will affect the body differently. It is important, therefore, that athletes experience all of them through the course of the ski season.

- ❑ Travelling smoothly and easily along the flat, feeling fresh and full of energy. (Easy)
- ❑ Skiing up a moderate hill which makes you breathe a little harder, but still leaves you in control of your breathing and your technique. (Moderate)
- ❑ Skiing up a steep hill which strains your body and increases your heart rate and your breathing. (Vigorous)
- ❑ An all-out sprint up a hill, racing against someone who doesn't let you pass easily. (Sprinting) Coaches should keep in mind that the priority of the L2T stage is to develop technique and aerobic fitness in as wide a variety of conditions as possible. Obviously, more practice time will be spent at lower intensities and more recovery will be required after sprinting and steep hill climbing.





To determine the intensity of effort for each athlete, the coach should talk to them during the activity. A good guideline to follow would be:

- ❑ During easy exercise an athlete should be able to converse and breathing should not interfere with the control of speech.
- ❑ During moderate and more intense exercise, as the effort increases, the need to breathe more frequently and deeply will increasingly interfere with a normal pattern of conversation as the effort increases.

Training Zones

Exercise/training intensities can be categorized in many different ways and are often described as “zones”. Zones can be divided into any number of finite categories, and they can be determined relative to many different physiological markers. Often, training zones are defined relative to maximum heart rate HR_{max} or perceived exertion (how hard a certain pace feels relative to an athlete’s maximum level of effort). However, they can also be determined based on the relative contribution of the different energy processes described above (i.e. aerobic and anaerobic). As an athlete matures, physical and technical abilities become more refined and more specificity is needed in the definition of training intensities, which in turn requires an increased number of training zones, each with a specific purpose.

At the L2T stage, athletes are still developing the machinery required for the energy processes to function in a mature fashion. As a result, three intensity zones are sufficient to categorize all the different ski speeds and levels of effort at which an athlete will train. In later stages of athlete development, these zones will be sub-divided to provide more specific intensity targets. The descriptions below will provide coaches with an understanding of the general benefits of each training zone. They should also help coaches relate each zone to the common cross-country ski examples listed earlier in this section.

- ❑ **Endurance Training.** This is the level of exercise intensity that develops strong central cardio-vascular components - a large powerful heart that can efficiently transport blood to the working muscles. It includes “easy” and some “moderate” intensity exercises (see Figure4.1). Usually this takes the form of “long slow distance” work-outs or fun outings where conversation and socializing are a major part of the experience. How long “long” is depends on the stage of development (both physical and technical) that the athlete has reached. Throughout an endurance athletes’ career, the majority of training time will be spent at this level of intensity. Athletes at the L2T stage of development can maintain this level of effort for 30 minutes up to about 2 hours.
- ❑ **Intensity Training.** This range of intensities also develops strong cardiovascular components and includes all “vigorous” exercise intensities. Some “moderate” exercise also provides an Intensity training effect because it involves enough anaerobic processes that it is more like “vigorous” exercise than “easy” exercise. Intensity training improves the efficiency of the exercising muscles and increases overall energy production capabilities. L2T athletes receive these benefits when they perform efforts that they can maintain for 90 seconds up to about 30 minutes. However, greater amounts of energy and longer recovery periods are required, so intensity training cannot be performed as frequently as endurance training. If



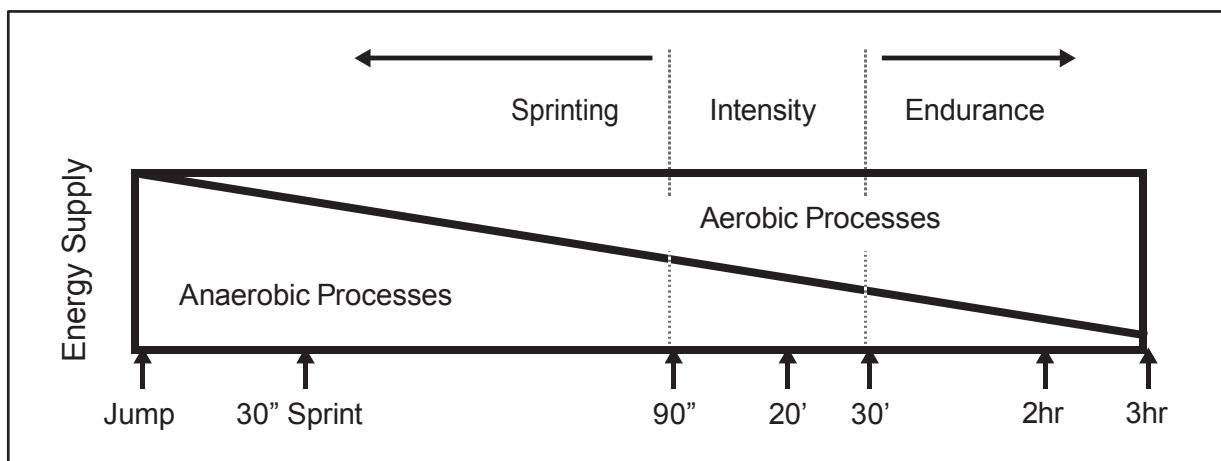


used too often, intensity training can prevent the athlete from recovering appropriately and lead to overtraining. Nonetheless, it is appropriate for shorter training sessions, intermittent work, technique and ski speed development, and pre-race warm-up.

- **Sprinting.** This level of intensity includes all types of “sprinting” – from practicing race starts to sprint races that last up to 1.5 minutes. When athletes are “sprinting”, their ski speed will be as fast as possible for the given distance and their perceived effort will be very high, but their heart rate will not reflect their level of effort. Sprint intensities require levels of energy production that exceed the maximum rate of the aerobic processes.

Figure 4.3

Schematic of the range of intensities associated with each training zone. Intensity is defined by the fastest pace that can be maintained for the time frames shown (adapted from Harre, 1982).



4.1.4 Relating Maximum Heart Rate and Muscle Function to Training Zones

Maximum heart rate (HR_{max}) is the maximum number of heart beats per minute during a specific activity. It is affected by age (it slowly decreases as a person becomes older), height (taller people generally have lower HR_{max} than shorter people), genetics and training history (endurance athletes tend to have lower HR_{max} than power and speed athletes). Generally, HR_{max} is also influenced by the heart's need to overcome gravity. Fully upright activities like running and skiing tend to produce higher HR_{max} than activities like cycling and swimming. Maximal heart rates in swimming and cycling are usually five to 10 beats lower than in cross-country skiing and running. As we usually determine zones from percentages of HR_{max} , it is important to note that training zones will likely be different for running and cycling. For athletes in the L2T stage of development, hearts are still growing and muscles are still developing, so HR training zones are difficult to apply accurately. For this reason, it is better to use average speed or perceived effort to determine training intensity. The table below shows how the different energy systems and muscle fibre types relate to the L2T-stage training zones and to perceived effort based on the rating of perceived exertion (RPE). Refer to Figures 4.5 and 4.6 for additional information on RPE.





Figure 4.4

Training Zone	Endurance	Intensity	Sprinting
Energy Supply	Primarily aerobic processes	Primarily aerobic processes; with significant contribution from anaerobic processes	Primarily anaerobic processes; significant aerobic component in efforts ≥ 1.5 min
Muscle Fibre Recruitment	- Mostly Type I - Moderate force and power - Long rest cycle	- Mix of Type I & II - High force and power - Decreasing rest cycle	- Mix of Type I & II - Max power - Short rest cycle
% HR_{max}	~ 60 – 85%	~ 85 – 100%	N/A
RPE	8-12	13-16	17-20

Generally, aerobic activity for L2T-stage athletes should be done at 85% of HR_{max} or less, and a prolonged higher intensity effort should only last five to 10 minutes. On the other hand, athletes in the T2T stage of development should be more physically ready to engage in higher intensity and longer duration activities. More information on what is appropriate for athletes at that stage will be provided at the next level - the NCCP CCI-T2T (Dryland) Workshop.

Keep in mind that, regardless of developmental stage, an athlete's ability to converse during exercise is a good general indicator of exercise intensity. The transition from endurance training to intensity training usually occurs when the athlete is no longer able to speak more than two or three words without breathing interrupting speech.

4.1.5 Explaining It to Your athletes - What Happens When You Exercise?

Below are several examples you can give your athletes to help explain the basic physiological events that occur in their bodies when they exercise. You may also wish to use some of these examples as references when you are planning or evaluating a training session. For example, into which category do the planned activities fall? What training zone(s) will be utilized? How much time will the athletes spend performing these activities? How does this compare to the timeline shown in Figure 4.3 and the LTAD recommendations for the L2T stage of development?

- **Transition (rest to exercise; change in speed).** When you first start moving, your energy systems will be working hard to adapt to the change in energy demand created by your change in pace (i.e. from sitting to jogging). Since the aerobic processes take longer to get going, the anaerobic processes will provide some energy to ensure that the overall demand is met.





- ❑ **Steady State Endurance Training.** Once you have warmed up, your breathing and heart rate will stabilize and you will begin to feel comfortable. At this point you will be producing most of your energy using the aerobic processes, and each muscle fibre will get ample rest between contractions. This is because you have many more motor units available than required for the power you are producing. You are easily able to converse with your friends while you do this kind of training.
- ❑ **Steady State Intensity Training (a long steady hill climb).** To move faster on the flats or to continue at the same speed when going up an incline, you will have to use additional muscle fibres to create the extra force you need. You will also use more anaerobic processes and, as a result, some waste products like lactic acid will be produced. Luckily, for the most part, you will still be using aerobic processes, including some that are very good at using up lactate. That will keep you from accumulating too much lactate in your muscles. If you continue at this speed, some muscle fibres will eventually fatigue, so others need to be recruited more frequently in order for you to maintain your power.

Coach's Note: Depending on the age and training history of the athlete, this range of intensity can be maintained for 20 to 45 minutes in a single, exhaustive effort. However athletes at the L2T stage of development should only sustain this type of effort for a maximum of 20 minutes. Although the intensity training zone includes efforts that can be maintained for up to 30 minutes, the training benefit is maximized when coaches avoid performing "low end" intensity training.

Transition Intensity Training (interval training or time trial). When you are moving so fast that breathing is heavy and it's difficult to speak clearly, your muscle fibres will use even more oxygen because they are contracting more frequently. More Type II fibres will be recruited, which increases the amount of anaerobic energy production. If you maintain your speed, your heart rate will gradually rise until it reaches its maximum. Your anaerobic processes will produce waste products even faster and your aerobic processes will increase energy production until they are working as fast as they can. Even though a lot of the lactic acid being produced is being cleared from your muscles, it will accumulate rapidly. This range of intensity can be maintained for approximately five to 15 minutes in a single, exhaustive effort.

Coach's Note: This type of training is NOT appropriate for athletes in the L2T stage of development. Athletes will naturally spend some time at this intensity during games, races and difficult terrain, but it should not be targeted specifically for training. It is also important to note that L2T athletes do not have the technical ability, muscle mass or metabolic machinery to produce a wide range of ski speeds during "high end" intensity efforts. Because of these developmental limitations, there is very little benefit to performing continuous training efforts that last between 90 seconds and five minutes.





- **Sprinting.** Huge amounts of energy are required in order to produce high forces with maximum speed. When you sprint, you will use a very large portion of the muscle fibres you have for each contraction. The aerobic processes will be too slow to provide much of the energy needed for this task, so throughout a sprint effort you will have to rely heavily on the anaerobic processes. As a result, high levels of waste products will accumulate quickly and muscle fibres will fatigue rapidly (because they get very little rest between contractions). Because your anaerobic processes are still developing, we say that sprinting can last up to 1.5 minutes. But as you know, it is impossible to run very fast for that long. True sprinting rarely lasts longer than 30-45 seconds, but what is happening inside your body is very similar when the duration is longer.

4.1.6 How Can Athletes Tell The Level at Which They Are Exercising?

At the L2T stage, there are many subjective indicators of intensity, including the level of exertion, how hard the person is breathing and the feeling of fatigue. Scales that allow athletes to rate their perceived exertion (like the RPE scale described in Figure 4.5) can be a valuable communication tool for coaches and athletes. In addition, the process of subjectively quantifying effort teaches the athlete valuable lessons in self-awareness.

In addition to helping athletes develop an awareness of the effort they exert in various situations, the concept of pace (average speed) should be introduced to L2T athletes so that they can begin to understand how speed is related to perceived effort, and how changes in terrain, snow conditions and technical efficiency influence both.

Figure 4.5 Borg Rating of Perceived Exertion (RPE) Scale

Exertion	RPE
No exertion at all	6
Extremely light	7
	8
Very light	9
	10
Light	11
	12
Somewhat hard	13
	14
Hard (heavy)	15
	16
Very hard	17
	18
Extremely hard	19
Maximal exertion	20

Figure 4.6 Modified Rating of Perceived Exertion (RPE) Scale

Exertion	RPE
Nothing at all	0
Very, very weak	0.5
Very weak	1
Weak	2
Moderate	3
Somewhat strong	4
Strong	5
	6
Very strong	7
	8
	9
Very, very strong	10



REFERENCES

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Borg, G., Figure 4.3, *Borg's Perceived Exertion and Pain Scales*, Human Kinetics, 1996.

American College of Sports Medicine. Borg, G, *Psychological Basis of Perceived Exertion*, *Medicine and Science in Sports and Exercise*, 14, 337-381, 1982.



4.2 Flexibility (Suppleness)

Flexibility is the ability to conduct movements at certain joints with an appropriate range of motion.

There are a variety of stretching techniques that can be used to develop and maintain flexibility, but at all stages of athlete development the emphasis should be on static and dynamic stretching.

- ❑ **Static Stretching** - requires athletes to reach a full range of motion around a certain joint until they feel the muscle stretch. Once the optimal range of motion is attained, the stretch needs to be held for at least 20 seconds in order for the full benefit to be achieved. Note however that the stretch should not reach the point where it is quite painful to hold it.
- ❑ **Dynamic Stretching** - is swinging a given body part until a full range of motion is reached. Athletes should feel the stretching without going hard and/or far enough to damage the muscle fibres with the excessive swinging motion. Dynamic stretching is often used as a component of a warm-up routine prior to a high intensity workout such as a competition.

The window of optimal trainability for flexibility, for both boys and girls, occurs between six and 10 years of age - during both the FUNdamentals and L2T stages. Special attention should also be paid to flexibility during PHV (T2T stage). Refer to figure 2.5 in section 2.6 for more information.

Flexibility considerations for the first three stages of the LTAD progression are:

- ❑ **Active Start Stage** - provide unstructured and organized physical activity opportunities on a daily basis.
- ❑ **FUNdamentals Stage** – this is the window of optimal trainability for both boys and girls. Basic static and dynamic flexibility/stretching exercises should be introduced in an appropriate setting, with an emphasis on proper technique. Development can occur through participation in a variety of off-snow activities.
- ❑ **Learning to Train Stage** – this is the window of optimal trainability for both boys and girls. Flexibility should be further developed using stage-appropriate exercises in suitable settings. By the end of this stage static stretching should become a regular part of physical exercise and specific stretches for cross-country skiing movements can be introduced. Flexibility assessments should be done at least twice a year.

Muscles will tighten and shorten with exercise. Regular stretching is required if an individual is to remain supple and agile. Moreover, in order to execute proper ski technique, it is important for an athlete to be able to (1) move through a large range of motions, and (2) have a balance between muscle groups.

A good flexibility program will increase the length of the muscles, prepare the muscles for intense work and help in recovery. Repetitive high intensity will over time shorten the length of the muscles. However a good flexibility program before a competition or intense training session is not the same as a flexibility program designed for long term improvement – different methods are required for the different situations.





Note: The following information on flexibility is very general and must be adapted to the needs of the athletes you coach *according to their stage of development*.

4.2.1 Guidelines for Developing Flexibility

The points below relate to the method of developing flexibility called static stretching.

- When stretching is done incorrectly or at the wrong time it can actually do more harm than good. It is essential therefore to understand the right techniques before you introduce a flexibility program.
- Flexibility exercises should be preceded by a light warm-up involving continuous, dynamic efforts (e.g. light running for five minutes).
- The exercises are performed without the help of a partner, and without the application of external force on the limb or joint.
- The muscle or muscle group must be stretched in a controlled and gradual manner, without any interruption of the movement, and until a slight tension is felt. Once the muscle is slightly stretched and relaxed, the athlete must hold the position for 20 to 40 seconds.
- Athletes should breathe slowly and deeply when performing a stretch.
- Exercises should be performed on both sides.
- Each exercise can be repeated two to four times during a practice session.
- Quick, sudden movements should be avoided when stretching, especially when the muscle is not sufficiently warm.
- For older athletes, the cool-down period of a practice session is conducive to performing flexibility exercises because (1) muscles are normally adequately warmed-up at that point, and (2) flexibility does not involve intense effort. While athletes are stretching, the coach can gather feedback concerning the practice session, and can provide his/her feedback or information as required.

Examples of stretching exercises for the main muscle groups are provided in sections 4.2.2 and 4.2.3.





Why Stretch?

Stretching, because it relaxes the mind and tunes up the body, should be a part of everyone's daily routine.

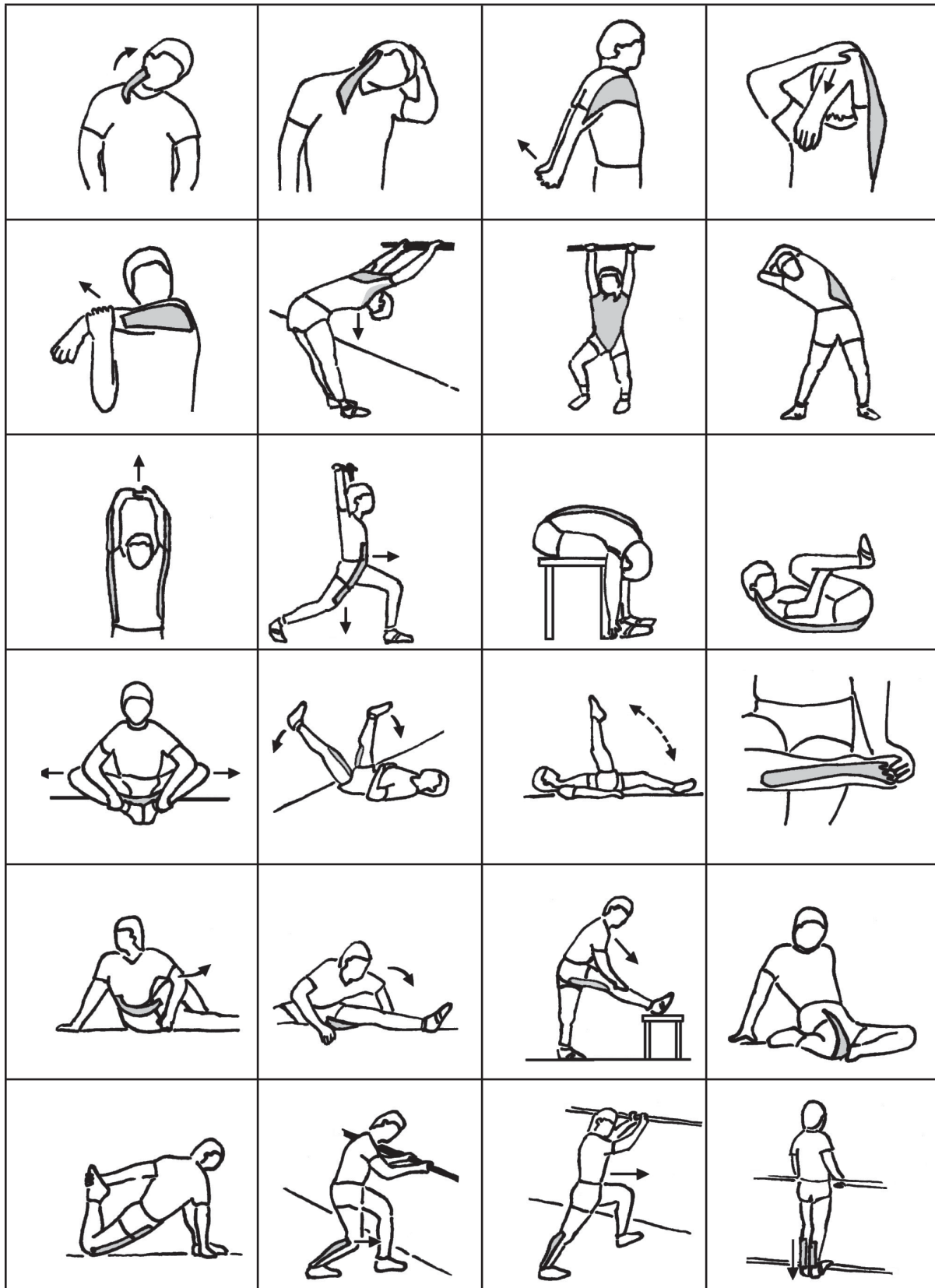
Regular stretching will:

- Reduce muscle tension and make the body feel more relaxed.
- Help coordination by allowing for freer and easier movement.
- Increase the range of motion.
- Make muscles more supple (injury is less likely).
- Contribute to correcting problems with technique due to muscle imbalances and poor posture.
- Improve circulation.
- Feel good!



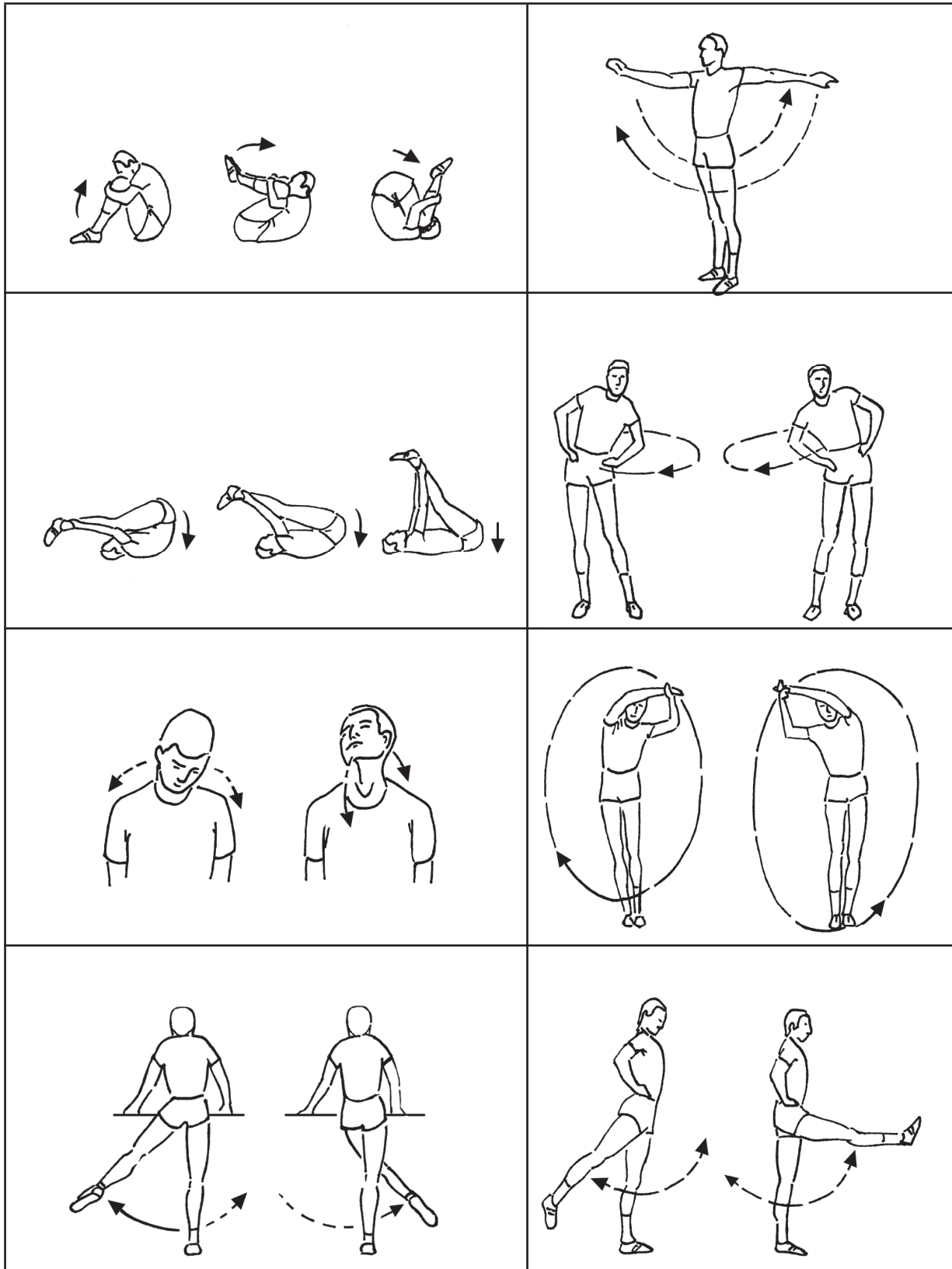


4.2.2 Basic Flexibility Exercises (Static)





4.2.3 Basic Flexibility Exercises (Dynamic)





4.3 Speed

Speed may be thought of as the ability to move a limb, limbs or the whole body at the greatest possible velocity. In addition, speed involves the capability to react to a stimulus or signal (such as a starting signal, stumble or fake/deke) in the shortest possible time.

Speed development includes linear, lateral, multi-directional speed, change of direction, agility and segmental speed. Speed may be incorporated as part of physical training and/or technical training depending upon the stage of development of the athlete or the sport specificity required.

For girls, the first speed training window occurs between six and eight years of age and the second window occurs between 11 and 13 years of age. For boys, the first speed training window occurs between seven and nine years of age and the second window occurs between 13 and 16 years of age. Refer to figure 2.5 in section 2.6 for more information. Note that there are two different systems being developed. The system referred to in the first window (Speed 1 – Central Nervous System) refers to short bursts of less than five seconds, while the speed referred to in the second window (Speed 2 - Anaerobic Alactic Power System) refers to 20 seconds or less.

Speed considerations for the first three stages of the LTAD progression are:

- Active Start Stage** - not applicable.
- FUNdamentals Stage** - window of optimal trainability (Speed 1) for girls - and also for boys during the second half of the stage. Develop linear, lateral and multi-directional speed with repetitions of duration of less than five seconds.
- Learning to Train Stage** - window of optimal trainability (Speed 1) for boys at the beginning of this stage. Further develop speed for athletes of both genders by using specific activities that focus on agility, quickness and change of direction. Games should be utilized to develop speed just as they are utilized to develop skills and aerobic fitness.

Note: The following information on developing speed is very general and must be adapted to the needs of the athletes you coach according to their stage of development.

4.3.1 Guidelines for Developing Speed 1

- To avoid injury, athletes should be warmed up before performing intense exercise.
- Activities aimed at improving speed should be scheduled at the beginning of the main part of the practice session, before the athletes are tired.
- Activities should be dynamic (i.e. movement and changes of position) and highly sport-specific. They must also closely replicate the particular movements for which increased speed is desired (adaptations are very specific).





- ❑ The volume and duration should be very low but the Central Nervous System (CNS), and to some extent the anaerobic alactic power system should be challenged.
- ❑ Movements should be performed at maximal or near-maximal speed.
- ❑ The duration of the exercise should not be more than five seconds. Full recovery should be achieved between sets.
- ❑ Rest between the repetitions needs to be long enough to allow for sufficient recovery. This will enable athletes to perform more repetitions at a high speed. Rest intervals can be as many as 12-15 times longer than the activity period (i.e. five seconds of sprinting followed by 60 seconds of relative rest).
- ❑ The rest periods should consist of very light activity involving the muscles used during the work periods (i.e. a slow walk if the athlete was sprinting).

Additional Notes on Developing Speed

- ❑ The total number of repetitions must not be too high; approximately 10 -12 is the norm, as speed tends to decrease thereafter due to fatigue. It is a good idea to divide the repetitions into sets (i.e. two sets of five repetitions each).
- ❑ It is highly recommended that speed is trained on a regular and frequent basis - for example as part of the warm-up at every training session.
- ❑ CNS and metabolic fatigue are not present towards the end or immediately after a warm-up, making this an optimal time to train speed.
- ❑ Short acceleration with proper posture and elbow and knee drive, take-off speed and segmental speed should be trained regularly outside of the window of optimal trainability for speed.





4.4 Skill

A skill is the ability to do something well. In the context of sport, a skill is a movement or a series of movements that is executed with competence. Children need to develop competency, first in movement skills and then in sport skills, in order to become physically literate.

- ❑ **Fundamental Movement Skills** - provide the base requirements for future advances in movement capacity. Refer to section 2.2 for more detailed information.
- ❑ **Fundamental Sport Skills** - such as running, gliding, jumping, catching, kicking, throwing and hitting are the building blocks for successful participation in most sports. Refer to section 2.2 of this Reference Material for more detailed information.

Fundamental movement skills and general sport skills should be further developed during the Learning to Train stage of development. It also should be noted that for optimal acquisition of sport-specific skills for cross-country skiing, all basic technique skills, both classic and skating, should be refined before the end of this period. Otherwise a significant window of opportunity is lost, compromising the ability of young athletes to reach full potential.

The window for optimal skill training begins at nine years of age for boys and eight years of age for girls, and ends at the onset of the growth spurt. Refer to figure 2.5 in section 2.6 for more information.

For detailed information on classifying sport skills, stages of skill development and planning guidelines for skill development, refer to section 10.2.

4.4.1 The ABCs

Agility, balance, coordination and speed are valuable in almost all sports. Developing the ABCs is an important part of physical literacy. There are a number of activities in which they can be learned and refined.

Some sports and activities are better at developing one or more of the ABCs than others. The key sports are as follows:

- ❑ Gymnastics is an excellent way for young children to learn and develop their agility, balance and coordination, while athletics (track and field) is a great way to develop speed and coordination.
- ❑ Skating and skiing provide excellent opportunities for the development of balance, coordination and speed, while soccer helps with speed, agility and coordination.
- ❑ In addition to developing confidence and safety in the water, swimming and synchronized swimming develop balance and coordination.
- ❑ Cycling and cross-country skiing are good ways to develop balance and the judgment of speed.





- ❑ Fundamental exercises designed to improve agility, balance and coordination on skis are listed in section 4 of the Community Coaching Reference Material. In addition, in section 5 of the CC Reference Material, agility and balance activities are incorporated into the Practice Plans for Levels 1, 2, 3 and 4.

Note: The following information on developing skills is very general and must be adapted to the needs of the athletes you coach *according to their stage of development*.

4.4.2 Guidelines for Developing Balance

- ❑ Although their primary focus is slightly different, some coordination or general motor development activities may also contribute to the development of balance.
- ❑ In general, developing balance requires creating conditions in which athletes assume an unusual position or posture (e.g. stand on one foot; stand on one foot and crouch; jump on a low bench and stay in position; hop on one foot, on the spot, forward, backward) and are asked to maintain it for a specified period of time.
- ❑ It is also possible to develop balance by performing normal movements in unusual conditions, for instance walking backward, with eyes closed, on heels, on a slope or a narrow and unstable surface (by drawing a line on the ground or placing a rope on the floor), etc. However, it is important to avoid excessively difficult situations that could cause falls or injuries.
- ❑ The use of large exercise balls (a.k.a. stability balls) can also present interesting motor challenges and can help develop balance. By using such balls, athletes make simple everyday activities such as sitting, standing or trying to maintain a horizontal body position much more difficult. Again, it is necessary to take appropriate safety measures to minimize the risk of a fall.
- ❑ To improve static balance and stability, athletes must lower their centre of gravity (for instance by bending the knees or flexing the hips), make the base of support larger (for instance by widening the legs), increase the number of contact points on the ground if this is possible (for instance by putting one hand on the ground), and ensure the weight is evenly distributed on each contact point.

4.4.3 Guidelines for Developing Coordination

- ❑ The activity must involve a sequence of actions that are performed in a given order.
- ❑ The level of difficulty of an activity aimed at developing coordination is determined primarily by the number of movements or actions that must be performed. Beginners or children should not have too many movements or actions to perform in sequence (two or three are sufficient).
- ❑ The actions or movements can be general in nature, or specific to cross-country skiing, depending upon the desired goal. For young children, priority should be given to general





coordination activities instead of sport-specific ones.

- ❑ Basic motor patterns must be mastered before the athlete tries a more complex sequence of actions. For instance, if athletes are not able to control basic motor patterns (e.g. running, jumping, rolling, turning, throwing and catching, jumping on one leg while maintaining balance, or lifting an arm and the opposite leg simultaneously), they should not attempt more advanced coordination activities.
- ❑ Sequences of movement can be designed for specific body parts (e.g. arms only, or legs only), for several body parts at a time or for the entire body. Coordination activities can also take the form of agility games (e.g. “follow the leader”).
- ❑ It is important to ensure that the sequence of movements is correctly executed, as the neuromuscular system tends to memorize motor patterns as they are learned in practice. For this reason, movements should be performed at low speed or intensity during the initial learning phase, and then progressively accelerated to full speed.
- ❑ It is desirable to create conditions which require athletes to perform movements in various directions and/or use their weaker side.
- ❑ An activity can be made more challenging by:
 - ✓ Increasing the speed of execution.
 - ✓ Adding new movements.
 - ✓ Modifying the order in which the movements must be performed.
 - ✓ Combining various actions already mastered but performing them in an unusual manner (e.g. dribbling the ball while squatting; running in the snow, sand or water).
 - ✓ Adding restrictions (e.g. less time, less space, increased accuracy, unstable environment).
 - ✓ Adding uncertainty (e.g. performing the action with the eyes shut).

These variations must be presented gradually, and only after the basic sequence of actions is mastered.

- ❑ It is better to repeat the movement sequences more frequently for less time than to repeat them less frequently for more time; in other words, learning will tend to be more effective if you have two five minute motor sequences four times a week than if you have one 40 minute practice session once a week.





4.5 Strength

Strength is the ability of the muscles to generate force through a single maximal voluntary contraction. There are three types of strength.

- ❑ **Maximum Strength** - is the highest level of tension generated by a muscle or muscle group during a maximum contraction, regardless of the duration of the contraction.
- ❑ **Speed-Strength** - is the ability to perform a muscle contraction or overcome a resistance as fast as possible (normally, very brief efforts of 1-2 second).
- ❑ **Strength-Endurance** - is the ability to perform repeated muscle contractions at intensities below maximum strength (normally, 15-30 repetitions or more).

The window for optimal trainability (for strength) for girls is immediately after PHV or at the onset of the menarche (first menstruation). This begins during the Training to Train stage of development. For boys the window of optimal trainability is 12 to 18 months after PHV, and occurs during the Learning to Compete stage of development. Refer to figure 2.5 in section 2.6 for more information.

Because the emphasis on developing strength takes place during subsequent stages of athlete development, all that is required during the L2T stage is for athletes to develop some basic core strength (important for good body posture, balance and prevention of injuries) and some basic general strength, particularly in the arms (important for skiing but not normally developed through daily activities).

A summary of the strength considerations for the first three stages of the LTAD progression is as follows:

- ❑ **Active Start Stage** - not applicable.
- ❑ **FUNdamentals Stage** - develop strength using exercises that incorporate the child's own body weight. Include hopping and bounding activities, as well as the use of medicine balls and Swiss balls.
- ❑ **Learning to Train Stage** - further develop strength using exercises that incorporate the child's own body weight, as well as medicine balls and Swiss balls, ski-related hopping and bounding exercises or routines, and wheeling up gradients. Introduce basic core strength exercises.

In most sports the development of the various types of strength is difficult to achieve through participation in the sport or activity itself. In addition, certain guidelines must be followed to avoid injuries, particularly among children and beginners. To guide you in the introduction of strength training, the following considerations have been provided.

Note: Specific strength development methods and the related safety measures that must be considered and implemented when putting them into practice will be covered in later NCCP workshops.





Note: The following information on developing core strength is very general and must be adapted to the needs of the athletes you coach *according to their stage of development*.

4.5.1 Guidelines for Developing Basic Strength

Examples of strengthening exercises using body weight and light weights are provided on the next page.

- ❑ In general, exercises involve localized muscle masses. In most of these exercises, the resistance is provided by the body weight of the athlete or by relatively light weights.
- ❑ It is recommended that athletes avoid heavy loads. Ensure that athletes are able to perform at least 12 to 15 consecutive repetitions of each exercise. Under such conditions, strength-endurance becomes the primary ability trained.
- ❑ The speed of execution must be moderate and controlled; athletes must end the exercise when the quality of execution starts to deteriorate.
- ❑ It is possible to use jumping or hopping exercises. As the speed of execution and muscle contraction are relatively high, these exercises will develop speed-strength (muscle power).
- ❑ Avoid exercises that could excessively overload the spine (compression stress).
- ❑ While developing strength, aim for muscle balance; for instance, develop both the upper and lower-body muscle groups, the muscles in front and behind body segments, and muscles on both the right and left sides.





4.5.2 Basic Strength Exercises Using Body Weight or Light Equipment

		Bench or stairs 	
Hands shoulder width 	Hands wider than shoulders 	Palms facing forward 	Palms facing backward
With or without twist 			Light bar
Medicine ball 	Medicine ball 	Medicine ball 	Soft ball (tennis)





4.5.3 Core Strength Development

Core strength development (abdominal wall and lower back) is important for athletes participating in any activities or sports beginning at the L2T stage. The integrity of the abdominal wall and lower back is important for maintaining good posture, and strength development in this area is a prerequisite to other kinds of strength training. As well, the ability to absorb high loads from other kinds of strength training, the ability to transmit forces from the upper body to lower body (and vice versa) and injury prevention are aided by a strong abdomen and lower back. Imbalances in strength and flexibility in the core can lead to injuries in the legs, hips and lower back and can cause problems with technique.

Simply put, core strength (and flexibility) is similar to tightening all the nuts, oiling the chain and truing the wheels on a mountain bike. Athletes can acquire the most expensive additional frames and components, but this will do them little good if their seat and handlebars are loose, or their chain is rusty and their wheels are wobbly. Having a tight seat post and handlebars may not win them any races but having loose ones can cause them all kinds of problems. In other words, the more biking athletes do, the greater the potential for problems if their equipment is loose. And the more training they do, the greater the potential for problems if they have poor core strength.

Recommendations for Introducing a Core Strength Program for Children

The following information can be used as a starting point for a long term development plan for core strength.

- ❑ Before introducing core strength exercises it is important to evaluate your athletes' physical and mental maturity. See "Pre-Core Strength Development Evaluation" below. If athletes are unable to complete these exercises correctly, they require additional work on their basic movement skills (ABCs) before proceeding further.
- ❑ **Learning to Train Stage** - core strength exercises are introduced to help develop coordination and technique. Begin by asking athletes to lie flat on their back and press their lower back to the floor by tilting their pelvis. Encourage them to relax. Progress with this exercise to the point where they can keep their lower back flat for 15 seconds. Following this a simplified version of the core routine can be implemented by substituting the lower abdominal exercise with the pelvic tilt coordination tests, and by reducing the duration of each exercise to 15 seconds. Practice once a week.
- ❑ **Training to Train Stage** - programs will differ depending on the developmental age of the individual athlete, but generally, by the beginning of this stage, all athletes should be systematically following a core strength program - up to two to three sets with breaks between sets. Practice once a week. Later in this stage practices may increase to three times a week in off-season and once a week during the competitive season.
- ❑ Don't invest too much time trying to develop a perfect program. Focus instead on ensuring that the exercises are implemented perfectly and consistently.





Evaluation (for Children) Before Beginning Core Strength Development

All tests should be performed without shoes to test the stabilizers of the foot and ankle.

- Static Stand (hip flexed) - appropriate for use with all ages:

- ✓ Stand erect on one foot.
- ✓ Flex the hip and bend the knee of the supporting leg.
- ✓ Hold this position for ten seconds.

Observe the ability to hold the position with as little shaking or lateral deviation as possible.

- Single Leg Squat - appropriate for use with all ages:

- ✓ Squat bending at the ankle, knee and hip.
- ✓ Hold lowest possible position for ten seconds.

Observe the depth of the squat and the ability to hold the position with as little shaking or lateral deviation as possible.

- Hop for Distance - appropriate for use with all ages:

- ✓ Hop maximum distance.
- ✓ Hold the landing (like a gymnastics landing) for 10 seconds.

Compare the distance achieved with the right and left legs; check the ability to hold the landing position for ten seconds; check if the athlete lands bending at the ankle, knee or hip using all three joints.

Some Key Concepts

- Focus on ensuring that the exercises are implemented perfectly and consistently.
- These exercises are to be done slowly. Slow movements will maximize the use of abdominal muscles, whereas fast movements will use hip flexors. Proper positioning of the feet and lower back will ensure the targeted muscles are used.
- The target time for each exercise is one minute. If the exercise is too difficult to do with proper technique for one minute, change the exercise in the appropriate manner to reduce the difficulty as the athlete fatigues so that you can maintain exercising for one minute. For example, in the lower abdominal exercise where the legs are maintained in a straight position off the floor, it is better to bend the legs at 30 seconds if fatigued than it is to quit. However, it is important not to progress to the next level of difficulty in the exercise until the proper technique can be maintained for the entire minute.
- Several exercises have progressions or slight variations. Use them to provide variety but don't change them until athletes have learned the exercise properly.
- There are four exercises that are done in a five exercise circuit. For most athletes the lower abdominal exercise is done twice in one circuit. For a few of the upper abdominal exercises it





is done twice. Refer to the monitoring of core strength to determine which series of exercises to do.

- ❑ Following is the suggested progression that should be used. Begin with Level A. When athletes are able to complete this level maintaining good technique, then move to Level B. As there are different degrees of difficulty for each exercise, you can create numerous variations of this exercise. In the following example, each exercise is to be done for one minute, with no breaks between exercises.
 - A. two sets – two minute break between sets.
 - B. two sets – one minute break between sets.
 - C. two sets – no break between sets.
 - D. three sets – no break between set one and set two, two minute break between set two and three, and eventually progressing to five sets with no break between sets.
- ❑ The suggested order of exercises in one set of the circuit.

Normal or Curved Back	Flat Back
Lower Abdominal	Upper Abdominal
Lower Back	Lower Back
Upper Abdominal	Lower Abdominal
Lower Abdominal	Upper Abdominal
Torso Rotation	Torso Rotation

Most people have a normal or curved lower back (lumbar region of the spine). A field test to determine the curvature of the back is to stand backwards against a wall with heels, rear end and shoulders touching the wall. If an athlete is able to stick a hand in the space between his/her lower back and the wall and the fit is snug, the athlete has a normal curvature. If there is room for “free play”, the lower back is considered to be abnormally curved. If it is difficult to insert the hand, the lower back is considered flat.

- ❑ A core strength program should be practised a minimum of three times a week. If the athletes’ time is limited it is better for them to do one set three times a week as opposed to doing three sets once a week.

Note: Unless athletes have good core strength, the more training they do, the greater the potential for injury.





Core Strength Exercises

❑ Lower Abdominals

Lie on back, keep lower back on floor at all times, head flat on floor. Turn toes in.

Level of Difficulty

- Level 1 Bend one leg bracing foot on floor. Raise other leg straight taking three seconds up and three seconds down with no pause at the bottom.
- Level 2 Raise both legs to 75°, hold for one minute, bend knees as fatiguing.
- Level 3 Same as Level 2, keeping legs straight for entire minute.
- Level 4 Raise both legs to 60°, hold for one minute with legs straight.
- Level 5 Raise both legs to 45°, hold for one minute with legs straight.
- Level 6 Raise both legs to 45°, scissor kick, spell letter with feet etc.
- Level 7 Raise both legs to 30°, mix of static and dynamic movements.
- Level 8 Raise both legs to 15°, mix of static and dynamic movements.

❑ Lower Back

Alternating Arms and Legs

- ✓ Lie on stomach, keeping hips down and palms up.
- ✓ Lift alternate arm and leg with hips down.
- ✓ Raise for two seconds, hold for two seconds, lower two seconds with no pause at bottom.

or

Modified Reverse Crunchie

- ✓ Stand with slight bend in knees holding light weight close to body.
- ✓ Curl head down until hip starts to rotate (hands about to knees) and then up.
- ✓ Down in five seconds and up in five second.
- ✓ Try to curl by one vertebra at a time.

❑ Upper Abdominals

Elevated Leg Crunchie

- ✓ Lie on back, with legs off the ground with knees and hips bent at 90°.
- ✓ Keep tongue pressed against the roof of mouth, toes pointed in toward each other and heels out and lower back on floor.
- ✓ Curl up slowly – up two seconds, hold two seconds, down two seconds with no pause at bottom.





Level of Difficulty

- Level 1 Hands on floor.
- Level 2 Hands crossed on chest.
- Level 3 Hands to ear.
- Level 4 Hands to spine between shoulder blades.
- Level 5 Arms straight back.
- Level 6 Arms straight back with weights.

❑ **Torso Rotations**

- ✓ Lie on back, knees and hips bent at 90° (similar to upper abdominals position).
- ✓ Hands on ear.
- ✓ Rotation is to be in trunk, not the neck.

Level of Difficulty

- Level 1 Rise up for two seconds, rotate right for two seconds, rotate left for two seconds, hold in middle for two seconds and down for two seconds with no pause at bottom.
- Level 2 Same as Level 1 but when rotating trunk right, rotate legs to left and when rotating trunk to left, rotate legs to right.

Monitoring Core Strength

Core strength can be monitored through a combination of abdominal strength tests and the progression attained in the core strength circuit exercises. In the early stages of core strength development, the abdominal test results will likely be more informative. With some experience in training and with the athlete recording normal scores for the abdominal test, circuit monitoring becomes more informative. These tests are more convenient to do on a solid table than on the floor.

❑ **Coordination Test**

This test is an exercise to test (and practise) the ability of athletes to flatten their back on the floor while they raise and lower their legs. The inability to do so will likely give a false reading in the following lower abdominal test (i.e. the lower abdominal test may indicate weak lower abdominals, whereas the strength may have been sufficient and it was lack of coordination that caused failure).

- ✓ Athlete lies flat on back with knees bent at 90° and feet flat on table, hands at side.
- ✓ Tester puts hand between lower back and table.
- ✓ Athlete pushes down on lower back while lifting knees to chest and back.
- ✓ Pressure on the tester's hand must be maintained throughout the test.





❑ **Lower Abdominal Test (do not do this test if the athlete has lower back pain)**

- ✓ Athlete lies on back – legs straight, arms bent, hands near head, elbows on table.
- ✓ Pelvis should be tilted so lower back is pressed against table (tester should put hand under lower back to feel if pressure is even).
- ✓ Athlete lifts legs to 90°, then slowly lowers legs without lifting lower back off the table.
- ✓ Tester marks the angle where lower back lifts off the table.
- ✓ See Table #1 for interpretation of test results.
- ✓ Many athletes will score low in this test.

Table #1 - Interpretation of Abdominal Tests		
Grade	Lower Abdominals (deg. off ground)	Upper Abdominals
50%	75°	Flexes vertebral column, but cannot complete sit-up with forearms extended forward.
60%	60°	Flexes vertebral column, and holds it flexed while coming upright with forearms extended forward.
70%	45°	
80%	30°	Flexes vertebral column, and holds it flexed while coming upright with forearms folded on chest.
90%	15°	
100% NORMAL	0°	Flexes vertebral column, and holds it flexed while coming upright with hands clasped on ears.

❑ **Upper Abdominal Test**

- ✓ Athlete lies on back – legs straight, toes turned in.
- ✓ Head should be tilted up, athlete should put tongue on the roof of mouth (stabilizes neck).
- ✓ Athlete does a complete sit-up, first by flexing (rounding) back, then by lifting trunk up (lower back is the last part of the back to come off the table).
- ✓ Degree of difficulty is controlled by the hand position. The easiest position is when the forearms are reaching forward; next more difficult when the forearms are folded across the chest; and finally most difficult when the hands are against ears and elbows are extended away from body (athlete should not move elbows forward).





- ✓ Athlete keeps toes in and head tilted up throughout.
- ✓ See Table #1 for interpretation of test results.

❑ **Standing Against Wall Posture Test**

Athlete stands with heels, rear end and upper back against wall. The tester sticks his/her hand in the space between lower back and the wall.

- ✓ If the hand is too snug (tester can barely get the hand in), the athlete tries the upper abdominal circuit.
- ✓ If the hand is too loose (lots of room for the fingers to move), the athlete tries the lower abdominal circuit.

For more detailed information on strength training for cross-country skiers, refer to the CCI – T2T (Dryland) Reference Material.





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SECTION 5 – NUTRITION





5.1 Nutritional Needs of Endurance Athletes

A good diet and sufficient intake of fluids are important for health, growth and maturation, and may also have a significant effect on the ability of your athletes to train and perform well in competition. Maintaining good dietary habits plays an important role in establishing a healthy lifestyle. This may also help athletes perform to their best and promote faster recovery, for example when there are several training sessions or competitions on consecutive days.



On the other hand, you have to be realistic about how much you can influence your athletes' diet. The determining factor is more likely to be the involvement of the athletes' parents; they are usually the ones who decide the type of food eaten at home and the way it is prepared, both on a day-to-day basis and for meals before or after training or competition.

This section is not trying to make you an expert in sport nutrition! It contains information and simple, practical recommendations about diet and hydration before, during and after activity, both in practice and in competition. These recommendations will help you inform and influence your athletes and their parents on: (1) the importance of a good diet and hydration; and (2) how to put in place simple steps that will be useful for both the general good health of the athletes and their performance.

Specific problems like weight management, special diets, commercial products, combining foods based on their glycemic index, vegetarianism and eating disorders are well beyond the scope of this module. If you have questions on these topics, or if you are not sure what to recommend in certain situations, do not hesitate to consult an expert in sport nutrition.

Be aware of how much influence you can have on your athletes and their parents, and avoid making comments that could be misinterpreted, for example on an athlete's weight or size. If you are not an expert in sport nutrition, avoid giving advice on how to lose or gain weight; it could do more harm than good. Once again, it would be useful to consult an expert.

Nutritional Needs of Athletes Generally

An athlete's diet must be well balanced, supplying adequate energy and nutrients for optimum performance and providing for the repair and maintenance of tissues and for growth. In this respect, the nutritional needs of an athlete in training are not significantly different from the requirements of all healthy individuals. However, athletes should pay attention to the following:

- ❑ **Eating a Variety of Foods.** Foods from each group should be eaten every day (grain products, vegetables and fruits, milk products, meats and alternatives).
- ❑ **Sufficient Energy Intake.** There must be adequate dietary intake to meet the energy demands of training, competition and body weight maintenance. Energy requirements vary according to age, gender, body composition and amount and type of physical activity (related to exercise intensity and volume). In general, judged sports such as gymnastics, diving, skating and equestrian require less energy than endurance events like triathlon, swimming, cycling, cross-country skiing, road racing, speed skating, etc.





- ❑ **Sufficient Carbohydrate Intake.** Provided by the “grain products” food group, carbohydrate is the main energy source athletes rely on in most sports. Whether they are involved in high-intensity, short-duration events or in endurance events, athletes use carbohydrate as their main source of energy. Carbohydrate stored in muscles can be depleted after 75 – 90 minutes of moderate to high-intensity activity.
- ❑ **Sufficient Fluid Intake.** The need for water increases during exercise because of the loss of fluid caused by sweating and increased ventilation. This is important for all sports, including water sports, as dehydration can lead to a marked decrease in performance.
- ❑ **Sufficient Protein Intake.** An athlete requires slightly more protein than a sedentary person to provide for adequate maintenance of muscle mass and repair of tissues.

Nutritional Needs of Endurance Athletes

Athletes need an optimum mix of nutrients for different types of sporting events. There is a well known saying in sports nutrition: *“you can’t make an average athlete elite with a good diet, but you can make an elite athlete average with a poor diet!”* This section will deal with the most important nutrient for endurance athletes – carbohydrates.

The major storage fuel in the body is fat. However, the oxidation of fats for energy will only support running/cross-country skiing at tortoise-speed (about 50% VO₂ max.). In order to run or ski at more upbeat speeds, athletes have to break down carbohydrate (both simple sugars and complex starches), which is the high octane fuel for the muscle cells and the preferred source of energy for this task. All carbohydrate is broken down into glucose. This is the only type of carbohydrate (excluding lactate) that skeletal muscle can readily metabolize for energy or store as glycogen. However, an individual’s storage depots of glycogen are rather limited (350g in muscles and 100g in the liver of an average adult). It takes from 90-180 minutes of continuous exercise performed at 60-80% VO₂ max to deplete muscle glycogen stores, but only 15-30 minutes of exercise performed at very high intensities above 90% VO₂ max, such as interval sessions or competitions.

Optimizing recovery from exercise depends upon the type of exercise, the intensity and duration, as well as the time between training sessions or competitions. Athletes must learn how to maximize their glycogen stores (as well as to ensure proper rehydration and rest) – *i.e. they must learn to co-ordinate nutrition with training!*

The resynthesis of glycogen begins immediately after exercise. The most rapid resynthesis occurs during the first five/six hours of recovery from exercise. Eating or drinking carbohydrate immediately after exercise accelerates this process. It has been found that the highest rate of muscle glycogen resynthesis may be achieved when carbohydrate is consumed at the rate of 1.2g per kg body weight per hour during the initial five hours of the recovery process (taken in 15-30 minute intervals). Approximately 10g of carbohydrate per kg body weight should be sufficient to replenish glycogen stores within 24 hours after a hard training session or competition.

An example of a 24 hour carbohydrate (CHO) nutrition recovery plan is as follows:

- ❑ A 70kg athlete has just finished a 10 km race and is scheduled to race again in 24 hours.





- ❑ He/she needs approximately 10g CHO per kg of body weight to restore muscle glycogen levels within 24 hours. $70\text{kg} \times 10\text{g CHO} = 700\text{g CHO}$ required.
- ❑ CHO should be consumed at the rate of 1.2g CHO/kg/per hour for the first five hours. $70\text{ kg} \times 1.2\text{g CHO} = 84\text{g}$ per hour. This is best taken in 15-30 minute intervals. Thus 42g per 30 minutes or 21g per 15 minutes is required.
- ❑ $84\text{g per hour} \times 5\text{ hours} = 420\text{g}$ consumed in five hours. Therefore the athlete would need to consume an additional 280g (700g minus 420g) over the next 19 hours (24 hours minus five hours) to optimize recovery.

Other important factors an athlete should consider in order to optimize recovery:

- ❑ The type of carbohydrate consumed during recovery may have an influence on the rate of muscle glycogen resynthesis. Some studies have indicated that it may be more effective to consume high glycemic index (HGI) carbohydrate in the first few hours post exercise, and then switch to low glycemic index snacks (meals) for the remainder of the recovery. Sports drinks are typically HGI. As well, these drinks assist in rehydration, which is an essential part of the recovery. Further studies are required in order to determine the mix of carbohydrate that maximizes glycogen restoration.
- ❑ Some studies indicate that consuming a protein-carbohydrate mixture immediately after exercise increases the rate of post exercise muscle glycogen resynthesis beyond that which occurs with carbohydrates alone. Other studies contradict this. However, some of the studies report that there was less post-exercise muscle soreness when a protein-carbohydrate drink is used. This may be due to the fact that small amounts of muscle protein are degraded and converted to fuel during exercise. It would therefore be prudent for athletes to add a high quality protein to their recovery drink in the event that further studies prove that protein increases the resynthesis of glycogen. The protein would also be beneficial for long-term recovery over days and weeks as it would help with net protein synthesis in the muscles.
- ❑ Rehydration post exercise is optimal when athletes ingest a volume of fluid equivalent to 150% of the body weight loss.
- ❑ **Carbohydrate Consumption During Exercise or Competition.** During long distance training sessions (longer than 45 minutes), or interval sessions (although short in duration), an athlete should drink 90-120mL (approximately three sips) of a sport drink every 10-15 minutes. Likewise, an athlete in a cross-country ski competition that is in hilly terrain and more than 11 km in length should consume a carbohydrate feed en route. These frequent feedings have a muscle glycogen sparing effect.
- ❑ **Pre-Race Carbohydrate Consumption.** A pre-race sport drink or gel taken anywhere from one/two hours prior to an event can top-up an athlete's tank of carbohydrates and act as a muscle glycogen sparing technique. Individuals respond differently to this intake, so all athletes need to experiment themselves to find out how close to a competition they can consume a sport drink or gel.
- ❑ **Carbohydrate Consumption During Cross-Country Ski Sprint Competitions.** As has been pointed out, carbohydrate consumption immediately after exercise accelerates muscle





glycogen resynthesis. This is true even during short recovery periods such as the period between heats in a sprint race where HGI carbohydrate consumption should take place approximately every 15 minutes. The formulation of the recovery drink should be similar to the 24 hour recovery drink.

☐ Food items containing 20-25 grams of carbohydrate:

- ✓ Two cups of skim milk.
- ✓ A little more than half a bagel.
- ✓ A 2/3 cup serving of cooked pasta.
- ✓ An apple OR a banana OR a pear.
- ✓ Four dates.
- ✓ A cup of orange juice.
- ✓ 1/5 cup of raisins (or two 1/2 oz packages).
- ✓ A medium baked potato.
- ✓ A slice and a 1/4 of most breads.
- ✓ An English muffin.
- ✓ A cup of oatmeal.
- ✓ One and a half cups of Special K cereal.
- ✓ 1/2 cup of cooked rice.
- ✓ Two tablespoons of jelly or jam.

☐ Food items containing 50 grams of carbohydrate:

- ✓ Four oz of whole wheat bread.
- ✓ Seven oz of whole grain rice.
- ✓ Two and a half oz of shredded wheat cereal.
- ✓ Seven oz baked potato.
- ✓ Nine oz banana.
- ✓ Two and three quarter oz of raisins.
- ✓ Seven oz of spaghetti.
- ✓ Two and a half oz of oatmeal.
- ✓ Eleven oz green grapes.
- ✓ Approximately 1 lb of oranges.

Sample Diets for Different Types of Sports

The following table identifies an action plan for athletes in different types of sports based on Canada's Food Guide. The appropriate dietary action plan should supply adequate energy to meet an athlete's current training demands. The number of recommended servings represents minimum quantities. Note: growth, gender and body size will influence energy needs.





Sample Diet - Recommended Servings Per Day

Food Group	Select an Action Plan		
	Judged Sports For athletes in judged sports, such as gymnasts, divers, and figure skaters	Team Sports For most athletes, including players in team sports	Endurance Sports For endurance athletes e.g., cross-country skiers, swimmers, cyclists competing in road-racing, cross-country runners, triathletes, speed skaters
Refer to <i>Canada's Food Guide</i> for examples of servings from each food group	NO ATHLETE SHOULD EAT LESS THAN THE MINIMUM NUMBER OF SERVINGS		
Grain Products	Minimum of 6 servings	10 servings or more	15 servings or more
Vegetables and Fruit	Minimum of 7 servings	10 servings or more	15 servings or more
Milk Products	3-4 servings	3-4 servings	3-6 servings
Meat and Alternatives	Minimum of 2 servings	2 servings	2-4 servings
Oils and Fats	Minimum of 30 to 45 mL (2 to 3 Tbsp) of unsaturated fat	Minimum of 30 to 45 mL (2 to 3 Tbsp) of unsaturated fat	Minimum of 30 to 45 mL (2 to 3 Tbsp) of unsaturated fat
Other Foods	Minimize – there just isn't room for extra energy coming from foods that are not nutrient-rich	Choose in moderation after you have enough servings from the other food groups	If you are finding it difficult to eat a large enough volume of food to meet your energy needs, extra sweets and fats can be added



**5.1.1 Nutrition Answer Sheet #1 (sample)**

A. My first answer	C. My answer after checking sections 5.1 and 5.1.2
B. More ideas after discussion with others	





Nutrition Answer Sheet #1 (working copy)

A. My first answer	C. My answer after checking sections 5.1 and 5.1.2
B. More ideas after discussion with others	







5.1.2 Canada Food Guide

Recommended Number of Food Guide Servings per Day									
Age in Years	Children			Teens		Adults			
	2-3	4-8	9-13	14-18		19-24	25-34	35-44	45+
Vegetables	4	5	6	7	8	7-8	8-10		7
Grain	3	4	6	6	7	6-	8	6	7
Milk and Alternatives	2	2	3-4	3-4	3-	2	2	3	3
Meat and Alternatives	1	1	1-	2	3	2	3	2	3

The chart above shows how many Food Guide Servings you need from each of the four food groups every day.























Having the amount and type of food recommended and following the tips in *Canada's Food Guide* will help:

- Meet your needs for vitamins, minerals and other nutrients.
- Reduce your risk of obesity, type 2 diabetes, heart





What is One Food Guide Serving?

 <p>Fresh, frozen or canned vegetables</p>	 <p>Leafy vegetables Cooked: 125 mL (½ cup) Raw: 250 mL</p>	 <p>Fresh, frozen or canned fruits</p>	 <p>100% Juice 125 mL (½)</p>		
 <p>Bread 1 slice (35)</p>	 <p>Bagel ½ bagel (45 g)</p>	 <p>Flat breads ½ pita or ½ tortilla (35 g)</p>	 <p>Cooked rice, bulgur or quinoa</p>	 <p>Cereal Cold: 30 g Hot: 175 mL (¾)</p>	 <p>Cooked pasta or couscous</p>
 <p>Milk or powdered milk 250 mL (1 cup)</p>	 <p>Canned milk (evaporated) 125 mL (½ cup)</p>	 <p>Fortified soy beverage 250 mL (1 cup)</p>	 <p>Yogurt 175 g (¾ cup)</p>	 <p>Kefir 175 g (¾ cup)</p>	 <p>Cheese 50 g (1 oz.)</p>
 <p>Cooked fish, shellfish, legumes, poultry, lean meat 75 g (2 ½ oz.) / 125 mL (½ cup)</p>	 <p>Cooked meat 175 mL (¾ cup)</p>	 <p>Tofu 150 g or 175 mL (¾)</p>	 <p>Eggs 2</p>	 <p>Peanut or nut butters 30 mL (2 Tbsp)</p>	 <p>Shelled and seeds</p>



Oils and Fats

Include a small amount – 30 to 45 mL (2 to 3 Tbsp) – of unsaturated fat each day. This includes oil used for cooking, salad dressings, margarine and mayonnaise.

Use vegetable oils such as canola, olive and soybean.

Choose soft margarines that are low in saturated and trans





Make each Food Guide Serving count...

wherever you are – at home, at school, at work or when eating out!

▶ **Eat at least one dark green and one orange vegetable each day.**

- Go for dark green vegetables such as broccoli, romaine lettuce and spinach.
- Go for orange vegetables such as carrots, sweet potatoes and winter squash.

▶ **Choose vegetables and fruit prepared with little or no added fat, sugar or salt.**

- Enjoy vegetables steamed, baked or stir-fried instead of deep fried.

▶ **Have vegetables and fruit more often than juice.**

Make at least half of your grain products whole grain each day.

- ▶ • Eat a variety of whole grains such as barley, brown rice, oats, quinoa and wild rice.
• Enjoy whole grain breads, oatmeal or whole wheat pasta.

Choose grain products that are lower in fat, sugar or salt.

- ▶ • Compare the Nutrition Facts table on labels to make wise choices.
• Enjoy the true taste of grain products. When adding sauces or spreads, use small amounts.

Drink skim, 1%, or 2% milk each day.

- ▶ • Have 500 mL (2 cups) of milk every day for adequate vitamin D.
• Drink fortified soy beverages if you do not drink milk.

Select lower fat milk alternatives.

- ▶ • Compare the Nutrition Facts table on yogurts or cheeses to make wise choices.

Have meat alternatives such as beans, lentils and tofu

- ▶ **often. Eat at least two Food Guide Servings of fish each week.***

- Choose fish such as char, herring, mackerel, salmon, sardines and trout.

▶ **Select lean meat and alternatives prepared with little or no added fat or salt.**

- Trim the visible fat from meats. Remove the skin on poultry.
- Use cooking methods such as roasting, baking or poaching that require little or no added fat.
- If you eat luncheon meats, sausages or prepackaged meats, choose those lower in salt (sodium) and fat.



***Enjoy a variety
of foods from
the four
food groups.***



***Satisfy your
thirst with
water!***

Drink water regularly. It's a calorie-free way to quench your thirst. Drink more water in hot weather or when you are very active.

*Health Canada provide advice for limiting exposure to mercury from certain types of fish. Refer to www.healthcanada.gc.ca for the latest information.





Advice for different ages and stages...

Children

Following *Canada's Food Guide* helps children grow and thrive.

Young children have small appetites and need calories for growth and development.

Serve small nutritious meals and snacks each day.

Do not restrict nutritious foods because of their fat content. Offer a variety of foods from the four food groups.

Most of all... be a good role model.

Women of childbearing age

All women who could become pregnant and those who are pregnant or breastfeeding need a multivitamin containing **follic acid** every day.

Pregnant women need to ensure that their multivitamin also contains **iron**.

A health care professional can help you find the multivitamin that's right for you.

Pregnant and breastfeeding women need more calories. Include an extra 2 to 3 Food Guide Servings each day.

Here are two examples:

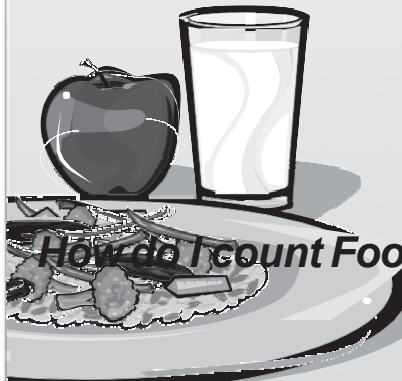
Have fruit and yogurt for a snack, or

Have an extra slice of toast at breakfast and an extra glass of milk at supper.

Men and women over 50

The need for **vitamin D** increases after the age of 50.

In addition to following *Canada's Food Guide*, everyone over the age of 50 should take a daily vitamin D supplement of 10 µg (400 IU).



How do I count Food Guide Servings in a meal?

Here is an example:

Vegetable and beef stir-fry with rice, a glass of milk and an apple for dessert

250 mL (1 cup) carrot and sweet red pepper	=	2 Vegetables and
Fruit Food Guide Servings 75 g (2 ½ oz.) lean beef	=	1 Meat and Alternatives Food Guide Serving
250 mL (1 cup) brown rice	=	2 Grain Products Food Guide Servings
5 mL (1 tsp) canola oil	=	part of your Oils and

Fats intake for the day 250 mL (1 cup) 1% milk =

1 **Milk and Alternatives** Food Guide Serving

1 apple = 1 **Vegetables and Fruit** Food Guide Serving





Eat well and be active today and every day!

The benefits of eating well and being active include:

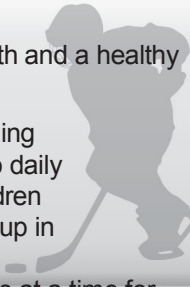
- Better overall health. Feeling and looking better.
- Lower risk of disease. More energy.
- A healthy body weight. Stronger muscles and bones.



Be active

To be active every day is a step towards better health and a healthy body weight.

Canada's Physical Activity Guide recommends building 30 to 60 minutes of moderate physical activity into daily life for adults and at least 90 minutes a day for children and youth. You don't have to do it all at once. Add it up in periods of at least 10 minutes at a time for adults and five minutes at a time for children and youth.



Start slowly and build up.

Eat well

Another important step towards better health and a healthy body weight is to follow

Canada's Food Guide by:

- Eating the recommended amount and type of food each day.
- Limiting foods and beverages high in calories, fat, sugar or salt (sodium) such as cakes and pastries, chocolate and candies, cookies and granola bars, doughnuts and muffins, ice cream and frozen desserts, french fries, potato chips, nachos and other salty snacks, alcohol, fruit flavoured drinks, soft drinks, sports and energy drinks, and sweetened hot or cold drinks.

Read the label

Compare the Nutrition Facts table on food labels to choose products that contain less fat, saturated fat, trans fat, sugar and sodium.

Keep in mind that the calories and nutrients listed are for the amount of food found at the top of the Nutrition Facts table.

Nutrition Facts

Per 0 mL (0 g)	
Amount	% Daily Value
Calories 0	
Fat 0 g	0 %
Saturates 0 g	0 %
+ Trans 0 g	
Cholesterol 0 mg	
Sodium 0 mg	0 %
Carbohydrate 0 g	0 %
Fibre 0 g	0 %
Sugars 0 g	
Protein 0 g	
Vitamin A 0 %	Vitamin C 0 %
Calcium 0 %	Iron 0 %

Limit trans fat

When a Nutrition Facts table is not available, ask for nutrition information to choose foods lower in trans and saturated fats.

Take a step today...

- ✓ Have breakfast every day. It may help control your hunger later in the day.
- ✓ Walk wherever you can – get off the bus early, use the stairs.
- ✓ Benefit from eating vegetables and fruit at all meals and as snacks.
- ✓ Spend less time being inactive such as watching TV or playing computer games.
- ✓ Request nutrition information about menu items when eating out to help you make healthier choices.



Enjoy eating with family and friends!

Take time to eat and savour every bite!

For more information, interactive tools, or additional copies visit Canada's Food Guide on-line at:

www.healthcanada.gc.ca/foodguide

or contact:

Publications
Health
Canada
Ottawa, Ontario K1A 0K9
E-Mail: publications@hc-sc.gc.ca
Tel.: 1-866-225-0709
Fax: (613) 941-5366
TTY: 1-800-267-1245

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5.1.3 Iron and Endurance Athletes

Iron depletion is a common nutrient deficiency worldwide. Despite the availability of iron-rich foods in Canada, cross-country skiers are at risk of iron depletion and developing iron deficiency. For example, iron depletion can develop quickly in any skier who participates in regular physical activity and has inappropriate, unplanned eating habits. Because endurance athletes are at higher risk than the general public, you should be aware of the principal causes of iron depletion in athletes and ways to prevent this from happening.

Iron and Anemia

The three key functions of iron are:

- ❑ Transport (hemoglobin) and storage (myoglobin) of oxygen.
- ❑ Energy production and cell diffusion.
- ❑ A functional role in the immune and central nervous system.

Iron deficiency is most commonly described as occurring in three stages.

- ❑ **Stage 1** - refers to the depletion of iron stores, which is characterized by low serum ferritin levels. Depleted iron stores have not been found to cause any dysfunction, although new data suggests that training adaptation may be improved when iron-depleted athletes increase dietary iron intake through iron supplementation.
- ❑ **Stage 2** - the major concern of iron depletion is that it may progress to Stage 2 - iron deficiency. Abnormalities such as reduced work capacity and exertional fatigue are seen in Stage 2, which can be detected by low serum iron, reduced transferrin saturation levels and low serum ferritin.
- ❑ **Stage 3** - iron deficiency anemia; this is the most severe stage, identified by a significant reduction in hemoglobin and hemtocrit levels and clear signs and symptoms of reduced work capacity, delayed recovery and greater susceptibility for illness.

Serum ferritin is an indirect measure of the total body iron stores, and can therefore provide an early warning signal that an individual is at risk for anemia (low hemoglobin). The body has a poor capacity to change iron stores rapidly, which makes an early warning sign especially important. If an athlete is anemic, it generally takes a long time to correct the situation.

The reported causes of iron deficiency are diverse and none fully explain this medical condition. Examples of likely causes include excessive sweating, gastro-intestinal bleeding, mechanical trauma, impaired iron absorption, heavy bleeding at time of menstruation, growth spurts and insufficient dietary intake of iron.

Treatment aims to normalize iron stores, and consists of: (1) increasing the dietary intake of absorbable iron; and (2) iron supplementation.





Maximizing Iron Absorption

- ❑ Iron in food of animal origin is absorbed more readily than the iron from grains, legumes, nuts and seeds. As well, foods of animal origin enhance iron absorption from other food sources.
- ❑ Eating a good source of vitamin C (i.e. fruit such as orange, grapefruit, lemon, kiwi; vegetables such as peppers, tomato) at the same meal as iron-rich foods will improve iron absorption.
- ❑ Delay drinking coffee or any other source of caffeine (i.e. cola, chocolate and many medications) until several hours after a meal to reduce their negative effect on iron absorption.
- ❑ Avoid consuming large quantities of EDTA (a food additive) by checking and becoming familiar with the list of ingredients in commonly used food items.

Daily Intake Recommendations for Iron

The Canadian Recommended Nutrient Intake (RNI) for iron is as follows:

Age	Females	Males
13-15	13mg	10mg
16-18	12mg	10mg
19-49	13mg	9mg

These intake recommendations may not be sufficient for cross-country skiers, however, because iron loss increases as a result of sweating and the breakdown of hemoglobin during endurance training/competitions.

Norms of Serum Ferritin

In the general population the normal values for serum ferritin ranges from 30-233 ug/L. The recommended serum ferritin level for cross-country skiers is between 35-200 ug/L.

Monitoring and Supplementation

The risk of overdosing from reasonable daily supplementation is low. However you should be aware that an excess in iron stores (high serum ferritin) is a risk factor for heart disease, stroke, cirrhosis of the liver and diabetes. Moreover it can be toxic and people do die from overdosing on it (typically children).

Iron supplements should not be used without monitoring iron status. Monitoring will help detect low AND high iron levels.





All cross-country skiers 14 years of age and older who are training more than 250 hours a year should have their hemoglobin and serum ferritin tested twice a year. Female skiers who are vegetarians, have a history of low serum ferritin and are training more than 250 hours a year should be tested three times a year.

When parents/athletes ask their doctor for a check-up, they should ask specifically for the serum ferritin test and hemoglobin test, as there are other types of blood tests for iron. Some medical practitioners may be reluctant to do these tests because they feel it is expensive and medically unnecessary. In case this happens, the parent/athlete should be prepared to explain clearly that the athlete is at high risk because of their involvement in endurance activities (and other reasons if they apply).

Competitive athletes should be encouraged to keep a record of their test results throughout their ski career.





5.2 Nutrition Before, During and After a Competition

5.2.1 Nutrition Answer Sheet #2 (sample)

Keep in mind that you are to choose ONE of three possible scenarios – nutrition before competition, nutrition between competitions or nutrition following competitions.

Our first suggestions	Our suggestions after reviewing section 5.2







Nutrition Answer Sheet #2 (working copy)

Keep in mind that you are to choose ONE of three possible scenarios – nutrition before competition, nutrition between competitions or nutrition following competitions.

Our first suggestions	Our suggestions after reviewing section 5.2







5.2.2 Eating Well Before, During and After Activity

Priorities for a Competition Day

On a competition day, the aim is to ensure proper hydration and sufficient energy to allow the athlete to meet the demands of the activity. As a result, the focus should be on ensuring the following:

- The amount of food consumed is appropriate given the type of effort to be performed.
- The majority of food ingested is carbohydrate.
- The fat content of the food ingested is low.
- Enough water is consumed.

Recommended Foods

General Characteristics

- ✓ *Rich in Carbohydrate.* The pre-event meal must be high in carbohydrate (65-70% of total calories consumed). Fat and protein, which take longer to digest, should be consumed in smaller amounts. For instance, pasta, rice, cereals, potatoes, bread, low-fat granola bars and dry cookies are all appropriate, as they are easy to digest and absorb.
- ✓ *Familiar.* Since pre-competition “nerves” can upset the stomach, athletes should be familiar and comfortable with the food. In other words, they should have tried it before, preferably in pre-exercise or training conditions.

The Best Choices When Breakfast is the Pre-Event Meal. The following are examples of foods that are appropriate for breakfast the day of a competition or during training:

- ✓ Cereal – with low-fat milk.
- ✓ Yogurt – low-fat, plain or fruit.
- ✓ Fruit.
- ✓ French toast and/or pancakes – with no added butter or margarine.
- ✓ Egg dishes – not fried.
- ✓ Ham or steak – if lean/not fried (small amounts).
- ✓ Potato – not fried.
- ✓ Rice – not fried.
- ✓ Noodles, pasta.
- ✓ Toast – with limited amounts of butter/margarine.
- ✓ Muffins – try jam or jelly, not butter.
- ✓ Beverages – athletes should drink plenty of fluid!
- ✓ Bottled water.





- ✓ Fruit juice – fresh, canned, cartons.
- ✓ Skim milk, Ovaltine.
- ❑ **The Best Choices When Lunch or Dinner is the Pre-Event-Meal.** The following are examples of foods that are appropriate for lunch or dinner before competition or training:
 - ✓ Fruit and vegetables, fruit and vegetable juices – fresh, canned, cartons.
 - ✓ Soups – broth-based.
 - ✓ Meat, fish, poultry – broiled, roasted, baked, barbecued, poached (reasonable portions; trimmed fat; skin from chicken removed).
 - ✓ Cold cuts – turkey, chicken, lean beef, lean ham (reasonable portions).
 - ✓ Meat alternatives – beans, peas and lentil dishes if these are familiar foods; gas produced when these foods are not part of the usual diet can cause discomfort.
 - ✓ Vegetables – steamed, boiled, baked.
 - ✓ Potatoes – baked, boiled, mashed (without butter/margarine).
 - ✓ Rice – steamed, plain.
 - ✓ Noodles – plain.
 - ✓ Pasta – plain or tomato or vegetable sauce.
 - ✓ Bread – rolls, crackers, all breads.
 - ✓ Salads – bean, peeled fresh vegetables, fruit salad, low-fat cottage cheese (small amount of dressing).
 - ✓ Desserts – fruit, yogurt (low fat), custards, puddings.
 - ✓ Cheese – in moderation.

Foods to Avoid

- ❑ **Characteristics.** The following should be limited before competition or training:
 - ✓ Fatty foods, because they are slow to digest.
 - ✓ Protein-rich foods, because they are slow to digest and are not needed as fuel during exercise.
 - ✓ Alcoholic beverages such as wine and beer, because they can have a dehydrating effect.
- ❑ **Before competition or training, avoid the following foods (breakfast).** The following foods are high in fat, difficult to digest, or nutrient poor:
 - ✓ Whole milk, cream.
 - ✓ Fried eggs.
 - ✓ Side bacon, sausage.
 - ✓ French fries, hash browns.





- ✓ Fried rice.
- ✓ Cream or butter sauces.
- ✓ Doughnuts, Danishes, pastries.
- ✓ Croissants.
- ✓ Butter, margarine.

❑ **Before competition or training, avoid the following foods (snack, lunch, or dinner.)**

The following foods are high in fat or nutrient poor:

- ✓ Cookies, crackers, chips, granola bars.
- ✓ Cream soups.
- ✓ Fried fish, meat, poultry.
- ✓ Buttered, sautéed, creamed vegetables, or soufflés.
- ✓ Fried potatoes.
- ✓ Butter or cream sauces.
- ✓ Pâté, sausages, processed meats, liverwurst.
- ✓ Potato and macaroni salad, creamy coleslaw.
- ✓ Salad dressing.
- ✓ Pies, ice cream, pastries.

Foods to be Wary Of

The following foods are not well tolerated before competition or practice and should therefore be treated with caution:

- ❑ Spicy foods may be difficult to digest before exertion. (When travelling in other countries, athletes can bring a few favourite spices if they are already used to them.)
- ❑ Fibre-rich foods like whole-grain bread, cookies, whole-wheat cereals and dried fruits (prunes, etc.) stimulate digestion and induce elimination. These foods should be avoided before exercise, especially if the athlete has diarrhoea.
- ❑ Gas-producing foods like cabbage, broccoli, onions and carbonated drinks make some athletes feel bloated.
- ❑ Coffee, tea, cola and chocolate may cause diarrhea, which can have a dehydrating effect.
- ❑ Alcoholic beverages can impair performance and have a dehydrating effect. In some sports, alcohol is a banned substance.

Digestion Period

The meal size and food choices will vary depending on the time between eating and performing. Athletes must allow sufficient time for digestion. High kcal meals, especially those high in fat content, take longer to digest than lighter snacks.





The guidelines below should be used when planning meal times relative to a training session, a competition or a series of competitions held on the same day. Coaches should be aware of individual tolerance levels for food. Experiment with these guidelines in practice to establish an appropriate protocol for each athlete.

- Allow 3-4 hours for a large meal (approximately 500-800 kcal or more) to digest.
- Allow 2-3 hours for a smaller meal (approximately 300-500 kcal) to digest.
- Allow 1-2 hours for a small snack or blender/liquid meal to digest, or whatever the athlete's own tolerance indicates.

If the athlete will be competing within the next two hours, small quantities of carbohydrate are the best choice: fruit, beverages, low-fat crackers, bread, yogurt and/or well-cooked pasta. The athlete should also drink plenty of water, and when traveling, bottled water should be used.

General Food Safety Advice

The following suggestions apply to food served in cafeterias and restaurants or prepared for bag lunches taken to sport venues:

- Hot dishes (e.g. meat, casseroles, rice) should be served hot (not warm).
- Cold foods (e.g. cold cuts, salads, milk, dessert, sandwiches) should be served cold (not warm).
- If the meals at the venue have NOT been refrigerated, do NOT eat salads prepared with mayonnaise (e.g. macaroni, potato or creamy coleslaw) or egg-based dishes (including custards).
- Foods should be served either hot or cold, and should be consumed within one hour of preparation.

For information specifically on nutrition and cold weather situations refer to section 8 of this document. For more information about eating well before, during and after an activity that is specific to cross-country skiing, refer to section 7 of the CCI-L2T (On- Snow) Reference Material.





5.2.3 Nutrition Answer Sheet #3 (sample)

Record important points you have picked up about the other two scenarios.

Making the Best Possible Choices	
Scenario ____	Scenario ____







Nutrition Answer Sheet #3 (working copy)

Record important points you have picked up about the other two scenarios.

Making the Best Possible Choices	
Scenario ____	Scenario ____







5.2.4 Hydration

Importance of Fluids

Proper hydration is important for all athletes to:

- Replace water lost as a result of sweating.
- Avoid marked decreases in performance that result from dehydration.
- Help maintain core body temperature within acceptable limits during exercise.



Effects of Dehydration on Performance

Dehydration negatively affects performance and is associated with premature fatigue. This is particularly the case for prolonged aerobic exercises such as distance running or cycling, but athletes competing in team sports or events of short duration can also be affected by dehydration.

Ironically, dehydration reduces the capacity of the digestive system to absorb water. Athletes should not wait until they are dehydrated before they drink, as this slows rehydration and causes gastric cramping.

Feeling Thirsty and Dehydration Level

It is well established that the sensation of thirst is not a good indicator of an individual's level of dehydration. When thirst manifests itself, approximately 2% of body mass has already been lost. Consequently, one cannot gauge dehydration by referring to the sensation of thirst. Therefore, during exercise it is important to drink on a schedule rather than according to thirst.

If thirst were the only point of reference used for determining fluid needs following profuse sweating, re-establishing optimum hydration could take 24 to 48 hours.

Drinking Fluids before Activity

Athletes should drink plenty of fluid every day, particularly before a practice session or competition. Athletes who are well hydrated have the following characteristics:

- Sweating that starts sooner and is more abundant.
- An enhanced rate of absorption of the fluids consumed during exercise.

In practical terms, this means drinking 1.5 - 2.5 cups (400 - 600mL) of fluid two to three hours before exercise. This allows time for excess fluid to be excreted as urine before the exercise starts. To ensure complete hydration, an athlete should consume 0.5 - 1.5 cups (150 - 350mL) of fluid about 15 minutes before exercising.





Drinking Fluids During Activity

- ❑ **Amount of Fluids to Drink.** Athletes should drink enough fluid to maintain fluid balance throughout the exercise. The amount of fluid an individual can tolerate during exercise varies from one person to another, but usually ranges between 10 and 15mL per kg of body weight per hour. In other words, as the following table suggests, a 60 kg person can absorb between 600 and 900mL of fluid in an hour, a 70 kg person between 700 and 1050mL, etc.

Body weight (kg)	Approximate quantity of fluid absorbed by the body in one hour (mL)	
	from ...	to ...
30	300	450
40	400	600
50	500	750
60	600	900
70	700	1050
80	800	1200
90	900	1350

Rather than drinking large amounts of fluid at one go, it is better to drink 0.5 - 1.5 cups (150 - 350mL) of fluid every 15 to 20 minutes, or as much as one can tolerate without feeling any discomfort.

Athletes rarely consume enough fluid to maximize the absorption capacity of the digestive system or to balance fluid losses. Increased fluid intake during exercise will improve fluid balance for most athletes.

- ❑ **Precautions.** To encourage athletes to drink plenty of fluids, have them bring several bottles or containers of water or sport drinks. For reasons of good hygiene, do not allow them to share bottles or containers with other people.
- ❑ **Sport Drinks.** Sport drinks containing carbohydrate are recommended for activities lasting more than 60 minutes without interruption. Several studies suggest an improvement in performance as a result of drinking sport drinks, which promote optimal performance by providing both fluids and carbohydrates.

When exercise lasts less than one hour, consuming a sport drink will probably not improve performance significantly. In this circumstance, drinking water should be adequate unless it is hot and humid, in which case a sport drink is recommended.





- ❑ **Strategy for Encouraging Hydration in Children.** Recent studies show that children's consumption of fluids is increased when drinks contain carbohydrates (40–80 grams per litre) and a little sodium. It is suggested that the coach encourage this type of drink rather than plain water to ensure that children take in enough fluids when they exercise in hot weather.

Rehydration After Activity

After an exercise where sweating has been profuse, it is extremely important to replace fluid. This sensation of thirst is not a good gauge. Consequently, forced hydration is often necessary.

It is possible to estimate how much fluid an individual has lost during exercise by weighing before and after the activity. The difference in kg represents the amount of fluid lost, in litres, since one litre of water weighs one kg. For each kg of body weight lost, at least 1.0 litre of fluid plus an extra 0.5 litre should be consumed. It is important to drink more than one litre per kg of body weight lost to account for urinary losses.

The colour and amount of urine are an easy way for athletes to monitor their dehydration level. Scanty, dark urine signals a need for more fluid, in which case athletes should force themselves to drink more fluids. Plenty of clear-coloured urine usually indicates adequate hydration.

5.2.5 Making Sense Out of Sport Drinks

Sport drinks are carbohydrate electrolyte solutions that are available in a variety of compositions. The following information explains why an athlete may choose to use a sport drink and if they do, how to decide which one is best for them.

Why?

- ❑ For energy - they are designed to maintain an athlete's blood glucose level, thereby minimizing fatigue during physical efforts that generally exceed 90 minutes duration.
- ❑ To prevent cramping - they contain the electrolytes that are lost in sweat and can therefore reduce the risk of muscle and stomach cramping.
- ❑ To hydrate - they improve hydration by 10% compared to water alone, since the sodium (i.e. an electrolyte) helps retain water.

When?

- ❑ For endurance – drinking a sport drink at regular intervals (i.e. every 15 minutes) will help maintain endurance when the exercise is longer than 90 minutes.
- ❑ Prevent hunger - before the exercise a sport drink may help to improve blood glucose levels and therefore prevent hunger.
- ❑ Recovery - following the exercise a sport drink will help restore fluids, electrolytes and energy (i.e. glycogen).
- ❑ Endurance needs – some sport drinks can meet the athletes' endurance needs as described





below, or an athlete may choose to have food and water instead:

- ✓ 30 - 60 grams of carbohydrate for every hour of non-stop exercise;
- ✓ 400 - 800mL of fluid for every hour of exercise; and
- ✓ up to 500mg of sodium per hour of exercising.

Which Sport Drink?

Athletes are very individual when it comes to deciding whether or not to use a sport drink and determining which sport drink works best for them. When experimenting to find out what is optimal, they should be made aware that they can tolerate a sport drink that is between 3% - 10% carbohydrate concentration (between three grams of carbohydrate in 100mL of fluid and 10 grams of carbohydrate in 100mL of fluid).

The following table (prepared in 2006) describes the composition of various sport drinks. To help your athletes choose which product is best suited for their individual needs, you may wish to provide them with a similar, current chart.

Composition of Sport Drinks: per 100mL (nutritional content according to mixing directions)

Product	First Three Ingredients	CHO (g)	Protein (g)	Fat (g)	Sodium (mg)	Potassium (mg)
Accelerade Advanced Sports Drink (1 scoop and 355mL)	sucrose, whey protein concentrate, trehalose	5.9	1.4	0.3	53.5	18.3
Accelerade Advanced Sports Drink (591mL bottle)	water, sugar, trehalose	6.6	1.5	0.0	49.1	6.8
All Sport Body Quencher (591mL bottle)	water, high fructose corn syrup, citric acid	6.7	0.0	0.0	22.9	20.8
Biox Amino Blast (600mL bottle)	water, whey protein isolate, fructose	4.8	3.3	0.0	6.7	20
Biox Carbo Blast (600mL bottle)	water, maltodextrin, fructose	18.3	0.0	0.0	3.3	16.7
Champion Nutrition Revenge Sport Energy Drink (1 scoop and 240mL)	CHO blend (including maltodextrin, amylopectin starch), fructose, sodium lactate	9.6	0.0	0.0	41.7	45.8





Champion Nutrition Revenge Pro Energy Drink (1 scoop and 240mL)	CHO blend (amylopectin starch, maltodextrin), fructose, protein blend	8.3	1.7	0.2	35.4	66.7
Cytomax Ready-to-Drink (240mL bottle)	water, maltodextrin, fructose	5.4	0.0	0.0	22.9	12.5
Cytomax Sport Energy Drink (1½ scoop and 475mL)	CHO blend (including amylopectin starch, maltodextrin), fructose, alpha-l-poly lactate	6.9	0.0	0.0	37.9	18.9
eLoad™ (1 packet and 500mL)	dextrose, sucrose, citric acid	5.4	0.0	0.0	74	19.3
Endurox R4 (2 scoops and 355mL) *fat and sodium vary slightly with flavour	dextrose, whey protein concentrate, complex carbohydrates	14.6	3.7	0.3*	59.2*	76.1 (chocolate) 33.8 (orange, lemon, fruit punch & vanilla)
Hydra Fuel (1 scoop and 240mL)	dextrose, fructose, citric acid	7.1	0.0	0.0	10.4	20.8
Gatorade Thirst Quencher (various sized bottles)	water, sucrose syrup, glucose-fructose syrup	5.8	0.0	0.0	45.8	12.5
Powerade (various sized bottles)	water, high fructose corn syrup, maltodextrin	7.1	0.0	0.0	22.1	13.3
Ultimate Nutrition Pure Muscle Carbs (2 scoops and 300mL)	complex carbs from grain sources, fructose, citric acid	17.3	0.0	0.0	11.7	0.0





5.3 Strategies for Promoting Recovery

Nutrition between Competitions

When there are two or more competitions on the same day, it is primarily the time available between periods of activity that will determine the quantity and type of food consumed. The principles described in this section, and also those contained in section 5.2.2, should be respected.

In general terms, it is better to consume snacks high in carbohydrates between each competition and wait until the end of the day to consume a more substantial meal. It is also important to ensure that athletes consume enough fluid between each event.

Recommendations for Replenishing Reserves After Activity

For rapid recovery, it is important that athletes refuel immediately after a practice session or competition, especially if another physically demanding event or training session is scheduled the following day. Athletes should:

- ❑ Drink plenty of fluids. At least 1.0 litre (four cups) of fluid per kg of body weight lost during exercise, plus 500mL is recommended. Refer to section 5.2.4, (Hydration) for rehydration strategies. To rehydrate between competitions on the same day, follow the guidelines for hydration during activity.
- ❑ Consume carbohydrates soon after the activity. As soon as possible after exercise, preferably within 30 minutes, athletes should consume carbohydrate; this procedure should be repeated every two hours until the next meal. This allows muscle energy stores to be replenished at a faster rate than if the athlete waits until mealtime to consume carbohydrate-rich foods. Athletes usually find it easier to consume liquid carbohydrate (fruit juices, sweet drinks, etc.) rather than solid foods, since exercise dulls the appetite.

The following table shows the amount of carbohydrate to consume relative to body weight. Also provided are examples of foods providing approximately 50 grams of carbohydrate.

Body weight (kg)	Approximate quantity of carbohydrate to consume up to 30 minutes after activity and every two hours until the next meal-time
30	45 grams
40	60 grams
50	75 grams
60	90 grams
70	105 grams
80	120 grams
90	135 grams





- ❑ Examples of foods containing approximately 50 grams of carbohydrate:
 - ✓ 700mL of sport drink.
 - ✓ 500mL of fruit juice or soft drink.
 - ✓ Three average size pieces of fruit.
 - ✓ A large Mars bar.
 - ✓ Three muesli bars.
 - ✓ Two pancakes with maple syrup.
 - ✓ 60g packet of jelly beans or jujubes.
- ❑ Examples of foods containing approximately 50 grams of carbohydrate and 10 grams of protein:
 - ✓ 300mL of milkshake.
 - ✓ 400g of fruit yogourt.
 - ✓ Bowl of cereal with milk.
 - ✓ 300mL of liquid meal supplement.
 - ✓ Two English muffins with peanut butter.
- ❑ The meal after exercise should be high in carbohydrate, adequate in protein and relatively low in fat. Carbohydrate-rich foods should constitute the meals and snacks that follow an intense effort, to ensure carbohydrate stores in the muscles can be replenished quickly.
- ❑ Moderate amounts of salt and a few portions of salty foods should be consumed - for example, tomato or vegetable juice, pretzels, canned soup or bouillon, pickles, ketchup, soy sauce, salsa, cheese, salted nuts.
- ❑ At least three portions of potassium-rich foods (vegetables and fruit) are recommended, for example, vegetables, potatoes, fruit juices and fresh fruit, dried fruit.
- ❑ Think ahead. Non-perishable foods can be brought to the competition or training site if food choices are limited there.







5.4 Getting the Message Across

5.4.1 Nutrition Answer Sheet #4 (sample)

Getting the Message Across...	
Educating Athletes	Keeping Parents Informed







Nutrition Answer Sheet #4 (working copy)

Getting the Message Across...	
Educating Athletes	Keeping Parents Informed







5.5 Nutrition: Self-Assessment

The items that are listed in the self-assessment below are the evidences that an Evaluator will be looking for during assignments and observations. They will help determine if you have the required abilities/competencies for coaching athletes at this level. This exercise will allow you to reflect on your current coaching practices and help you identify areas of strength and areas for improvement.

To rate your ability to provide nutritional support to athletes in training and competition, circle the number at right that best represents whether you achieve the corresponding statement at left (Never, Sometimes, Often, Always).

I provide basic nutritional advice to my athletes by...	Never	Sometimes	Often	Always
Reinforcing healthy eating habits as outlined in Canada's Food Guide	1	2	3	4
Ensuring appropriate hydration before activity	1	2	3	4
Recommending what to eat before competition or before activity to maximize performance	1	2	3	4
Identifying when to eat before activity to maximize performance	1	2	3	4
Ensuring appropriate hydration during competition	1	2	3	4
Identifying foods that should be restricted or eaten with caution	1	2	3	4
Providing information on food safety concerns	1	2	3	4
Ensuring appropriate hydration following competition	1	2	3	4
Recommending what to eat after competition to maximize recovery	1	2	3	4
Identifying when (how soon) to eat after competition to maximize recovery	1	2	3	4
Communicating with parents to reinforce healthy eating habits	1	2	3	4
Identifying strategies to ensure that appropriate foods are available for activity and competition	1	2	3	4

DATE: _____





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SECTION 6 – DESIGNING YOUR OWN SPORT PROGRAM





This section on Designing Your Own Sport Program complements the information provided in section 5 of both the Introduction to Community Coaching Reference Material and the Community Coaching Reference Material, and is directed primarily at supporting you in your role as a coach working with children in the Learning to Train stage of development.

6.1 Designing a Program for Athletes in the Learning to Train (L2T) Stage of Development

A sport program is a planned progression of activities for the purpose of fostering athletic development over time. When designing a program, the nature, number, frequency, duration and content of these activities need to be adapted to the athletes' stage of development, skill level and sport experience in order to create an optimal learning situation. The objective of this section is to teach you how to design a basic sport program that addresses these considerations and meets the needs of the athletes with whom you are working.

6.1.1 Track Attack Program

The Track Attack program is designed to promote the continued physical development of children within a cross-country skiing context. It recognizes that the Learning to Train stage of development (eight to 12 years) is one of the most important periods of motor development, and it is intended to both encourage enjoyment of the sport of cross-country skiing and enhance competence in the basic skills required to excel in it.

To encourage the participant and to recognize progress, Track Attack “Targets” have been established. The Track Attack incentives, which are trading cards depicting famous cross-country skiers, are awarded for the successful achievement of each Target. The Attack Log contains descriptions of each Target, and a place for the related incentive card to be mounted for display.

The Track Attack Targets represent five categories of activity, all of which relate to the aim and objectives of the program. Within each category, there are three Targets, one for each year of the program. The five categories and the Targets within them are listed below:

Technique.

- #1 The Athlete's Edge – Totally Tuned Technique: Diagonal Stride Like Devon Kershaw
- #2 The Athlete's Edge – Totally Tuned Technique: Double Pole Like Beckie Scott
- #3 The Athlete's Edge – Totally Tuned Technique: One Skate Like Chandra Crawford

Attendance at Competitive Events.

- #4 Racing Rocks! – Ski Tournament
- #5 Racing Rocks! – Midget Championships (or equivalent)
- #6 Racing Rocks! – Provincial/Territorial Championships





Participation in Another Dimension of Skiing.

#7 Off-Track Fun – Backcountry Adventure

#8 Off-Track Fun – Snow Camp

#9 Off-Track Fun— Ski Orienteering

Training.

#10 Fast Track to Success – Practice Sessions

#11 Fast Track to Success – Ski Preparation

#12 Fast Track to Success – Roller Skiing

Something Different.

#13 Outside the Box – Team Sprints

#14 Outside the Box – Xtreme X-Country (Double Cross)

#15 Outside the Box – Off-Season Camp

6.1.2 Athlete Information Chart

Record essential information about your athletes in the form below.

Gender composition (check one)	All Female	()	
	All Male	()	
	Co-ed	()	
Number of athletes in the L2T stage of development	Children: 8 years of age	_____	_____
	Children: 9 years of age	_____	_____
	Children: 10 years of age	_____	_____
	Children: 11 years of age	_____	_____
	Children: 12 years of age	_____	_____
	Total	_____	_____
Within this stage of development, there are important differences	Height and weight	Yes ()	No ()
	Skill level	Yes ()	No ()
	Level of experience	Yes ()	No ()
Average number of years of training and competition in cross-country skiing, including the present year		_____	

Use this information to assist you in completing the exercises that follow.





6.1.3 Orientation Chart

Check the ONE statement in each of the four categories below that best describes your program's orientation:

General	Skill Development
<input type="checkbox"/> Have athletes experience new activities.	<input type="checkbox"/> Promote the acquisition of basic ski technique skills.
<input type="checkbox"/> Improve athletes' general abilities and their mastery of the activity.	<input type="checkbox"/> Improve basic ski technique skills already acquired.
<input type="checkbox"/> Identify athletes with the potential to perform at a higher level.	<input type="checkbox"/> Encourage the acquisition of new ski technique skills that are complex or more advanced.
<input type="checkbox"/> Have athletes specialize in long versus short distance events.	<input type="checkbox"/> Improve format-specific tactical preparation (individual sprint, team sprint, mass start, etc.).
Physical Conditioning	Performance
<input type="checkbox"/> Improve athletes' general fitness.	<input type="checkbox"/> Give athletes the opportunity to gain experience by taking part in competitions.
<input type="checkbox"/> Improve athletes' sport-specific physical condition.	<input type="checkbox"/> Encourage the achievement of particular standards of performance.
<input type="checkbox"/> Prepare athletes to achieve particular levels of performance in cross-country ski physical tests.	<input type="checkbox"/> Participate in competitions to win; win a championship.

6.1.4 What Special Activities/Competitions Are There in Your Program?

To complete this section, pull out (1) the working copy of the Planning Calendar Worksheet (section 6.1.5) in the Reference Material, (2) the current and following year calendar that your Facilitator handed out, and, if available, (3) a handout of a current Special Activities/Competition Schedule for your region.

- Using the information from sections 6.1.5 a. and 6.1.5 f. in your Coach Workbook on the start and end dates for your program, fill in the top two lines of the Planning Calendar Worksheet:
 - ✓ First, write down the month when your program starts.
 - ✓ Then, using the current calendar, write down the date of the Monday in the first week of your program.





- ✓ Then, using calendars from both the current and following years, write down the dates of all the Mondays in your program and indicate when the month changes.
- ☐ Your Planning Calendar Worksheet should now look similar to this example:

Figure 6.1 - Planning Calendar Months/Dates

Month	September		October				November				December						
Day = Monday			17	24	1	8	15	22	29	5	12	19	26	3	10	17	24

- ☐ Now indicate the most important special activities/competitions planned for your program this season by shading in the appropriate boxes. These will include the Track Attack targets (Midget Championships, Backcountry Adventure, etc.) you identified under “Year One” in Step 6.1.2 in your Coach Workbook.
- ☐ Next list the other special activities/competitions (treasure hunt, club moonlit ski, etc.) you have planned, but have not yet noted on the chart. For more ideas about possible activities refer to Table 3.1.2 (Special Activities/Competitions Chart) in this Reference Material.
- ☐ If an activity occurs several times, it should be allocated a row of its own on the chart. If an activity occurs only once it should be identified by placing an “X” in the “Other” row. A notation to describe it can go below the chart or be entered using a code as described below.
- ☐ You are now ready to complete the chart:
 - ✓ Start by selecting a row corresponding to one type of activity/event.
 - ✓ Then put an X in every week for which this type of activity/event is scheduled. If necessary, indicate the number of events of this type during the week (e.g. “X2” for two events).
 - ✓ Circle the most important activities, ones that require lead up preparation such as an important competition.
 - ✓ For the type of activity/event in the “Others” row, create your own codes to identify them, e.g. “FR” for fund-raiser or “CP” for Christmas Party.
 - ✓ If necessary, identify weeks when there are program breaks or interruptions.
 - ✓ Keep in mind that a skill development camp for athletes at this stage of development will usually involve one or two overnights.
 - ✓ Repeat this step for every type of activity/event.





☐ The first months of your Planning Calendar Worksheet should now look something like this:

Figure 6.2 - Planning Calendar Activities/Events

Month	September				October				November				December					
Day = Monday			17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31
Skill Dev. Camps							X							X				
Competition Preps (Time Trials, rehearsals)													X			X		
Competitions																		RT
Special Activities – Classroom					X						X							
Special Activities – Dryland			X						X									
Special Activities – On-Snow																		
Social Activities					X						X					CP		
Roller Skiing					X	X		X	X									
Classic Technique											X2	X	X	X2	X			X
Skating Technique												X	X	X	X			
Up/Down Technique																		X
Regular Dryland Practices			X2	X2	X1	X2	X	X1	X2	X2	X2							
Others								FR										

Off-Season Camp
Snow Camp
Ski Preparation Workshop

Break:
no practice sessions or
competitions scheduled
during this week

FR= Fundraiser CP=Christmas Party RT=Regional Trials for Provincial/Arctic Winter Games

What Are the Major Phases in Your Program?

Keep in mind that at this stage your program should be designed to promote a wide range of cross-country ski activities that encourage the enjoyment of the sport and enhance competence in the basic skills required to excel in it.

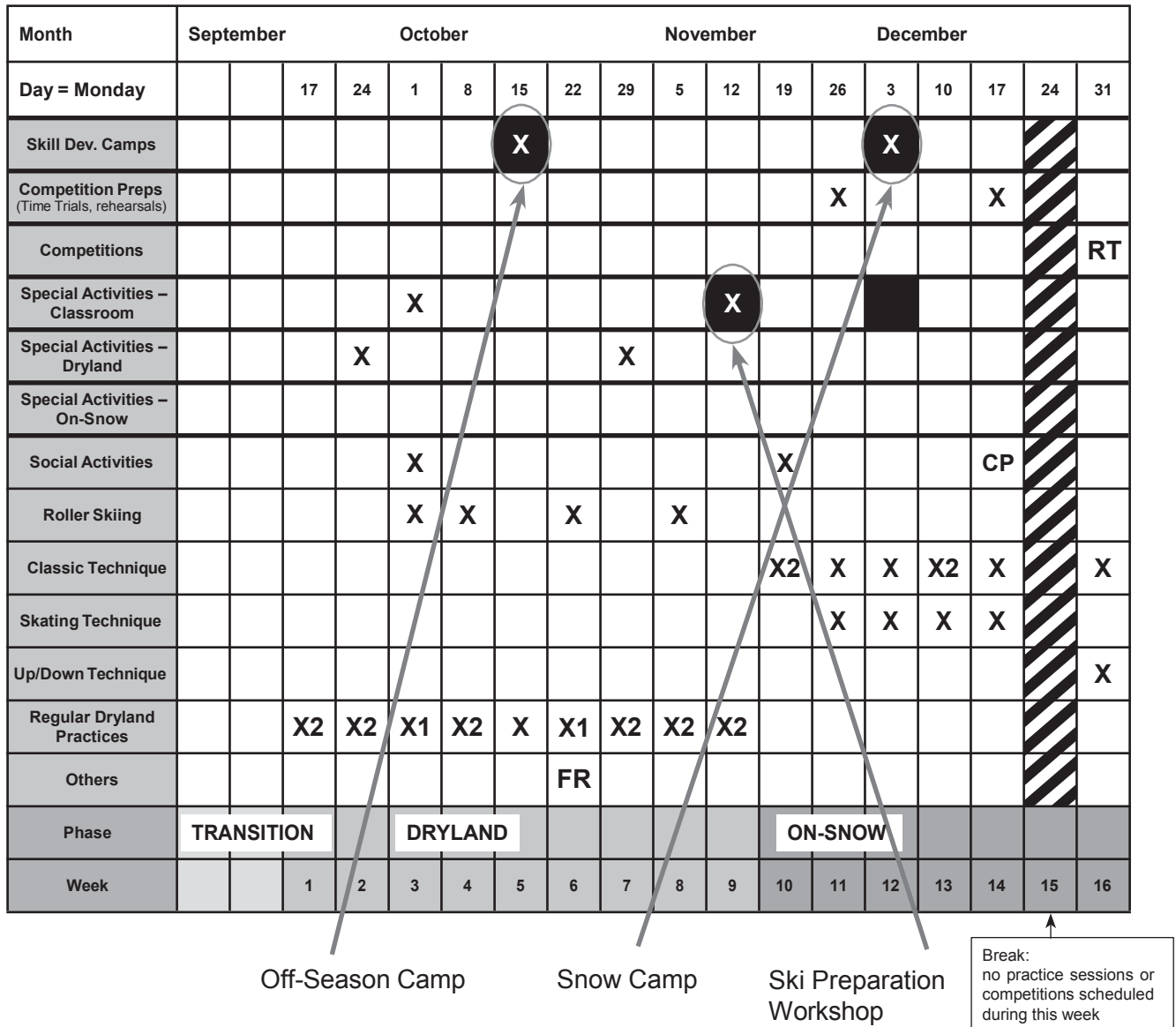
- ☐ For athletes in the L2T stage of development, your program is divided into these three phases:
 - ✓ Dryland Phase: The number of weeks between the first regular practice session in September and the first practice session on snow.
 - ✓ On-Snow Phase: The number of weeks between the first regular practice session on snow and the last practice or activity/event of the season in which the athletes will take part.





- ✓ Transition Phase: The number of weeks between the last practice session or activity/event the athletes will take part in (the last supervised contact you will have with them) and the start up of your program the following season.
- ☐ To mark these phases on your planning calendar:
 - ✓ Use the two rows at the bottom of the calendar labelled **Phase** and **Week**.
 - ✓ Block out each phase and write the name of the applicable phase in the first row.
- ☐ Your Planning Calendar Worksheet should now look something like this:

Figure 6.3 - Planning Calendar Phases/Weeks



FR= Fundraiser CP= Christmas Party RT= Regional Trials for Provincial/Arctic Winter Games









6.1.6 Competition Calendar Planning

Optimal competition calendar planning at all stages is critical to athlete development. At certain stages, development of physical capacities takes precedence over competition and at other stages the ability to compete becomes the focus. Competition schedules should therefore be selected by the coach and athlete based on the athlete's developmental needs.

Successful long-term athlete development must incorporate a system of training and competition that is optimized for the abilities of athletes during the various developmental stages. The following factors should be considered when planning:

- ❑ At the Learning to Train and Training to Train stages, an insufficient number of competitions (training to competition ratio) will result in a lack of sport skills to build on in later stages.
- ❑ Optimal training to competition ratios are required for all stages of LTAD except Active Start.
- ❑ The level and length of the competitive season should be aligned with the changing needs of the developing athlete progressing through LTAD.
- ❑ At all stages (except Active Start), the appropriate level of competition is critical to the technical, tactical and mental development of the athlete.
- ❑ The “competition” and/or evaluation needs of athletes may not be met by using a simplified version of a “senior” competition format.

Figure 6.4 Competitor Pathway for Junior Cross-Country Skiers





6.2 Analyzing Your Program

By analyzing the key indicators this section will help you determine how well your program can meet its objectives.

6.2.1 Number of Special Activity Days (including competition days)

Using the chart below, calculate the number of special activity days (camps, backwoods ski trips, competitions, etc) in your program. Count both introductory competitions (e.g. ski tournaments, time trials, etc.) and more formal competitions (e.g. a provincially-sanctioned regional cup race in a neighbouring community).

Identify the Number of Weeks in Your Program When There Are Special Activities/Competitions With:			Partial Total
1 day		x 1	=
2 days		x 2	=
3 days		x 3	=
4 days - <i>Not usually applicable at this stage</i>		x 4	=
5 days - <i>Not usually applicable at this stage</i>		x 5	=
A: Number of special activity/competition days in your program (add all the numbers in the column Partial Total):			A =

6.2.2 Number of Practice Days

Calculate the number of practice days in your program.

Period	Length (Weeks)	Avg. # Practice Days/wk	Partial Total
Dryland Phase	x		=
On-Snow Phase	x		=
Transition	x	Not applicable	=
B: Approximate number of practice days in your program (add all the numbers in the column Partial Total):			B =

6.2.3 Analysis

For each statement in the column “Key Element in Your Program” in the chart on the next page, circle the entry in the column (A, B, or C) that best corresponds to the data for your program. For example, if your program is 26 weeks long, circle the Row 1 entry “20 and 30” in Column B. Use the information in sections 6.2.1 and 6.2.2 to help you do this analysis.





#	Key Element in Your Program	Column A	Column B	Column C
		If your number is less than	If your number is between	If your number is more than
1	Length of your program in weeks	15	20 and 30	35
2	Length of the Dryland Phase in weeks	6	7 and 14	15
3	Length of the On-Snow Phase in weeks	9	10 and 16	20
4	Length of the Transition Phase in weeks	20	20 and 30	30
5	Number of special activity or competition days	8	8 and 20	20
6	Average length of a practice session in the Dryland Phase	60 minutes	60 and 120 minutes	120 minutes (2 hours)
7	Average number of practice days per week in the Dryland Phase	2	2 and 3	4
8	Average length of a practice session in the On-Snow Phase	60 minutes	60 and 120 minutes	120 minutes (2 hours)
9	Average number of practice days per week in the On-Snow Phase	2	2 and 3	4
10	Percentage of program devoted to special activities, including competition	10%	20-35%	40%
11	Percentage of program devoted to practice sessions	70%	70-85%	85%

❑ To calculate the percentages:

- ✓ Total number of program days = total number of competition days (A) plus total number of practice days (B).
- ✓ Percentage of training program devoted to special activities or competition = number of special activity or competition days divided by total number of program days, expressed as a percentage.
- ✓ Percentage of training program devoted to practices = number of practice days divided by total number of program days, expressed as a percentage.





6.3 Athletic Abilities: Growth and Development Considerations




The table on the following page presents information on when to emphasize and when to avoid training certain athletic abilities.

These guidelines represent the opinion of experts in the fields of growth, development and training; as such, they apply to most sports. At the same chronological age (e.g. 12 years of age) there can be significant differences in physical maturity. For example it would not be unusual for some athletes to be ahead of or behind the general training guidelines for their age by two or more years. In other words there could potentially be as much as four years difference in the training guidelines for any two 12 year old children in the group with which you are working.

6.3.1 Guidelines for the Training of Athletic Abilities by Athletes' Developmental Age

The chart on the following page provides guidance on how to adapt training to account for potential differences in developmental age.

Legend

 = Avoid	↑ = high priority, develop
 = Window of optimal trainability	→ = medium priority, maintain
 = Introduce with moderation	↓ = low priority, maintain

Definitions

- 1. Core strength** - refers to strengthening the muscles at the “core” of the body, the trunk versus the limbs. Typically, core strength will focus on abdominal and back muscles.
- 2. General strength** - refers to a series of 10 to 20 repetitions performed at sub maximal intensity using exercises that involve large muscle groups. The most common purpose of general strength is to learn proper strength training technique and prepare the muscles and tendons to undergo a more specific phase of strength training. General strength is also used for hypertrophy (gain of muscle mass) and for strength maintenance.
- 3. Power strength** - refers to the combination of speed and strength training. Plyometrics is typically known as a strength training method that will emphasize power development. Power strength training is performed by using light weights (or simply the body's weight) so that athletes don't damage their muscles with the fast cycles of contractions.





Athletic Abilities	Developmental Age in Years																	
		6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21-23	23+
Aerobic Power (intense efforts of 2-10 min)	F						↓	→	↑	↑	↑	↑	↑	↑	↑	↑	→	→
	M								↓	→	↑	↑	↑	↑	↑	↑	→	→
Aerobic Endurance (15 min+ at low to moderate intensity)	F				↓	→	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	→
	M				↓	↓	→	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	→
Anaerobic power (8-45 sec.; includes speed 2)	F							↓	↑	↑	↑	↑	↑	→	→	→	→	→
	M									↓	↓	↑	↑	↑	↑	↑	→	→
¹ Core strength	F	↓	↓	↓	↓	↓	→	→	↑	↑	↑	↑	↑	↑	↑	↑	↑	→
	M	↓	↓	↓	↓	↓	→	→	→	↑	↑	↑	↑	↑	↑	↑	↑	→
Strength- Endurance	F				↓	↓	↓	↓	→	→	→	→	↑	↑	↑	↑	↑	→
	M				↓	↓	↓	↓	↓	→	→	→	→	↑	↑	↑	↑	→
² General strength and ³ power strength	F							↓	↑	↑	↑	↑	↑	↑	↑	↑	↑	→
	M									↓	↓	↑	↑	↑	↑	↑	↑	→
Maximum Strength	F										↓	↓	→	→	→	→	→	→
	M												↓	↓	→	→	→	→
Flexibility	F	↑	↑	↑	↑	↑	→	→	→	→	→	→	→	→	→	→	→	→
	M	↑	↑	↑	↑	↑	→	→	→	→	→	→	→	→	→	→	→	→
Speed (less than 5 sec. for speed 1 and 5 to 20 sec. for speed 2)	F	↑1	↑1	↑1	↑1	↑1	↑1	↑2	↑2	↑	↑	↑	↑	↑	↑	↑	→	→
	M	↓	↑1	↑1	↑1	↑1	↑1	↑1	↑2	↑2	↑2	↑2	↑	↑	↑	↑	→	→
Agility/Balance/ Coordination	F	↓	→	↑	↑	↑	↑	↑	↑	↑	↑	→	→	→	→	→	→	→
	M	↓	↓	→	↑	↑	↑	↑	↑	↑	↑	↑	→	→	→	→	→	→
Technique	F	↓	↓	↑	↑	↑	↑	↑	↑		↑	↑	↑	↑	→	→	→	→
	M	↓	↓	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	→	→	→	→
Tactics and Decision-making	F				↓	↓	↓	↓	↓	→	→	↑	↑	↑	↑	↑	↑	→
	M				↓	↓	↓	↓	↓	→	→	↑	↑	↑	↑	↑	↑	→





6.4 Reflections on Your Program

6.4.1 Common Issues and Possible Solutions

Some common issues in programs for athletes in the Learning to Train stage of development are listed below, with possible solutions. If your program does not appear to have a specific issue move on to the next point on the list.

Possible Issue in Sport Program	Solutions to Consider
The overall program is too short to allow any significant athletic development.	<ul style="list-style-type: none"> <input type="checkbox"/> Extend the length of the program; increase the number of practice sessions (this may require an investment of your time initially in order to expand your program support structure.) <input type="checkbox"/> Encourage your athletes to attend inter-club and regional camps hosted by neighbouring cross-country ski clubs. <input type="checkbox"/> Encourage your athletes to join training groups in neighbouring cross-country ski clubs or training groups with sports that are compatible and require a similar level of fitness.
The Dryland Phase is too short and athletes are not adequately prepared for the snow season component of the program when it begins.	<ul style="list-style-type: none"> <input type="checkbox"/> The same solutions as above but specifically addressing the needs of the athletes during the Dryland Phase of the program. <input type="checkbox"/> Introduce athletes to dryland activities that are complementary to the sport of cross-country skiing, and which they can do on their own time, such as canoeing and hiking
Athlete participation in the dryland sessions is inconsistent, and attendance drops off badly in the weeks prior to snow arriving.	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure the activities you select are appropriate for the age, fitness and skill level of your athlete. <input type="checkbox"/> Plan each session carefully to accommodate the varied levels of development within the age range you are working with. <input type="checkbox"/> Take advantage of the differences between the Dryland and On-Snow Phases, such as the fall weather (i.e. temperature) and utilize practice sessions for team building purposes – include a good mix of outdoor social activities. <input type="checkbox"/> Utilize games to develop skills, speed, power AND aerobic fitness. <input type="checkbox"/> Encourage unstructured play.





	<ul style="list-style-type: none"> <input type="checkbox"/> Keep in mind that if you want dryland practice sessions to be successful, they: <ul style="list-style-type: none"> ✓ must be a group activity (at this age); ✓ must be well planned; ✓ must be motivating; and ✓ must offer variety and challenge.
The On-Snow Phase is too short (the local snow season is short) and technique development is therefore compromised.	<ul style="list-style-type: none"> <input type="checkbox"/> Increase the number of roller ski sessions (for your older athletes) and use those sessions to develop technique. <input type="checkbox"/> Access snow within a 1–2 hours drive (each way) by coordinating day-trips for your team. <input type="checkbox"/> Access snow that is more than a two hour drive from home by planning overnight trips/camps for your team.
Lit ski trails are not available locally, resulting in only one practice session a week which is too long in duration.	<ul style="list-style-type: none"> <input type="checkbox"/> Utilize headlamps – athletes will enjoy the experience of skiing with a headlamp. For the longer term, encourage your club to raise funds for and install a lit trail system. <input type="checkbox"/> Commute once a week to neighbouring communities that do have lit trail systems. <input type="checkbox"/> Hold practices right after school when there is sufficient light to do so.
Some athletes have not mastered the basic cross-country ski skills (classic and skating) they should have learned before the end of the FUNdamentals stage.	<ul style="list-style-type: none"> <input type="checkbox"/> Use roller ski sessions (for your older athletes) to improve their skill level before the snow season begins. <input type="checkbox"/> Coordinate opportunities for these athletes to ski with technically good skiers outside of regular practice sessions. <input type="checkbox"/> Offer to work with these athletes one-on-one outside of regular practice sessions. <input type="checkbox"/> Create a “Catch Up” program that allows these athletes an opportunity to catch up without compromising the mainstream program.
The athletes are only loosely connected to each other.	<ul style="list-style-type: none"> <input type="checkbox"/> Arrange for 10-15 minutes of social time following practice sessions. <input type="checkbox"/> Schedule social activities into your plan, e.g. fundraising (car wash), pizza and hot chocolate at an athletes’ home following practice. <input type="checkbox"/> Arrange for team suits, coats, toques, etc.





	<ul style="list-style-type: none"> <input type="checkbox"/> Build a number of overnight activities where the team members stay together and work cooperatively as a unit – such as hikes, camps and trips to competitions - into your program plan for the season. <input type="checkbox"/> Keep the group in touch year-round.
<p>There are not enough special activities (including competitions) in your seasonal plan.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Include low key, easy-to-implement time trials using simulated race formats (relays, interval starts, team sprints, etc.) in your practice sessions. <input type="checkbox"/> Create a committee responsible for special activities, which will in turn enlist parents and other club volunteers to help organize relevant events for your club and team. <input type="checkbox"/> Coordinate with neighbouring clubs and take turns. <input type="checkbox"/> Organizing special activities including low key competitions.





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SECTION 7 – INTRODUCING ADVENTURE-BASED ACTIVITIES





7.1 Adventure-Based Activities

During the Learning to Train (L2T) stage, children should be encouraged to utilize their skills and explore the different kinds of cross-country ski activities that are available to them. As athletes in this age group respond well to adventure-based activities, it is important to provide a challenging program with plenty of opportunities for peer group interaction in order to address their needs.

The concept of adventure-based activities should be introduced to your club athlete development program early, beginning with the special activities described in the practice plans in your NCCP Community Coaching materials. These activities might include treasure hunts, sprint games, ski tournaments, ski orienteering, skill development camps on snow, backwoods tours, mini-Olympics, etc. By the time children reach the L2T stage, and especially at the end of this stage, they should be ready for more advanced adventure-based activities such as a provincial/territorial championships, off-season camps, midget championships, overnight backcountry excursions, kayaking trips, roller skiing, extreme x-country activities (i.e. Double Cross), etc.





7.2 Skill Development Camps

Why Camps?

Camps are an integral part of a progressive club athlete development system. Camps can help young skiers learn ski-related technical skills, teamwork, self-reliance and good eating habits. They can facilitate the recruitment of new participants, motivate, promote friendships, influence lifestyle choices and provide a positive introduction to activities that encourage physical fitness. The list of potential benefits goes on and on.

Planning Your Camp

If you are planning your first camp you may wish to consider the following points:

- ❑ Younger athletes (FUNdamental stage) require more supervision than those in the L2T stage, and organizers need to plan coach/parent support accordingly.
- ❑ A camp program that is too difficult will discourage future involvement. The program may need adapting in order to meet the needs of the youngest and/or less skilled participants, and in some cases alternative activities may be required.
- ❑ Overnight camps - especially weekend camps (Friday evening to Sunday afternoon), where all the athletes stay in one location - are more effective for team building and less demanding on the athletes than single day camps. It is easier to build in rest periods and social time if all the participants are staying at one location.
- ❑ Camps can be used effectively to bridge the period between the end of the snow season and the start up of your fall program in September.
- ❑ Develop your own checklist of tasks to help you with your planning, and add notes as you go along so that the next time it will be easier to do. Below is a starter list:
 - ✓ Develop a draft budget.
 - ✓ Determine the dates for the camp, where it will be held and who will help with the coaching.
 - ✓ If it is a snow camp, connect with the ski area to ensure your grooming needs can be met.
 - ✓ Determine how many parent volunteers will be available to help with grocery shopping and food preparation during the camp.
 - ✓ Arrange for transportation (and drivers) as needed for the duration of the camp.
 - ✓ Determine the rates for trail fees.
 - ✓ Determine the maximum number of participants (male and female) that you can accommodate.
 - ✓ Make tentative accommodation arrangements; ensure there are appropriate cooking facilities and enough cold storage for all the perishable foods.





- ✓ Arrange for special facilities or equipment that you may need – canoes, swimming pool, bowling alley, wax room, etc.
- ✓ Arrange for special presenters (who can present effectively to young skiers) you wish to include – e.g. a high level athlete, an expert on backcountry safety, a nutritional expert, etc.
- ☐ When the above tasks are completed a Camp Notice can be drafted and detailed preparations can proceed.
 - ✓ Develop and distribute a Camp Notice.
 - ✓ Send an information package to your coaches outlining their roles, what equipment they need to bring and an expense claim outline.
 - ✓ Inform your coaches of club/camp policies (i.e. roller ski policy; in-camp transportation policies – e.g. athletes not permitted to transport themselves or others during camp; athlete conduct and disciplinary policies, etc.).
 - ✓ When the number of participants is confirmed develop a meal plan taking into account dietary needs of the participants.
 - ✓ Develop a shopping list for camp groceries.
 - ✓ Ensure parent volunteers looking after food purchase and preparation are aware of the food budget and know the process for purchasing additional groceries as needed during the camp.
 - ✓ Develop an emergency action plan (EAP) and circulate it to all your volunteers and coaches.
 - ✓ Copy your coaches on all correspondence to the participants.
 - ✓ One week before the camp, confirm all reservations.
 - ✓ Send out any final reminders to participants.
 - ✓ Make arrangements for athletes who need to be picked up from the bus station or other stop off point in the community where the camp is being held.
 - ✓ Arrange for a coaches meeting before the camp starts to review the camp agenda, camp policies and everyone's roles and responsibilities.
 - ✓ Arrange for post-camp delivery of athletes to the bus station etc.
 - ✓ Arrange for help with camp clean up on the last day.
 - ✓ Arrange for a camp inspection before departing.

7.2.1 Camp Notices (samples)

Fall Camp Notice

Name of Camp: Loon Lake Fall Camp.

Dates: Friday, October 3rd to Sunday, October 5th, 20xx.





- Location:** Names of nearest community and accommodations (include telephone number). Include written directions or provide a map. Note: all athletes and coaches must stay with the group at the designated accommodations for the full duration of the camp.
- Coaches:** Names of coaches. Contact information of head coach.
- Camp Begins:** 6:00 PM on Friday October 3rd. You are expected to arrive on time. Dinner will not be provided on Friday so please make arrangements to eat prior to arriving at the camp.
- Camp Ends:** 2:30 PM on Sunday October 5th. This camp has a full participation policy. This means that participants are expected to arrive before the camp starts on October 3rd and stay until the camp ends on October 5th unless you have made prior arrangements with the Camp Coordinator.
- Camp Fee:** Your camp fee is \$xx.00. This includes accommodation (Friday and Saturday nights), meals (Saturday breakfast through to Sunday lunch) and trail passes. The Camp Coordinator must receive your camp fee, registration form and waiver no later than September 28th, 20xx. Your attendance will not be confirmed until forms and fees have been received.
- Camp Schedule:** Includes:
- ✓ Roller ski sessions - please remember your helmets and reflective vests. You will not be allowed to participate without them!
 - ✓ A long hike in *challenging* terrain.
- Enclosures:** What to Bring List, Waiver Form, Registration Form

What to Bring List:

- ✓ medical number
- ✓ warm layers of clothes suitable for extreme changes in temperature - from cold to very hot and dry during the same day
- ✓ for rain (jacket & pants)
- ✓ for snow (jacket & polar fleece / poly-underwear)
- ✓ for shine (hiking shorts)
- ✓ light hiking boots and running shoes
- ✓ socks – bring lots of extra socks in case of wet weather
- ✓ regular training clothes
- ✓ heart rate monitor if you have one (borrow one if possible)





- ✓ roller skis (skating skis)
- ✓ ski poles for hiking, pole striding (shorter than your regular classic poles)
- ✓ ski poles (skating) for roller skiing
- ✓ ski boots (skating) for roller skiing
- ✓ bike helmet & reflective vest
- ✓ water bottles – a minimum of two (be prepared to pack enough water for several hours away from camp)
- ✓ daypack (suitable for hiking)
- ✓ sun hat (baseball cap & toque) – expect the unexpected
- ✓ mitts & gloves
- ✓ sun glasses
- ✓ sun screen
- ✓ mosquito repellent (bug spray)
- ✓ personal hygiene items (soap, shampoo, toothbrush, deodorant, etc.)

Winter Camp Notice

- Name of Camp: Whiskey Jack Snow Camp.
- Dates: Friday, December 8th to Sunday, December 10th, 20xx.
- Location: Names of nearest community, accommodation (include telephone number) and ski trails. Include written directions or provide a map. Note: all athletes and coaches must stay with the group at the designated accommodation for the full duration of the camp.
- Coaches: Names of coaches. Contact information of head coach.
- Camp Begins: 6:00 PM on Friday December 8th. Participants are expected to arrive on time. Dinner will not be provided on Friday so please make arrangements to eat prior to arriving at the camp.
- Camp Ends: 2:30 PM on Sunday December 10th. This camp has a full participation policy. This means that participants are expected to arrive before the camp starts on December 8th and stay until the camp ends on December 10th unless prior arrangements have been made with the Camp Coordinator.
- Camp Fee: The camp fee is \$xx.00. This includes accommodation (Friday and Saturday nights), meals (Saturday breakfast through to Sunday lunch) and trail passes. The Camp Coordinator must receive your camp fee, registration form and waiver no later than December 01, 20xx. Your attendance will not be confirmed until forms and fees have been received.
- Enclosures: What to Bring List, Waiver Form, Registration Form



**What to Bring List:**

- ✓ all gear for classic and skating sessions (skis, poles, boots)
- ✓ skis glide waxed and ready to go
- ✓ basic tools (scraper, cork, etc.) and a few basic waxes (glide and grip waxes)
- ✓ paper towels
- ✓ ski suit & warm-ups, running shoes
- ✓ heart rate monitor
- ✓ outdoor clothes for all weather conditions
- ✓ homework
- ✓ bathing suit
- ✓ small backpack
- ✓ personal toiletry items, including a towel
- ✓ water bottles
- ✓ medical number



**7.2.2 Camp Registration Form (sample)**

Camp Name and Location: _____

Athlete's Full Name: _____

Parent/Guardian Name(s): _____

Mailing Address: _____

Postal Code: _____ Telephone: _____

Email Address: _____

Date of Birth: Year _____ Month _____ Day _____

Name of Club: _____

Name of Personal Coach: _____ Telephone: _____

Recent Injuries: _____

Food Allergies/ Dietary Concerns: _____
(e.g. diabetic, vegetarian, nut allergies, etc.)Other Allergies/Medical Concerns: _____
(e.g. asthmatic, drug allergies, etc.)

Current Medications: _____

Emergency Contact: _____ Telephone: _____
(in the event of an emergency this person will be contacted when parents are not available)

Medical Card No: _____ Dental Plan No: _____

Name of Family Doctor: _____ Telephone: _____

Return registration form, camp waiver and payment to the Camp Coordinator at:

Name: _____

Mailing address: _____

Telephone #: _____

Email address: _____

Registration Deadline: _____ . Make cheque payable to: _____ .







7.23 CCC Camp Waiver Form

Note: This waiver will cover participation in all of the activities encompassed in the named camp.

Name of Camp: _____

Location/date(s) of Camp: _____

IN CONSIDERATION OF Cross Country Canada (hereinafter called **CCC**), _____

_____ (hereinafter called the **Host Division**) and

_____ Ski Club (name of hosting Club, hereinafter called the **Host Club**) accepting my entry into the above named activity, I hereby for myself, my heirs, executors, administrators and assigns, forever release, and forever discharge, **CCC**, **Host Division** and the **Host Club**, their executive directors, servants, agents, sponsors, supporters, employees or volunteers from any and all claims, demands, damages, costs (including solicitor and client costs on a full indemnity basis), actions or causes of actions, proceedings arising out of or in consequence of any loss, injury or damage which may arise by reason of negligence of **CCC**, **Host Division** and the **Host Club**, their servants, agents, sponsors, supporters, employees or volunteers.

Without limiting the generality of the foregoing, I further release any and all recourses which I may now or hereinafter have resulting from any decisions of **CCC**, **Host Division** and the **Host Club**.

In addition to the foregoing, I further waive any claims I might have in connection with any cancellation or rescheduling of the event for whatever reason.

I declare that my physical condition, to the best of my knowledge, is adequate to participate safely in the sport of cross country skiing, and that no physician or other qualified individual has advised me against participating in the sport. I further acknowledge and agree that it is my choice as whether I will obtain a physical examination prior to participating in the camp, and I hereby acknowledge and agree to assume all risks associated with not obtaining such examination, or if I do obtain an examination and is instructed not to participate in the camp, I hereby assume all risks associated with my participation.

I authorize and consent to the publication by **CCC**, **Host Division** and the **Host Club** of any materials containing my name or picture, and I release to **CCC**, the **Host Division** and the **Host Club** and all persons acting under authority from them, any claims I might have due to the initial or subsequent publication of such material.

By completing this **Waiver of Liability** with my signature below, I hereby agree to abide by the Rules and Regulations as set forth by **CCC**, **Host Division** and the **Host Club**, and to follow the instructions of the coaches/organizers during the camp.





Minor Participant Release and Indemnification

As a parent or guardian of _____ who is under the age of majority (as applicable in the participants home province), I have read and understand the contents and intent of this waiver and accept its terms and conditions on behalf of

Name of Parent/Guardian: _____

Date: _____

Parent/Guardian Signature: _____

Witness: _____

Submit this form to the Camp Coordinator prior to participating in the camp.

Attention Host Club: Please have all non-club members sign this form when participating in a club-organized camp. All club members having completed the Club Waiver Form upon application to the club need not complete an additional waiver form when participating in their own club camp. Participant Waiver Forms are to remain with the **Host Club Executive. DO NOT** submit these forms to **CCC** or your **Division Office.**





7.24 Fall Camp Worksheet (working copy)

Age Range: <u>9 to 12</u> # Boys: _____ # Girls: _____	
Overall Emphasis: _____ _____	
Friday 18:00 _____ _____ _____ 21:30	_____ _____ _____ _____
Saturday 7:30 _____ _____ _____ _____ _____ _____ _____ _____ _____ 21:30	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____
Sunday 7:30 _____ _____ _____ _____ _____ 14:30	_____ _____ _____ _____ _____







7.2.5 Camp Agendas (samples)

Fall Camp Agenda

Friday Evening

Arrive at Camp

- 18:00 Icebreaker game (frisbee, Capture the Flag, soccer)
- 18:45 Roller ski safety session; roller ski session (skating) at Dempster Elementary School parking lot; drink and snack break; mini-speed and agility workout
- 20:00 Camp information session; snacks
- 21:30 Lights out

Saturday

- 07:30 Chores; breakfast; clean up from breakfast; pack bag lunch for hike
- 09:00 Introduction to general strength exercises (include medicine ball; Swiss ball); drink and snack break
- 10:00 Game – Dragon Tails
- 11:00 Hike to Lookout with poles; ski walking using proper technique; integrated discussion on training intensities and zones
- 12:30 Lunch/rest
- 15:00 Arrive back at camp; drink and snack break; rest period
- 16:00 Introduction to flexibility session
- 17:00 Chores; dinner; clean up from dinner
- 19:00 Presentation or video/DVD on hydration and nutrition
- 19:45 Game – Sharks and Minnows
- 21:30 Lights out

Sunday

- 07:30 Chores; breakfast; clean up from breakfast
- 09:00 Introduction to core strength - five exercises taught properly; drink and snack break
- 10:00 Organize into groups; Team Orienteering
- 11:00 Team relays including “The Great Canadian Candy Scramble”
- 11:45 Lunch; clean up after lunch; pack; clean up cabins
- 12:45 Roller ski technique session (skating) at Dempster Elementary School parking lot; drink and snack break
- 14:30 Wrap up

Winter Camp Agenda

Friday Evening

Arrive at Camp

- 18:00 Icebreaker game
- 18:45 Hands on ski preparation session (cleaning skis and grip waxing); drink and snack break; discussion on appropriate ski equipment (boots, poles, skis)
- 20:30 Camp information session
- 21:30 Lights out





Saturday

07:30	Chores; breakfast; clean up from breakfast
09:00	Classic technique session (zone 1) with on-site video replay; drink and snacks
11:00	Rest and homework, individual feedback on video
12:00	Chores; lunch; clean up after lunch
13:15	Downhill technique session with on-site video replay; drink and snacks
15:00	Group soccer game on skis
15:45	Race strategy session (pre-race and post-race); athletes develop their own pre and post race routines for the next day; organize into relay teams for Sunday
17:30	Chores; dinner; clean up after dinner
19:00	Bowling
21:00	Drinks and snacks
22:00	Lights out

Sunday

07:30	Chores; breakfast; clean up from breakfast
08:30	Skating technique session (zone 1) with on-site video replay; drink and snacks
10:30	Obstacle Relay; practice pre and post race routines; recognition/focus on good technique and effective relay exchanges
12:00	Chores; lunch; clean up after lunch
13:00	Treasure Hunt
14:00	Pack; clean up cabins
14:30	Wrap up

7.26 Coach “To Bring List”

- Video camera.
- Heart rate monitors.
- Props for games (soccer ball, frisbee, hula hoops).
- Roller ski equipment (fall camps).
- Ski equipment – skis, boots, poles (snow camps).
- Wax box and tools (snow camps).
- Wobble boards, tension bands, Swiss balls, medicine balls, mats, pull-up bar, stop watch, step-up block, etc.
- First aid kit.
- Radios.
- Cell phones.
- Emergency Action Plan.
- Medical waivers/information sheet.





- Extra roller ski safety vests, helmets, etc.
- Roller ski signs for sides of road (SKIERS IN AREA, etc.).
- Videos/DVDs (nutrition, technique, waxing, training, races etc.).
- Handouts.
- Wax bench/ski form.
- DVD player/ laptop and projector.
- Board games, cards, appropriate videos (for evening social time).
- Copies of policies, procedures.
- Camp Evaluation Forms.
- CCC Accident Report Forms.
- Assessment Forms (flexibility, core strength, etc.).

7.2.7 Risk Management for Camps

- You will find most of the liability insurance information you require in your club's CCC Membership/Insurance Guide. As a club coach you should be familiar with this document. Read it carefully!
- Club and regional camps (like other normal cross-country ski programs organized by your club) are covered under the CCC Liability Insurance Program, provided this type of activity has been reported by your club.
- The use of a CCC Camp Waiver Form is required if an athlete is not a current member of the host club. Refer to section 7.2.3 for a copy of the form.
- Under the CCC liability insurance program, coaches have liability insurance coverage for all normal cross-country ski training activities provided they are registered members of their club.
- Camp organizers should have copies of the CCC Accident Report Form in case of injuries to athletes, coaches and/or volunteer helpers. A copy of this form is available in the CCC Membership/Insurance Guide.
- Refer to section 6 in the ICC Reference Material and section 8 in this Reference Material for detailed information on the risks associated with cross-country ski activities and emergency action plans (EAP).
- Some types of camps, such as those involving training on glaciers, certain hiking routes, backcountry skiing in avalanche areas, the use of helicopters, etc., have higher than usual risks associated with them. If you are planning a camp of this kind you may wish to consult with the insurer, through your club and division, to find out if there are any restrictions you should be aware of, and/or if there are any additional steps/requirements that you need to consider.





7.28 Camp Meals

Preparing for and cleaning up from camp meals is an important component of an athletes' education – it has the potential to develop both their self-reliance and an awareness of their nutritional needs.

In an ideal situation, skiers' camp experiences will begin when they are eight to ten years of age, and their skills and knowledge will build as they grow. The objective is to teach them how to eat appropriately as athletes, both at home and away from home, regardless of their family situation. As they develop, athletes can be given increasing responsibility. For example, during the FUNDamentals stage the camp organizers may purchase the food and prepare group meals while the athletes take turns peeling the vegetables, setting the table and/or doing the dishes. During the Training to Train stage, the camp organizers may purchase the food, store it at the camp location and provide instructions (including recipes for the athletes to use – see below!), while the athletes are entirely responsible for preparing their meals and cleaning up afterwards.

Sample Shopping List

This list is for 25 athletes and five coaches who will be staying in cabins with a kitchen facility and basic cooking utensils. They will be preparing their own meals.

☐ Dairy

- ✓ two large blocks of cheese (two kg each) cut into smaller blocks and put into zip lock bags
- ✓ one pkg of margarine with 12 individual squares per package (1-2 squares per cabin)
- ✓ yogurt (14 - 750mL containers - two per cabin - most popular flavours strawberry & peach)
- ✓ cream cheese - four blocks (250g) cut in half (1/2 block per cabin)
- ✓ milk (seven) four litre jugs (one per cabin) - may have to replenish on Saturday or Sunday
- ✓ ice cream (four) four litre containers (every second cabin gets a pail) - strawberry ripple & chocolate ripple most popular flavours
- ✓ eight dozen eggs - one dozen per cabin & a few extra for the five person cabins
- ✓ parmesan cheese - three cans

☐ Bread & Cereal

- ✓ seven dozen bagels - cheese, sesame or multigrain are good choices
- ✓ whole wheat bread - seven loaves (one per cabin)
- ✓ six or seven dozen buns (Italian or kaiser roll type) to be used for lunches and with whole wheat spaghetti
- ✓ cereal: three jumbo Cheerios; three jumbo Shreddies; three jumbo Raisin Bran





- ✓ one large box of instant variety pack oatmeal (40 individual servings per box)
- ✓ rice - two packages (two kg size) of parboiled white or brown rice (not instant); this will have to be separated into zip lock bags
- ✓ spaghetti - 10 packages (500 grams) whole wheat spaghetti (one per cabin & some extra)
- ✓ ten 680mL cans of spaghetti sauce

☐ **Meat Products**

- ✓ three 200g packages of each of the following cold meats per cabin - black forest ham, roast beef and chicken (or turkey) breast.
- ✓ purchase frozen meatballs (three packages/boxes) and add them to the sauce; approximately 64 meatballs per package
- ✓ two boxes (four kg size) of frozen chicken breasts (approx. 20 per box); divide four or five in zip lock baggie and put into cabins in fridge
- ✓ three cans of tuna fish (packed in water)

☐ **Fruit & Vegetables**

- ✓ Romaine lettuce (five heads)
- ✓ 14 cucumbers (two per cabin)
- ✓ seven bags of carrots (pre-peeled mini carrots)
- ✓ 14 peppers (seven each red and green)
- ✓ broccoli (seven bunches - 1/2 per cabin)
- ✓ apples (15 lbs) - green & red
- ✓ navel oranges - one large bag (10 lbs)
- ✓ one dozen good-sized tomatoes
- ✓ 40 bananas (maybe cheaper to buy a case of bananas)
- ✓ three heads of garlic – divide and put in fridge of each cabin

☐ **Drink Crystals**

- ✓ lemonade crystals (1.8 kg jar)
- ✓ six boxes of juice (six litre boxes) or 36 one litre boxes

☐ **Staples**

- ✓ napkins
- ✓ ziplock bags (one jumbo box (60) of large size & one jumbo box of medium size)
- ✓ foil and seran wrap (one roll of each)
- ✓ peanut butter (one 2 kg jar)





- ✓ strawberry jam (one large jar)
- ✓ sugar (one 2 kg bag) - can be divided into small baggies
- ✓ two bottles medium size of salad dressing (ranch & creamy Caesar most popular)
- ✓ two large mustard squeeze bottles (for sandwiches)
- ✓ soy sauce & teriyaki sauce (two large containers)
- ✓ mayonnaise (one 1 litre jar)
- ✓ coffee - two packages - for coaches
- ✓ tea - one small box - for coaches
- ✓ dry soup packages that can be made up individually (48)
- ✓ granola bars - one jumbo pkg
- ✓ crackers - six jumbo stone wheat thins (red oval) 900 gms

❑ Treats

- ✓ cookies of choice - four jumbo boxes
- ✓ large box of natural flavor micro-wave popcorn
- ✓ hot chocolate powder (big box of individual servings)
- ✓ marshmallows & generic rice crispies (one large box) to make rice crispie squares

Cooking Tips - Fall Camp

(sample handout for athletes preparing their own meals)

Some of you are “pros” at cooking and food preparation.... and for others the next three days will be a learning experience! Please learn from one another and remember that teamwork is the KEY. One person should not be doing it all.

- ❑ Always wash your hands before & after doing any food preparation.
- ❑ One small cup (mug) in your room can be used for your measuring cup. One of these mugs is equal to 1/2 a cup.
- ❑ Every second cabin has mustard, mayonnaise and salad dressing - visit your neighbor if it is not in your fridge.
- ❑ Think ahead. When you have a quiet moment at lunch or an afternoon break, wash and peel carrots, celery and cucumbers for snack time. A supply of these peeled and cut veggies should be available in the fridge at all times.
- ❑ A different athlete could be assigned to peel and chop each day.
- ❑ If you need to restock, the supplies are in the coaches’ cabin.
- ❑ Adult food consultants will be available to help with the two dinners - lasagna and stir-fry. They are to assist you in following the recipe; they are not expected to do the cooking for you.





- Read the entire recipe before you start cooking.
- Be respectful of different food preferences; it is better to add spice to your own stir-fry, than to make the pan too spicy for your roommates!
- One of the coaches will be around during the lunch hour to assist you and answer food questions.

Breakfasts

Saturday

- ✓ Cold cereals / oatmeal
- ✓ Fruit
- ✓ Bagels / toast
- ✓ Yogurt
- ✓ Milk / juice

Note: Individual microwave servings of oatmeal. Read the package for directions. It is instant!

Sunday

- ✓ Scrambled eggs
- ✓ Toast, yogurt, fruit, milk & juice

Scrambled Eggs Recipe (makes 4 to 6 servings)

1 dozen eggs (2 eggs per person)

1 tsp of pepper and salt if desired

1/4 cup milk

1/2 cup grated cheese

– crack eggs into a large bowl

– beat until uniform in colour and yolks are broken

– add salt, pepper and cheese mix well

– oil frying pan lightly with margarine

– heat frying on medium and when margarine starts to sizzle pour in ingredients

– shove eggs around as they cook

– eggs are ready in approximately five minutes

Note: Remember to wash your hands before and after food preparation! Restock your supply of peeled, washed and cut vegetables





Lunches

☐ Saturday and Sunday

- ✓ Cold meats are available in the fridge & canned tuna is also available. The most nutritious cold meats are roast chicken and roast turkey, however lean ham and roast beef are also good choices.
- ✓ Cheese and veggies should be ready for sandwich construction.
- ✓ Cheese and crackers are another lunch option.
- ✓ Help yourself to some fruit!
- ✓ Your lunch break is a good time to wash lettuce for the evening salad. Let it dry in the sink for half an hour, shake it dry and store in a plastic baggie in the fridge.
- ✓ Please replenish your supply of washed and peeled vegetables.
- ✓ Now is the time to replenish your fruit supply from the coaches' cabin.
- ✓ Refill your water bottle with sport drink.
- ✓ Make-up container(s) of juice.

Dinners

Don't forget to wash your hands before and after preparing dinner!!

This is a group effort that requires cooperation.

☐ Saturday – Option #1

- ✓ Chicken stir-fry (vegetarians can substitute tofu for chicken)
- ✓ Rice

Read the entire recipe for both stir-fry and rice before starting!!

Designate someone to cut the chicken into small pieces, to set the table, and another to make the rice. Elect a main cook and assistant.

Start cooking rice before starting to cook the chicken stir-fry!

Extra soy sauce & hoisin can be added on the side to taste.

Rice Instructions (makes 4 to 8 servings)

2 cups rice

4 1/2 cups water

- *add water in a large to medium pot*
- *bring water to a full boil*
- *add rice – do not stir*
- *cover pot with a lid*
- *reduce heat to low immediately*
- *cook without “peeking” for 20 minutes (adjust cooking time according to type of rice)*





- *remove pot from element and let stand covered for five minutes (if too much water was added you must drain the water from the cooked rice)*
- *fluff with fork and serve*

Chicken Stir-Fry Instructions

- *remove chicken from fridge*
- *select one chicken breast per athlete*
- *cut chicken into small strips or pieces*
- *chop freshly washed veggies (onion, peppers, carrots, mushrooms, broccoli)*
- *heat two tablespoons of oil in a large frying pan and the temperature should be on medium /high*
- *add chicken, stir- fry for six to ten minutes (should be completely white in colour)*
- *add garlic and fresh washed and cut vegetables*
- *stir-fry until tender crisp approximately five to ten minutes (any longer & the veggies will be mushy!)*
- *add approximately 1/4 to 1/2 cup hoisin sauce or soy sauce or a mixture of each according to your preference!*

☐ Saturday – Option #2

- ✓ Lasagna
- ✓ Tossed green salad
- ✓ Buns

Lasagna Instructions

- *remove lasagna from the refrigerator and read the directions*
- *cover the lasagna with tin foil tenting loosely, so that the cheese does not stick to the foil as it is cooking*
- *remove the foil for the last 15 minutes of cooking*
- *if the lasagna is thawed and not frozen it should be ready in approximately 35 to 45 minutes. If it is still frozen it may take as long as 1 hour to cook*

Salad Instructions

- *wash lettuce and let drip-dry or dry with clean towel. Do this in the AM or at lunch and refrigerate for crispy lettuce!*
- *tear washed lettuce (gently) into small pieces, and arrange in a large bowl*
- *add an assortment of vegetables, cleaned, peeled and chopped... (carrots, peppers, celery, mushrooms, onion, cucumber, tomato etc.).*
- *toss with large spoons*
- *serve with salad dressing on the side*
- *every second cabin will have salad dressing and so visit your neighbor with an empty mug to fill with salad dressing*
- *serve with a spoon*

An alternative would be to serve fresh cut veggies and use the salad dressing as dip....





7.29 Camp Evaluation Forms (samples)

Adapt according to the camp objectives and the athletes' stage of development.

Fall Camp

Location: _____ Date: _____

Please circle the appropriate answer - yes or no.

Do you feel that the camp environment was friendly and welcoming? Yes / No

Did you receive enough one-on-one support from the coaches? Yes / No

Did you learn more about proper hydration and nutrition? Yes / No

Could you demonstrate the difference between static and dynamic stretching to another skier? Yes / No

Did you learn more about how to control your speed when on roller skis? Yes / No

Do you feel that you now know a basic core strength routine well enough to do it on your own? Yes / No

Do you know when it is beneficial to use ski walking? Yes / No

Do you plan on participating in another cross-country ski camp in the future? Yes / No

Please write down any additional comments you have about the camp:





7.3 Ski Orienteering

Ski orienteering is a cross-country endurance winter sport in which athletes use a compass and map to find their way. Having its origins in the 1890s, it is a sport with a long tradition. Ski orienteering became recognized as an Olympic sport in 1949. A ski orienteering World Championships is held every even-numbered year, and a ski orienteering World Cup is held on alternate years. The program includes competitions in long distance or medium distance, short or super-sprint distance, and a relay.

Similar to the orienteering disciplines practised in the summer season, ski orienteering requires a very high level of physical and mental fitness. An elite ski-orienteering athlete has to make hundreds of route choice decisions at high speed during every race, and to do that needs excellent skiing and map reading skills - and the ability to combine those two.

The ski trails are intentionally prepared to various standards so that, throughout the competition, the competitor has to make decisions about which route between the controls is fastest. The route choice is made based on the gradient, distance and degree of grooming of the ski trails, all of which can be read from the map.

A successful ski orienteerer must master all the basic classic and skating cross-country ski techniques. With respect to physical fitness requirements, the demands of ski orienteering would be similar to marathon running or loppet skiing.

7.3.1 Terms, Concepts, and Gear

Orienteering/Ski Orienteering Maps

An orienteering map is a type of topographic map that is designed specifically for orienteering (topographic means that it shows, through contour lines, the shape of the land – the hills, the valleys and so forth). However an orienteering map provides more information than a topographic map in that it shows additional features as well – features that are relevant to an orienteering competitor such as ski trails, fences, clearings, thick brush and so on.

Although a variety of types of orienteering maps exist, most of them adhere to a standard that is followed world-wide. That standard includes a colour-coding system to identify different types of features:

- Black** - indicates man-made features such as roads, trails, buildings and fences, plus rock features, such as cliffs and boulders.
- Brown** - indicates topographic features such as hills, valleys, ridges, earth banks and ditches.
- Blue** - indicates water features, such as lakes, ponds, swamps and streams.
- White** - indicates a normal forest (this is different from some government maps which may use white to indicate fields and green to indicate forest).
- Yellow** - indicates clearings and fields.
- Green** - indicates thick brush such as bushes or thorns.





Compasses

Orienteering compasses are different from many other compasses such as those used for boating, surveying or military purposes. In a pinch, any type of compass that displays a needle can be used for orienteering, but orienteering compasses are best for orienteering activities.

The most common type of orienteering compass is the baseplate variety. The compass needle sits in a housing in the center, which is set on a clear plastic baseplate. With this equipment athletes can set bearings from where they are to where they are going, which is very useful if they are trying to find places that have few nearby features to guide them.

Another type of orienteering compass is the thumb compass which straps to the athlete's thumb. This compass allows for quick reference since it is held against the orienteering map. Some athletes like it for its simplicity, others like it for speed of reference during a competition. However, although it allows an athlete to orient the map with ease it cannot be used to set bearings.

To learn more about introducing children to compasses you can refer to section 5 (Level 3, Practice Plan 35) of your Community Coaching Reference Material, the Canadian Orienteering Federation website at <http://www.orienteering.ca:80/> or other library or website sources.

Special Orienteering/Ski Orienteering Terms

- Control** - this is the point (circled on the orienteering map) which the athlete is seeking. The orange and white marker located there is called a control marker.
- Course** - the orienteering course is the “set” of controls around which the athlete must navigate.
- Leg** - a “leg” is the portion of a course between two consecutive control points.
- Knoll** - a small hill.
- Spur** - a small ridge or protrusion on a hillside.
- Re-entrant** - a small valley or draw running down a hillside.
- Contour** - a line indicating differences in elevation in a given area. Using contours, the shape of most landforms (hills, valleys, slopes, knobs, kettleholes, sand dunes, etc.) can be shown on a map. Children are usually taught about contours after they have mastered map reading and basic navigational skills.
- Linear feature** - a ski trail, stream, fence, stone wall, or other feature that is essentially linear. In contrast a point feature would be a boulder, well or spring, and an area feature would be fields or lakes.
- Catching features** - a large feature which is not easy to miss. An orienteer might use a catching feature, such as a lake beyond a control point, to “catch” them if they missed the control.





Equipment for Elite Ski Orienteering Competitors

- ❑ **Ski Equipment** - competitors require the same racing skis, ski poles, suits, boots and bindings as competitive cross-country skiers.
- ❑ **Map Holder** - a specially designed map holder attached to the chest makes it possible to view the map while continuing to ski.
- ❑ **Map** - the map provided by the organiser shows the control points, which must be visited in the designated order. The map is designed to give all the information the competitor needs in order to decide which route is the fastest.
- ❑ **Compass** - the compass is attached to the map holder or to the skier's arm.
- ❑ **Control Card** - a control card is attached to the competitor's arm. At each control, the competitor punches the card with a paper punch located at the control in order to prove he/she has visited that control.

7.3.2 Introducing Children to Orienteering/Ski Orienteering

There are a number of different ways children can be introduced to orienteering (dryland) and ski orienteering (on-snow), three of which are outlined below. What is most important to keep in mind is whether or not the activity is appropriate for the age and skill level of the skiers.

- ❑ **String Courses.** For children as young as toddlers there is a special orienteering course called a String Course. The entire route is marked from start to finish so that no one will become lost. A simple map indicates the route and the location of the markers, which are called "controls". As children grow older, they can be introduced to maps, map colours, map symbols, direction, how to determine where they are, and so on - all on a well-marked course they can follow themselves. Refer to section 7.3.3 for detailed information including a map.
- ❑ **Orienteering Poker Ski.** An introductory game called Orienteering Poker Ski has been provided in the form of a lesson plan in section 5 (Level 3, Practice Plan 35) of your Community Coaching Reference Material. This activity is suitable for children eight years of age and older.
- ❑ **White Courses.** Older children can be introduced to orienteering on a White Course. This course is suitable for adult and teen beginners as well as children who have developed the necessary skills. It is usually two to three kilometres in length - just right for a short hike. Control markers are placed on major features such as trail junctions, streams, buildings or clearings. The points are marked on the map and the objective is to find them in the right order. Navigation takes place along trails or streams, through fields, or in other easy areas. Children should attempt a White Course first with their family/club group, then together with other children, and finally by themselves. Refer to section 7.3.4 for an example of a White Course map.

An excellent source of information on introducing children to orienteering is the American Orienteering Federation website at <http://www.us.orienteering.org/OYoung/>.





7.3.3 The String Course

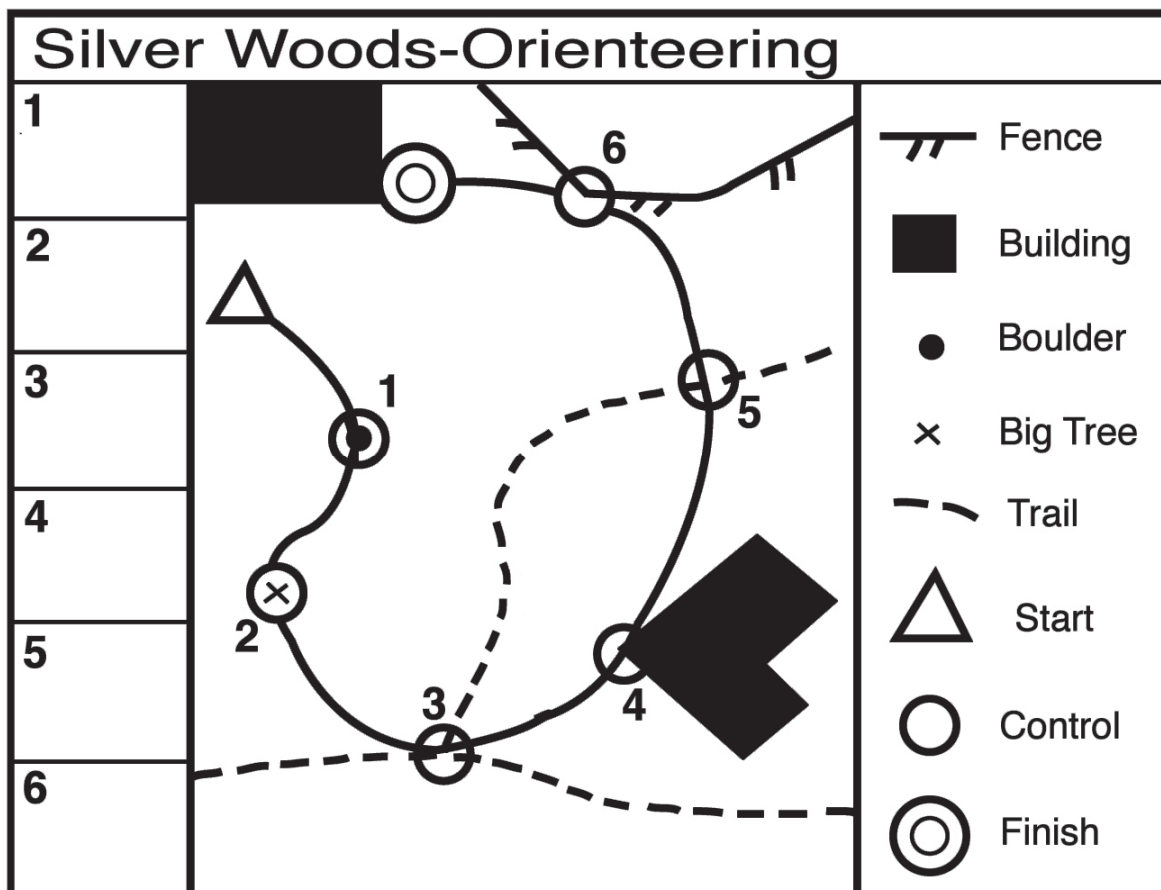
A String Course is a short course marked with a continuous ribbon or yarn. The map should be kept as simple as possible and should include only the area close to the course (refer to the example orienteering map below). Children should be encouraged to color their map with the appropriate map colors.

From the start, the ribbon or yarn (the “string”) and the corresponding map guide the child along the course. When children reach the locations on the map that are circled (these are called “controls”), they will discover an orange and white nylon marker called a “control marker”. At each control there will also be a marking device or a bag of stickers that are used to mark the appropriate box on the map (evidence that the child has been at that control). Eventually the string will lead the children to the finish line, which is usually in the same location as the start.

The route should be set up so that a child is able to find all the points and not get lost.

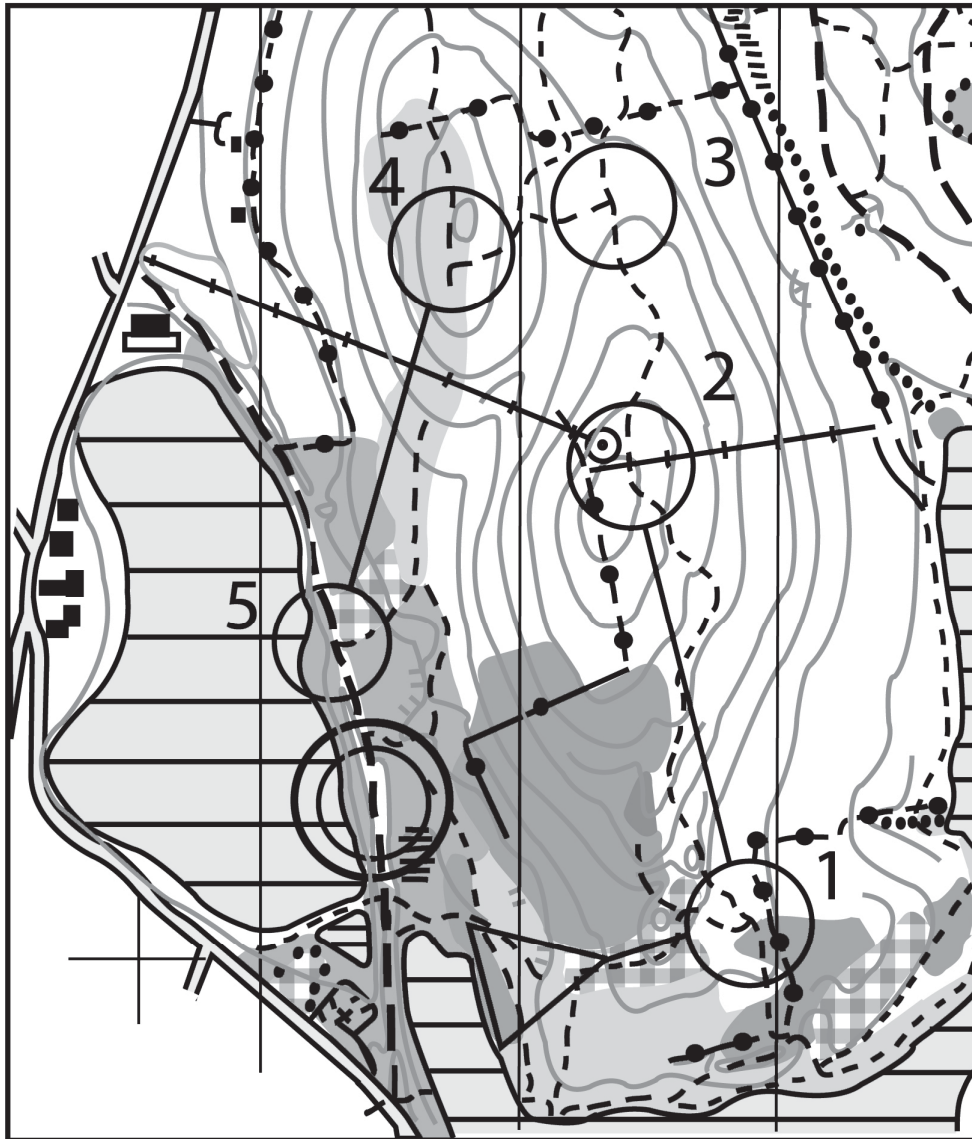
For the youngest competitors, the above experience will provide a challenge while giving them exercise, fun, exposure to maps and some level of confidence at being alone in the woods. For children ready for more of a challenge, the locations of the controls can be left off the map, creating a situation in which the child has to figure out where the controls should be. Alternatively, some controls can be placed away from the string (but inside the loop formed by the string). Many variations are possible.

Figure 7.1





7.34 White Course Map (sample)



LEGEND

	hill; small knoll		lake or pond, marsh
	depressions, small pit		open land, semi-open
	steep earthbank, tower		building, power line
	fence, stone wall		foot path, vehicle track
	boulder, small, large		road
	int. stream, narrow marsh		brush, very thick brush





7.4 Backcountry Adventures

A backcountry adventure could take place during a weekend (one or two nights), or longer. It might be a ski to a lake in the vicinity of your home community, a ski to a chain of backwoods cabins that your club (or a neighboring club) has established for this purpose, a true backcountry trip into the mountains and avalanche country, or a similar activity. The following article illustrates the different possibilities.

Spring Skiing in the B.C. Rockies

April 26th was an absolutely perfect day for a spring backcountry ski near the Continental Divide in Kootenay National Park. A cloudless blue sky prevailed throughout the day, as did temperatures which climbed to the zero range. Good old “blue extra” worked like a charm throughout the day in about five cm of new snow on top of a virtually bomb-proof base. It was the best day possible for the last ski outing of the year for the members of our B.C. Rockies Junior Racing Ski Team.

The focus of the team throughout the ski season had been on developing the skills and strategies needed for racing over competition trails. But now that the season’s end was upon us, we decided that it was time to enjoy some of the other experiences that this sport has to offer. The Kootenays are rich with opportunities for backcountry excursions, and this type of activity was ideally suited to the kind of post-competitive season diversion we had in mind.

Late in the afternoon of Friday the 25th, team members, coaches and parents from Kimberley and Cranbrook met near the Kootenay River at Wasa Junction. From there we drove north through Invermere and onwards to the Dolly Varden campground along the Kootenay River in Kootenay National Park. After we got our tents set up on the snow, we played “hide the avalanche transceiver”. This is a drill that trains rescuers to efficiently search and locate persons missing in an avalanche by closing in on the signal emitted by the personal transceiver that each backcountry skier wears. As night fell we talked and huddled around the wood stove in the kitchen shelter while it got colder and colder and colder. The highlight of the evening was the spectacular night sky, and in particular, an unparalleled view of the Hale-Bopp comet.

Despite -15C temperatures, we were eventually able to coax everyone out of their tents the next morning. Those who were warmest were the most difficult to get out. After a breakfast of oatmeal, hot chocolate, fruit and toasted bagels, we were ready to roll. A half-hour drive brought us to the Tokuum Creek trailhead and, thankfully, warming temperatures.

A quick waxing of the skis, a final check of the avalanche transceivers and we were off! The Tokuum Creek Valley heads north from the highway near Vermillion Pass towards Opabin Pass and the Lake O’Hara area. While we had vague thoughts of making it to the Alpine Club of Canada’s “Fay Hut”, we had no definite objective in mind. The group skied up the valley floor just west of the Continental Divide where the snow pack is very deep. We learned about avalanche terrain and safe techniques for crossing avalanche areas, and enjoyed the beautiful scenery.





The trek took us to a lunch spot along Tokuum Creek and at the outermost point we came just two kilometres short of the Fay Hut.

We had asked everyone to bring a surprise snack or treat item and a lunch contribution. As a result we had a great lunch with pita bread and bagels, salsa and tortilla chips, different kinds of cheese and meats, hummus (pureed chick peas, garlic and sesame butter), fruit and all kinds of baked items. There were some very interesting sandwiches! We made plans for a future spring ski over the Lake O'Hara - Opabin Pass route, and for a return hike in the summer to the Fay Hut.

The seven hour trip ended with a ski out down a whooping-and-hollering final descent which was more exciting for those skiing on their "skinny skis" as opposed to steel-edged back country skis. Key stops on the return trip included an ice cream store, the Fairmont Hot Springs and a restaurant for dinner. Not only did we have a super time on skis, but it was also a great team-building and social occasion. All agreed that there was no better way to end our season on snow together.

Safety Considerations

- Understand the special risks involved.
- Read the appropriate sections in your CCC Insurance Guide. Also, read the relevant sections in the ICC, CC and CCI-L2T Reference Materials, including Cold as a Risk Factor, Safety Measures to Avoid Cold Injuries, Frostbite, Hypothermia, Emergency Action Plan and Backcountry Safety.
- Search relevant websites such as the Canadian Avalanche Association (CAA) for more information: <http://www.avalanche.ca/>.
- Follow all safety requirements outlined in the CCC Insurance Guide.
- Ensure that the leadership is properly qualified for the type of activity you are undertaking.
- Prepare your athletes well.
- Ensure your leaders are well prepared.

Educating Your Athletes

As a minimum, each child should complete the following steps before they graduate from your club Skill Development Program:

- Learn to dress and pack appropriately for a long ski in areas they are not familiar with (not their own ski area).
- Learn about frostbite and hypothermia.
- Learn to read a map.





- ❑ Observe a presentation on backcountry safety by a qualified guide or leader, or watch a Canadian Avalanche Association (CAA) video/DVD presentation on backcountry safety. The recommended CAC video/DVD for skiers in the L2T stage is “Beating the Odds”.

Why is education on this subject necessary?

Backcountry skiing is a much-enjoyed aspect of cross-country skiing that adults participate in, and should therefore be part of a well-rounded cross-country ski program for children. If children are being taught skills that will allow them to access the backcountry in future years, they should also be taught basic backcountry safety skills.





7.5 First Aid Kit

A complete first-aid kit is essential. The kit should be prepared to treat the most common problems that you would anticipate at a practice session or competition. This would include supplies for major trauma, illness, small wounds and blisters. You will require diagnostic tools and medication – and don't forget the directions. If you are undertaking a special activity such as an overnight hiking trip or a backcountry ski you may require additional activity-specific contents.

The best preparation for dealing with an injury or illness that requires first aid is to have attended appropriate first aid training courses and to be current.

❑ Factors to consider when planning a first aid kit:

- ✓ What type of activities it will be used for (practice sessions, a long hike into a remote area, water-based activity, etc.).
- ✓ Number of participants.
- ✓ Length of activity (practice session, camp, trip, etc.).
- ✓ Remoteness.
- ✓ Likely environment (cold, heat, altitude, etc.).

❑ Protect your first aid kit from:

- ✓ Moisture.
- ✓ Rough handling.
- ✓ Expired dates.

❑ Essential contents - the following list is a standard St. John's Ambulance first aid kit "essential" list for hiking, cycling, skiing and similar activities:

- ✓ 15 cleansing wipes.
- ✓ 4 knuckle bandages.
- ✓ 4 gauze pads (5 cm x 5 cm).
- ✓ 1 gauze pads (5 cm x 4.5 m).
- ✓ 1 pressure bandage (5 cm x 5 cm).
- ✓ 1 adhesive tape (1.25 cm x 4.5 m).
- ✓ 2 triangular bandages.
- ✓ 1 pair of tweezers.
- ✓ 1 pair of scissors (14 cm).
- ✓ 1 rescue sheet.
- ✓ 25 adhesive bandages (1.9 cm x 7.5 cm).
- ✓ 2 small fingertip bandages (butterfly bandages).
- ✓ 4 gauze pads (7.5 cm x 7.5 cm).





- ✓ 1 gauze bandage (7.5 cm x 4.5 m).
- ✓ 1 pressure bandage (10 cm x 10 cm) (abdominal dressings; breathable, silicone waterproof).
- ✓ 1 pair of vinyl gloves.
- ✓ 1 first aid pocket guide.

□ **Additional items to consider including:**

- ✓ AR mask.
- ✓ moleskin – transparent blister tape.
- ✓ oral thermometer.
- ✓ accident report form (or notebook and pen).
- ✓ polysporin.
- ✓ tincture of benzoin.
- ✓ 1 disposable razor.
- ✓ metal splints.





REFERENCES

International Orienteering Federation website.

Canadian Orienteering Federation website.

White Course Map, New England Orienteering Club, 1994.

US Orienteering Federation website.

Spring Skiing in the BC Rockies, Ski Cross Country, 1997.

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SECTION 8 – SAFETY AND RISK MANAGEMENT





This section on Safety and Risk Management complements the information provided in section 6 of the Introduction to Community Coaching Reference Material, and is directed primarily at supporting you, as a developing coach, in your role working with children in the Learning to Train stage of development.

This section is also intended to provide you with materials that will assist you if you choose to work with athletes in the Training to Train stage and beyond.

8.1 Sport Safety

By its very nature, physical activity can present some risk of injury and one of your key responsibilities as a coach is to manage the potential risks that present themselves during practice, competition or special activity.

Material in this section highlights some of the specific areas of risk that are a concern at this stage in an athlete's development.

8.1.1 Roller Skiing

Roller skiing is an integral part of the sport of cross-country skiing, providing one of the most enjoyable and highly specific forms of ski training that can be practised in the dryland training season. Roller skiing is also a sporting activity that is characterized by important legal and safety issues:

- ❑ The effective practice of roller skiing requires extended stretches of relatively smooth pavement. There are few venues where such conditions have been created exclusively or primarily for the use of roller skiers. Therefore, most roller skiing takes place on public roads and highways. In some municipalities or provinces, this practice is limited or prohibited by legislation.
- ❑ Several factors contribute to the existence of a considerable risk of injury during roller skiing. These include the relative instability of roller ski wheels, the lack of brakes, a hard road surface, the exposure to motor vehicles travelling at relatively high speeds and the inexperience of either roller skiing participants or motor vehicle drivers in sharing the road.

Cross Country Canada exercises leadership in this area in the form of a policy document that serves to:

- ❑ help manage the risk to its membership;
- ❑ reduce the exposure of CCC, its member Divisions and registered clubs to legal liability for related accidents, as identified in CCC's insurance contract; and
- ❑ contribute to the adherence by roller skiers to prudent and responsible practices that will gain the respect of the Canadian public, thereby protecting the right to roller ski on public roads wherever such practices are permitted.





CCC Roller Skiing Policy

- ❑ **Aim.** The aim of this policy is to state the CCC approach to managing these issues and to establish guidelines for procedures to be followed by CCC members engaged in roller skiing.
- ❑ **Authority.** This policy is developed by the National Ski Team Committee (NSTC) and promulgated under the authority of the Board.
- ❑ **Definition.** For the purposes of this policy, roller skiing includes all dryland training conducted on roller skis, roller blades (in-line skates) and scooters.
- ❑ **General Guidelines.** The following guidelines describe the procedures to be adopted by CCC members at all times when roller skiing:
 - ✓ Think safety first.
 - ✓ It is the responsibility of the individual to ensure that he/she possesses the skills to roller ski safely in the selected terrain. It is also the responsibility of the individual to ski in a safe, non-hazardous manner.
 - ✓ Choose terrain that matches ability. Avoid areas with steep downhill, stop signs at the bottom of hills, railroad crossings, potholes or other hazards.
 - ✓ Wear protective clothing. A hard-shell, regulation helmet (ANSI, CSA or Snell) is mandatory. Inexperienced roller skiers should also wear leather-palmed gloves, wrist guards, knee pads and elbow pads.
 - ✓ Ski under control. If in doubt, walk down steep hills or intentionally fall before reaching an unsafe speed.
 - ✓ Do not wear “iPods” or other electronic devices that will decrease your ability to hear and react to any situation that may occur.
- ❑ **Roller Skiing on Public Roads.** The following guidelines describe the procedures to be adopted by CCC members when roller skiing on roads that are also being used by automobile traffic:
 - ✓ If roller skiing must be conducted on public roads, select roads with minimal traffic. Roads with wide shoulders are preferable.
 - ✓ Refrain from roller skiing where the practice is prohibited by law. In such situations, work through your Club or Division to negotiate road closures for periods set aside for roller ski training.
 - ✓ Roller ski when traffic is light and visibility is good. Do not ski when visibility is poor.
 - ✓ Obey the rules of the road. Skiers must adhere to traffic signals and posted signs.
 - ✓ Where possible, conduct technique sessions in areas with controlled vehicle access.
 - ✓ For time trials, competitions or similar events, on public roads where traffic is permitted during the event, put out large signs that say: “Caution – Roller Skiers Training. Drive Carefully” or similar warnings. If a large event is scheduled, it is desirable also to post marshals to warn motorists of the activity.





- ✓ Wear clothing that is light or bright in colour, in order to be more visible to motorists. The use of fluorescent clothing or vests is endorsed as an extra step that should be considered.
 - ✓ Roller ski only in a single file and on the right side of the road travelling with the traffic, like a bicycle, or as required by local regulations.
 - ✓ Scan the road for traffic and maintain situational awareness at all times, creating time to react to traffic as it approaches.
 - ✓ When being passed by a car, yield as much room as possible. If practising skating technique, switch to classic as a vehicle passes so as to take less room on the road.
 - ✓ Be polite to drivers. A good relationship and good reputation with those with whom roller skiers must share the road is an important element in ensuring safety and protecting the privilege to use roads and highways for this purpose.
- ❑ **Insurance Implications.** The adoption by CCC of this policy has important insurance implications. Lack of compliance with the guidelines contained in this policy on the part of CCC members engaged in roller skiing may result in a breach of the CCC insurance policy and liability coverage may be denied.

8.1.2 Bicycling

Bicycling is a popular form of physical activity and transport. Between 86% and 90% of Canadian children aged 10 to 14 are cyclists. Once your cross-country ski program begins to include dryland activities (practice sessions, camps, etc.), it is inevitable that you will have to consider this form of off-season exercise and how you want to deal with it. Knowing how to incorporate cycling into your program SAFELY is therefore essential information for every cross-country ski coach.

Incidents causing injury are understandable, predictable and up to 90% preventable. The most frequent causes of bicycle incidents causing injury are:

- ❑ Loss of control – due to hitting a rut, bump or loose gravel, riding double, stunt riding, a foot slipping from the pedal.
- ❑ Mechanical problems – brake failure, changing gears, chain slippage, loose pedals.
- ❑ Entanglement – feet, loose clothing, packages, etc. get caught in wheels or chains.
- ❑ Cyclist ignorance – of safety practices and traffic laws.

It is important for you and the other administrators/coaches working with your program to have a plan as to when and how you want to include bicycling activities. Together you should determine what the safety rules will be, which roads are acceptable to use, which roads are out-of-bounds, etc.





Insurance Implications

It is also important to learn the limitations of your club's CCC liability insurance policy. Does it include "road cycling" for training purposes and for recreational purposes? Does the insurance coverage extend to off-the-road "mountain biking" training activities and off-the-road "mountain biking" recreational activities? Does it matter which type of bike you use in these different scenarios? Each year, before undertaking cycling activities, you should check with your club officials to determine what restrictions apply. Lack of compliance with standard safety precautions and the insurance policy guidelines may result in a breach of the CCC insurance policy and liability coverage may be denied.

YOUR BIKE INJURY FACT SHEET

- Over 100 Canadians die each year from bike injuries. Children aged five to 14 account for about half of these deaths.
- Every year, over 50,000 children are seriously injured in bike related mishaps.
- Survivors with brain injury may suffer seizures, intellectual and memory impairment and personality changes.
- The human skull can be shattered by an impact of 7-10 km/hr, and children's skulls are more vulnerable than adults.
- A fall from 60 cm (two feet) can cause permanent brain damage; a fall at a speed of 20 km/hr can result in death.
- Head injuries account for 75% of all deaths from bike injuries.
- 85% of bike injuries **do not** involve a motor vehicle.
- 85% of incidents between cyclists and cars are due to rider error.
- Only 2-11% of bicycle riders always wear a helmet.
- Wearing a bicycle helmet reduces the risk of head injury by 85% and of brain injury by 88%.**

8.1.3 Heat and Humidity

As your athletes get older and their fitness requirements increase, your ski program will extend further into the summer months. Knowing how to exercise safely during that period should therefore become an important part of the knowledge base of coaches working with cross-country ski programs for athletes in the Learning to Train stage and older.





The information contained in this section will help you implement training and competition practices that will reduce the risk of injuries related to heat and humidity.

The Challenge of Exercising in the Heat

- During exercise, the muscles produce heat. This heat must be dissipated or the body runs the risk of overheating. Overheating can result in serious, potentially life-threatening injuries.
- Sweating is one of the heat-dissipating mechanisms of the body. When sweat evaporates, it cools off the body.
- Most sport activities lead to heat production and sweating. Evaporation of sweat works best when the air is dry. In moist, damp air, sweat cannot evaporate easily, and cooling off is harder.
- If the air temperature is high during vigorous activity, athletes can lose a significant amount of water through sweating.
- High temperatures and high relative humidity make it hard for the body to dissipate heat; heavy sweating occurs, but the water loss does not help cool off the body. Under these conditions, athletes run the risk of overheating.
- Water loss as a result of heavy sweating can lead to dehydration. Dehydration can reduce performance, decrease the body's ability to dissipate heat and endanger health.
- During exercise in the heat, adequate hydration is a must. Athletes must drink water whenever the risk of dehydration is present.
- Thirst is not a good indicator of a need for water. In fact, dehydration has already started if an athlete feels thirsty.
- In most exercise conditions, the rate at which athletes lose water exceeds the rate at which they can absorb it by drinking. Exercise in a hot environment accentuates this.
- Athletes therefore need to drink fluids before they are thirsty.
- Because their sweating mechanism is not fully developed, children run a higher risk of overheating when exercising in the heat. In addition, children tend to not drink enough during exercise, especially if the drink is not flavoured.

Steps to Take to Avoid Heat Injuries

- Give athletes enough time to get used to the environment they will face in competition.
- Insisting on heat acclimatization may mean not entering competitions or adjusting duration and intensity of training if athletes cannot train in a similar climate for approximately two weeks beforehand.





- ❑ To protect athletes (especially young children) from the potentially harmful effects of ultraviolet (UV) rays, have them do the following:
 - ✓ Wear clothes that cover the upper part of the body, the neck, the arms and the legs.
 - ✓ Use sun screen lotion (protection factor of 30 or more) on exposed skin, including the face and hands.
 - ✓ Avoid exposing their body to the sun without effective protection when the UV index is high.
 - ✓ If possible, train in the shade.
- ❑ Before exercise, athletes should drink 400 to 600 ml of fluid.
- ❑ During exercise, athletes should drink 150 to 250 ml of fluid every 15 minutes. Remind athletes to drink, lead by example, and never restrict athletes from drinking during a practice or competition.
- ❑ After exercise, athletes should re-hydrate by drinking as much fluid as thirst dictates; athletes may have to force themselves to drink.
- ❑ Beverages should be cool (8° to 10°C) and not excessively sweet (children prefer flavoured sport drinks, and using them encourages children to drink).
- ❑ Tell athletes to bring a personal water bottle with cold fluids to each practice or competition; inform parents about the importance of hydration; make sure each bottle is clean and well identified.
- ❑ Tell athletes to monitor their hydration level by checking their urine. If it is dark, if there is not much of it, and if it has a strong smell, athletes are probably dehydrated and should force themselves to drink.

Note: Pay particular attention to these steps during the first few hot days of spring or summer, when athletes are not yet acclimated to hot and humid weather.

The Humidex

- ❑ The humidex is a useful guide to assessing the risk of exercising in hot and humid conditions.
- ❑ The humidex describes how hot and humid weather feels to the average person.
- ❑ The humidex combines the temperature and humidity into one number to reflect the perceived temperature.
- ❑ Because it takes into account both heat and humidity, the humidex provides useful information about the risks of exercising in the heat.





- ❑ The table below shows the humidex value for various air temperatures and levels of relative humidity. For instance, if the air temperature is 25°C and the relative humidity is 70%, the humidex is 32°C. This means that the sensation of heat when it is 25°C and the relative humidity is 70% is about the same as when it is 32°C and the air is dry (20% relative humidity).

		Relative Humidity (%)																		
		15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
Air Temperature	20						20	20	21	22	22	23	24	24	25	25	26	27	27	
	21						21	22	22	23	24	24	25	26	26	27	28	29	29	
	22						22	22	23	24	25	25	26	27	27	28	29	30	30	31
	23						23	24	24	25	26	27	28	28	29	30	31	31	32	33
	24						24	25	26	27	28	28	29	30	31	32	33	33	34	35
	25				25	26	26	27	28	29	30	31	32	33	33	34	35	36	37	
	26				26	27	28	29	30	31	32	33	33	34	35	36	37	38	39	
	27				27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
	28			28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	
	29			29	30	31	32	33	35	36	37	38	39	40	41	42	43	45	46	
	30			30	31	33	34	35	36	37	39	40	41	42	43	44	46	47	48	
	31			32	33	34	35	37	38	39	40	42	43	44	45	47	48	49	50	
	32		32	33	34	36	37	38	40	41	42	44	45	46	48	49	50	51	53	
	33		33	34	36	37	39	40	41	43	44	46	47	48	50	51	53	54	55	
	34		34	36	37	39	40	42	43	45	46	48	49	51	52	53	55	56	58	
	35		36	37	39	40	42	43	45	47	48	50	51	53	54	56	57	59		
	36		37	39	40	42	44	45	47	49	50	52	53	55	57	58	60			
37	37	38	40	42	44	45	47	49	51	52	54	56	58	59						
38	38	40	42	43	45	47	49	51	53	54	56	58	60							
39	39	41	43	45	47	49	51	53	55	57	59									
40	41	43	45	47	49	51	53	55	57	59										

Guidelines for Exercising at Different Humidex Values

The guidelines below are provided for a heat-acclimated, well-hydrated person. If the humidex is above 30°C, and especially if it exceeds 35°C:

- ❑ Tell athletes to bring extra water or sport drinks, ensure there will be access to water during the practice or competition, and bring a big jug of fluids.
- ❑ Tell athletes to dress in loosely fitting, lightweight, light-coloured clothes.
- ❑ Plan for low-intensity activities.





- Plan for shorter work bouts, with frequent and longer pauses.
- Schedule practices early in the morning or during the evening; avoid the hours between 10 AM and 6 PM.
- Consider changing the location of the practice to a shaded area, or ask athletes to bring umbrellas to create shade during breaks.
- Consider exercising indoors, in a facility with air conditioning.
- Consider alternatives to physical exercise.

Humidex Value	Discomfort at Rest	Risk of Overheating During Exercise
Below 24°C	None	Low to moderate
25 to 29°C	None	Moderate
30 to 39°C	Some	High – Children should be monitored closely
40 to 45°C	Great	Very high – Exercise is not advised for children, older people, or individuals with a poor fitness level
Above 45°C	Great risk of overheating even at rest	Extreme – Exercise is not advised for any athlete

8.1.4 Head Injuries and Concussions

Head injuries and concussions can occur in any sport, either in practice sessions or during competitions. Because of the potentially serious consequences of injuries to the head, coaches must take certain safety precautions to help prevent such injuries and enforce strict safety procedures if injuries do occur.

The information contained in this section is not designed to train coaches on how to implement a medical treatment or to offer medical advice if a concussion occurs. Rather, its purpose is to provide some recommendations on *how to manage situations involving head injuries in a responsible manner*. It is important to note that there is currently a lack of consensus in the medical community regarding precise grading scales and criteria for returning to training or competition following a concussion.

What Is a Concussion?

A concussion is an injury to the brain that results from a blow to the head or to another part of the body that allows the transmission of impact forces to the head. A concussion manifests itself as a temporary alteration in mental state; it may also be accompanied by physical symptoms.





Some Common Causes of Concussions

The situations that may result in head injuries vary greatly from sport to sport. Producing a comprehensive list of possible causes is therefore difficult. However, some common causes include:

- Direct blows to the head, face, jaw or neck.
- Collisions from the blind side or hits from behind.
- Hard fall on the buttocks or a whiplash effect.
- Poor quality of protective sport equipment (shock absorption), failure to wear protective head equipment or improper adjustment of such equipment.
- The environment (e.g. obstacles near a playing surface).
- Significant differences in the skill level, age or size of athletes involved in activities with physical contact or risk of impact.
- Poor physical condition or insufficient strength in the neck and upper-body musculature.

The following information is presented as a series of guidelines only. Head injuries must be treated by a qualified medical professional.

Symptoms of a Concussion

Symptoms of a concussion include headache, dizziness, loss of consciousness, nausea, lethargy, memory loss, confusion or disorientation (lack of awareness of time, place, date), vacant stare, lack of focus, ringing in the ears, seeing stars or flashing lights, speech impairment, balance impairment and problems with sight. Other signs may include a major decrease in performance, difficulty following directions, slow responses to simple questions and inappropriate or unusual reactions (laughing, crying) or behaviours (change in personality, illogical responses to sport situations).

Managing an Athlete with Symptoms of a Concussion

Take the following short-term measures if an athlete suffers a concussion:

- Arrange to have an unconscious athlete with significant changes in mental state following a head injury transported to the emergency department of the nearest hospital by ambulance. This is a serious situation, and the athlete *must be seen by a medical doctor immediately*. In such a situation, the *Emergency Action Plan (EAP) must be implemented*.
- Do not allow an athlete showing *any* symptoms of a concussion to return to the current practice or competition.





- ❑ Do not leave an athlete showing symptoms of a concussion alone, and make sure that he or she is monitored for any deterioration in his or her condition. The athlete should be medically evaluated as soon as possible after the injury. The circumstances of the injury should be recorded and communicated to the medical personnel.
- ❑ If any of the symptoms of concussion reoccur, the athlete's condition should be considered serious, and the individual *must* go to hospital immediately.

A person can suffer from a concussion without losing consciousness.

Managing an Athlete's Return After a Concussion

Although an athlete may have received authorization to return to regular training and competition, this must be done gradually. The athlete must be re-evaluated periodically during the weeks that follow his or her return to ensure that there are no recurring symptoms.

Listed below are a series of steps to help coaches manage the return to training or competition of an athlete who has suffered a concussion. Each step should take at least one day, although each step may be longer or shorter depending on individual circumstances (Step 5 applies predominantly to sports that involve body contact).

- ❑ **Step 1:** No activity - complete rest; if no symptoms are observed for one full day, proceed to Step 2.
- ❑ **Step 2:** Low-intensity continuous exercise, such as walking, jogging or cycling on a stationary bicycle; if no symptoms are observed, proceed to Step 3.
- ❑ **Step 3:** Low-intensity, sport-specific activity without contact; if no symptoms are observed, proceed to Step 4.
- ❑ **Step 4:** Moderate-intensity, sport-specific training activities without body contact; if no symptoms are observed, proceed to Step 5.
- ❑ **Step 5:** Regular practice with body contact if it is required by the sport (no hard impact); if no symptoms are observed, proceed to Step 6.
- ❑ **Step 6:** Return to regular training and to competition.

If symptoms do recur, the athlete must *immediately* stop any form of activity and be examined by a medical doctor before resuming training or competition. It is extremely important for the athlete, the coach and the medical personnel to be open and frank when evaluating the athlete's condition. If recurring symptoms are not disclosed, the athlete may suffer permanent damage.

Repeated Concussions

Some data suggest that after a first concussion, athletes are at greater risk of future concussions. If an athlete has a history of repeated concussions, he or she should participate in sport activities only after obtaining *full clearance* to do so from a medical professional.





8.1.5 Exercising With Asthma

Improved physical fitness will help reduce the severity of asthma in most people, because the lungs and heart don't need to work as hard when trained. Therefore, it is important for an individual with asthma to maintain a good level of fitness! However, if one of the children registered in your program is asthmatic and intends to begin exercising in that setting, the asthma should be under control before he/she starts.

Although many young athletes may be seen using inhalers, sport participation does not cause asthma in children.

What Is Asthma?

- Asthma** is a common respiratory problem that affects about 10% of the population. It is characterized by shortness of breath. This is due to the contraction of the smooth muscle around the airways.
- Exercise induced asthma (EIA)** is an asthmatic attack triggered by exercise. The cooling and drying of the respiratory tract when moving large amounts of dry air during intense exercise is considered to be the main cause, and it can occur from five minutes to six hours after exercise. Because of this, cross-country skiers are at high risk. Approximately 80% of asthmatics experience EIA, whereas only 2-3% of the non-allergenic population experience EIA.

What Are the Symptoms?

- Coughing, wheezing or shortness of breath - more than you would expect for the level of exertion.
- Shortness of breath, worse near the beginning of intense exercise (the first 15- 20 minutes). This shortness of breath may lessen as the exercise continues.
- Shortness of breath is usually worse when breathing cold, dry air than warm, moist air.

If the child has EIA experiences only, pre-exercise treatment is usually sufficient. However, if the child has mild asthma whose symptoms are intensified due to exercise, he/she will likely need daily anti-inflammatory therapy *in addition* to pre-exercise treatment.

Suggestions That May Help Your Asthmatic Athletes

- Inhale a bronchodilator (e.g. Ventolin, Berotec, Pro-Air) or a bronchial anti-inflammatory (e.g. Intal, Fivent, Tilade) about 15 minutes prior to exercise.
- When beginning an exercise session, perform a prolonged, gradual warm-up, with a low heart rate, and increase the intensity slowly. A good warm-up is essential.
- Breathing through a balaclava, mask or scarf will humidify the air slightly on very cold, dry days.
- On very cold days, delay high intensity workouts to a warmer part of the day, or miss that session.





- ❑ Avoid exercising at times of day or in locations where pollutants or pollens are at their maximum.
- ❑ When preparing for a competition, do an extended warm-up, with a gradual increase in intensity and with vigorous exercise at the intensity just below your maximal exercise level (short-term burst activities like sprints are thought to intensify EIA more than steady-state exercise).
- ❑ Taking two grams (2000 mg) of Vitamin C one hour before a competition may provide some protection against an asthma attack.
- ❑ If post-exercise attacks are a problem, asthmatic athletes should develop a post-event strategy together with you to ensure timely use of their medication. Someone who knows how to use the “puffers” should be waiting at the finish line and be free to stay with them for a period of time following the event. Explain to them that it is not sufficient to leave the medication in the car or with an official who is not free to drop everything if they are having an attack.
- ❑ Many “puffers” do not work well if they have been outside in the extreme cold for long cold periods. Treat them like video camera batteries and keep them warm.
- ❑ After a workout or a competition a lengthy graduated warm-down provides a slow warming down of the airways, which lowers the risk of EIA. An abrupt stop may cause asthma symptoms to return.

Note: Competing on very cold, dry days should be undertaken with caution. Susceptible athletes should always take the precautions mentioned above, and in addition they should be encouraged to balance the importance of the event with their long term health, and to make their decision with care.

Disclaimer: This information is designed to aid coaches in managing asthma-related symptoms during exercise in cold weather. It is not a substitute for qualified medical advice. If your athletes experience asthmatic conditions before, during or after skiing, encourage them to seek medical advice without delay.

8.1.6 Cold Weather and Competitions

In most regions of Canada severe cold weather can occur when a competition is being held. Because of the potential risk involved, coaches should (1) prepare their athletes for this possibility in advance, and (2) take certain precautions when dealing with such situations.

Developing athletes don't usually have access to the high tech clothing that can provide them with the best protection from the cold. Most young athletes cannot afford clothing of this kind if they are going to outgrow it in a year, and as a result this age group may often be more vulnerable to severe weather conditions than adults.

To help you educate your athletes the following list has been developed for a handout.





Cold Weather Tips for Your Athletes

The following guidelines will help your athletes deal with conditions of extreme cold weather:

- Don't be afraid to wear extra clothing during a competition. In cold weather conditions, vests can be an important addition and it may also be reasonable to wear two layers of synthetic (polyester) underclothing. Balaclavas and neckwarmers may be warranted as well. Wear a warm hat and replace racing gloves with warmer mitts. Even older athletes at high level events may choose to compete with warm ups on, especially if there are long fast down hills and windy sections along the course.
- Male skiers should always consider wearing windproof underwear if they are wearing a lycra racing suit.
- Creams, lotions and jellies can reduce the direct exposure of the skin to the air. However, to be effective they must not have a water base. Many athletes have had success with petroleum jelly and Dermatone.
- Ski glasses/goggles can keep the wind out of your eyes, but they can also cause a “wind tunnel” effect on other parts of your face. For eye comfort, blink more often than usual. This is particularly true if you wear contact lenses.
- Individuals have a different tolerance to cold weather. Consider this when you make your decision on what to wear, or whether to enter the competition or not. For more information on exercise induced asthma in cold weather conditions refer to section 8.1.5 above.
- If you are 10 years of age or younger and the temperature is going to be colder than -15C at start time, you should seriously consider not entering the race.
- Take extra care that your nutritional needs are met on the morning of the race.
- Bring extra foods and fluids to the race site in case there is a delay.
- Ensure that your warm-up is done correctly. If you are following a proper warm-up routine you should be physically prepared for your race and able to ski at the appropriate pace right from the start. Regardless of the temperature, the “feeling” should be the same. What changes as the temperature drops is how the warm-up is done to get and maintain this “feeling”. Typically a good warm-up increases the core temperature, uses muscles and techniques at the intensity level required during the race, and sets the appropriate arousal level without your being fatigued at the start. On a cold day you may wish to cut the warm-up short because you are afraid of becoming cold. However, your warm-up should be long enough and intense enough for you to break into a sweat. To maintain this warmed up state, you need to minimize the amount of time you are in damp or wet clothing. In these conditions a well-prepared athlete will put on dry gloves/mitts and hat after the warm-up and before the start.
- In these conditions you should change at least your gloves and hat, and other clothing as well if you can, as soon as you have completed your race and before you do your warm-down.





- ❑ Keep in mind that cross-country skiers are at risk in cold weather situations because exhaustion and dehydration are both influencing factors with respect to hypothermia. In such conditions, it is especially important to do your warm-down with another skier. You could be unaware of your condition and put yourself at risk by skiing onto an unused part of the course alone.
- ❑ Take responsibility for your own safety.

Cold Weather Considerations for Race Officials That Coaches Should Know

- ❑ The basic considerations for determining postponement, alteration or cancellation of a competition are:
 - ✓ temperature;
 - ✓ wind;
 - ✓ the duration of exposure;
 - ✓ shelter, clothing and other protection against the cold; and
 - ✓ the ability of the organizers to meet the extra demands required to ensure the safety of everyone involved.

Did You Know???

Races

303.2.2: With air temperatures below -20C (temperature measured at the coldest point of the course and without wind factor) and competition distances less than or equal to 15 km, the Jury must postpone or cancel the competition. With competition distances greater than 15 km and temperatures less than -18C without wind factor, the Jury must postpone or cancel the competition.

With any difficult weather conditions (eg. strong winds, high air humidity, heavy snow, icy track conditions), at any air temperature, the Jury may, on consultation with the Team Leaders of the participating teams and the doctor responsible for the competition, postpone, cancel or shorten the competition.

Loppets

387.2.1: Between -15 and -25C, recommendations regarding cold weather protection should be made available to the participants. Under such conditions it is the responsibility of the participants to seek the information and to follow the recommendations given by the organizer.

387.3.1: If the temperature in a major portion of the course is -25C or below, the competition shall be delayed or cancelled.

Excerpts for Canadian competitions from CCC Rules & Regulations (2006)





- ❑ Always take into consideration the age and experience level of the field of skiers when determining whether to alter or cancel a competition. The rules that govern “races” were established for experienced, healthy elite athletes at high level competitions. -20C is the coldest temperature at which you can hold the event. Under some circumstances, modifications or cancellation should occur at temperatures warmer than -20C.
- ❑ Adequate controls must be established to insure the recommendations are being followed and the health and safety of competitors are protected.
- ❑ It is possible to have a situation where it is best to cancel the events for athletes ten years of age and younger, shorten the distances for remaining athletes 18 years of age and younger, and retain the events originally scheduled for older athletes. For example, if the temperature is between -15C and -20C, whether other factors such as wind chill are involved or not, you may wish to shorten some distances (i.e. a 5 km event for Juveniles could be shortened to 3.5 km), while retaining the original distances for the adult categories. Or, you may choose to shorten the distances for all age groups.
- ❑ The Jury has the option of delaying the start time if it appears that the temperature will rise to an acceptable level later in the day. This decision can create new problems, however, and should be carefully thought through. It is possible that skiers will be at greater risk skiing at -19C after an extended period of repeated delays, (i.e. 2-3 hours) than they were at -21C two or three hours earlier.
- ❑ Some additional factors to consider before delaying the start time would be:
 - ✓ Is there adequate shelter for all the competitors close by the staging area, or will they be cramped into crowded, humid vehicles for an extended period of time with no place to change their clothes before they compete?
 - ✓ Will there be food and fluids available at the race site that all the competitors can access? For example, athletes may have traveled two or three hours to get to the race site that morning and they may not have the extra refreshments they will require for a lengthy delay. They may never have been to this race site before and they may not have been aware that refreshments were not available at the site.

Each of the above could influence how well the athlete handles the cold temperature when the race finally does get underway.

- ❑ If there is any possibility of a delayed start, enough advance warning must be given to the coaches and athletes to allow them to make appropriate decisions regarding warm-up routines.
- ❑ Ensure an adequate supply of wool blankets and refreshments (drinks prepared at the correct temperature!) at the finish line.
- ❑ Station someone trained in First Aid at the finish line. Have them (1) check each athlete for frostbite, and (2) ask each athlete a few questions to check out their responses.





- ❑ One of your greatest frustrations will be the variations in the temperature readings between one thermometer and another. Long before you host your event select a reliable model and purchase enough of them to cover all the bases.
- ❑ Don't hold the competition unless you are prepared for the conditions!

8.1.7 Backcountry Skiing

The following article by Knox Williams offers eight steps to help you discover that skiers can ski the backcountry safely, provided they take the time to learn about the activity first.

Into the Backcountry

You live in a part of the world that has splendid scenery. You take advantage of every opportunity to get outdoors. Of the seasons, you love winter the best. You would like very much to take up backcountry skiing.

But there are inherent risks, and you don't know how to get started – safely!

I have been in the avalanche business for 25 years, and I have read far too many avalanche articles that seem to have one purpose, to scare the reader. This article is different. I am going to give you an eight-step plan for learning about avalanches *so that you will understand and respect them, not fear them*. Learning respect should be your goal, because you then have the knowledge and confidence to travel where you like with a good idea of what the real risks are.

“All the avalanche experts are dead”, I was told when I first began my avalanche education (and didn't know an avalanche from a snowball). That's bunk! I didn't believe that then, and I certainly don't now. You don't have to die in an avalanche, or be scared badly enough to wish you were dead, to have avalanche savvy. However, you will have to work at learning about snow and avalanches before you gain the confidence to judge the risk and make a “go or no go” decision.

Like life, avalanche education is “hard by the yard, but a cinch by the inch”. What I mean by this is don't try to swallow the whole avalanche pill of knowledge at once: it will choke you. Rather, take your education in small doses; it will eventually develop into a clear picture. You will discover two things on your quest for knowledge. First, attaining an avalanche education is a life-long endeavor. No matter how much you learn, every winter will bring new revelations and challenges. Second, *you will be studying in the most wonderful classroom on this planet – the lofty domain of mountains*.

With this in mind, here are my “eight steps to reducing your avalanche risk.” Some involve time and work on your part, and others are offered as simple tips, but taken altogether, they are guaranteed to improve your odds in a risky situation.





- ❑ **Step #1. Get Smart!** The smart first step is to learn from the avalanche experts. This will take a commitment of time and effort on your part. Let's divide the task into three parts:
 - ✓ First, do some reading. There are several good and entertaining books available. Four of the best are: "The ABC of Avalanche Safety" by E. LaChapelle; "Snow Sense: A Guide to Evaluating Snow Avalanche Hazard" by J. Fredston and D. Fesler; "Avalanche Safety for Skiers and Climbers" by T. Daffern; and "Staying Alive in Avalanche Terrain" by B. Tremper. These are carried by large bookstores and all good outdoor recreation stores.
 - ✓ Second, check out the videos on avalanche safety. Three that I recommend are: "Avalanche Awareness: A Question of Balance"; "Winning the Avalanche Rescue: Not a Second To Waste"; and "Avalanche Rescue Beacons: A Race Against Time". These are available for sale or rent at most outdoor recreation stores.
 - ✓ Third, wherever available, take an Avalanche Awareness Course. For more information on courses, including Online Avalanche Courses, contact the Canadian Avalanche Association (CAA) web site at <http://www.avalanche.ca>.
- ❑ **Step #2. Call the Hotlines.** There is a toll free hotline (1-800-667-1105) for you to call to get the latest information on mountain weather, snow and avalanche conditions. This is updated daily, seven days of the week, from November through April.
- ❑ **Step #3. Identify Avalanche Terrain.** Avalanches run repeatedly year after year in the same areas - slopes called avalanche paths. Avalanches most often start on slopes of 30-45 degrees but sometimes start on slopes as shallow as 25 degrees and as steep as 50 degrees. Knowing the slope angle is "rule number one" in recognizing avalanche terrain, for once slopes angles reach 30 degrees, you are in potential avalanche terrain regardless of all the other factors.

Although many avalanches start on large open slopes near or above timberline, they can also start on smaller, low-elevation slopes such as gullies, road cuts and small openings in the trees. Avalanches seldom start in dense trees, but once started they can flow through moderately dense forest.

Finally, avalanches are more likely on slopes that face away from the prevailing wind. These "leeward" slopes collect snow that blows over the ridge. This snow builds into wind slabs and is more dangerous than the shallow, harder snow on the windward side of the ridge.

- ❑ **Step #4. Steal Nature's Signs.** Sometimes the snow shows clear and present danger signs of avalanche. The best clue is fresh avalanches, which tells you that some slopes have already stressed out and that others may be near breaking point. Also watch for snow that collapses beneath you or sends cracks shooting ahead. These are signs that the snow cannot hold you up. Some weather signs that the hazard could be worsening fast are heavy snowfall – more than one inch per hour – or strong winds creating blowing snow and snow plumes off the ridges.

Keep observing and evaluating all day long. Keep asking yourself these four questions: *Is the terrain capable of producing an avalanche? Could the snow slide? Is the weather contributing to instability? Is there a safer route?*





- ❑ **Step #5. Test the Snow.** Look for test slopes where you can dig snowpits and perform stress tests. A test slope is a small, steep slope – preferably 30 degrees or steeper – where you will not be in danger of causing an avalanche, but is near enough to a larger slope that you are concerned about. You can learn all about snowpits from one of the books listed above or from an avalanche course, but your procedure should be something like this: with your shovel, dig a hole several feet wide and four to five feet deep (or to the ground.) Smooth the pit wall and then look at and feel the snow for changes in layering, texture and strength. Next, perform several “shovel shear” tests, followed by a “rutschblock” test. These tests will answer many of your questions about the local snow strength. (It’s always good practice to fill in your snowpits afterward to keep someone else from skiing into them.)

There are other tests you can do on skis to test for unstable slabs. In a safe location on a small slope or on the very edge of a large slope, jump on your skis or do a quick ski cut on a steep traverse to see if you can make the snow fracture. Finally, if you are on a ridge above a steep slope, try kicking off blocks from a small cornice. Do so by very carefully stomping with one ski to cause a refrigerator-size block to fall onto the slope below. This test simulates the weight of one or more skiers on the slope without putting anyone at risk.

- ❑ **Step #6. Travel Smart.** There are several rules of backcountry travel that will help to minimize your avalanche risk. Here is a quick list:
 - ✓ **One at a time.** If your group comes to a slope that you are nervous about, only one person at a time should go onto the slope. Whether crossing or going up or down, do so one at a time while all others act as spotters from a safe location. This way, should an avalanche occur, there will be only one victim and lots of rescuers.
 - ✓ **Avoid the center.** The greatest danger on any steep slope comes when you are in the middle of it. Should an avalanche break, you have no escape route. So avoid the center of open slopes. Cross it at the very top or bottom. Go up it or down along the edges. These positions give you a much better chance to escape.
 - ✓ **Stay on shallow slopes.** You can always travel avalanche-free on slopes up to 25 degrees, and more than 95% of the time you are safe on slopes up to 30 degrees. To measure angles exactly, you should buy an inexpensive slope meter (about \$35 in mountain recreation shops.) One caution, however; be extra cautious whenever steeper slopes lie above shallow ones. Though avalanches won’t start on shallow slopes, it is possible that you could trigger an avalanche far above you, placing you in harm’s way.
 - ✓ **Should you travel alone?** While nothing may be so companionable as one’s self, there is no greater way to increase your avalanche risk than to travel alone. You have no one to save you from partial or shallow burials.
- ❑ **Step #7. Take Your Pulse.** In other words, check your attitude! It can get you in trouble. Are you so goal-orientated – to climb this peak or ski that bowl – that you are willing to take unwarranted risk? Are you so close to reaching your goal that you overlook clear and present danger signs? Are you letting group dynamics or peer pressure cloud judgment? Are you letting haste or fatigue get you in trouble? To prevent accidents from happening, you must control the human factor in your decision-making.





❑ **Step #8. Be Ready for Rescue.** Thousands of skiers, climbers and snowmobilers have triggered avalanches and lived to tell about it. After all, statistics show that for every 15 people caught one will die while 14 will live. Some people were just lucky; the avalanche spit them out at the last moment. Others lived because they did things that helped. There are three parts to the rescue equation that will reduce your risk: what equipment to carry; what to do if you are caught; and what to do if a friend is caught.

- ✓ **Rescue gear.** A small shovel and an avalanche rescue beacon are two items that everyone who goes into steep terrain should not be without. The beacon makes for a quick find of a buried victim, and the shovel is absolutely necessary for digging avalanche debris. Most avalanche victims cannot survive a burial of 30 minutes or longer, and beacons and shovels are the best way for quick recovery.

Modern avalanche beacons are expensive, more than \$300 each, and it takes at least two to make the system work, but it is the best investment you can make for your personal avalanche safety. After you buy a beacon, you'll need to practise with it to become a good rescuer. This kind of practice is a lot of fun.

- ✓ **If you are caught, what can you do to improve your odds of survival?** It's always best to avoid getting caught in the first place, for the speeds and forces that avalanche victims are subject to can cause severe harm even if the group is prepared for rescue. Still though, there are things you can do.

Many victims survived because they were able to escape to the side. Others were able to grab a tree. Many others, once swept downhill, were able to swim with the moving snow, similar to body-surfing in the ocean. This may let you end up on top. If you can't make it to the surface, try to make (before the avalanche stops) an airspace in front of your face, which will give you breathing space. If all goes well, your companions will find you quickly with their beacons.

- ✓ **If a friend is caught, what can you do to hasten a speedy recovery?** Watch the victim on his descent. Go immediately to the last-seen area and search downhill from there. Turn your beacon, search for surface clues and probe debris. Do not abandon the search too soon or send searchers out for additional help. You are the buried victim's best chance for survival.

So there they are, my eight steps for avalanche safety. To summarize, let's see how you can reduce your avalanche risk on a typical day tour. First, be prepared before you leave home. Armed with avalanche knowledge (#1) and the day's forecast (#2), and equipped for rescue and survival (#8), you have taken the first steps to avoid disaster. You probably started the day with a plan or goal; don't be afraid to change it if necessary (#7). Once in the backcountry, your tour will probably take you in or near avalanche terrain (#3). Right away, start looking for clues of unstable snow (#4), and whenever necessary, test the snow (#5). If there are obvious danger signs, don't go, alter your route. Without any clear and present danger, still proceed with caution (#6). If you follow these steps, you will never be caught off-guard.





8.1.8 Eye Protection

The depletion of the ozone layer has become a serious problem for the health and welfare of the world's population. As the ozone layer depletes, we are becoming more and more exposed to harmful ultraviolet (UV) radiation. This affects all parts of our bodies, including our eyes.

Some Facts About UV Radiation

- Reflections off the surface of the earth increase the effect of UV. Earth and grass reflect 5%, sand 17%, water 20% and snow 85%.
- Clouds and haze may actually increase the amount of radiation reaching the ground - although dark clouds may reduce it.
- UV radiation is almost 17 times worse in the winter and spring months than it is in the summer months.
- At noon, the amount of radiation is greater than it is at other times of the day.
- Altitude increases radiation. There is a 16% increase for every 1000 metres above sea level.

To protect your athletes from the potentially harmful effects of ultraviolet rays

- Wear a hat or cap with a visor.
- Wear eyewear with UV protection when participating in outdoor sports, and particularly in winter sports. You may wish to use polarized lenses as they remove reflections off the snow and are impact resistant.

Winter Eye Injuries

Other possible winter eye injuries include:

- Freezing of the cornea.** This is caused when an athlete who is not wearing protective eyewear tries to keep his/her eyes open during a strong, cold wind.
- Eyelashes freezing together.**
- Snowblindness.** This is caused by the effect of the sun on snow. It can be prevented by good sunglasses with side shields, or goggles. It is just as necessary on cloudy or overcast days as it is in full sunlight when an athlete is on the snow. Snowblindness can even occur during a snow storm if the cloud cover is thin.
- Contact with a ski pole.** Mass start races, sprint races, the exchange zone in relay events and some games/exercises used to teach ski skills may increase the risk of eye injury. In these situations wrap-around eye protection is recommended.





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**SECTION 9 – SKILL DEVELOPMENT – DRYLAND
TECHNIQUES**





Incorporating sport-specific off-season (dryland) activities such as ski walking, ski striding and roller skiing into your athlete development program helps prepare your skiers for the winter season. As such, these activities form an important component of a complete seasonal plan for cross-country skiing.

9.1 Introduction to Ski Simulation Exercises

9.1.1 Introduction to Roller Skiing

Young athletes are introduced to roller skiing for the purpose of improving their ski technique and developing basic roller ski skills that they can build on in the future. When introducing this new activity you may wish to educate both the athlete and their parents on the principal objective at this stage and to explain to them that it should not be used as a “training method” before the athlete enters the Training to Train stage.

For those athletes that pursue excellence, roller skiing will become an essential, specific, all round training method, and skiers in the Training to Compete and Training to Win stages may use it for up to 50% of their off-season training. With good skills, these athletes can do strength, sprints, distance and technique work - all on their roller skis.

Understandably it takes practice for an athlete to achieve a good level of competency and there are progressive steps beginners should follow when they first start out in order to ensure their safety and long-term success with this activity. Following are guidelines to help your athletes get started the right way.

- Young athletes can be introduced to roller skis before the end of the Learning to Train stage.
- The activity should take place in group sessions under the supervision of a qualified coach.
- Initial roller ski sessions should be short in length (not more than 30-40 minutes) because beginners may develop shin pains the first few times they try it.
- Initial roller skiing instruction for young athletes should focus on skating technique. A good introductory roller ski is a light “skating” ski.
- Along with the mandatory helmet and a reflective vest, you may wish to encourage beginners to use elbow and knee pads. Train your athletes to put on their helmet before they put on their roller skis.
- Roller skiing should be introduced without poles.
- An empty paved parking lot is a good location for the first sessions. If that is not available, locate a stretch of smooth, paved flat road with as little traffic as possible.
- Initially the emphasis should be on the athlete establishing a personal comfort level. Begin with exercises they can handle. Simple agility courses can be set up to help the athlete develop skills that will provide them with a general sense of control, such as turning and





stopping. The next step is to work on balance, rhythm and coordination - skills that provide the foundation for good technique.

- ❑ Before athletes move on to more advanced technique work they should be familiar with all of the roller ski speed-control techniques. They should also be able to demonstrate the following – the ability to double pole with their hips forward on pole plant, to step turn, to control their speed by having one ski on a slower surface, to stop by going off the road surface, and to comfortably ski down moderate hills. It is important for the athlete to achieve a level of confidence where they can stand (put their full weight) on top of one ski.

Control Tips for Roller Skiers

- ❑ Control your speed in potentially dangerous areas, for example road intersections or areas with potholes.
 - ❑ To control or reduce speed, stand up straight – the increased wind resistance will slow you down. Do this before you pick up too much speed.
 - ❑ Begin with snowplowing – before you pick up too much speed.
 - ❑ Place one ski on a slower surface (gravel or grass) at the side of the road.
 - ❑ Take short, quick steps into the fall-line of the hill, thereby traversing the slope.
 - ❑ When turning, look in the direction you want to go (where you want to end up), not where your skis are pointed.
-
- ❑ Once these basics have been established, the technique focus should be on Two Skate and One Skate - with and without poles. When learning skating technique on roller skis, the skier should focus on the same technique cues they would on snow - balance, weight shift, powerful push off and full extension.
 - ❑ For initial technique instruction, use easy terrain that is flat or very gradually uphill, so that balance is more easily maintained. Steeper uphill should be avoided so that the skiers do not have to push too hard and can concentrate on technique elements. Downhills should be avoided as speed makes learning technique and balancing on roller skis more difficult; athletes should develop a degree of confidence before applying their skills to such terrain.
 - ❑ Encourage your athletes to focus on the proper execution of a technique, so that you are not correcting bad habits later.
 - ❑ Consider using a bike to teach roller ski sessions. This allows you the flexibility needed to observe all of the skiers in your group.
 - ❑ Encourage your club to purchase several pairs of roller skis specifically for the use of this age group. This will make it possible for all of the athletes in your group to try them out and learn some basic skills. It will also allow for some additional time for the athletes to determine whether or not they wish to make the level of commitment to the sport of cross-





country skiing that would justify the financial investment of purchasing their own roller skis and related equipment. When athletes have advanced to the T2T stage and they want to use the club skis on a regular basis (two or more times a week over an extended period) they should purchase their own equipment.

As mentioned above, the recommended development stage for introducing roller skiing as a “training method” is Training to Train. Refer to the Competition Coach Introduction (CCI) - Training to Train (Dryland) Reference Material for more information.

Roller Ski Tips for Your Athletes/Parents

- ❑ Lightweight roller skis are a must for young skiers. Heavy roller skis are too hard on the legs and can give an athlete back problems.
- ❑ When purchasing roller skis, first find out about the cost and availability of replacement parts for that particular model.
- ❑ Roller skis come in different speeds. It is important to ensure that the speed of the roller skis matches the terrain in which they will usually be used (ideally an athlete will use equipment that allows them to ski at a speed similar to that which they would on snow). Using lightning fast roller skis on easy terrain will do little to improve a skier’s conditioning.
- ❑ Speed reducers are useful for slowing down on downhill slopes.
- ❑ The wheels of roller skis should be checked regularly for excessive wear on one side - for example uneven wear caused by snowplowing. Each session the roller skis should be alternated from one foot to the other to encourage even wearing of the wheels.
- ❑ Be careful of paint lines on the road when it rains. These can be very slippery, as can wet leaves in the autumn.
- ❑ Proper maintenance can greatly increase the effective life of roller skis. Following are some guidelines to help achieve this:
 - ✓ Tighten all nuts before starting the workout.
 - ✓ Take wrenches and other necessary tools on long roller ski sessions.
 - ✓ Check your wheels before and after each workout.
 - ✓ The wheels should be lubricated with penetrating oil when they get wet.
 - ✓ Use a pocket-size diamond file to keep the carbide tips of the ski poles sharp. Use it after each outing, otherwise the tips will become too dull and will require a shop-based sharpening.
- ❑ Poles do not grip on the pavement as well as they do on snow, which can cause arm action to change. Special carbide pole tips help correct this problem, and so will skiing on new and warm road surfaces because they provide the best grip. Your athletes should ensure that the pole tip and handles are correctly aligned and sharp, and be careful to plant their pole so that the tip digs in properly. When they return to skiing on snow, they should be aware that they may have to adjust their pole action.

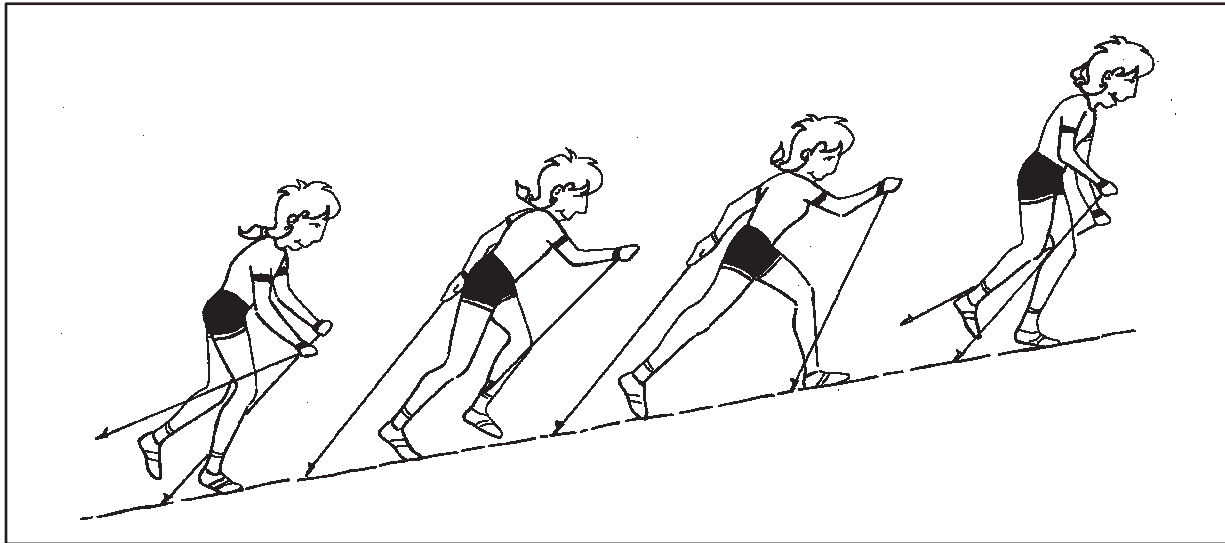




- ❑ Roller blading is problematic as an off-season activity for developing technique skills. Due to the manoeuvrability and generally high speed of roller blades, athletes using them are unable to simulate proper cross-country skiing technique.

Roller skiing is a good way to enforce good technique habits. It is also a good way to acquire bad habits. It is CRITICAL for you to pay close attention, ongoing, to your athletes' technique when they are roller skiing.

9.1.2 Introduction to Ski Walking



As with roller skiing, young athletes are introduced to ski walking and ski striding for the purpose of improving their ski technique and developing basic skills that they can build on in the future. When properly executed, these ski simulation techniques will look quite similar to techniques used on snow.

Ski walking is a dryland technique that is used to imitate the on-snow uphill Diagonal Stride technique (without the glide). Athletes should learn ski walking on a mild to moderately steep slope. Once learned, it can be used on steep inclines as well.

When ski walking, the push-off action from one leg begins as the second leg is being brought forward and the hips are falling forward. A side view of the skier during this phase would show the hips of the skier just in front of their toes at the point in time when their feet are together. It is the “falling” action of the upper body and the hips moving ahead of the toes before the push-off that allows the skier to have the powerful leg push that propels them both forward and up the hill (not up in the air), thus covering the greatest possible distance. When imitating the Diagonal Stride technique, skiers should not overextend their foot strike, as this will cause their hips to stay back and prevent them from executing a powerful push-off. As with the Diagonal Stride on snow, the front foot should land lightly reaching forward, with the toes pointing slightly up. The upper body should also be leaning forward.



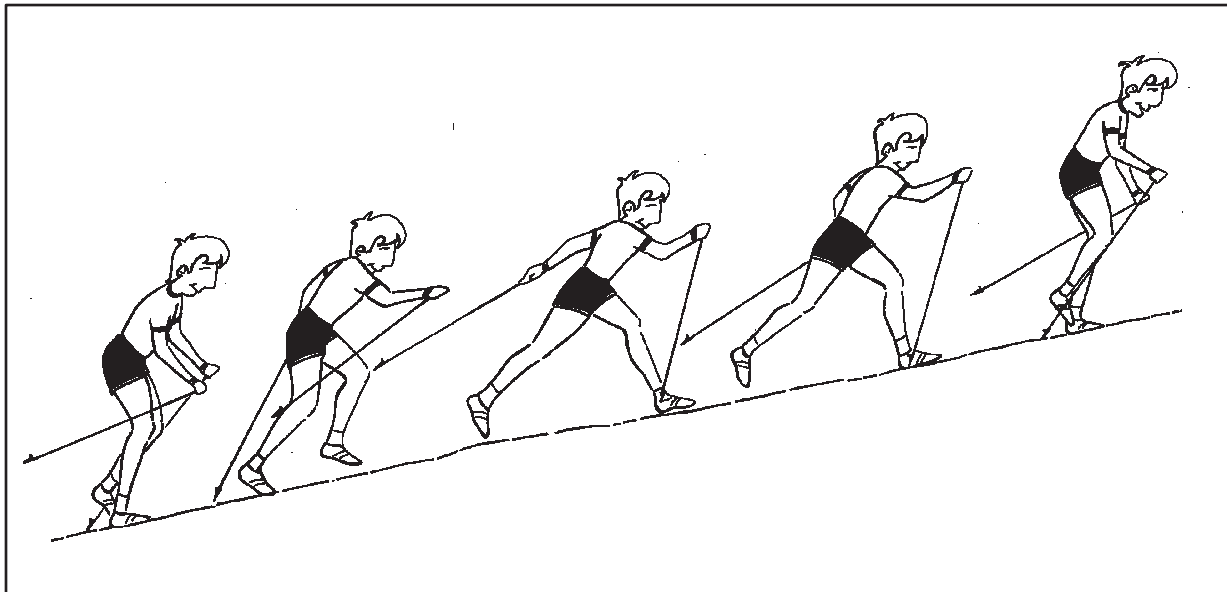


To execute a proper weight shift the skier needs to have his/her weight over their foot at the time when it lands (head over foot) and when the push-off phase is initiated. One common mistake is for skiers to have their hips too far back at the time of the push-off, causing them to propel themselves upwards rather than straight forward. To correct this problem, ask them to slow down their movements until they can “feel” that they are slowly falling forward when their feet are together and their hips are in front of their toes (before they initiate the push-off).

The poles used for both ski walking and ski striding should be shorter than those used on snow. The general rule for adult athletes is that they should be 7.5 to 10 cm shorter. The reason for this is that the glide phase in a Diagonal Stride cannot be reproduced fully in a dryland setting. Poles should not be introduced until the skier has become familiar with the technique. When they are introduced, it is important to emphasize the complete extension of the arm with every stride. When this is done properly, the skier will release his/her grip on the handle and extend their fingers back. Ensure the pole straps fit adequately to allow for the full extension of their fingers without losing the pole.

Children can be introduced to ski walking techniques (without poles) at the beginning of the Learning to Train (L2T) stage of development.

9.1.3 Introduction to Ski Striding



The basic difference between ski walking and ski striding is that ski striding is done with more intensity and has a flight phase where both feet are off the ground. Children should be introduced to ski striding (without poles) at the beginning of the L2T stage of development. Poles can be added once they have mastered the technique. Note that the purpose of ski striding at this stage of development is for teaching technique, not for doing intensity training.





REFERENCES

Cross Country Canada, *NCCP Level 2 Technical Manual - Cross Country Skiing*, 2005.

Niemi, A. *Ski Walking and Ski Striding Technique Illustrations*, 2007.

Getting Started with Rollers, Ski Cross Country, 1999, pp.15.



SECTION 10 – PLANNING A PRACTICE





This section on Planning a Practice complements the information provided in the Reference Material for Introduction to Community Coaching (sections 5.2, 7.3 and 7.4) and Community Coaching (sections 5.1.4, 6, and 10.3), and is directed primarily at supporting you in your role as a coach working with children in the Learning to Train stage of athlete development.

10.1 Introduction

10.1.1 Key Questions to Consider When Planning a Practice

When you are planning a practice there are key questions you ask yourself, such as:

- Who are my athletes?
- What are the logistics?
- What are the safety risks and how should I prepare for them?
- What skills/abilities should be trained at this stage?
- What am I trying to accomplish with my practice?
- How do I ensure the practice is challenging and therefore interesting to each participant?
- How will I organize my practice?
- How am I going to deliver my practice?

The purpose of this section is to provide you with materials that will assist you in answering these questions and to prepare you for successfully coaching children in the Learning to Train (L2T) stage of development.

10.1.2 Logistics Chart

Facilities/Equipment	Days/Times Available	Restrictions
Dryland		





On-Snow		
Indoors		





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Your Logistics Chart Checklist

- To what facilities do you have access (e.g. wax room, terrain park, hills suitable for downhill technique sessions, daylodge, ski area groomed for classic technique/skating technique, school gym for indoor exercises, safe paved area for roller skiing, lit trails, etc)?
- What restrictions are there on the use of the facilities and equipment you need (e.g. roller ski area is too flat, you have to share the only good lit hill with another group, the day lodge is too crowded, grooming is undependable, the lit trail loop is short, etc.)?
- On what days and at what times do you have access to the facilities you need (e.g. Tuesday, 7 PM - 9 PM)?
- What equipment do the athletes possess (e.g. skating and classic skis, roller skis, etc)?







10.1.3 Practice Planning Sheet #1 (sample)

Team/Program: _____ Date: _____

Location: _____ Time: _____ Duration: _____

Objective(s): _____

Equipment: _____

Activities Goals: Athletic abilities, type of effort, length, intensity, movements, etc.	Key Points/Messages Guidelines, Safety, etc.
Introduction (duration = min)	
General Warm-up (duration = min) Specific Warm-up (duration = min)	
Main Part (duration = min)	
Warm-down (duration = min)	
Conclusion (duration = min)	







Practice Planning Sheet #1 (working copy)

Team/Program: _____ Date: _____

Location: _____ Time: _____ Duration: _____

Objective(s): _____

Equipment: _____

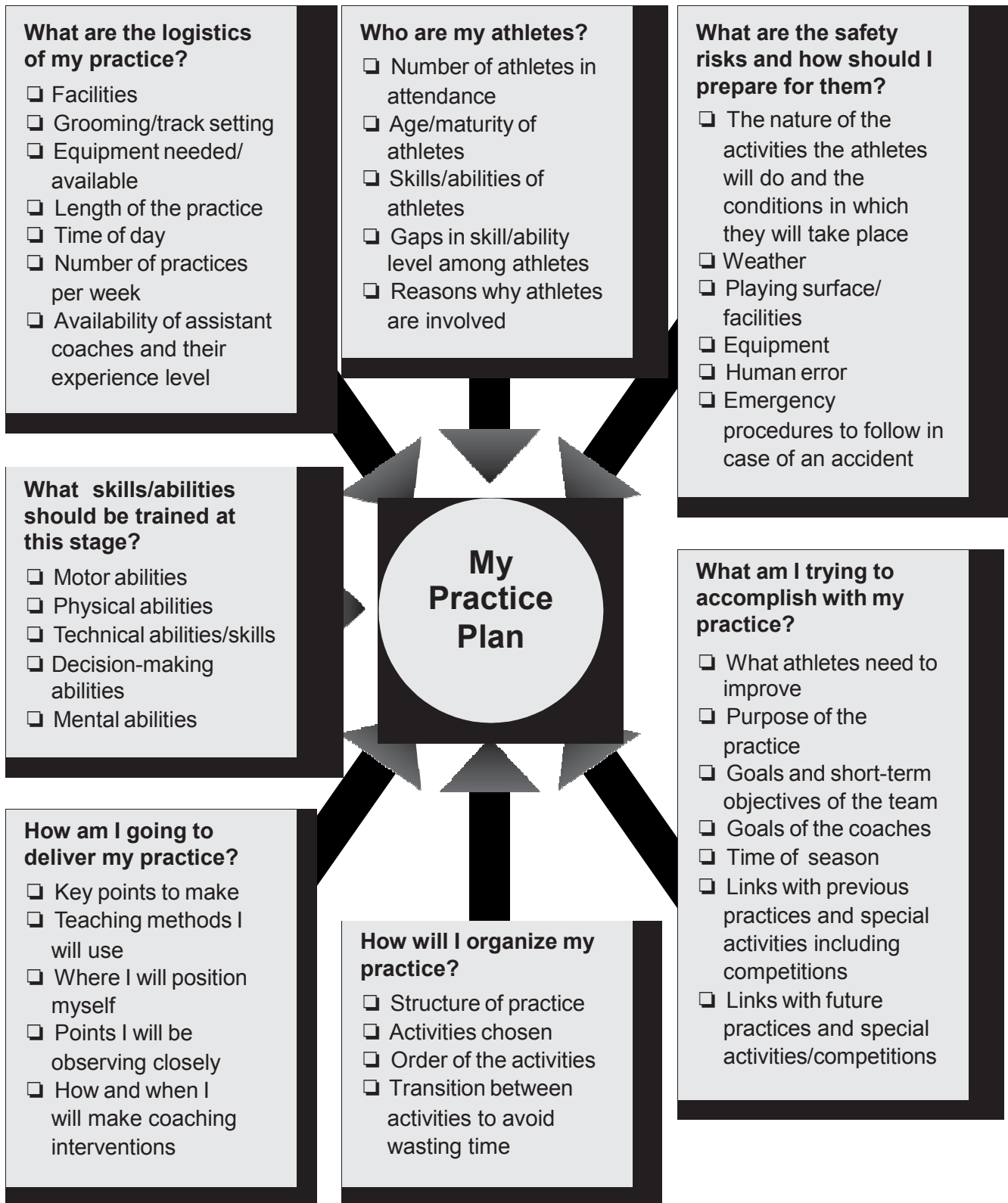
<p style="text-align: center;">Activities</p> <p>Goals: Athletic abilities, type of effort, length, intensity, movements, etc.</p>	<p style="text-align: center;">Key Points/Messages</p> <p style="text-align: center;">Guidelines, Safety, etc.</p>
<p>Introduction (duration = min)</p>	
<p>General Warm-up (duration = min)</p> <p>Specific Warm-up (duration = min)</p>	
<p>Main Part (duration = min)</p>	
<p>Warm-down (duration = min)</p>	
<p>Conclusion (duration = min)</p>	







10.1.4 My Practice Plan





10.1.5 The Parts of a Practice

A model practice has five parts:

- ❑ **The Introduction:** The coach prepares the site and equipment, welcomes the athletes and tells them what will happen during the practice. This is also a good time to assess the general status of the athletes (e.g. do they have appropriate equipment and clothing?).
- ❑ **The Warm-up:** The coach plans activities that gradually activate the athletes and prepare them physically and mentally to effectively perform the main part of the practice. The warm-up consists of two parts: (1) general and (2) specific.
 - ✓ General. The general warm-up aims to raise the body temperature until the athlete perspires, to allow for progressive muscle stretching.
 - ✓ Specific. The specific warm-up, which is sport-specific, aims to prepare the warmed muscles for the types of movements the athlete will perform in the main part of the practice. The movements in the specific warm-up should mimic those of the main part, gradually building in intensity and range of motion.
- ❑ **The Main Part:** The coach ensures a smooth flow of activities that are challenging for the athletes and help them improve their sport-specific abilities and fitness. The activities chosen must be appropriate for the age, fitness and ability levels of the athletes.
- ❑ **The Warm-down:** To initiate the recovery of the body, the coach plans low-intensity transition activities between the more intense efforts of the main part and the end of the practice. The coach also plans for some time for athletes to stretch.
- ❑ **The Conclusion:** The coach provides comments on the practice and gives athletes an opportunity to provide feedback. The coach ensures that the practice ends on a positive and friendly note. The coach also provides some information about the next practice or game.





10.2 Designing Activities for Practices

10.2.1 Choosing and Designing Activities for Practices

The art of practice planning lies in making good choices about activities. As the figure below shows, the activities you choose and the way you run them should be guided by three factors: the goal of the activity, the sport itself and the athletes you coach.

- Establish a goal for each activity you choose.
- Choose a goal that is appropriate for the athletes, taking into consideration their maturity and their proficiency in the sport.
- Teach the activity (duration or number of repetitions, speed of execution, tasks the athletes perform) with the intent of achieving the goal.

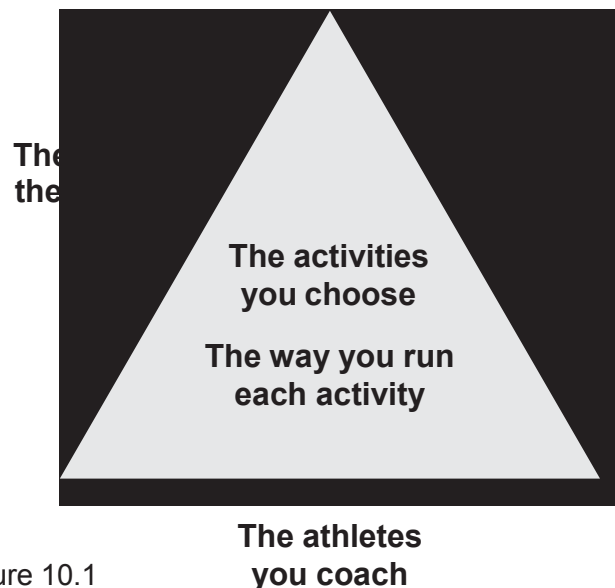


Figure 10.1

By taking into account the specific needs of athletes and the characteristics and demands of each activity, you can select the type and conditions of practice that are most appropriate. This way, you increase the probability that the desired learning or training effects will occur. The procedure below is recommended when planning the activities of a practice.

- Step 1:** Determine what you want the athletes to be able to do. This may be a long-term goal, one that may take several practices or even weeks to achieve.
- Step 2:** Assess the nature of the task you want the athletes to be able to do in terms of the skills (open vs closed, discrete vs serial vs continuous) and the athletic abilities (physical, motor, tactical, mental) involved.
- Step 3 (*):** Given the nature of the task and its demands, determine whether it is appropriate to the age and development stage of the athletes, as well as their stage of skill development. If your answer to these questions is YES, then proceed to Step 4; if the answer is NO, return to Step 1 and make the necessary adjustments.





- ❑ **Step 4 (*):** Decide whether the task needs to be broken into distinct parts or if it should be executed as a whole.
- ❑ **Step 5:** Determine the type of practice that is most appropriate (massed vs distributed, constant vs variable).
- ❑ **Step 6:** Determine the practice conditions that are most appropriate.
- ❑ **Step 7:** Given your logistics and the equipment available, select or design sport activities that meet the above criteria.
- ❑ **Step 8:** Define the measures of success for the activity.
- ❑ **Step 9 (*):** Identify potential risk factors associated with the activity, and take them into account in the activity you design.
- ❑ **Step 10:** Think about the best way to explain the activities to make it easy for athletes to understand what the activity is about and how it should be performed.

Notes:

- 1) Steps marked with an asterisk (*) involve safety considerations.
- 2) The above guidelines apply to the planning part of a practice only. The delivery of a practice involves additional coaching skills related to interaction with people, group management, teaching and learning, intervention, etc.

Order of Activities in the Main Part of the Practice

Practices often feature several activities aimed at developing a variety of abilities. Paying attention to the order in which the activities take place in the main part of the practice may improve your chances of achieving the goal for that practice. Here are a few general guidelines to help you determine the optimal order of activities.

- ❑ Early in the main part of the practice athletes are not tired, so try to plan for:
 - ✓ Activities to acquire new techniques, skills or motor patterns.
 - ✓ Activities that develop or require coordination or balance.
 - ✓ Activities that develop or require speed.
- ❑ Then consider:
 - ✓ Activities that develop or require speed-fitness.
 - ✓ Activities that develop or require strength.
 - ✓ Activities that develop or require strength-fitness.
- ❑ Later in the main part of the practice athletes may be tired, so try to plan for:
 - ✓ Activities to consolidate skills already acquired.
 - ✓ Activities that develop or require aerobic fitness.
 - ✓ Activities to develop flexibility.





10.2.2 Activity Worksheet #1 (sample)

Practice session date: _____ Athletes: _____

Name of the activity: _____ Warm-up () Main part () Warm-down ()

Duration: _____ Objective(s): _____

Equipment needed: _____

Description and diagrams: *(Athletic abilities to be trained, purpose, movements, types of effort, duration, etc.)*

Directions/guidelines to give athletes: _____

Success criteria: _____

Risk factors/safety guidelines to give to athletes: _____

Notes/comments: _____







Activity Worksheet #1 (working copy)

Practice session date: _____ Athletes: _____

Name of the activity: _____ Warm-up () Main part () Warm-down ()

Duration: _____ Objective(s): _____

Equipment needed: _____

Description and diagrams: *(Athletic abilities to be trained, purpose, movements, types of effort, duration, etc.)*

Directions/guidelines to give athletes: _____

Success criteria: _____

Risk factors/safety guidelines to give to athletes: _____

Notes/comments: _____







10.2.3 Classifying Sports Skills

A skill is the ability to do something well. Most sport skills involve a movement or a series of movements. A skilled sport performance can therefore be characterized by the following:

- High certainty in bringing about the expected end result.
- High precision.
- Efficiency, e.g. it is performed with minimum energy expenditure or in the shortest possible time.

Sport skills are classified according to whether the movements involved:

- Are performed in a stable and predictable environment.
- Have clearly defined start or end points.

Some sports are easy to classify, because they involve few well-defined skills; however, this is not the case for others that may involve a variety of skills performed in different conditions or situations.

The tables that follow provide basic information about how to classify skills and what sports showcase which kinds of skills.

Knowing the type of skills that are featured in your sport, or that are called upon in certain situations, may help you make planning decisions about what activities to choose for your practices and how they should be run.

1) Classifying Sport Skills by the Stability and Predictability of Their Environment

Closed Skills	↔	Open Skills
The movements are performed in an environment that is both stable and predictable.	The movements are performed in an environment that is predictable, but changing.	The movements are performed in an environment that is unpredictable.
Sport examples: <ul style="list-style-type: none"> • Archery • Athletics (throws, jumps) • Bowling • Diving • Figure skating • Gymnastics • Shooting • Swimming in a pool • Weightlifting 	Sport examples: <ul style="list-style-type: none"> • Cross-country skiing • Luge • Cross-country running • Golf • Road cycling • Alpine skiing • Speed skating • Yachting 	Sport examples: <ul style="list-style-type: none"> • Combative sports • Racket sports • Team sports





Note: As indicated by the middle column (↔), there is a continuum between purely closed skills and open skills.

2) Classifying Sport Skills by the Distinctiveness of Their Beginning and End Points

Discrete Skills	Serial Skills	Continuous Skills
Distinct and easily determined beginning and end points.	A series of discrete actions linked together.	Actions are repetitive. No distinct and easily determined beginning and end points.
Examples of discrete skills: <ul style="list-style-type: none"> • Catching a ball • Throwing a punch • Swinging a golf club • Throwing a ball 	Examples of serial skills: <ul style="list-style-type: none"> • Gymnastics routine • Figure skating routine 	Examples of continuous skills: <ul style="list-style-type: none"> • Cycling • Running • Swimming • Cross-country skiing

10.2.4 Stages of Skill Development

Developing Sport Skills

It may take months or even years of practice for an athlete to reach the “Refinement” stage as defined in the following chart. Also, the vast majority of athletes will never reach the “Creative Variations” stage. Consequently, at the “Competition Coaching - Introduction” level, few coaches work with athletes who achieve an advanced stage of skill execution. Therefore, the focus should be on ensuring that the fundamentals are correct and that they can be performed in a variety of situations and conditions.

- When learning a skill, athletes progress through predictable stages. The chart on the following page outlines some key concepts about the stages of skill development and the needs of the athlete at each stage.
- While each athlete can be expected to go through each stage, the time and the amount of practice necessary to progress from one to the next can vary greatly from one athlete to another.
- The stages of skill development described in the following chart (initiation, acquisition, consolidation, refinement and creative variations) apply regardless of the type of skill or how it is classified.
- It is important that you recognize the stage of skill development your participants are at, as well as the specific needs they have at each stage, and that you plan your practice accordingly (i.e. that you select the right types of activities and the appropriate way to run them).





Skill Development Stages Chart

Beginner		Intermediate	Advanced	
Initiation	Acquisition	Consolidation	Refinement	Creative Variations
Key Points to Look For				
<p>The first contact the athlete has with the skill. The athlete may have no idea of what to do to perform the skill.</p>	<p>The early stage of learning, where the athlete becomes capable of:</p> <ol style="list-style-type: none"> 1) Coordinating key components of movements; and 2) Executing them in the correct order, thus performing a rough form of the skill. The movements are not well synchronized or under control and they lack rhythm and flow. The execution is inconsistent and lacks precision. The athlete has to think about what he/she is doing while performing the skill. Both form and performance tend to deteriorate markedly when the athlete tries to execute movements quickly or is under pressure, as may be the case in a competitive situation. 	<p>The athlete can execute the movements or the skill with correct form. Movement control, synchronization and rhythm are good when performing the skill under easy and stable conditions. The movements can be repeated consistently and with precision under these conditions. Some elements of performance can be maintained when the athlete is under pressure, conditions change or demands increase, but performance remains inconsistent. The athlete begins to develop a more personal style.</p>	<p>The athlete can execute the movements in a way that is very close to the ideal in terms of form and speed. The performance is very consistent and precision is high, even under very demanding conditions and in situations that are both complex and varied. Only minor fine-tuning may be necessary to achieve optimal execution, and a fairly personal style is established. All components of the movement have been automated, which enables the athlete to focus on the environment while performing and to make rapid adjustments as necessary. The athlete can reflect critically on his/her performance to make corrections.</p>	<p>This stage is achieved only by the best athletes in the world. The movements can be performed according to the ideal, and the athlete has developed a personal style that is efficient. Personal interpretation of movements or personal movements can be combined into unique patterns in response to specific competitive situations.</p>





Beginner		Intermediate		Advanced	
Initiation	Acquisition	Consolidation	Refinement	Creative Variations	
At this stage, athletes need to...					
<ol style="list-style-type: none"> 1) Have a clear mental image of what correct execution looks like. 2) Understand the fundamental positions, stances, and patterns of the sport or skill. 3) Feel safe when performing the skill. 4) Reach a comfort level with some movements or feelings that may be unfamiliar and that are part of the skill to be learned. 	<ol style="list-style-type: none"> 1) Understand clearly what they have to do, and have a good mental picture of the task. 2) Perform a lot of repetitions at their own pace and under conditions that are stable, easy and safe. 3) Practise on both sides, if appropriate. 4) Find some solutions by themselves through trial and error, based on feedback from the coach. 	<ol style="list-style-type: none"> 1) Be exposed to a variety of situations, and perform a lot of repetitions under varied conditions. 2) Have clear objectives for both form (correct execution) and the result of actions. 3) Be challenged by more complex and demanding tasks or conditions, and find more solutions through trial and error, based on less frequent feedback from the coach. 4) Practise the movements or the skill in conditions where fatigue prevails or that replicate competitive demands and deal with the consequences of errors. 	<ol style="list-style-type: none"> 1) Be exposed to complex or demanding competitive situations that require the skill to be executed at a very high level. 2) Learn how to solve problems they encounter. 	<ol style="list-style-type: none"> 1) Be exposed to complex or demanding competitive situations that require the skill to be executed perfectly. 2) Develop their own solutions. 	





10.2.5 Planning Guidelines

- ❑ As the Skill Development Stages Chart on the previous page shows, the needs of athletes differ depending on their stage of skill development. Athletes' needs should guide the goals you have for practices that aim at developing skills.
- ❑ For practices that aim at developing skills, you should ensure that the goals, as well as the activities in which the athletes are involved, are adapted to the needs of the athletes and that the conditions in which these activities take place also match the athletes' capabilities. Selecting or designing appropriate activities and identifying suitable conditions in which they take place are therefore critical steps in planning your practice.
- ❑ You will likely have to allow for the fact that not all athletes are at the same stage of skill development. This can be dealt with by planning different activities for different groups of athletes or adapting practice conditions to different athletes' needs.
- ❑ You can plan the activities and tasks that athletes will do during a practice in many different ways. Athletes can perform:
 - 1) the whole skill, or only parts of it,
 - 2) many repetitions without rest, or rest for varying amounts of time in between repetitions, or
 - 3) the same task several times in a row, or distinct movements or actions each time either in a predictable order or in random order.
- ❑ The most effective activities/tasks, types of practice or practice conditions may also vary with the skill to be learned (open, closed, discrete, serial or continuous) or the athletes' stage of skill development. Additional adjustments may be necessary to take into consideration the age of the athletes. Planning guidelines for activities and practice conditions that support skill development at various stages are proposed in the following pages.
- ❑ The CCC Athlete Development Grid in section 2 of this Reference Material (Athletes and their Sport Needs) specifies what movement and technical abilities to train, as well as the priority for training these abilities at various ages and levels of competition.





10.2.5 (a) Activity Planning Guidelines for Various Stages of Skill Development

Recommended Practice Conditions	Stage of Skill Development			Refinement (Minor improvements)
	Initiation (First contact)	Acquisition (Movement patterning)	Consolidation (Correct execution in variable conditions)	
Surrounding environment	Stable and predictable, free of distractions	Stable and predictable, free of distractions	Increased variability and distractions in the environment, but not to the point where movement patterns deteriorate	Competition conditions
Decision-making	No decision-making or options from which to choose	Simple decision-making, maximum of two options	More complex decisions to make, increased frequency of decision-making, and more options (3-4)	Complex decisions, as many options and at the same frequency as in a competition
Speed of execution	Slow and controlled	At athlete's own pace	Increased, variable, and close to competitive demands	Similar to conditions in competition
Number of repetitions	As needed, depending on athlete's general motor development	High	High	As many as possible
Risk factor	Completely safe conditions, errors of no consequence	Low-risk conditions	Less than or similar to what is encountered in regular competition	Similar to a high level of competition
During training, the emphasis should be on...	Basic stances and positions; getting the idea of what the movements are about, look like	Global execution and general form of the movement	Maintaining the form of movements and some performance consistency under a variety of conditions and under stress	Creating conditions that stress the specific elements that need adjustments





10.2.5 (b) Planning Guidelines for Part, Progressive Part or Whole Practice

Type of Practice	Definition	Examples	Most Effective For or When ...	Not Recommended For or When ...
Part Practice	A complex skill is broken down into distinct parts that are practised separately	Breaking down a gymnastics or a figure skating routine into parts	<ol style="list-style-type: none"> 1) Skills that involve some risk in the early stage of learning 2) The parts are performed relatively independently of each other in the real skill 3) Serial tasks of long duration where errors in one part do not affect the actions in the parts that follow 4) Slow serial tasks where the parts do not affect each other 	<ol style="list-style-type: none"> 1) The interaction between each part is high 2) An error made or a change happening in one part affects the actions in the part that follows 3) Discrete skills that are short, are performed fast, or involve balls or objects on a trajectory 4) Coordination of different parts of the body is important (hand and foot motion) 5) Continuous skills
Progressive Part Practice	Parts of a skill are gradually integrated into larger blocks that come progressively closer to the real, whole action	<ol style="list-style-type: none"> 1) Linking some parts of a gymnastics or a figure skating routine in the order in which they will be performed 2) Skating and stick handling in ice hockey 	<ol style="list-style-type: none"> 1) The task has parts that interact with one another, and adjustments may be necessary as a result of events that occurred in a previous part 2) The learner has reached a stage where linking actions in a complex skill no longer poses safety risks 	The learner cannot yet link critical parts or actions in a complex skill, and this poses safety risks
Whole Practice	The learner practises all parts of the skill in the right order from the outset	<ol style="list-style-type: none"> 1) Golf swing 2) Throwing a ball 3) Swinging a bat 4) Kicking a football 	<ol style="list-style-type: none"> 1) Continuous skills 2) Discrete skills that must be performed rapidly and in which various parts of the body are involved 3) Coordination of different parts of the body is important (hand and foot motion) 	The learner cannot yet link critical parts or actions in a complex skill, and this poses safety risks





10.2.5 (c) Planning Guidelines for Massed or Distributed Practice

Type of Practice	Definition	Examples	Most Effective For or When ...	Not Recommended For or When ...
Massed Practice	<p>1) An approach to practice in which a given task or movement is repeated many times in a row without pauses or rest, OR</p> <p>2) Where the pauses or the rest between each repetition are short compared to the duration of the actual task or movement itself</p>	<p>1) In cross-country skiing, over a two-minute period, shifting weight from one leg to the other and gliding as long as possible each time without using poles</p> <p>2) Punching a bag for three minutes</p>	<p>1) Discrete skills or tasks that are very short (and where movements are therefore performed rapidly), in particular during the acquisition phase <i>(Note: in some cases, such as throwing, some rest between repetitions may be necessary to avoid injuries)</i></p> <p>2) During the acquisition and consolidation stages of skill development</p> <p>3) The energy requirements of the task are not too high</p> <p>4) The activity or the task performed poses little risk</p>	<p>1) Continuous or serial skills or tasks that require a lot of speed or coordination and where fatigue can build up and affect the quality of execution</p> <p>2) Fatigue developing during the session increases the risk of accident or injury, particularly toward the end of the practice</p>
Distributed Practice	<p>An approach to practice in which the pauses or the rest following each repetition of a task or movement are long compared to the duration of the actual task or movement itself</p>	<p>In track and field, practising an all-out start from the blocks over 10 or 15 metres five times, with a one-minute recovery consisting of light jogging and walking between each repetition</p>	<p>Continuous or serial skills or tasks that require a lot of speed or coordination and where fatigue can build up and affect the quality of execution or increase the risk of accident or injury</p>	





10.2.5 (d) Planning Guidelines for Constant, Variable or Random Practice

Type of Practice	Definition	Examples	Most Effective For or When ...	Not Recommended For or When ...
Constant Practice	A practice sequence in which the same tasks or movements are repeated under the same conditions from one repetition to another	Throwing a ball 10 times at the same speed, from the same spot, to the same target	<ol style="list-style-type: none"> 1) The athlete is in the initiation or acquisition stage of skill development 2) Massed practice is an effective method 	The athlete is beyond the initiation or acquisition stages of skill development, in particular, for discrete or open skills
Variable Practice	A practice sequence in which the same tasks or movements are repeated but where one aspect of the execution is changed from one repetition to another	Throwing a ball 10 times, but varying one of the following each time: speed, distance, velocity, target	<ol style="list-style-type: none"> 1) The athlete is in the consolidation stage of skill development 2) Massed practice is an effective method 3) Distinct skills or movements are performed during the same practice 	The athlete is in the initiation stage of skill development
Random Practice*	A practice schedule in which various discrete or serial skills that are required for performance in the sport are practised in random order, and where the learner does not practise the same task on two consecutive attempts	<ol style="list-style-type: none"> 1) In tennis, moving backward to do a backhand, then serving, then moving forward to return a volley 2) In basketball, practising non-repeating types of shots 	<ol style="list-style-type: none"> 1) Serial skills that are already acquired 2) Skills that are both discrete and open 3) The athlete is in the consolidation stage of skill development, or is beyond this stage 4) When distinct skills or movements are scheduled to be performed during the same practice 	The athlete is in the initiation or acquisition stage of skill development

**There is strong evidence that random practice, while sometimes associated with inferior performance in the short term, results in superior performance in the long term. In other words, when constant practice is used to learn a skill or task, the performance during the session is often better compared to random practice, but the latter promotes better skill retention and overall performance in the long run. This suggests that random practice may be a very effective approach for both discrete and serial skills, as well as for open skills. The reasons for this may be that random practice causes athletes to forget short-term solutions to the task at hand; this could engage them actively in the learning process, by eliminating automatic repetitions.*





10.2.6 Important Notes

Performance versus Learning

- ❑ Motor performance is the participant's behaviour when executing a task, as determined by the coach through qualitative and/or quantitative assessments.
- ❑ Learning refers to the permanent change in the motor performance (or skill) as a result of practice.
- ❑ A reassessment of motor performance at a later date (retention test) is therefore necessary to determine if skill learning has indeed occurred.
- ❑ Failure to appreciate the difference between performance and learning can lead to a misinterpretation of an athlete's progress or actual capability to execute a task independently and consistently.
- ❑ It is important to establish a distinction between how well a skill can be performed during a training session, and how well the participant performs when it counts, i.e. in competition.

Rate of Improvement and Amount of Practice

- ❑ Improvements in skill occur rapidly in early practice, but more slowly in later practice. Learning occurs in stages, with a different rate of improvement associated with each stage.
- ❑ The amount of practice is the single most important variable that leads to motor performance improvements and skill learning.

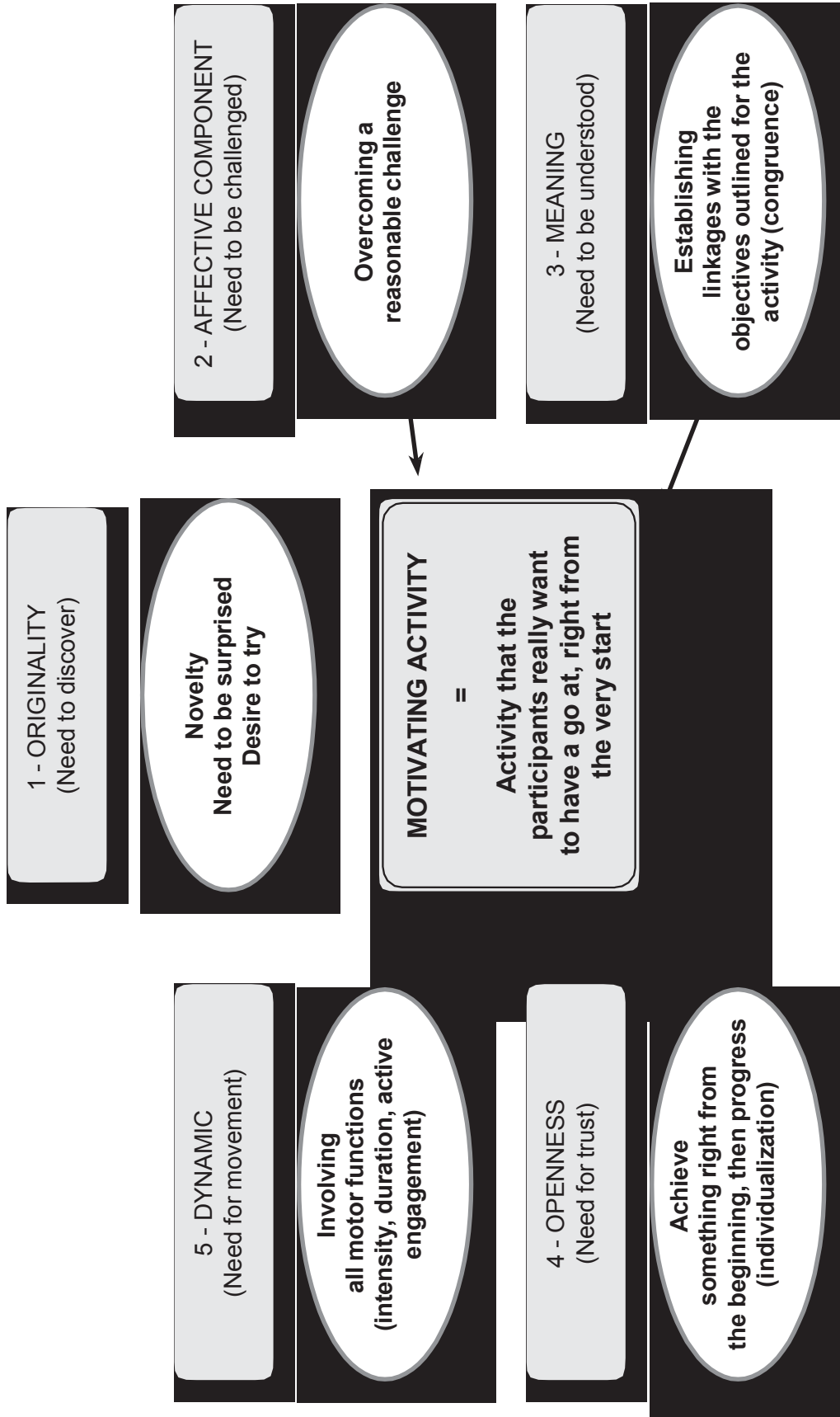
Short and Long-Term Effects of Using Specific Practice Conditions

- ❑ Both variable and random practice conditions have been shown to positively affect learning, to promote the ability to transfer the skill into another environment and to increase generalization because they are challenging to the athlete and promote effortful, problem-solving activities during movement repetitions.
- ❑ Repeating the same task many times under the same conditions (blocked practice) usually results in good performance improvements in the short-term.
- ❑ Repeating the different tasks under variable conditions (random practice) usually results in inferior performance improvements in the short-term compared to blocked practice, yet it promotes greater learning in the mid to long-term as determined by retention and transfer tests.
- ❑ Coaches who incorporate a problem-solving approach to skill training by using random practice may need to educate participants and their parents about the short and longer-term effects of this method, as opposed to other approaches, such as blocked practice.





10.3 Five Criteria to Develop Challenging Activities That Motivate Athletes to Learn



Principle: An activity does not necessarily have to feature all criteria simultaneously to be considered “motivating”; rather, the coach must decide which of these criteria should apply in a given situation in order to generate an optimal level of interest in the participants.





10.3.1 The Challenge Zone

Matching the Difficulty of the Activity with the Skill Level of the Participant

When the requirements of an activity are too demanding for the athlete's ability, he/she may become anxious or discouraged and therefore may have difficulty learning. On the other hand, when the requirements are not sufficiently demanding, the athlete may quickly show signs of boredom or lack of interest. The difficulty level associated with the task must therefore be "optimal," i.e. the athlete must feel that he/she has the ability to succeed but that the activity represents a challenge. In other words, the athlete will be motivated to learn when challenged at the appropriate level, which implies that there must be a reasonable chance of either success or failure when he or she performs a task. As a general rule, if the athlete's success rate is approximately two times out of three, then the activity represents a suitable challenge.

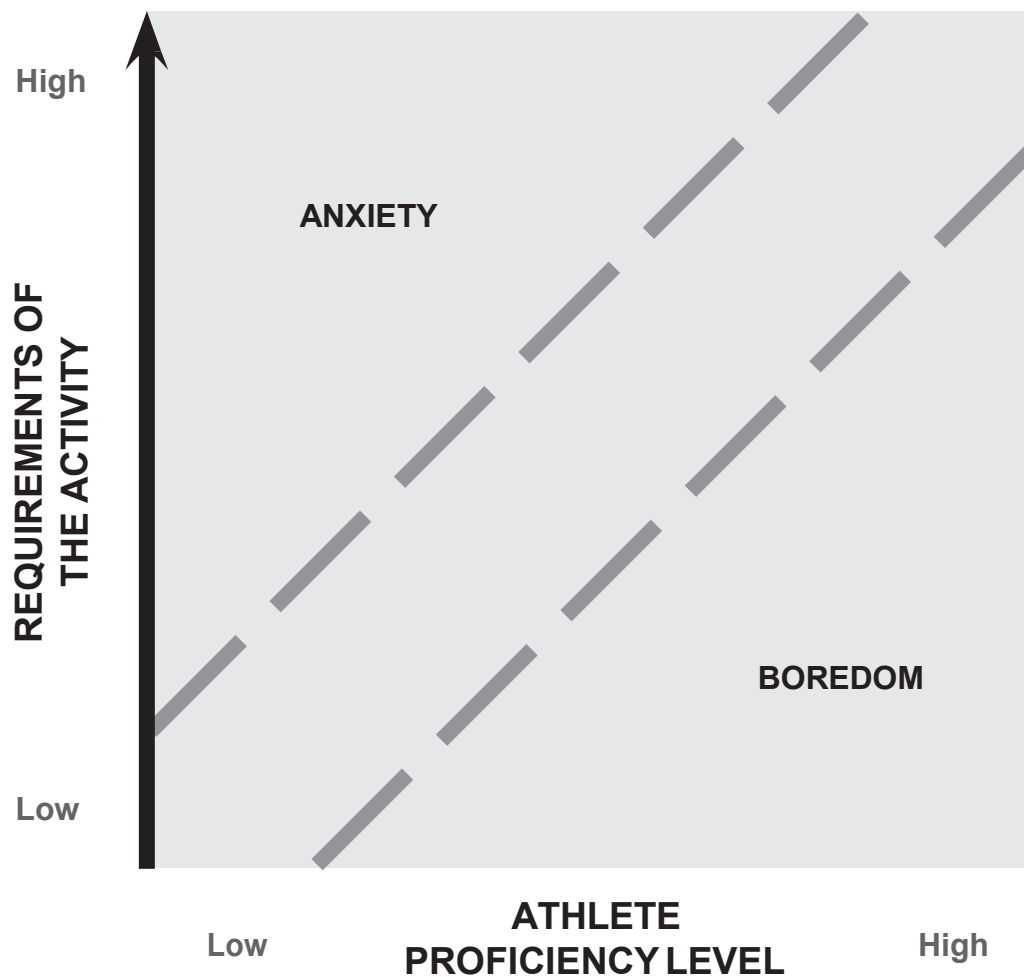


Figure 10.2





10.3.2 Practice Planning Worksheet #2 (sample)

Sport/team/athlete(s): _____ Date: _____

Location: _____ Start time: _____ Total duration: _____

Objective(s): _____

Equipment: _____

Activities Goals: Athletic abilities, type of effort, length, intensity, movements, etc.	Key Points/Messages Guidelines, Safety, etc.
Introduction (duration = min)	
General Warm-up (duration = min) Specific Warm-up (duration = min)	
Main Part (duration = min)	
Warm-down (duration = min)	
Conclusion (duration = min)	







Practice Planning Worksheet #2 (working copy)

Sport/team/athlete(s): _____ Date: _____

Location: _____ Start time: _____ Total duration: _____

Objective(s): _____

Equipment: _____

<p style="text-align: center;">Activities</p> <p>Goals: Athletic abilities, type of effort, length, intensity, movements, etc.</p>	<p style="text-align: center;">Key Points/Messages</p> <p style="text-align: center;">Guidelines, Safety, etc.</p>
<p>Introduction (duration = min)</p>	
<p>General Warm-up (duration = min)</p> <p>Specific Warm-up (duration = min)</p>	
<p>Main Part (duration = min)</p>	
<p>Warm-down (duration = min)</p>	
<p>Conclusion (duration = min)</p>	







10.4 Practice Planning Checklist

Structure and Organization

- The practice is organized and well structured (introduction, warm-up, main part, warm-down and conclusion).
- The length of the practice is appropriate for the age and ability level of the athletes.
- Full use is made of available facilities and equipment to achieve the practice goals.
- Activities are planned so that there is minimal waiting time for the participants.
- The transition from one activity to the next is planned in such a way as to minimize the time wasted.
- In the main part of the practice activities are sequenced optimally relative to each other.

Nature of the Activities

- The practice includes a variety of activities.
- Athletes have sufficient practice time during each activity.
- The activities have well-defined goals, and the purpose of the tasks involved is clear.
- The activities are adapted to the skill and fitness level of the athletes.
- The activities are appropriate to the growth and development stage of the athletes.
- Practice conditions are adapted to the athletes' stage of skill development.
- The activities present exciting and reasonable challenges to the athletes and are chosen or designed so that the success rate by the participants when performing the task is about 65-70%.

Safety

- Potential environmental, equipment/facilities and human risk factors have been considered, and the activities are designed accordingly.
- An Emergency Action Plan is available.





10.5 Practice Planning Tips

- ❑ Always include a warm-up in your practice plan. Never skip or rush the warm-up, as this may lead to injury. If you are short on time, consider having athletes warm up before the practice; for instance, if facilities are available for only a limited period of time.
- ❑ Get help from anyone who is available. For example, parents can help by arranging stations so that you can maximize the time your athletes are active. In this case, make sure your assistants are familiar with your practice plan and give them simple and clear tasks.
- ❑ Avoid activities and games that eliminate people – the athletes who need the most practice will probably get bumped first.
- ❑ When you plan an activity that involves opposition, pair up athletes with similar ability levels so that they can challenge each other and each has a fair chance of success. This may also reduce the risk of injuries.
- ❑ Think of all the skills required to perform the drill! A drill or an activity might be relevant to your sport or to the long-term goal you have in mind, but the skill or fitness level of your athletes AT THIS TIME may be such that they cannot really benefit from it.
- ❑ Be realistic about the actual number of skills your athletes can learn in a season. For some skills, it may take a lot of time and practice for athletes to go beyond the Acquisition stage.
- ❑ Always make sure that athletes have mastered the fundamentals of their sport before you plan for more advanced techniques. However, it is a good idea to start developing tactical and decision-making skills early on. To do this, put your athletes in quite complex sport-specific situations that require them to use their observation skills, analyze the situation and come up with possible solutions.
- ❑ Plan for fun – can you find a way to develop a skill or ability through a game or activity the athletes enjoy doing? Ask athletes which activities they like the most; use those ones often, or try variations of them to achieve specific goals.
- ❑ Be creative when athletes have to do a lot of repetitions, as is the case in the Acquisition and Consolidation stages of skill development. Although your athletes may have to work on the same fundamental movements in many practices to acquire the correct motor patterns, you can avoid monotony by using different activities or games that require the movements and looking for new and fun ways of doing them.
- ❑ Take time to get athletes to talk about their own performances and discuss what they think is important to work on improving individually and as a team. Try to build this into your next practice plan.
- ❑ Use random practice whenever possible, as it promotes better long-term performance improvements.
- ❑ Better long-term improvement in performance can be achieved by not making practices too predictable.





- Motor tasks that do not produce extreme fatigue or muscle soreness can be practised daily.
- Tasks that do produce marked fatigue or muscle soreness should not be practised every day and recovery between practices must be longer. Alternate the days where these skills or tasks are performed with recovery days, or with days where other, less tiring skills are practised. For skills that involve some impact or where exhaustion can occur, it may be necessary to practise them only every third day.
- Be aware of athletes' physical capabilities before you ask them to do physical activity (growth and development). Keep in mind that there could be significant physical differences between athletes the same age.
- Simulate competitive situations in practice. Include all elements of the game or competition in your practices, e.g. rules, competition protocols, interaction with officials, respect for opponents and teammates, etc.
- Make a list of all the skills that athletes should be coached in, given their age and experience – this becomes a key element of your development plan.
- The first time you play a game or conduct a drill, it may not be as successful as you might like – athletes may need more time to learn it. Give the activity a name, so that they will recognize it immediately in the future.
- Find out what your athletes like and dislike about practice. Keep a file or a list of favourite drills, activities and games. Don't be afraid to repeat a game or drill – we enjoy doing the things we like to do.
- Keep a binder that has EVERYTHING in it: medical information, player information, rosters, directions, systems of play, team rules, etc. Keep a written or electronic record of what you do in practice.
- Make a list of EVERYTHING: have a TO DO LIST (generic sheet for every day/practice).
- Make a list of all your “systems of play”, break them all down into parts and organize drills for each individual concept. Break down all concepts into different options. Develop a drill for every option.
- Try to keep things as simple as possible.

Practice does not make perfect, it only makes permanent. Perfect practice makes perfect, permanently.





10.6 Planning a Practice: Self-Assessment

To rate your ability to plan a practice, circle the number at right that best represents whether you achieve the corresponding statement at left (Never, Sometimes, Often, Always).

I plan practices that are well organized by...	Never	Some- times	Often	Always
Identifying my athletes' ages, abilities and performance levels on the plan	1	2	3	4
Indicating a clearly defined goal for my athletes that is consistent with their growth and development stage	1	2	3	4
Including an introduction, warm-up, main part, warm-down and conclusion on the practice plan	1	2	3	4
Outlining on the plan the facilities and equipment needed to achieve practice goals	1	2	3	4
Indicating a timeline for the practice	1	2	3	4
Ensuring that activity durations are consistent with athletes' growth and development stage	1	2	3	4
Identifying factors that need to be checked to ensure safety (environmental, mechanical, etc.)	1	2	3	4
Positioning my practice plan in an overall season plan	1	2	3	4
Describing the rationale for the practice goals	1	2	3	4
Describing practice activities through the use of illustrations, diagrams and explanations	1	2	3	4
Indicating on my practice plan the key performance factors (coaching points) that will be highlighted in the practice	1	2	3	4
I design activities that improve athlete performance by...	Never	Some- times	Often	Always
Ensuring they are appropriate for my athletes' growth and development stage	1	2	3	4
Ensuring that they contribute to achieving overall practice goals	1	2	3	4





Ensuring that they are safe (environmental, mechanical, etc.)	1	2	3	4
Ensuring that they contribute to the development of skills	1	2	3	4
Ensuring that they contribute to the development of athletic abilities	1	2	3	4
Identifying appropriate work-rest ratios, target training loads, and target intensities	1	2	3	4
Sequencing activities so they enhance skill development and induce the desired training effects	1	2	3	4
Indicating variations or modification of practice conditions that challenge athletes	1	2	3	4
Integrating mental skills (goal setting, visualization, arousal control, focus, etc.) into each practice	1	2	3	4
Promoting basic decision-making by athletes	1	2	3	4
Ensuring that they are appropriate in relation to the location in the season plan	1	2	3	4
Indicating objectives that are based on analysis of the athlete or team during competition	1	2	3	4
Indicating adaptations that will assist athletes returning from injury	1	2	3	4
I have designed an Emergency Action Plan that specifies	Never	Some-times	Often	Always
The location of telephones (cell or land lines)	1	2	3	4
Correct emergency telephone numbers	1	2	3	4
A medical profile for each athlete under my care	1	2	3	4
The location of a fully stocked first-aid kit	1	2	3	4
Designated roles for a Call Person and a Person in Charge	1	2	3	4
Directions for reaching the practice site (map, address, etc.)	1	2	3	4

DATE: _____





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SECTION 11 – EVALUATION





This section complements the information provided in section 4.4 of your Introduction to Community Coaching Reference Material and section 11 in your Community Coaching Reference Material, and is directed primarily at supporting you in your role as a coach working with children in the Learning to Train stage of development.

11.1 CCI Certification Process

The NCCP is a competency-based program. This program trains coaches, and then permits trained coaches to become certified. Certification is based on demonstrating abilities to “do” certain things that are deemed important for meeting the needs of those being coached, thereby creating an environment that will both optimize athletic development and encourage individuals to make a life-time commitment to sport and physical activity.

The Learning to Train (L2T) stage of athlete development is a very important period for developing physical literacy and refining ski skills, as children who do not develop their fundamental motor skills by 12 years of age are unlikely to reach their full potential. Together the L2T and Training to Train (T2T) stages constitute important stages of athletic preparation. It is therefore essential for the children you are coaching that you continue to improve your skills and stay current.

In the new NCCP system a coach is described as:

- **In Training** - when the coach has completed some of the required training for a context.
- **Trained** - when the coach has completed all required training for a context.
- **Certified** - when the coach has completed all evaluation requirements for a context.

- The CCI-L2T (Dryland) and L2T (On-Snow) workshops provide you with the basic training you require in order to coach children in the L2T stage of growth and development.
- When you have completed the two CCI-L2T workshops you will be designated a “CCI coach in training”.
- The CCI-T2T (Dryland) and T2T (On-Snow) workshops provide you with the basic training you require in order to coach children in the T2T stage of growth and development.
- When you have completed the two CCI-T2T workshops you will be designated a “trained CCI coach”.
- When you have successfully completed the four CCI workshops (refer to section 11.2) and the required tasks and evaluations - including “Making Ethical Decisions (MED)” - relating to the CCI context, you will be CCI certified.





- ❑ CCI certification is a prerequisite for entry into the next step in the NCCP progression (i.e. attendance at the first Competition Coaching: Development (CCD) workshop).
- ❑ Once you have achieved a particular status in the CCI certification progression (i.e. “CCI coach in training”, “trained CCI coach” and “certified CCI coach”), it will be recorded on the Coaching Association of Canada (CAC) database as part of your coaching record.
- ❑ Your certification status will be valid for a period of five years, and can be extended by completing designated development activities, such as coaching seminars, practical assignments and additional coaching workshops.
- ❑ Your certification status can be revoked if you contravene the CCC Coaches Code of Conduct or NCCP Code of Ethics.

A complete explanation of the CCI certification process and the forms used in this process are available on the Cross Country Canada website. In addition the following chart identifies the key outcomes and evaluation components which comprise CCI certification:

Outcomes	Evaluation Components
1. The coach makes ethical decisions.	Ethics Evaluation. The coach successfully completes the Coaching Association of Canada’s CCI “Making Ethical Decisions (MED)” online evaluation.
2. The coach provides appropriate support to athletes.	<p>Risk Management. The coach demonstrates appropriate risk management practices during a practice session (dryland or on-snow).</p> <p>L2T Practice Session. The coach successfully organizes a safe, effective practice session for athletes in the L2T stage of development (on-snow).</p> <p>T2T Practice Session. The coach demonstrates the ability to organize a safe, effective practice session for athletes in the T2T stage of development (dryland).</p> <p>Interventions. The coach demonstrates an effective intervention that promotes learning.</p> <p>Planning a Practice. The coach prepares an appropriate practice plan and submits it to the Facilitator.</p>
3. The coach analyzes ski technique.	<p>Detects Technique Deficiencies. The coach correctly identifies aspects of intermediate techniques that require improvement.</p> <p>Corrects Technique. The coach correctly prescribes changes that will result in improvement.</p>





<p>4. The coach provides appropriate support to athletes.</p>	<p>Skill Development Camps. The coach successfully organizes and leads an overnight interclub (i.e. regional) camp for athletes in the FUNdamentals and/or L2T stages of development.</p> <p>Training Camps. The coach successfully completes a Provincial/Territorial Coaching Experience (P/TCE) assignment at a Provincial/Territorial Team Camp.</p>
<p>5. The coach supports the competitive experience.</p>	<p>Competitions - 1. The coach successfully leads a club team to a Regional Cup race, Midget Championships or a similar age-appropriate competition for athletes in the L2T stage of development.</p> <p>Competitions - 2. The coach successfully leads a club team to a nationally sanctioned competition (CPL or CSL) such as a Provincial/Territorial Cup.</p> <p>Ski Preparation. The coach demonstrates the ability to provide appropriate waxing support for their athletes at a club or regional level competition.</p>
<p>6. The coach designs a sport program for athletes in the L2T and/or T2T stages.</p>	<p>Sport Program. The coach prepares an appropriate sport program and submits it to the Facilitator.</p> <p>CCI-L2T Certification Test. The coach successfully completes a knowledge test demonstrating his/her understanding of the key coaching concepts covered in the CCI-L2T program.</p> <p>CCI-T2T Certification Test. The coach successfully completes a knowledge test demonstrating his/her understanding of the key coaching concepts covered in the CCI-T2T program.</p>
<p>7. The coach has personal technical competence.</p>	<p>Technique Evaluation. The coach demonstrates an intermediate level of technical skill in each of the ski techniques covered in the CCI-T2T (On-Snow) workshop.</p> <p>Note: Coaches with a significant reason for being unable to complete the technical skill requirements have an opportunity to apply for an exemption.</p>
<p>8. The coach has general coaching experience.</p>	<p>L2T Coaching Experience. The coach completes 40 hours of coaching in one season (dryland and on-snow combined), working with athletes at the L2T or T2T stage of development, and receives satisfactory reviews from the parents and athletes.</p> <p>T2T Coaching Experience. The coach completes 60 hours of coaching in one season (dryland and on-snow mixed), working with athletes at the L2T or T2T stage of development, and receives satisfactory reviews from the parents and athletes.</p>





Your Certification Checklist

- CCI-L2T (Dryland) Workshop**
 - ✓ Complete the workshop.
- CCI-L2T (On-Snow) Workshop**
 - ✓ Complete the workshop.
 - ✓ Personal technique competence assessed.
 - ✓ Technique analysis (intermediate level) skills assessed.
 - ✓ Complete CCI-L2T Certification Test and submit to Facilitator.
- Before Participating in the T2T (Dryland) Workshop**
 - ✓ Complete 40 hours of coaching in one season.
 - ✓ Lead a club team at a Regional Cup, Midget Championships or a similar age-appropriate competition for children in the L2T stage of development.
 - ✓ Organize and lead a skill development camp.
 - ✓ Submit NCCP CCI-L2T Experience Form (evidence of 40 hrs of coaching etc.) to your Facilitator.
- CCI-T2T (Dryland) Workshop**
 - ✓ Complete the workshop.
- Before Participating in the T2T (On-Snow) Workshop**
 - ✓ Develop and submit a written sport program for athletes in the L2T and/or T2T stage of development.
 - ✓ Develop and submit a written practice plan for both dryland and on-snow practices.
- CCI-T2T (On-Snow) Workshop**
 - ✓ Complete the workshop.
 - ✓ Personal technique competence evaluated.
 - ✓ Technique analysis (intermediate level) skills evaluated.
 - ✓ Complete CCI-T2T Certification Test and submit to Facilitator.
- Prior to Completing the CCI Context**
 - ✓ Lead an on-snow practice session for L2T athletes and be evaluated.
 - ✓ Lead a club team at a nationally sanctioned competition (CPL or CSL) competition such as a Provincial/Territorial Cup.
 - ✓ Support a Provincial/Territorial team at a training camp (P/TCE Assignment).
 - ✓ Lead a dryland practice session for T2T athletes and be evaluated.
 - ✓ Submit NCCP CCI-T2T Experience Form (evidence of 60 hrs of coaching etc.) to Facilitator.



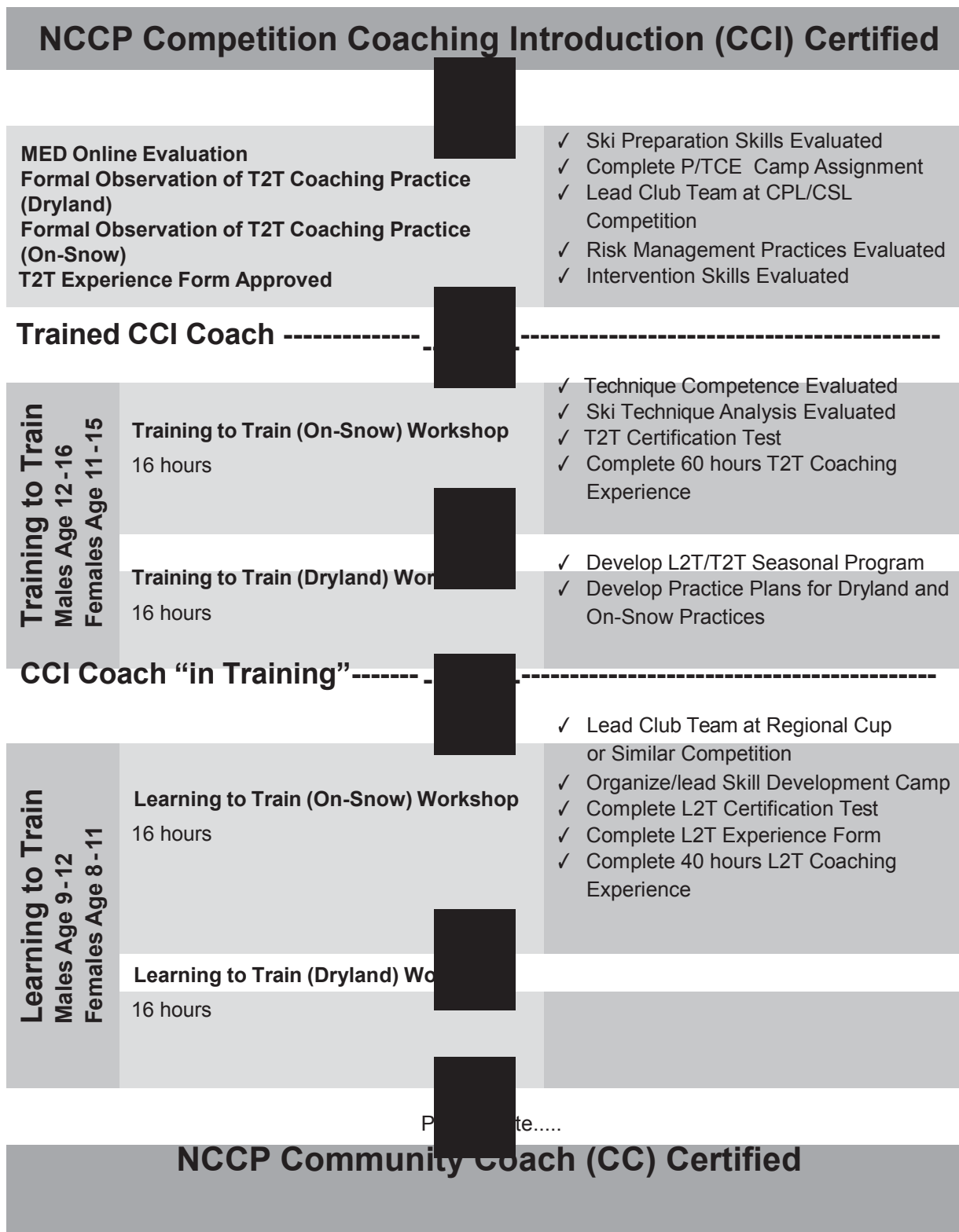


- ✓ Complete the Coaching Association of Canada's CCI "Making Ethical Decisions (MED)" online evaluation.
- ✓ Ski preparation skills evaluated.
- ✓ Participants who have not completed their other certification steps by the end of the CCI-T2T workshop will have an opportunity to complete the process by :
 - submitting their NCCP CCI-T2T Experience Form to their Division Office; and/or
 - submitting outstanding written assignments to a Facilitator for review, and/or
 - arranging an evaluation opportunity for technique competence and/or technique analysis with a qualified Evaluator. This process must be completed within 12 months of the date the T2T (On-Snow) workshop was attended.
- ✓ The cost of a post-workshop evaluation for technique competence and/or technique analysis (if required) is the responsibility of the club or individual.





11.2 CCI Coach Flowchart





11.3 Evaluation Form



CCI Learning to Train (Dryland) Workshop Cross-Country Skiing

Date of Workshop: _____ Location: _____

Facilitator's Name: _____

Please fill in this form and hand it in to the Facilitator before you leave. Your comments are important to the ongoing development of the National Coaching Certification Program.

Please answer the following:

The workshop gave me a better understanding of how to work effectively with parents to help achieve our shared goals.

1	2	3	4	5
<i>Strongly disagree</i>				<i>Strongly agree</i>

The workshop provided me with tools to assist me in making developmental, age-appropriate choices with my coaching.

1	2	3	4	5
<i>Strongly disagree</i>				<i>Strongly agree</i>

I learned about creating a fun, team-oriented environment that will motivate skiers to achieve their personal goals in sport.

1	2	3	4	5
<i>Strongly disagree</i>				<i>Strongly agree</i>

The workshop helped me determine how well my program reflects the guidelines outlined in Cross Country Canada's LTAD model.

1	2	3	4	5
<i>Strongly disagree</i>				<i>Strongly agree</i>





Please answer the following questions:

What sections of the workshop did you find particularly useful?

Would there be anything you would like to see added to this workshop? If so, what would it be?

Are there any additional comments or suggestions you wish to add?

Thank you for your feedback, and best wishes in your coaching.





11.4 Self Test

The following is your “CCI-L2T (Dryland)” Self Test. Please answer T (true) or F (false) to each of these statements.

- | | | |
|---|---|---|
| 1) Physical literacy should be developed before the onset of the adolescent growth spurt. | T | F |
| 2) The L2T stage of development is a window of optimal trainability for strength | T | F |
| 3) Tracking growth before, during and after maturation allows coaches to address the critical periods of physical development (fitness, strength, speed and flexibility) and skill development. | T | F |
| 4) The five basic elements of training and performance are: | T | F |
| ✓ Endurance | | |
| ✓ Strength | | |
| ✓ Speed | | |
| ✓ Skill | | |
| ✓ Flexibility | | |
| 5) The systematic development of self-reliance skills begins during the L2T stage of development. | T | F |
| 6) A sport program is a planned and progressive sequencing of activities. | T | F |
| 7) During the L2T stage athletes should be encouraged to take an increasingly systematic approach towards the development of their own fitness. | T | F |
| 8) The body derives energy from four different fuel systems. | T | F |
| 9) The “zone 1” level of exercise intensity is too low to have any meaningful training benefit. | T | F |
| 10) When stretching is done incorrectly or at the wrong time it can do more harm than good. | T | F |
| 11) For girls a window of optimal trainability for speed occurs between six and eight years of age. | T | F |
| 12) Fundamental movement skills should be mastered, motor development emphasized and basic cross-country ski skills refined during the L2T stage of development. | T | F |





- | | | |
|---|---|---|
| 13) Core strength development (abdominal wall and lower back) is important for athletes participating in any activities or sports beginning at the L2T stage. | T | F |
| 14) Skill Development Camps should not be introduced to children before the end of the L2T stage of development. | T | F |
| 15) Carbohydrate consumption should be avoided before, during and after long training sessions and competitions. | T | F |
| 16) It is not beneficial to wear eyewear with UV protection during the winter months. | T | F |
| 17) Athletes should be introduced to roller skiing during the L2T stage of development for the purpose of building their upper body strength. | T | F |
| 18) Ski walking is a dryland technique that is used to prepare athletes for Double Poling during the winter season. | T | F |



**Answer Sheet**

- 1) Physical literacy should be developed before the onset of the adolescent growth spurt. **True**
- 2) The L2T stage of development is a window of optimal trainability for strength. **False**
- 3) Tracking growth before, during and after maturation allows coaches to address the critical periods of physical development (fitness, strength, speed and flexibility) and skill development. **True**
- 4) The five basic elements of training and performance are: **True**
 - ✓ Endurance
 - ✓ Strength
 - ✓ Speed
 - ✓ Skill
 - ✓ Flexibility
- 5) The systematic development of self-reliance skills begins during the L2T stage of development. **False**
- 6) A sport program is a planned and progressive sequencing of activities. **True**
- 7) During the L2T stage athletes should be encouraged to take an increasingly systematic approach towards the development of their own fitness. **True**
- 8) The body derives energy from four different fuel systems. **False**
- 9) The “zone 1” level of exercise intensity is too low to have any meaningful training benefit. **False**
- 10) When stretching is done incorrectly or at the wrong time it can do more harm than good. **True**
- 11) For girls a window of optimal trainability for speed occurs between six and eight years of age. **False**
- 12) Fundamental movement skills should be mastered, motor development emphasized and basic cross-country ski skills refined during the L2T stage of development. **False**
- 13) Core strength development (abdominal wall and lower back) is important for athletes participating in any activities or sports beginning at the L2T stage. **False**
- 14) Skill Development Camps should not be introduced to children before the end of the L2T stage of development. **False**





- 15) Carbohydrate consumption should be avoided before, during and after long training sessions and competitions. **False**
- 16) It is not beneficial to wear eyewear with UV protection during the winter months. **False**
- 17) Athletes should be introduced to roller skiing during the L2T stage of development for the purpose of building their upper body strength. **False**
- 18) Ski walking is a dryland technique that is used to prepare athletes for Double Poling during the winter season. **False**





11.5 NCCP CCI-L2T Experience Form



CC #: _____ LAST NAME: _____

FIRST NAME: _____ STREET: _____

CITY: _____ PROV.: _____

PC: _____ PH: _____ BIRTHDAY (d/m/y): _____

MALE or FEMALE ENGLISH or FRENCH EMAIL: _____

1. Complete one season of coaching experience (a minimum of 40 hours including preparation time; dryland and on-snow mixed) working with athletes at the L2T stage of development.

Beginning date: _____ Ending date: _____

Receive a satisfactory evaluation from a club leader (i.e. Club Head Coach, SDP Programmer) who has gathered comments from skiers and parents involved with the program).

2. Organize and lead an overnight, interclub skill development camp (dryland or on-snow) for athletes in the L2T/FUNDamentals stages of development.

Date, name and location of camp: _____

3. Lead a club team to a Regional Cup, Midget Championship or similar age-appropriate competition for athletes in the L2T/FUNDamentals stages of development. Provide appropriate waxing support for your athletes and receive a satisfactory evaluation from a NCCP Evaluator.

Date, location and signature of evaluator: _____

4. Lead a safe, appropriately structured and appropriately organized on-snow practice session for athletes in the L2T stage of development, and receive a satisfactory evaluation from a NCCP Evaluator.

Date, location and signature of evaluator: _____



APPENDIX A – COACHING ATHLETES WITH A DISABILITY



APPENDICES

Appendix 1: Coaching Athletes With a Disability

RESOURCE LIBRARY

The purpose of the NCCP Reference Material is to provide you, as a community coach, with a resource “library” to assist you in the ongoing development of your coaching skills.

The content of this document is intended to complement the information provided in your Community Coaching materials, and is directed primarily at supporting you in your role as a coach working with children in the Learning to Train stage of athlete development.







Please sign the following statement and have it verified by a leader from your ski club (Head Coach, SDP Programmer, Club Executive):

I, _____ have completed the NCCP CCI-L2T experience requirements for cross-country skiing.

DATE

Signature of Applicant

I verify that _____ has completed the NCCP CCI-L2T experience requirements for cross-country skiing.

DATE

Signature of Club Official

Please forward to your Division Office





11.6 NCCP CCI-T2T Experience Form



CC #: _____ LAST NAME: _____

FIRST NAME: _____ STREET: _____

CITY: _____ PROV.: _____

PC: _____ PH: _____ BIRTHDAY (d/m/y): _____

MALE or FEMALE ENGLISH or FRENCH EMAIL: _____

1. Complete one season of coaching experience (a minimum of 60 hours including preparation time; dryland and on-snow mixed) working with athletes at the T2T stage of development.

Beginning date: _____ Ending date: _____

Receive a satisfactory evaluation from a club leader (i.e. Club Head Coach) who has gathered comments from skiers and parents involved with the program.

2. Assist a provincial/territorial team at a training camp and receive a satisfactory evaluation from the Head Coach (P/TCE Assignment).

Date, name and location of camp: _____

3. Lead a club team at a nationally sanctioned competition (CPL or CSL) such as a Provincial/Territorial Cup race.

Date, name and location of competition: _____

4. Lead a safe, appropriately structured and appropriately organized dryland practice session for athletes in the T2T stage of development, and receive a satisfactory evaluation from a NCCP Evaluator.

Date, location and signature of evaluator: _____





Please sign the following statement and have it verified by a leader from your ski club (Head Coach, SDP Programmer, Club Executive):

I, _____ have completed the NCCP CCI-T2T experience requirements for cross-country skiing.

DATE

Signature of Applicant

I verify that _____ has completed the NCCP CCI-T2T experience requirements for cross-country skiing.

DATE

Signature of Club Official

Please forward to your Division Office





Dear Coach,

The Coaching Association of Canada is pleased to offer you an interactive website that enables you to check your accreditation online. Go to www.coach.ca where you can:

- track your progress through the NCCP;
- update your coaching profile;
- print out copies of your coaching card or a transcript of your coaching courses;
- visit the Coaching Tips and Tools section;
- and so much more!



Coaching
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of Canada



National
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