



Whitewater CanoeKayak



*Long-Term Paddler
Development Model*



www.canoekayak.ca

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Notes on this Document

The term "paddler" includes participants in all sports within CanoeKayak Canada - Whitewater, be they racers, competitors, recreationalists or other participants. Although the term "athlete" is often used, this model covers all participants and competitors in whitewater paddling who are called upon to demonstrate athletic attributes and skills.

"Kayak" refers to the boat of choice and applies to decked whitewater canoes and kayaks.

"Coach" refers to a person that provides ongoing personal instruction, training support, mentorship and guiding for personal growth and development of paddlers

"Instructor" refers to a person that provides periodic personal technical instruction.

This document serves to embrace the principles of the LTAD framework in whitewater paddling sport from a strategic CanoeKayak Canada - Whitewater perspective. The Long Term Paddler Development (LTPD) framework does not respond in detail to the diverse demands of each discipline. For discipline specifics, please contact the respective member disciplines for their LTPD plans.



Photo: Chuck Lee



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Foreword

CanoeKayak Canada - Whitewater, in partnership with Sport Canada, developed this handbook to share with the paddling community and the larger Canadian public, a new vision consisting of a long-term plan that presents the 'big picture' of river paddling sports in Canada. What exactly does this represent? It is a rich, interwoven tapestry made up of people of all ages and interests. Look a little deeper and one common source of motivation emerges – a passion for canoeing and kayaking as an important part of an active lifestyle.

Water has always been a source of inspiration and challenge, it has the capacity to engage and captivate us, whether young or old, for pleasure, for competition or professionally. The canoe and kayak are unique Canadian cultural icons that have been adopted by the world and modified for international sport and recreation activities.

However, despite a dedicated volunteer committee-based organizational structure that complements the administrative responsibilities of CanoeKayak Canada - Whitewater, what has come to light are many gaps in our system. These gaps need to be addressed to maximize growth, ensure a positive experience, and prevent a backwards direction in our sport.

Canada's Long Term Athlete Development (LTAD) program focuses on effective training of all athletes and participants and on the crucial role of the coach/ instructor in driving all aspects of the sport. It also recognizes the essential role of the parents, sponsors, officials, administrators, sport scientists, and all stakeholders.

Training the right components at the right stage of development by the right people is the key to success for all athletes from beginners to Olympians. LTAD incorporates important lessons learned from exercise science – specifically, growth processes offer critical periods when young bodies experience maximum response to training stimuli. At the same time, it emphasizes the intellectual, emotional and social development of the athlete.

CanoeKayak Canada – Whitewater has modified the term “Long Term Athlete Development” (LTAD) to “Long Term Paddler Development” (LTPD). This more accurately reflects the large and critical role that recreational paddling plays in the sport with the term ‘Long Term Paddler Development’ (LTPD).

In whitewater sport, LTPD encompasses every discipline, with the racer and competitive athlete as the central focus but not neglecting the relevant role that active participation for life has in whitewater paddling.

As a model, LTPD gives the Canadian whitewater community a vision of where we want to be. For years to come, it will help us to improve our infrastructure and programs, and to create new initiatives to ensure the best opportunities for all our athletes and participants, whatever their personal goals or stage of development.

The key benefits

-  ***Like a brick foundation, all stakeholders can better see how they fit together into a collaborative whole and are better able to make the necessary, ongoing changes.***
-  ***Instructors and Coaches will begin to see a larger role for themselves as leaders in all aspects of the sport.***
-  ***Real, measurable growth will lead to greater 'ParticipACTION' and podium performances internationally.***

The competitive nature of sport implies that only a few athletes will advance to elite ranks. But LTPD is not just an elite model. It provides a solid foundation for all paddlers at all ages and levels, encouraging long-term participation, enjoyment and achievement.

Overview of Long Term Paddler Development

What is Long-Term Paddler Development?

Long-Term Paddler Development (LTPD) is a systemic approach being adopted by CanoeKayak Canada - Whitewater to maximize the potential of participants and athletes in our sport.

The LTPD framework defines optimal training, competition, and recovery programs based on developmental age rather than chronological age.

By tailoring sport development programs around basic principles of growth and maturation, especially during the critical early years of development, LTPD enables athletes and participants to;

- Improve their overall health and wellness
- Increase their lifelong participation in paddling and other physical activities
- Reach their full potential in their sport

LTPD sets out recommended training sequences and skills development for everyone – from 7 to over 70. It addresses the physical, mental, emotional, technical, and tactical needs of athletes as they pass through each stage of development.



Adapted to the specifics of our sport, the LTPD model will provide participants, athletes, instructors and coaches with the tools to support the progression from beginner to champion, if that is the paddler's goal. LTPD will also help the recreational paddler to develop the skills needed to enjoy the thrill and enjoyment of whitewater paddling.

Parents will be able to use LTPD to help them understand the key stages of athlete development necessary for success, along with the right mix of skills, coaching, and support required along the way.

And LTPD will guide CanoeKayak Canada - Whitewater and administrators at all levels in planning and delivering programs to advance paddling sports in Canada.



Long-Term Athlete Development for Canada

To improve international performances by Canadian athletes and to encourage lifelong participation in sport by Canadians, Canada has adopted a made-in-Canada LTAD model. This general model is described in the 2005 publication, Long-Term Athlete Development – Canadian Sport for Life, ISBN 0-9738274-0-8, published by the Canadian Sport Centres and available at www.ltad.ca.

Canada's LTAD

- establishes a clear development pathway from playground to podium – and to being active for life.
- integrates the needs of athletes with a disability.

Overall, LTAD promotes a healthy, physically literate nation, whose citizens participate in lifelong physical activity.

Why Canada Needs a New Approach

In 2005, Canada began the LTAD, a major project to shift the Canadian paradigm in our national sport system.

Why the need for change? LTAD arises in part from the declining international performances of Canadian athletes in some sports and the difficulty many sports are facing in identifying and developing the next generation of internationally successful athletes. In addition, participation in recreational sport and physical activity has been declining and physical education programs in our schools are being marginalized.

A contributing factor was the way Canadian sport borrowed pieces of theories and training methods from countries with impressive podium performance records. What we had was a patchwork approach, not a sport development system.

Radical change was needed. To find a solution, an elite team of sport scientists, coaches, and technical and administrative sport leaders pooled their expertise to look closely at athletes and sport in Canada. They drew on their own expertise and on a wealth of sport science including exercise physiology, sport psychology, psychomotor learning, sport sociology, and nutrition.

The result? The LTAD program. A made-in-Canada system based on our own culture, traditions and geography that reflects our social, political and economic realities.



Photo: Chuck Lee



Why Canada needs a physical literacy program that includes kayaks

The LTAD and Canadian Sport for Life program showcase the need for children to develop the basic fundamental movement skills, running, jumping, kicking, throwing and catching. Swimming is another fundamental skill because of our affinity to water and the need to prepare society to be safe around water. All of these skills are part of the Active Start phase of the LTAD from the age of 0 to 6.

The ability to use a watercraft is another foundational movement skill that is a unique learned behaviour that can be started between the ages of 6 and 9. Once the basic swimming skills are in place, children can develop fundamental skills in a boat. These unique skills include;

- balance
- propulsion
- directional control

These skills are very dissimilar from other sports but are shared between all watercraft.



Photo: Chuck Lee

The fundamental watercraft skills of balance, propulsion and directional control are equally applicable to canoes, kayaks, rafts, rowboats, rowing sculls, sailboats and surfboards. Children learning these skills at an early age will be prepared to handle a multiplicity of watercraft as they mature and grow.

Children's kayaks are suitably designed and constructed to be particularly useful in a traditional aquatic environment that is found across Canada, the swimming pool. Small, lightweight, durable, inexpensive and easily stored, kayaks provide the perfect medium for children to learn to manage a boat in a safe and controlled environment at their local pool.

The normal 25 m pool can easily accommodate 15 boats and paddlers on the water. When not in use, the boats can be stored against the wall. Children learn the basics from entries and exits to forward strokes and turning strokes through easy games. Within an hour they are cruising around the pool and playing games like bumper boats, tag and ball games.

Less cumbersome than canoes, easier to maneuver and very responsive, whitewater kayaks make the perfect vehicle to develop the second phase of aquatic literacy – above the water boating skills.

Boating skills typically require different physical motor skills from normal sports because propulsion is centred around the core trunk area and upper body limbs. The sport gives equal treatment to different body types because weight bearing is not an issue and can encourage heavier people to be physically active.



Why Whitewater Sport in Canada Needs Long-Term Paddler Development

Canada has a tradition of canoeing and kayaking and has produced world champion slalom and freestyle paddlers, but too often we do not look further than the next competition season. LTPD is a reflection of the strengths and weaknesses in the current state of whitewater sport in Canada in a format that will challenge and strengthen this system.

There are 10 positive reasons for implementing LTPD:

- 1) *To establish an optimal development pathway for athletes and participants*
- 2) *To identify gaps in the current development pathway that could be affecting our talent development system and athlete performance*
- 3) *To form a framework in which to incorporate solutions*
- 4) *To improve communication at all levels of participation and development*
- 5) *To produce a streamlined, efficient system across all disciplines*
- 6) *To foster awareness, education, and planning for parents*
- 7) *To serve as a planning tool, based on scientific research for coaches and administrators*
- 8) *To create a change agent that will facilitate planning, training, competition, and recovery programs for developing paddlers*
- 9) *To assist athletes in achieving excellence and podium performances*
- 10) *To promote lifelong enjoyment of whitewater sport*

The principles of LTPD are designed to review existing paddler programming and to provide a basis for all future initiatives. The mechanism of change requires a multi-year plan and the participation of all stakeholders in enabling collaboration among all paddler communities in achieving local, regional, and national goals.

Where Are We Now? — An Analysis of our Contextual Reality

Canadian whitewater sport has an extensive history and established structures for whitewater paddling. LTPD offers an ideal opportunity to review these structures. This section provides a broad overview of our current position and covers general strengths and weaknesses, although not all points will apply equally to all disciplines. Some disciplines may be stronger in various areas and weaker in others.



Photo: Chuck Lee



Where are we now?

- and Where do we want to be in 2020?



PADDLERS

Strengths

- Large population of whitewater participants in the Active for Life stage.
- Dedicated athletes at the Transformations, Training to Compete and Training to Win stages
- Multi-disciplinary sport allows all athletes to find a passion within the sport
- International success of athletes creating pathways for future success.

Weaknesses

- Late entry of children into the sport
- Low proportion of females involved in whitewater sport
- High dropout rate between the ages of 17 - 20
- Lack of a logical athlete development pathway
- Lack of an integrated talent ID system based on the principles of LTPD



LEADERS, INSTRUCTORS & COACHES

Strengths

- Many dedicated leaders, instructors and coaches across Canada who help participants and athletes build skills and knowledge and achieve their dreams
- Several pockets of talented and exceptional coaches for each discipline
- Various recently revised components of coaching education receiving high praise from within and outside the industry
- The consolidation of instruction programs within CanoeKayak Canada's – NCCP certification programs
- Recognition across all levels of the Canadian sport system of the National Coaching Certification Program (NCCP) as governed by the Coaching Association of Canada



Photo: Chuck Lee

Weaknesses

- Not enough CanoeKayak Canada NCCP certified leaders, instructors and coaches
- Large percentage of uncertified coaches
- Large areas of the country do not have any qualified leaders, instructors or coaches
- Lack of female leaders, instructors or coaches
- Database for leaders, instructors and coaches is not comprehensive
- The most knowledgeable coaches work at the elite level and there are few that work at the developmental level, which also must have high-calibre coaching
- Lack of recognition and promotion of top coaches at every stage of athlete development
- Coaches largely unaware of the critical periods in which accelerated training can take place
- Coaches lacking a complete picture of the benefits of a holistic approach to athlete development



Photo: Edmond Duggan

All programs are **athlete centered, coach driven**. In order for the coach to help the athlete reach their dream, he/she must be able to play effectively five (5) roles.

1. The **architect**, responsible to design the athlete's pathway towards the final goal of the year.
2. The **builder**, responsible to structure, lead and manage a Integrated Support Team (PET).
3. The **artisan**, bringing support to the athlete in the training environment. Raising the performance capacity of the athlete and integrating all the performance factors (5Ss) in order to prepare the athlete to perform at identified competitions.
4. The **counsellor**, bringing support to the athlete in a competition environment. Making sure the athlete is in an ideal performance state, stays focused throughout the competition and extend to the limit of their performance capacity.
5. The **facilitator**, bringing socio-emotional support to the athlete as related to the situation at the moment.

COMPETITION / EVENTS



Strengths

- Competitions available for recreational participants
- Strong tradition of slalom and wildwater national championships in Canada
- National Team selection races in slalom and freestyle
- Numerous regional festivals and recreation events celebrate whitewater paddling that connect the community
- Club, school and university canoe polo tournaments

Weaknesses

- Freestyle and Canoe Polo do not have a strong history of national championships
- Many areas in the country do not have any competitions nearby
- Poor communication about competitions
- No coordination of local, regional and national competitions and events
- National schedule is dependent on international schedule which is not consistent
- Junior World Slalom Championship event is every other year limiting opportunities especially for odd age juniors
- Lack of quality competition venues
- Travel distance between east and west requires special consideration for scheduling national events
- Not eligible for Canada Summer Games due to insufficient number of provinces in CKC-W

LEADERSHIP



Strengths

- National office in Ottawa and provincial offices in BC, AB, SK and QC
- Stakeholders with a strong desire for whitewater sport/industry to succeed in all forms
- Good work taking place within many of Canada's member bodies
- Key volunteers and administrators interested and committed to the sport.
- Commitment by CanoeKayak Canada to address change where required
- Diverse club infrastructure to run programs

Weaknesses

- Lack of awareness by schools, recreation departments and pools of opportunities to access paddling programs and facilities
- No support structure in most of Canada for whitewater sport
- Club system not well developed in most of Canada
- System works in silos without communication and coordination between disciplines, CKC, provinces, clubs
- Lack of integrated and enhanced communication system that links all key players
- Team selection and talent I.D. is not well developed in some disciplines
- Whitewater plays second fiddle to CKC-Sprint within the national office.
- Lack of use of modern technology to generate research data, feedback, store analysis, and retrieve data to deliver targeted information
- Parents are too heavily involved in administration and leadership in sport organization



FACILITIES

Strengths

- Abundance of whitewater rivers in Canada
- World-class whitewater venues
- Clean real whitewater
- Swimming pools across Canada
- Most communities have a river or lake in their core area that can be used to learn and train on
- Internet blog pages allow paddlers to connect to set up trips and activities

Weaknesses

- Lack of clubhouse and whitewater facilities in urban locations
- No indoor or all-season facilities to allow training in the off-season
- No Olympic style artificial courses in Canada
- Remote access to whitewater in most of Canada requires transportation
- Shortage of entry level equipment



Photo: Chuck Lee

ENVIRONMENT

Strengths

- Whitewater paddling takes participants outdoors into unique natural locations
- No trace – low impact activity
- Sustainable and green activity
- Paddlers are emotionally connected to water
- As an ecosystem
- As a playground
- As a Canadian tradition

Weaknesses

- Resources and materials do not reference or discuss the environment including the CKC-W Code of Ethics
- Little connection of school's water ecology programs with paddling and river environments.
- No consistent practices between certified leaders, instructors or coaches
- Remote access to whitewater in most of Canada requires transportation
- Shortage of entry level equipment

OFFICIALS

Strengths

- Enthusiastic and committed judges
- Large number of internationally certified judges

Weaknesses

- Need opportunities to develop officials at every big event.
- No official system for training, upgrading, certifying and coordinating judges at the provincial or national level
- All costs are borne by the volunteer
- Not enough officials to host an international event



Photo: Chuck Lee

PARENTS

Strengths

- The key figures in supporting their child's dreams related to paddling activities
- Large number of passionate and supportive parents involved in sport who contribute in various roles
- Parents can actively participate with their children as paddlers, safety boaters, trip leaders, chaperones and shuttle drivers



Photo: Chuck Lee

Weaknesses

- Non-paddling parents are often scared and over protective
- Too heavily involved in administration and leadership in sport organizations
- Parents do not often understand how challenging mentally and emotionally whitewater paddling can be
- Communication and inclusion of parents as volunteers is not done very well
- Parents do not understand athlete progression through LTPD stages

CONSEQUENCES OF OUR CURRENT SYSTEM

- Very limited entry points for children to be exposed to kayak and canoe sport and to develop skills
- Fundamental physical literacy and aquatic literacy skills associated with boat balance, propulsion and directional control are not developed in school age children
- The general population does not have proper safe boating skills either on the lake or on rivers in any type of watercraft
- Children are not having fun as they participate in paddling programs
- Underdeveloped and unrefined skills due to inadequate instruction and coaching
- Bad habits developed from lack of training
- Short-coming of fundamental athlete preparation requiring remedial programs by provincial and national team coaches
- Athletes exit the sport and do not to return
- Fitness and physical development program is not well planned leading to a lack of proper fitness for athletes at higher levels
- Fluctuating performances as a result of the lack of a developmental pathway
- Athletes failing to reach their optimal potential
- No systematic development of the next generation of international athletes
- Failure to reach optimal performance levels in international competitions

Where do we go from here?

The LTAD model is the blueprint for building the best sport system possible. Intrinsicly within the sport system structure is the recognition that ongoing change is necessary to develop a supportive training environment so that all participants and athletes can achieve their potential, whatever their aspirations.

Long Term Paddler Development (LTPD) is a plan for athletes to maximize their potential through optimal training, competition, and recovery techniques throughout their athletic careers. In addition, LTPD is about enjoying life-long participation in whitewater canoe/kayak sports and other physical activity. Training, racing, and recovery programs are based on an athlete's developmental age rather than chronological age and are designed to optimize development during critical periods of maturation and trainability. LTPD also takes into account the physical, mental, emotional, and cognitive development of all participants.



The 10 Key Factors Influencing LTPD

The first step to finding a solution and further advancing whitewater paddling in Canada is an understanding of the 10 key factors influencing LTPD and its application to paddling sport.

The 10 key factors are:

1. The 10 Year Rule to Reach the Top
2. The FUNdamentals
3. Specialization
4. Developmental Age
5. Physical, Mental, Cognitive, and Emotional Development: A Holistic Approach
6. Planning and Periodization
7. Calendar Planning for Competition
8. System Alignment and Integration
9. Continuous Improvement
10. Windows of Trainability

The 10 key factors are examples of:

- information on adapting training and competition programs to the growth and development stage of the paddler, with special emphasis on the windows of optimal trainability.
- guiding principles of motor and skill development as related to the growth, development and maturation age.
- guidance and tools to assist coaches, parents, and administrators in delivering LTPD in order to achieve top performers and lifelong participation in paddling sport.

Rationale for the LTPD Framework

Note: Research suggests that whitewater paddling requires both an early start and a late specialization program that is different from the generic LTAD. Paddlers should begin **FUNdamentals** and **Developmentals** at the age of 8 and 10 respectively and then specialize in a specific discipline around the age of 15-16.

- The LTPD framework has been developed to take into account an early start, late specialization paradigm. It has six main stages: FUNdamentals, Developmentals, Transformations, Pursuit of Excellence, Training to Win, and Active for Life.
- Age specialization appears to be a key issue for paddling sport because it should be an early start sport, but it is also a sport where paddlers can go on to enjoy a competitive career well into their 30's and can be active paddlers through the rest of their lives. The ages outlined are general guidelines. The individual tempo of development and maturation will influence when an athlete may reach a particular stage. However, each will go through the same stages.
- The involvement of young paddlers in the **FUNdamentals** first and then **Developmentals** is desirable as a mechanism to support the development of a range of technical elements across any subsequent choice of discipline.
- Various **FUNdamentals**-friendly activities in the pool and through games are also desirable to provide well-rounded paddling literacy at an early stage. A participant friendly start at the **FUNdamentals** stage ages 6-10 in pools and camps and unstructured play in boats has emerged as a huge advantage in establishing aquatic literacy. It provides sound general development, athlete competency, physical skills, a rich social experience, and meaningful personal growth leading to building character and coping skills for success and achievement in all life activities, on and off the water.

Rationale cont...



- Having developed a roll, eddy turns, ferries, surfing and understanding currents in **Developmentals**, the athlete will be at a stage where they can transition into the variety of whitewater sport activity (recreational Grade III rivers, slalom, freestyle, canoe polo or wildwater). **Transformations** is this stage of the LTPD from ages 12-17 that gives athletes this opportunity.

- Having made a choice as the athlete moves through **Transformations**, the selection of a whitewater discipline and boat will focus the activity of the training. The **Pursuit of Excellence** stage of the process from age 16 to 21 brings the athlete to a higher level of competence and gives them the skills to compete at the international level.



- The **Developmentals** stage of the LTPD takes the basic skills and knowledge from **FUNDamentals** and introduces the paddler to the river environment. The balance, propulsion and directional control skills provide the foundation to develop the necessary skills to safely and comfortably navigate down a river.



- The **Training to Win** phase picks up as athletes make the transition to the Senior Team and begin competing in World Cup, World Championship and the Olympics. In whitewater competition this stage can start as early as 21 but may take several years to break in to this select group.



- The **Active for Life** phase of the LTPD can be entered into at any time and from any phase after progressing through the **Developmentals**. Teenagers and Adults will quickly progress through the **Fundamentals** and **Developmentals** stages, often in a single instructional session.

There are different streams of participants in the **Active for Life** phase based upon the characteristic of the individual and their interests. The LTPD identifies 3 distinct groups;

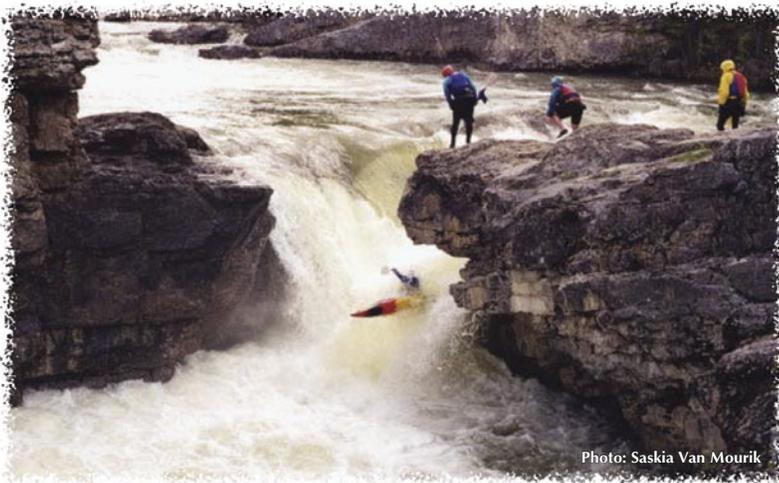


Photo: Saskia Van Mourik

Adventure for Life.

- “Whitewater kayaking is well known for the sense of adventure, risk and challenge. Each river has a distinct and individual character that changes over the year allowing each individual to choose the level of risk and challenge they are seeking. “



Photo: Edmond Duggan

Competitive for Life.

- “Athletes can continue to compete for many years in their choice of slalom, wildwater, canoe polo or freestyle. The perfecting of technique, maintaining physical health and conditioning, enjoying competition and camaraderie with other athletes are important factors for people to participate.”



Photo: Chuck Lee

Explore, Enjoy and Experience for Life.

- “whitewater kayaking provides an opportunity to travel to unique environments and experience wilderness that can only be seen from the river. “



The 10 Key Factors

1. The 10-year Rule to Reach the Top:

Scientific research has identified that it takes at least 10 years and 10,000 hours of training for a talented paddler to reach the high performance levels from the time that they begin to specialize in their sport. There are no shortcuts. Development of elite whitewater canoe/kayak athletes is not a short-term process. Short-term performance goals must not be allowed to undermine long-term athlete development.

What does this mean for whitewater paddlers? Time and money have to be invested for a significant period and the support of parents is essential especially in the **Transformations** and **Pursuit of Excellence** phases. It is also important for the athlete to be supported by the club and coaches.

Since tremendous effort and motivation are needed, a realistic strategic plan and pacing are musts. Relaxation and recovery principles, long overlooked have to be built into training for sustained commitment over the long haul.

This factor is supported by The Path to Excellence, which provides a comprehensive view of the development of U.S. Olympians who competed between 1984 and 1998.

The results reveal that:

- U.S. Olympians begin their sport participation at the average age of 12.0 for males and 11.5 for females.
- Most Olympians reported a 12 to 13 year period of talent development from their sport introduction to making an Olympic team.
- Olympic medalists were younger — 1.3 to 3.6 years — during the first 5 stages of development than non-medalists, suggesting that medalists were receiving motor skill development and training at an earlier age. However, caution must be taken not to fall into the trap of early specialization in late specialization sports.

2. FUNDamentals:

FUNDAMENTAL MOVEMENT SKILLS - running, jumping, kicking, throwing and catching

FUNDAMENTAL MOTOR SKILLS - agility, balance, coordination and time/space orientation are the basis for all other sports and are known collectively as physical literacy.

Children should develop physical literacy before puberty and the onset of the growth spurt in adolescence. They are best learned through safe, fun and active participation in games in both structured and unstructured environments. There are three activities that are extremely important to the development of physical literacy:

Athletics: run, jump, kick and throw

Gymnastics: ABCs of athleticism (agility, balance, coordination and speed) as well as the fundamental movement patterns of landing, static, locomotion, rotation, swing, spring and object manipulation

Swimming: for water safety reasons, for balance in a buoyant environment and as the foundation for all water based sports

An individual who is not competent in the basic movement skills will have difficulty participating in a range of sports and will have fewer opportunities for athletic success and life-long enjoyment of physical activity.

Other activities develop balance while in movement:

- Skiing and skating
- Snowboarding and skateboarding
- Cycling
- Kayaking and canoeing



Without these basic movement skills, a child will have difficulty participating in any sport and will have fewer opportunities for lifelong enjoyment of physical activity or for any athletic success.

Kayaking requires individuals to learn a new balance mechanism, a completely different method of propulsion and controlling directional movement that is not normally part of the social recreation and sports activities in Canada. Introduction of these skills at an early age enable individuals to enjoy a variety of on-top of the water sports activities later in life. These other sports include: canoeing, kayaking, sailing, rowing, rafting, sailboarding, surfing, kiteboarding and general boating.

Specialization:

Basic boat skills are best developed early as a fundamental physical literacy skill. However, whitewater canoe/kayak competition is a late-specialization sport where national level athletes typically do not emerge until their early to mid 20's. Paddle sport has elements of both early and late specialization sports. Overall it can best be described as an early start, late specialization sport.

We depend on other components of the sport system such as schools, recreation centers and other sports to provide children with opportunities to develop physical literacy (during the FUNdamentals stage) and early speed and suppleness (during the Developmentals and Transformations stages). Athletes need to continue to participate in a variety of sports and physical activity during the Fundamentals, Developmentals and Transformations stages in order to succeed in a late-specialization sport such as whitewater canoeing/kayaking.

LTPD actively discourages early specialization in late-specialization sports. Specializing before the age of 13 in late-specialization sports contributes to imbalanced physical development, inadequate development of the full range of basic movement and sport skills, overuse injuries, and early burnout.

LTPD is about making sure that paddlers get optimal training, competition, and recovery throughout their career in order to allow them to:

- Reach their athletic potential.
- Enjoy life-long participation in canoeing/kayaking and other physical activity.
- Training, racing, and recovery programs are based on a paddler's developmental age rather than chronological age and are designed to optimize development during critical periods of accelerated adaptation to training.
- LTPD also takes into account the physical, mental, emotional, and cognitive development of all participants.

Children need an early start so they can learn to propel and steer the boat in balance while they are developing suppleness, which means before the age of 13. Between the ages of 8 and 14, children need to develop their overall motor control in the context of watercraft. As teenagers, they develop the level of intellectual and emotional maturity required by the paddler-water relationship and can then begin the Transformation and Training to Compete stage. However, paddlers should not specialize in a particular discipline until they are at least 14 to 16 years of age. Specializing too early contributes to:

- Deficits in the fundamental movement and sports skills.
- Injuries.
- Physical and mental burnout.
- Early retirement from training and competition.

Developmental Age:

Chronological age refers to the number of years and days elapsed since birth. In sport, the calendar age of a child is less important than the degree of his or her physical, mental, and emotional maturity – the developmental age. A group of children of the same chronological age will differ by several years in their biological age and maturity of physical, motor, cognitive and emotional qualities.

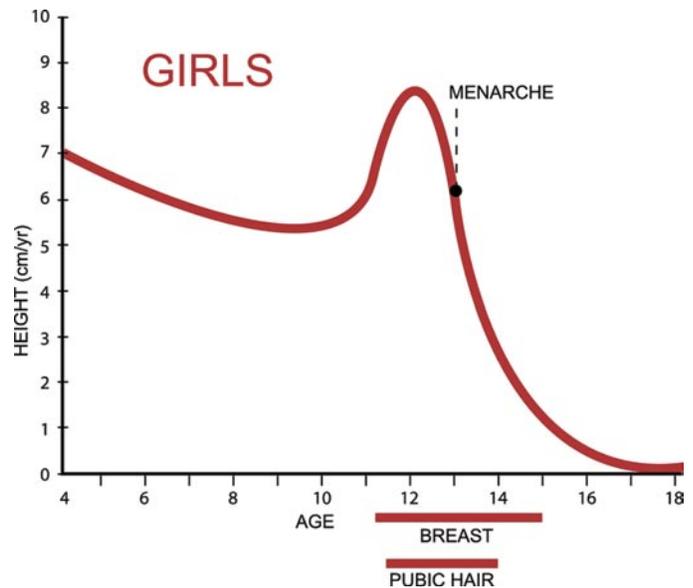


LTPD is based on maturity, not chronological age. We all follow the same stages to maturity, but the timing, rate and magnitude of maturity of various qualities differs between individuals. During late childhood and adolescence, athletes who are the same chronological age may be four to five years apart developmentally. Children of the same calendar age can differ enormously in their level of maturation – the structural and functional changes in their bodies as they grow into adults. LTPD requires the identification of early, late and average maturation to help design appropriate instruction, training and competition programs according to the readiness of the participant.

Rapid or slow transit through puberty can also be important. Rapid transit means that the individual goes through the growth spurt quickly (e.g. in 1.5 years) as compared to another individual who may take 4 or 5 years, or more, to reach maturity (slow transit). Rapid transit can have a detrimental, but not necessarily permanent, effect on skills, speed, strength, power and flexibility, because of the large changes in limb and body length. Coaches, parents and athletes must be well-informed about the impact of rapid transit. Some sports have made the decision that athletes not compete during the growth spurt, or are highly selective about the number and type of competitions and the goals set for athlete performance.

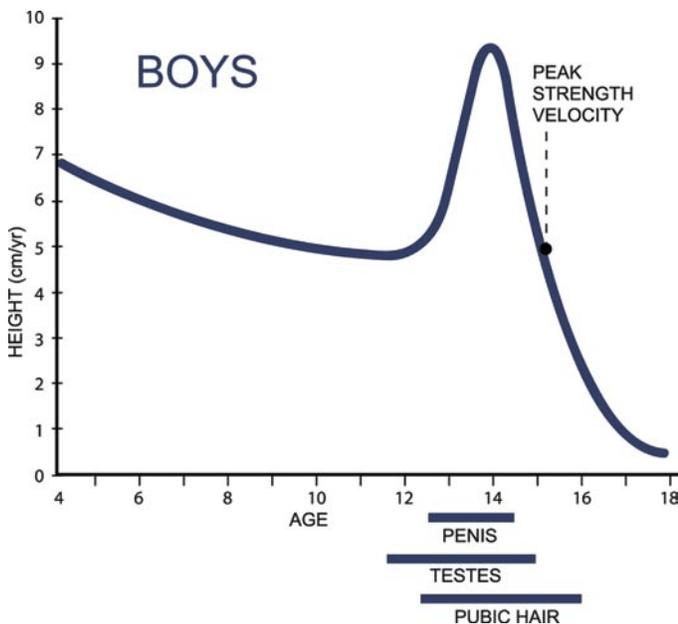
Coaches need to understand these developmental differences and take them into account when they select athletes. Coaches should design training and competition programs that match the individual readiness of their young athletes. Two very useful indicators are the beginning and the peak of the growth spurt. Females mature faster than males.

Peak Height Velocity (PHV) in girls occurs at about 12 years of age. Usually the first physical sign of adolescence is breast budding, which occurs slightly after the onset of the growth spurt. Shortly thereafter, pubic hair begins to grow. On average, menarche, or the onset of menstruation, comes rather late in the growth spurt, occurring after PHV is achieved. The sequence



of developmental events may normally occur 2 or even more years earlier or later than average, depending if you are an early or late maturer.

PHV in boys is more intense than in girls and on average occurs about 2 years later. Growth of the testes, pubic hair, and penis are related to the maturation process. Peak Strength Velocity (PSV) comes 12 to 18 months after PHV. Thus, there is pronounced late gain in strength characteristics of the male athlete. As with girls, the developmental sequence for male athletes may occur 2 or more years earlier or later than average. Early maturing boys may have as much as a 4-year physiological advantage over their late-maturing peers. Eventually, the late maturers will catch up when they experience their growth spurt.



In order to design a tailor made training program to the athlete at puberty, it is important to determine precisely the onset of the growth spurt and the peak height velocity curve (PHV)



5 *Physical, Mental, Cognitive, and Emotional Development: A Holistic Approach*

A major objective of LTPD is taking all aspects of personal development into consideration – the whole person. At each stage, coaches should consider the emotional, mental, and cognitive development of each paddler, in addition to their physical development, when they plan training, racing, and recovery programs.

In relation to Whitewater Paddling there are several different stages of emotional, mental and cognitive development which dramatically impact the ability, interest and capacity for the athlete to learn. These variations are subject to personal character differences and to environmental conditions. Risk tolerance and the recognition of danger is a large factor when planning programs for children, teens and adults.

Each individual child has a different tolerance for challenge and risk but this is also influenced by their age and the environment in which the risk is presented. Instruction in a swimming pool gives a safe and secure environment for introducing children to kayaks and learning the entry and exits. Before the age of 9 – 10, the use of spray skirts has to be carefully planned, controlled and monitored to ensure that wet exits are natural and performed without hesitation. It is not uncommon for some individuals no matter their age to have a fear of tipping over and being trapped in the boat. This fear has to be respected, but with time and patience, most people can overcome their fears. Teenage girls are some of the worst for building this fear up and becoming difficult to handle.

Prior to the age of 9 - 10 the cognitive awareness of hazards and real danger is not well developed and care in designing a program is required to limit exposure to real risk. While the technical skills may be in place, special and cognitive awareness is limited. This requires that training sites are free of any peripheral hazards.

A greater percentage of boys are more risk tolerant and actually looking for more excitement than girls of the same age. Whitewater sport is unique in the psychological challenge it presents for athletes in a risk environment. The ability to select appropriate training programs and sites that blend challenge and comfort in a progressive manner is critical to retain athletes in the sport.

6 *Planning and Periodization:*

Simply put, designing a yearly plan is time management. It means planning the right activities with the adequate degree of difficulty and in the right sequence to reach the training and competition objectives sought.

Periodization provides the framework for organizing training (for example; mode, volume, intensity, frequency of training), competition and recovery into a logical and scientifically based schedule in order to achieve optimum performance at the required time. A periodization plan that takes into account growth, maturation, and trainability principles should be developed for each stage of a whitewater paddler's development.

The plan must be broken down into workable units. The proper sequencing of these units (periods; phases; mesocycles) is critical for success. In order to reach optimal performance in a competition environment, the training units have to be sequenced in the following manner:

- 1. Develop the performance capacity of the paddler. The performance factors are sport specific skills, tactics/strategies, physical components, mental skills.**
- 2. Integrate the performance factors in a complex and harmonious blend in the competition period by alternating training microcycles and modelled competition microcycles.**
- 3. Prepare the paddler to perform at identified competitions and taper for the decisive competition of the year.**

What does the coach need to know in order to design an annual plan?

- 1. Know how a sport specific athletic form is developed**
- 2. The requirements (demands) of the sport in competition**
- 3. The competition calendar and its relative importance**
- 4. The actual training state of the athlete at the start of a yearly plan**
- 5. The contextual reality that the coach and athlete have to cope with**
- 6. The sport specific LTPD model**

Planning, adequately training, competition and recovery is the critical blueprint for success.



7 *Calendar Planning for Competition:*

“Competition should be considered by the coach as twofold. On the one hand, competition is the culminating point of training for events such as regional championships, national championships, the World Cups and the Olympic Games. On the other hand, competition is a means to advance paddler development and to improve a particular aspect of the performance.” (Cardinal, 1995)

The system of competition makes or breaks athletes. The competitions and calendar should support and be consistent with LTPD. Different stages of development have different requirements for the type, frequency, and level of competition. At some stages of development, for example Transformations, training and development should take precedence over formal racing and short-term success. At later stages, it becomes more important for athletes to experience a variety of competitive situations and to perform well at high-level competitions. The fact that most whitewater disciplines are individual sports means that individual competition schedules can be designed by the coach and the paddler to match the individual athlete’s development needs.

“Training can only approximate competition like conditions. It can only be the mirror image of the real thing. Only in competition, when confronted by the opponent, do whitewater paddlers find the absolute stimuli-inducing adaptations, the creative thinking requiring the precise tactical adjustments for the particular competition situations, and the emotional control and rigorous discipline required to implement the competition plan. The coach must expose the paddler to numerous competitions in order to improve her or his adaptation capacities related to all types of competition conditions and opponents” (Cardinal, 1995).

8 *System Alignment and Integration:*

All parts of the system supporting whitewater sport are affected by LTPD. To advance the sport, the interconnected parts must work together as an effective overall system. All programs should be athlete-centered and coach-driven, with all additional players as the supporting cast. The key players involved in whitewater sport are:

- Athletes
- Coaches
- Parents
- National Sport Organizations and Provincial Sport Organizations (PSOs)
- Officials
- Competition Organizers
- Course Designers
- Equipment Manufacturers
- Performance Enhancement Teams (PETs)

“It’s not just the bricks; it’s how we put them together!”

LTPD recognizes that physical education, school sports, recreational activities, and competitive sports are interdependent. For example, as a late-specialization sport, whitewater canoe/kayak racing and competition depends on schools, municipal recreation programs and other sports to provide children with opportunities to develop physical literacy and early fitness. LTPD recognizes that enjoying a lifetime of paddling activity and achieving athletic excellence are both built on a foundation of physical literacy and fitness. All elements of the sport system must be integrated and aligned with one another to achieve these goals.

Similarly, all parts of the canoe/kayak system – schools, municipal recreation programs, adventure sport camps, paddling clubs, provincial associations, Canoe-Kayak Canada and competitions – across all regions; must be integrated and aligned with one another. Each element in the system plays a crucial role in a paddler’s development. For the system to work well, they must be mutually supportive, clear in their roles and responsibilities, and clear in how they contribute to the “bigger picture” of athlete development. Just as the athletes who are fast must integrate and align their movements, the components of the canoe/kayak system must integrate and align their activities. Whitewater paddlers will do best in this sport system that is clear, seamless and based upon a consistent set of principles.



LTPD allows paddlers and their families to identify the opportunities available to them and to understand the pathway they need to follow. If they want to canoe/kayak at a high performance level, they will know (in general terms) what type of training, racing, and recovery they should be doing at each stage, when they should start to specialize in whitewater paddling and when they should specialize in one of the disciplines of slalom, wildwater, freestyle or polo and what they need to do to move up through the system. They (and their parents) will have the knowledge to advocate for programs, coaching, equipment, competitions, and other services that will support their long-term development. In a system where the various elements are integrated and aligned, talented whitewater paddlers will be less likely to “fall through the cracks.”

9 Continuous Improvement:

The concept of continuous improvement, which permeates LTPD, is drawn from the respected Japanese industrial philosophy known as Kaizen.

LTPD is based on the best available scientific research and empirical evidence, but knowledge and understanding evolve. LTPD should definitely respond to, integrate and in some cases, stimulate research and discipline-specific innovations.

Continuous improvement ensures that:

- LTPD responds and reacts to new scientific and sport-specific innovations and observations and is subject to continuous research at every stage of athlete development and in all fields of studies.
- LTPD, as a continuously evolving vehicle for change, reflects all emerging facets of physical education, sport, and recreation to ensure systematic and logical delivery of programs to all ages.

Due to its heavy technical component, whitewater sport is exposed to experimental approaches. Due to rule changes boats have evolved dramatically since 2004. Our multi-variable sport has always been and will continue to be subject to technical changes.



Photo: Chuck Lee

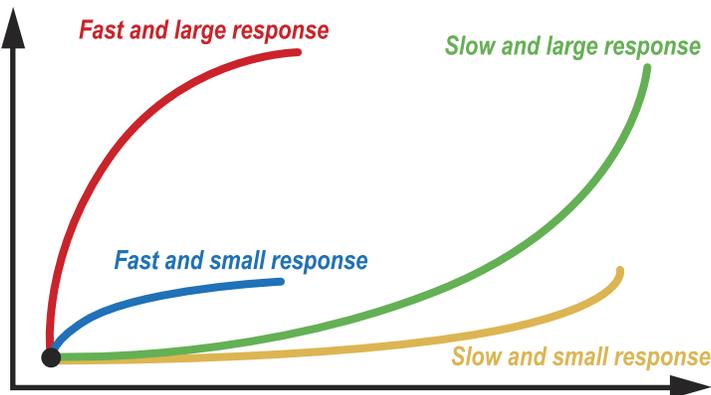
10 Trainability:

Sports scientists have identified five physical capacities that are crucial for athlete development: stamina, strength, speed, skill, and suppleness. These are often referred to as the 5 Basic S's of Training and Performance.

All physiological systems are always trainable, but there are sensitive periods in development when the body is particularly responsive to specific types of training. To reach their genetic potential, whitewater paddlers need to do the right type of training at the right stage. Otherwise, they can still be very fast, but they will never be as fast as they might have been.

Athletes cannot recover fully from inadequacies in their early training. Trainability refers to how responsive an individual is to a training stimulus at different stages during growth and maturation. Although all physiological capacities are always trainable, there are sensitive periods in the development of a specific capacity during which training has the most effect. These are referred to as “sensitive windows of accelerated adaptation to training.”

Variation in Trainability (Adapted from work by Bouchard et.al., 1997)



Variation in Trainability illustrates the evidence to date that supports the fact that there is a high degree of variation in the trainability of humans (athletes), both from the standpoint of the magnitude of change and the time course of response to a given stimulus. This probably reflects the 'elasticity' of response to various stimuli and human diversity (as largely dictated by the underlying genetic matrix and supported by the environment in which an individual is immersed) (Norris & Smith, 2002).

Correct training during these critical windows is essential for individuals to achieve their genetic potential. Scientific evidence shows that humans vary considerably in the magnitude and rate of their responses to a given stimulus. This variability underlines the need for a long-term approach to a paddler's development, so that athletes who respond slowly are not short-changed.

For stamina and strength, the critical periods of trainability are based on developmental age; specifically, the onset of the adolescent growth spurt. For speed, skill and suppleness, the sensitive periods of trainability are based on chronological age. Note that, on average, girls reach these windows of trainability at a younger chronological age than boys.

Stamina (Endurance)

Stamina is the ability to maintain prolonged physical effort without tiring. The critical window of trainability occurs at the onset of Peak Height Velocity (PHV), which is the adolescent growth spurt. The best age for training stamina therefore is around 10 or 11 for girls and 12 or 13 for boys. Athletes should focus on aerobic capacity training as their growth rate accelerates; aerobic power should be introduced progressively after growth rate decelerates.

Paddling sports do not have the same aerobic capacity demands of other sports that involve the larger lower body muscle groups. Young people involved in paddling sports will have limited endurance at this stage and it is difficult to build it within a boat. They need to be active in a variety of other sports to develop aerobic capacity as they enter their growth spurt.

Strength

Strength is the ability to exert or resist force.

For girls, there are two sensitive windows of trainability for strength:

- The first is immediately after PHV and
- The second is at the onset of menarche.

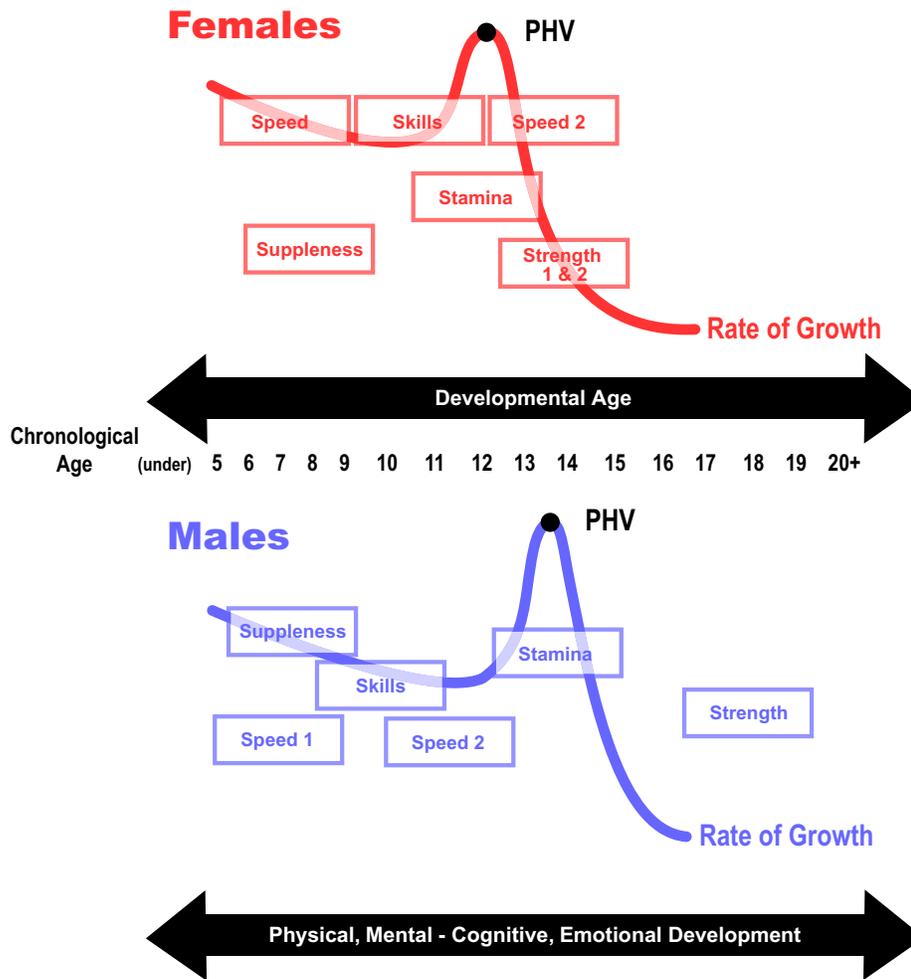
For boys, there is one strength window and it starts 12 to 18 months after PHV.

Speed (Agility and Quickness)

Speed means not only velocity (covering distance in a short time), but also ease and rapidity of movement. There are two critical periods for trainability of speed. During the first speed window, training should focus on developing agility and quickness; during the second speed window, training should focus on developing the anaerobic alactic energy system system that supports intermittent periods of high-intensity work during exercise. Whitewater paddling is quite dependent on both of these traits for success.



Pacific Sport - Optimal Windows of Trainability (Balyi and Way, 2005)



For girls, the first speed training window occurs between the ages of 6 and 8 years and the second window occurs between the ages of 11 and 13 years.

For boys, the first speed training window occurs between the ages of 7 and 9 years and the second window occurs between the ages of 13 and 16 years.

Skill

For girls, the window for optimal skill training occurs between the ages of 8 and 11 years; for boys, it occurs between the ages of 9 and 12 years. During this window, children should be developing physical literacy; that is, competence in the fundamental movement and sport skills that are the foundation for all sports. Competence in these skills makes it easier for children to learn and excel in late-specialization sports such as whitewater canoe/kayak. On average, a child’s nervous system is fully developed by 10 years of age. Thus, the optimal period for developing fundamental movement skills and a range of basic sport skills is before 10 years of age. The hormonal system undergoes rapid development during adolescence. This is the optimal period for developing anaerobic capacity and strength. The general growth curve describes overall growth of the skeletal system, organs, and cells.



Suppleness (Flexibility)

Suppleness means moving and bending with agility. For both girls and boys, the critical window of trainability for suppleness occurs between the ages of 6 and 10. In addition, special attention should be paid to flexibility during PHV. The sensitive windows of trainability for speed, skill, and suppleness occur before children start paddling. We rely on schools, recreation centers and other sports to provide children with the correct training and opportunities to develop these capacities. We should pursue building relationships with these organizations to advocate and support appropriate training. For athletes who miss these training periods, coaches will need to design and implement individualized programs to remedy any shortcomings.

Stages of LTPD in Whitewater Canoe/Kayak

Whitewater canoe/kayak has been identified as an early start - late specialization sport, which means that most competitors will not achieve their maximum potential until their mid-twenties. But it also means that athletes can benefit from starting into this sport at an early age. Whitewater athlete development is a long term process. A solid foundation of movement skills and fitness is critical for everyone, especially athletes participating in late-specialization sports. In order to reach their maximum potential, whitewater canoe/kayak athletes need to build physical literacy as children through:

- The mastering of fundamental movement skills and fundamental sport skills
- By participating in a wide variety of sports and physical activity when they are young.

Early specialization in whitewater canoe/kayak can harm the athlete's long term development in the sport.



LTPD gives coaches, administrators, clubs, and others involved a clear understanding of how they can best support the athletes for whom they are responsible. It gives athletes a clear idea of what they need to do and when they need to do it in order to excel at the elite level.

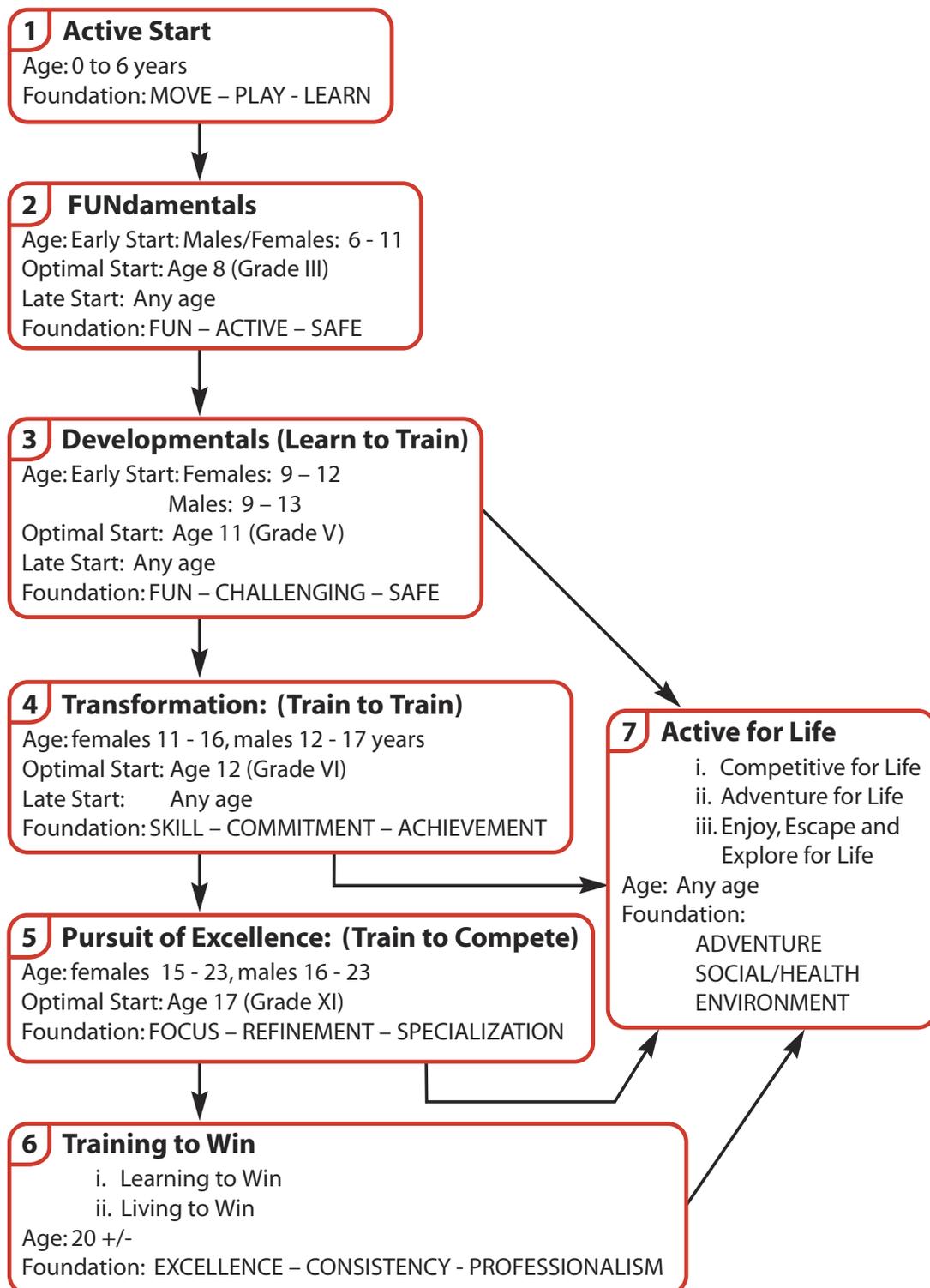
There are 7 stages that make up the Whitewater Canoe/Kayak LTPD Model, the final competitive stage being 'Training to Win'. However that is not to say that this is the only stage where competition and success should occur. We want to develop a framework that will allow athletes to be successful at every stage.

The LTPD framework outlined below describes the optimal development pathway for a paddler who starts paddling between 6 and 11 years of age and continues through to racing successfully at the high performance level. The early stages of development will be the same for all paddlers - no matter what age they enter into the sport - even for adults.

When the volume of training starts to increase during the Pursuit of Excellence stage; the pathway of those who choose to compete at a high level will diverge over those who choose to paddle and compete for enjoyment and fitness. Any training, racing, and recovery program should reflect the goals of the paddler for whom it is designed.



The 7 Stages of LTPD in Whitewater Canoe/Kayak





1) Active Start

Age: 0 to 6 years

Foundation: MOVE – PLAY - LEARN

Objectives:

Learn fundamental movements and link them together into play.



Key Outcomes:

Physical activity should be fun and a natural part of a child’s daily life. Active play is the way young children are physically active.

CKC does not play an active role in this stage other than recommending that children learn to swim and play in boats with their parents as a part of developing physical literacy. Paddling with parents in canoes and kayaks will assist children to innately develop boat balance skills and to understand currents and water features when they start to paddle on their own.

2) FUNDamentals

Age: Early Start: Females: 6 - 11
(Optimal Start: Age 8 – Grade III)
Males: 6 – 11
Teen/Adult Entry: Females – any age
Males – any age

Foundation: FUN – ACTIVE – SAFE

Objectives:

- To allow children/adults to explore the fun of paddling their own kayak with their friends in an experiential manner
- To develop the physical-aquatic literacy skills of balance, propulsion and directional control skills in a boat through a guided discovery process
- To build water sense, comfort and safety awareness in a boat
- Introduce appropriate, positive challenges that develop self confidence, focus, resiliency and emotional control
- Create a passion for aquatic boating activities





- Introduce gross motor skills (agility; balance; coordination; rhythm; time/space orientation; speed; dexterity “hand-eye coordination”) that will facilitate technique acquisition later in this stage (6 year span)
- Introduce simple rules and ethics of the sport
- Introduce basic practical tactical knowledge leading to modified games

Guiding Principles

- Provide a safe, non-threatening learning environment that supports children through challenges
- Provide a stimulating and active learning environment
- Adapt equipment, lesson plan, terminology, training environment and activities to the age level of the participants
- Only communicate essential need to know information to the learner

Key Outcomes:

At the end of this stage, participants will:

- be physically literate (competent in fundamental movement skills)
- possess fundamental canoe/kayak skills (entries/exits, balance, edge control, strokes, rescues)
- have an opportunity to participate in pool and lake paddling and canoe polo games
- be comfortable and confident in boats and playing in, on, under and around the water
- be able to swim effectively and comfortable wearing their PFD
- demonstrate boat control on flat water

Children at this age are at the optimal point to learn basic skills; therefore the objectives of the programs should be to introduce and improve upon boating basics (comfort, confidence, balance, propulsion, strokes and boat control) in the pool and lake.

To help develop other basic sport skills, coordination and body awareness, children should be enrolled in other sporting activities three to four times per week. Developing physical literacy requires a broad base of activities such as soccer, swimming, gymnastics, indoor climbing, etc.

Physiological Readiness

This stage coincides with the critical windows for suppleness and speed 1 (agility). For instructors/coaches that want a testing regimen, a simple flexibility test such as the “Sit and Reach Test” can be used to monitor hamstring and low back flexibility; and a shuttle run test to monitor agility.



Photo: Chuck Lee

Technical:

Paddlers at this stage should focus on learning to properly control the boat on flat water.

In this stage the significant technical skills that will be completed will include:

- entries and exits in the boat with and without sprayskirt
- proper body posture in the boat
- paddle grip and wrist control
- balance and centre of gravity
- boat stability using knee-hip control of boat edges and paddle strokes
- propulsion strokes and the ability to propel the kayak in a straight line for 100 m.
- directional control strokes and the ability to navigate an obstacle course
- picking up a ball from the water and throwing it at a target
- equipment care and handling



Tactical:

In this stage, children should engage in fun activities in the pool and the lake to give paddlers the opportunity to play, control their boat and avoid obstacles.

Special care and attention in regards to participant safety is essential in the early and middle stages because spatial awareness and hazard identification is not fully developed prior to the age of 10. Children should be comfortable swimming and should have basic safety knowledge about the boat.

Toward the middle/end of the stage, paddlers should be able to participate in a canoe polo game and be able to pass and catch the ball.

Mental Preparation:

The main focus at this level is to create an environment where the children want to paddle, enjoy being on the water, learning to paddle and being social. Instructors/ coaches need to clearly understand the importance of such a social environment and have the skills to create it. They need to be skilled at teaching the basic skills through variety and hidden drills. Variety offers kids a stimulus so they wish to continue participating, have a desire to stay involved and have developed self confidence. All this creates a foundation from which the instructor/coach and the paddler develop a long term productive relationship.

Instructing / coaching:

Instructors/coaches who are dealing with paddlers learning basic skills in the pool or lake in the start of this stage should have Community Kayak Instructor 1 - Pool or Community Kayak Instructor 1 – Open Water certification.

Instructors/coaches will require a good knowledge of growth and development and knowledge of the fundamental movement skills and fundamental sport skills that make up physical-aquatic literacy. They should have the ability to assess physical-aquatic literacy and make recommendations to the children to improve any gaps.



Photo: Chuck Lee

The mission of the instructor/coach is to create conditions, design programs and implement lessons that ensure the active involvement of all participants. The focus will be on fundamental movement skills and motor skills (ABC's). The children will be introduced to activities in order to create motor patterns that will facilitate sport specific skill acquisition at the next stage of athlete development. Learning takes place in a FUN and JOYFUL environment.

Training Volume:

This stage may be offered in a variety of forms, including introductory lesson(s) in a school or youth group, as part of a summer camp, or as an ongoing club program. Each form will require a different training setup.

Children should begin with 1-4 sessions lasting 60 minutes. The session should include a warm up; work on general technical skills, modified games - activities with simple rules and a cool down.



Once the basics are covered then the children can progress to do 1-2 sessions per week lasting 90-120 minutes with more of an aerobic fitness component included. Nevertheless, kids should be encouraged to play around with all the equipment as experimentation is critical in learning and developing paddling skills.

Competition / Games:

Children should compete in informal pick up games at club level events aimed at their level. Competitions should last for 10-20 minutes of the 60 minute session and be interspersed with technical development components and time in the boat. Paddlers should compete in a boat best suited to their skill level and be encouraged to participate in as many activities as possible.

Monitoring:

The FUNdamentals stage is about introducing children to kayaks and making the sport fun. The instructor/coach will monitor sport specific motor skills of balance, propulsion and directional control. There is little rationale for an early talent identification and physiological monitoring program to test children at this age.

Nutrition:

Children should be made aware of proper hydration. Clubs should offer a variety of healthy snacks at events and the instructor/coach should use informal talks to share their knowledge of healthy choices.

Safety:

CKC recommends an instructor/coach to paddler ratio of 1:15 in the pool when a lifeguard is on deck. In an open water environment outside of a controlled area the ratio should be 1:5. Assistants are useful to help with equipment and monitoring students. Paddlers should wear lifejackets at all times when on the water outside of the pool or controlled swimming area where a lifeguard is present. The instructor/coach should have been trained in first aid and CPR.

The child must be able to easily detach the spraydeck and wet exits have to be automatic. Until this can be guaranteed, each child that is wearing a spraydeck must have a direct spotter on the water within reaching distance from them to guarantee the child's safety.

NOTE: Children who cannot be fully trusted with a spraydeck attached wet exit can paddle in the pool or lake without a spraydeck.

Special care and attention in regards to participant safety and group management is essential because spatial awareness and hazard awareness is not fully developed at this age. Children should be comfortable swimming what they paddle and should have basic safety knowledge about the water.

Equipment:

Equipment will be provided to participants through the program provider; the pool, private operator, recreation department or club. Paddlers need only to provide a swimming suit and warm undergarments.

At the beginning of this stage, paddlers will require stable boats preferably those made from plastic.

Having equipment that fits is necessary for children to learn the fundamentals of kayaking.

- smaller boats enable better boat control. Outfitting of the boats with hip padding and footrests will enhance edge control and balance
- smaller paddle blades with smaller, shorter diameter shafts allow for proper stroke technique
- PFD's and helmets must fit comfortably and not ride up or shift so the protective equipment is always functional and not irritating



- warm clothing to make the paddling environment comfortable in cool weather or cold water is essential for programs that operate in these conditions. This would include neoprene booties and gloves, neoprene wetsuits, paddling jackets and fleece sweaters
- lightweight spraydecks with shockcord rands are recommended to make wet exits easy

Children should also be taught how to look after boats and paddles that are fragile and how to treat other equipment so that it lasts longer. Children should also be familiar with getting in and out of a composite boat.

Clubs should have an assortment of boats so that as skill levels increase paddlers are able to paddle different boats.

Supporting Infrastructure:

Schools, swimming pools, youth groups, municipal recreation departments, youth camps and clubs play a key role at this stage to introduce children to kayaks in a safe, supervised and comfortable pool environment or a supervised waterfront environment.

The other entry point is through kayaking parents who encourage their children to paddle with them.

After an initial introduction in a supervised environment, clubs and youth camps can provide ongoing opportunities for youth to paddle and develop their skill base.

Environment:

Participants will gain an appreciation for the natural environment where they paddle and understand the value of clean water and the fish and animals which live there.

Ancillary Capacities:

By the end of this stage, children and parents should be educated about proper clothing and equipment at practice (boat paddle, warm gear, principles of layering and good clothing, safety equipment, hydration, environmental factors, personal factors) and they should be aware of how to properly warm up and cool down for practices; calisthenics, stretching and jogging.





3) Developmentals

Age: Early Start: Females: 9 – 12
 (Optimal Start: Age 11 – Grade V)
 Males: 9 – 13
 Teen/Adult Entry: Females – any age
 Males – any age

Foundation:

FUN – CHALLENGING – SAFE



Photo: Chuck Lee

Objectives:

- To offer children/adults a fun experience paddling down a river with their friends
- To create graduated challenges that provides children/adults the opportunity to build confidence, self esteem, resiliency and emotional control
- To develop the physical-aquatic literacy skills in a moving water environment that requires the refinement of balance, propulsion and directional control skills for the river
- Develop motor skills (agility; balance; coordination; rhythm; time/space orientation; speed; dexterity “hand-eye coordination”; etc)
- To teach river sense, comfort, decision making and safety awareness on the river that will provide a lifelong understanding of moving water dynamics and personal safety
- To identify and foster the emergence of enthusiastic and talented river paddlers
- Introduce ancillary capacities (warm-up; hydration; cool-down; stretching; etc.)

Guiding Principles:

- Provide an incremental risk learning environment that allows participants to build skills without undue fear/anxiety that would inhibit the learning process
- Adapt equipment, lesson plan, terminology, training environment and activities to the age, skill level and developmental level of the participants
- Focus on consistency of performance when executing river skills that achieves a success rate of 95% and minimizes river swims
- Each lesson should be simple, communicating only what the participant needs to know to accomplish the task and avoiding complex directives
- Maintain a fun and positive environment where participation, accomplishment and enjoyment are valued and celebrated
- The participant must be actively engaged in the activity motor and cognitive wise.
- The frequency of practice as well as the number of repetitions must be high enough to ensure learning
- Skill (technique) learning must come under the umbrella of tactics. The participant must have a clear idea of what tactical problem he/she can solve with the skill taught.
- After warmup, skill development should come next in a session, because learning requires a rested central nervous system and requires concentration.
- Block learning with controlled conditions and random learning in variable conditions must be used.
- Coaches should be knowledgeable on growth, development and maturation process. Coaches should monitor PHV (peak height velocity) with girls.
- Cash in on the windows of optimal trainability: flexibility; speed; endurance.
- The athlete should spend more time training than competing (90% / 10%).



Key Outcomes:

At the end of this stage, paddlers will have developed the core river paddling skills required to transition into a more complex environment that will involve them in one or more of the whitewater paddling disciplines. The paddler will:

- paddle with proper technique
- have a competent flatwater roll
- demonstrate speed and strength
- demonstrate general endurance
- understand river features and water dynamics
- select lines and routes down the river
- negotiate upstream slalom gates and offset gates
- surf and play on gentle waves
- handle polo balls and play positions in canoe polo
- demonstrates a sense of respect and awe for the natural environment they paddle in

Physiological Readiness:

This stage corresponds well with the optimal time for Skill Development. For girls, the window for optimal skill training occurs between the ages of 8 and 11 years; for boys, it occurs between the ages of 9 and 12 years. During this window, children should be developing physical literacy; that is, competence in the fundamental movement and sport skills that are the foundation for all sports. Competence in these skills makes it easier for children to learn and excel in late-specialization sports such as whitewater canoe/kayak.

Technical:

Paddlers at this stage will have developed fundamentally sound forward strokes, forward and reverse sweeps and bow draws. They will be competent in completing eddy turns, ferries, backferries and surfing. They will be able to consistently roll their boat in flatwater and in eddies. These paddlers can position their boat on a wave, dynamically change edges and maintain good posture. They pass polo balls accurately, receive a pass, and block off attacking boats.

As they gain experience and comfort they should paddle K-1, C-1 and C-2 and participate in river running, slalom and canoe polo disciplines. By the end of this stage, paddlers should be able to maneuver a canoe/kayak in moving water and in slalom gates.

Advancing a paddler into a difficult river environment may result in poor technique and adversely affect participant interest. The paddler should be able to adapt their technique to new rivers and all environmental conditions.

By the end of this stage of development, paddlers should be experimenting in canoes and kayaks. Paddlers will also be ready to explore the disciplines of slalom, wild water, canoe polo or freestyle.

Tactical:

During this stage paddlers should be introduced to the various aspects of racing and competitions.

Slalom - the paddler should be able to navigate the slalom course in a controlled manner, have a race strategy that they follow, employ basic pacing skills and have the ability to remember the course

Polo - the paddler should be able to play their position, plan an attack and position their boat on defence



Photo: Chuck Lee



Mental Preparation:

By the age of 10 spatial awareness and hazard identification are becoming more developed and the unseen hazards on the river are more fully appreciated. Children should be comfortable swimming what they paddle and should have basic safety knowledge about the hazards that exist on and near the river.

This age group is ready to learn what to focus on and how to develop that skill. In doing this, they will begin to understand and can be taught that what they think and feel affects their performance; and, how to develop “control” over those thoughts and feelings.



Photo: Chuck Lee

They can also learn how to set effective goals at a number of different levels; outcome, performance, process and its relationship to the skill. Paddlers should be introduced to breathing and relaxation skills. Finally, paddlers can be taught how to communicate effectively with their instructors/coaches and how to ask for feedback.

Instructing / Coaching:

Instructors/coaches who are active at this stage should be at a minimum either NCCP River Instructor 2 or NCCP Coach Introductory 1 certified and continue with their professional development. They will also need to have completed a Swiftwater Rescue course and maintain their First Aid and CPR qualifications.

All instructors/coaches working with paddlers at this stage of development should have a thorough knowledge of the growth and maturation stages (physical literacy). The instructor/coach will be acting as a teacher, a leader and a facilitator to paddlers and parents.

The mission of the coach is to teach the basic sport specific skills and elementary tactics essential to participate in the chosen activity as well as introduce physical conditioning and fundamental mental skills. The sport specific skills are coupled with motor skills development. Children should be involved in several sports.

Training Volume:

During the paddling season, paddlers enrolled in an ongoing program should be actively on the water for 2-4 times per week for a 1-2 hour session. Summer camps and short term programs can build a program lasting 2-7 days that run 4-6 hours each day. In both situations it is important for the program to have a variety of locations and/or activities that maintain interest and enthusiasm.

During the off season, paddlers should be participating in other complimentary sporting activities (soccer, swimming, flat water kayaking, cross country skiing, cross country running, gymnastics, indoor climbing to name a few), but at the same time clubs should offer 1 session per week of paddling specific training so they do not lose touch with the paddlers.

Competition:

The majority of competitive pursuits at this stage will be local, informal pickup events lasting 30 minutes. Paddlers in this stage should be able to participate in one fun participation competition per month. This does not mean that paddlers should only go to one competition per month, but rather that local Club competitions should emphasize skill development and fun instead of traditional competitions.

Monitoring:

The Developmentals stage is about introducing children to the challenge of the river and making the sport fun. The instructor/coach will monitor sport specific motor skills of balance, propulsion and directional control in the river.



Many female children and a few male children will start their growth spurt during this stage. This is known as peak height velocity (PHV) since PHV is used as a marker for many of the sensitive windows of trainability. Height should be measured a minimum of 4 times per year.

Although endurance is not one of the sensitive windows of trainability listed in this section, it is still a very important measure in general health and wellbeing and can be used as a benchmark for future improvement. CKC suggests using a simple field test such as the Cooper test or the Leger test to measure endurance. In addition, rapid growth generally results in losses of flexibility, so the "Sit and Reach Test" should also be employed here to monitor hamstring and lower back flexibility.

Instructors/Coaches need to evaluate and monitor the psychological readiness of the paddlers to progress through this stage. Evaluation tools and techniques to handle difficulties must be developed.

Nutrition:

In addition to proper hydration and food choices, paddlers in this stage should be aware of proper pre-activity day foods and the timing of snacks and meals throughout the day in relation to practices and events. This information can be provided through instructor/coach information or through Tool Kits and online logs.

Safety:

The volume of training is increasing at this stage, therefore paddlers should be introduced to basic injury prevention ideas such as stretching (when and how), and various recovery techniques (stretching and ice).

Adequate on-water rescue must be available for any paddlers who do not have reliable rolls especially on more difficult water. The instructor/coach can be on the water, have a qualified assistant ready for rescues or rely on the training group to undertake the rescues. Teaching kids how to effectively be safe and rescue should be introduced at this stage.

Equipment:

Clubs and program providers will continue to provide all the necessary equipment to support the paddler while on the water. At the end of this stage, paddlers can be expected have some of the gear required to be safe and comfortably outfitted to be on the water. This might include booties, wetsuit, paddling jacket, warm undergarments, pfd and helmet.

Boat progression should correlate with skill and maturation; paddlers should be trying competition boats once they feel competent in more stable boats. Instructors/coaches are advised to assess that paddlers are using proper equipment and that they are demonstrating effective and correct technique.



Photo: Chuck Lee

Supporting Infrastructure

Clubs play the key role at this stage with day camps, after school paddling and cub-cadet introductory competition programs. The clubs and provinces play an active role in the development of paddlers at this stage through the delivery of the cadet and junior programs.

The other entry point is through kayaking parents who encourage their children to paddle with them.



After the basic river skills are introduced, clubs and youth camps can provide ongoing opportunities for youth to paddle and develop their skill base.

Parents are important and their involvement will strengthen the club system and volunteer base needed to build the infrastructure for paddling at the club, provincial and national levels.



Photo: Chuck Lee

Environment

The transition to the river environment creates an opportunity for the instructor/coach to develop an environmental awareness of the magical places a kayak will take them. Geologic and biologic systems can be introduced that enable the participant to gain a greater appreciation for the world they live in. Time should be taken to discuss leave no-trace philosophy and environmental stewardship for our waterways that can help maintain a legacy for generations to come.

Ancillary Capacities:

At this stage of development paddlers will further develop the ancillary capacities introduced in the FUNdamentals level.



4) Transformation:

Age: Females: 11 to 16
(Optimal Start: Age 12 – Grade VI)
Males: 12 to 17 years
Teen/Adult Entry: Females – any age
Males – any age

Foundation:

SKILL – COMMITMENT – ACHIEVEMENT



Objectives:

- Consolidate and refine basic skills (techniques and tactics)
- Develop the whitewater skills for paddlers to progress to more difficult Grade III water
- Build the desire to improve in all facets of whitewater sport and a commitment to train to improve skills and knowledge
- Generate opportunities for success and to create a sense of achievement in one or more disciplines of whitewater sport
- Develop personal decision making
- Acquire, consolidate and refine basic practical tactical knowledge appropriate to the level of performance of the athlete
- Develop a solid general physical foundation: speed; strength; endurance; flexibility
- Self organization of ancillary capacities (warm-up; hydration; cool-down; stretching; etc.)
- Introduce fundamental mental skills (concentration, self-activation; visualization; relaxation; positive internal dialogue; etc.)
- Introduce ideal performance state for competition and challenges

Guiding Principles:

- All whitewater disciplines will be introduced and developed in this stage
- An incremental risk learning environment will be provided that allows participants to build skills without undue fear/anxiety that inhibits the learning process
- Skills and tactics are stabilized in controlled conditions (block learning), practised in random conditions and performed in a state of light to moderate fatigue to mirror the reality of competition and whitewater challenges
- A regular training regime will emphasize sport specific endurance, strength, speed and skills for whitewater paddling proficiency
- Training loads are raised progressively, the intensity gradually increased and active vs rest time is mirrored to reach competition requirements
- Athletes learn to extend to the limit of his/her performance capacity methodically and systematically in order to improve
- Paddlers will become self-aware of risk and safety
- Paddlers are environmentally conscious of the rivers and ecosystems they paddle in
- Maintain a positive social environment where skill development and success are valued and celebrated
- Coaches should be knowledgeable on growth, development and maturation process and monitoring PHV (peak height velocity) with girls and boys
- Coaches will utilize the windows of optimal trainability: speed; endurance; strength.
- In this late specialization sport, the ratio training to competition for this level should be 85% / 15%
- Coaches will apply single or double periodization for yearly planning



Key Outcomes:

At the end of this stage, paddlers will have developed the core whitewater paddling skills required to transition into a competent paddler in one or more of the whitewater paddling disciplines. Paddlers will be ready to move into the Pursuit of Excellence phase. The paddler will:

- paddle with proper technique and confidence on Grade III whitewater
- roll their kayak/canoe consistently on whitewater
- be proficient in paddling slalom canoes and kayaks, playboats and wildwater boats
- display confidence at different levels of competitions and race situations
- negotiate upstream slalom gates and offset gates
- paddle a wildwater boat and select routes down the river
- surf and play on waves and in holes
- handle polo balls and play positions in canoe polo
- demonstrate appropriate and measurable improvements of sport-specific speed, strength and endurance
- build a strong aerobic paddling base (wild water racing).
- developed core strength (slalom and freestyle)
- transition from a competent all-round river boater into a proficient provincial class paddler in the discipline of their choice

Physiological Readiness:

This stage encompasses many different windows of trainability for both males and females as most paddlers will begin and some may complete PHV during this stage. This is a critical stage where biological maturation has a strong influence on training and technique and it is essential to measure PHV to determine when the various training windows occur.

- **Speed** - the speed window can be trained relying on chronological age. This window should focus on the development of anaerobic alactic system and capacity with the appropriate rest period. At this stage the effort can be sustained to a maximum of 20 seconds.



- Girls – the second speed window for girls will be finishing at the start of this stage between the ages of 11-13
- Boys – the same speed window for boys will finish between the ages of 13 and 16.
- **Strength** – the strength window can be trained based upon the PHV curve in boys and girls and also by menarche in girls
 - Girls – there are 2 strength windows for girls that may occur together or at different times
 - just right after PHV signals a window for strength training
 - the onset of menarche signals the start of strength training
 - Boys - the onset of the strength window for males is 12-18 months after PHV
- **Stamina** - The onset of the PHV growth spurt will signal the start of the aerobic capacity window for both sexes. This window to develop aerobic capacity finishes at the peak of the PHV
 - After the peak of PHV is achieved there is an opportunity to train for maximum aerobic power
 - Paddlers at this age should start doing some dry-land aerobic training to supplement on-water aerobic training in order to avoid over use injuries and muscular imbalances
 - Girls – Onset of PHV growth spurt
 - Boys – Onset of PHV growth spurt

Technical:

At this stage the paddlers should be looking to improve and understand their technique through kinesthetic sensation (feel) and a variety of feedback from the coach. It is essential that the paddler's good technique transfers to the boat in terms of good boat acceleration and clean workouts. The paddler should also learn to transfer their technique to racing. Video analysis may become a very useful tool in helping the paddler and coach refine technique.

This period is where paddlers will be able to start to build strength and utilize this to drive and maneuver their boat. It is important to maintain proper paddling techniques and not to allow paddlers to muscle their boat inappropriately.

Paddlers will be able to consistently roll their boat in all types of whitewater. They will understand different approaches, entries and exits for a variety of upstream gates. They can control wildwater boat direction using their boat edges and boat tilt. Paddlers can change position of their boat on a wave, dynamically change ends and maintain good posture. They pass polo balls accurately, receive a pass, and block off attacking boats.



Photo: Edmond Duggan

Tactical:

During this stage paddlers should be introduced to the various aspects of racing and competitions. They should have a competition plan for dealing with new sites/venues and should have practiced their plan along with a good warm up.

Slalom - the paddler should be able to navigate the slalom course in a controlled manner, have a race strategy that they follow, employ basic pacing skills and have the ability to remember the course

Wildwater - the paddler should be able to stay in the current, maintain a consistent stroke rate, and remember the lines through significant features

Freestyle - the paddler should be able to understand how to approach the wave/hole, set up for a move and know how to transition to the next move

Polo - the paddler should be able to play their position, plan an attack and position their boat on defense

Mental Preparation:

During this stage all the psychological skills need to be taught and learned;

- what to focus on and how to focus training
- how to re-focus if you lose it
- how to set various goals (process, performance, outcome; and how/why each are important, but how they can also be stressors)
- understanding and learning how to relax for sleep, and within a competition; how to energize and how to recognize when it is necessary
- how to set up effective plans for training and for competition
- how to assess each of the above skills on a regular basis (after competitions, at the end of the year)
- how to visualize effectively (not an easy skill for many paddlers).



The order in teaching and learning of these skills will depend, to a degree, on the paddler's needs.

Coaching:

Coaching at this level will be shared between the club coach and the Provincial coach depending on the time of year, coaching resources, location and skill sets.

Coaches training paddlers at this stage should be NCCP level 3 certified and/or a Competition Intro Coach. Coaches need to be mentored by a Competition Development Coach. They should also consider participating in coach development workshops and continuing on with coaching education through National Coaching Institutes.

The mission of the coach is to raise the performance capacity of the athletes (5 S's), prepare them to perform at identified competitions and reach a peak performance at the decisive competition of the year. Athletes should be involved in at least two sports (one major sport and one minor). 5 S's = stamina; strength; speed suppleness and skills.



Photo: Edmond Duggan

Training Volume:

During the general preparation and competition season period these paddlers should be doing 4-6 paddling sessions per week of 60-90 minutes in length.

During the off season, paddlers at the start of this stage should be participating in other complimentary sporting activities (soccer, swimming, cross country skiing, cross country running, gymnastics, indoor climbing to name a few), but at the same time clubs should offer 2-3 sessions per week of paddling specific training so they do not lose touch with the paddlers.

By the end of this stage, paddlers should be introduced to training camp environments. Paddlers at the end of this stage should be specialized in one boat class and one discipline and this should be their main focus.

Competition:

Paddlers at the beginning of this stage are ready to participate in formal competitions. This stage reflects the speed, strength and the stamina windows therefore, competition should reflect these windows. It is important for the development of the paddler that they race both slalom and wild water and become comfortable freestyle paddlers.

As paddlers progress through this stage they should be exposed to increasingly competitive style races. As the paddlers progress through this stage, more and more minor and major competitions will be available to compete in: CKC recommends that the paddler only compete in two major competition per season and one minor competition per month. This does not mean that paddlers should only go to one competition per month, but rather that local Club competitions should emphasize skill development instead of traditional competitions.

Paddlers in this stage are ready to compete in two major competitions per year, one being the Provincial Championships and the other the National Championships.



Monitoring:

Height should be measured four times per year to monitor PHV.

In addition, this stage corresponds to the stamina - aerobic capacity window, thus a sport specific training measurement for aerobic power and capacity should be used such as the CKC-W Paddling Ergometer Test.

This stage also corresponds with the strength window, thus a sport specific training measurement should be used to monitor progress.

Paddlers should be introduced to heart rate vs. effort, heart rate vs. speed and their relation to race pace.

Nutrition:

In addition to proper hydration and food choices, paddlers in this stage should be aware of proper pre-race and race day foods and the timing of snacks and meals throughout the day in relation to practices and races. This information can be provided through coach information or through Tool Kits and online logs.

Safety:

The coach and paddler should be fully aware of the safety requirements of the sport including appropriate equipment and procedures for all kinds of weather conditions. This includes club, provincial and national policies and regulations.

The volume of training is increasing at this stage, therefore paddlers should be introduced to basic injury prevention ideas such as stretching (when and how), and various recovery techniques (stretching and ice).

Adequate on-water rescue must be available for any paddlers who do not have reliable rolls especially on more difficult water. The coach can be on the water, have a qualified assistant ready for rescues or rely on the training group to make the rescues. Teaching kids how to effectively be safe and rescue should be introduced at this stage. Paddlers are recommended to take the CKC-W River Rescue course to develop their safety skills and river hazard awareness.

Equipment:

Boat progression should correlate with skill and maturation; paddlers should be in competition boats once they feel competent in more stable boats. Coaches are advised to assess that paddlers are using proper equipment and that they are demonstrating effective and correct technique. Responsibility for the maintenance and repair of equipment should be introduced.

The paddler should have their own personal gear and kit but may still be reliant on club boats and paddles at the start of this phase. As they progress, a personally fitted boat will be necessary to move forward into the next phase.

By the end of this stage paddlers should have their own equipment. They should be aware of personal characteristics that they like their equipment to have. They should also be proficient at making small repairs to their equipment.





Supporting Infrastructure:

Clubs play the key role at this stage with cadet-junior competition training programs. The clubs and provinces play an active role in the development of paddlers at this stage through the delivery of the cadet and junior programs.

The other program opportunity is through kayaking parents who encourage their children to paddle with them.

Parents are important and their involvement will strengthen the club system and volunteer base needed to build the infrastructure for paddling at the club, provincial and national levels.



Photo: Chuck Lee

Environment:

Paddlers will be training on natural and man-altered sites. An appreciation for rivers, the value of clean water, and the opportunity to enhance a river environment within a balanced framework are important concepts to be imparted to the participants.

Ancillary Capacities:

By the end of this stage paddlers should not only be doing proper warm-ups and cool downs, but should also know the reason why they are doing these things. The paddler will initiate learning the basics of health and wellness and be responsible for injury prevention and rehabilitation.



5) Pursuit of Excellence

Age: females 15 to 23
Optimal Start: Age 17 – Grade XI
males 16 to 23

Foundation:

FOCUS – REFINEMENT – SPECIALIZATION

Objectives:

To have the athlete select and focus competitive training in one discipline and one boat class. To transition from a competent all-round whitewater boater into a proficient national class athlete in the discipline of their choice.

To develop athletes to the national team level and to be able to compete internationally at the junior and under 21 age groups.

- Refine sequence of basic sport skills at competition intensity
- Increase and improve the athlete's repertoire of skills
- Develop consistency in implementing variants of basic skills and the new skills acquired in a competition environment
- Increase the success rate of the skills and practical tactical knowledge executed in competition
- Further develop and refine sport specific aerobic, anaerobic, speed, strength and skills for whitewater competition in either slalom, wildwater, freestyle or polo
- Further develop and refine competition skills including mental preparation, race strategies, ideal performance states and the ability to handle a variety of conditions and situations
- Develop and consolidate new practical tactical knowledge tailor made to the strengths of the athlete/team
- Improve decision making (individual tactics)
- In an analogous competitive situation, the player should be able to solve the same tactical problem using different ways (skills/techniques)
- Develop a system of associative solutions for canoe polo. It is considered the quickest link between the perception of a playing situation as a team and the adequate response
- Develop game plan
- Optimize ancillary capacities
- Develop the performance capacity of the athlete/team and integrate the performance factors, "10 S's", to reach a peak performance at a pre-determined time of the year

Guiding Principles:

- Design a yearly training, competition and recovery plan based on a year-round training commitment with expected podium performance built into the plan with an appropriate training to competition ratio recommended. Apply single, double or triple periodization tailor made to the athlete's needs and the competition calendar (annual training and competition plan / specialization in 1 sport)
- Athletes and coaches need to monitor and manage fatigue / recovery
- In training, spend more time on random conditions (simulating competition requirements) than on controlled conditions (repetitive learning)
- Training intensity must always be high to optimal. Sub-maximal intensity will alter the motor coordination of the athlete
- Be aware of the factors that influence tactical thinking when the athlete is confronted by a decision-making situation: speed of the action taking place, quality of observation of the athlete; experience and tactical knowledge of the athlete; memory (remembering practical problems solved), and their emotional state
- Coaches should be knowledgeable regarding the growth, development and maturation process
- Introduce the athlete to international competitions





- Ensure that the choice of competition favours athlete development
- Facilitate referral of athletes to specialized coaches when appropriate
- In competition, the athlete should concentrate on the task to do, not the outcome
- Emphasis in canoe polo training should be on cooperation, synchronization between players and the speed of execution
- When preparing for a canoe polo competition, the athlete should focus on exploiting the flaws and deficiencies of the up-coming opponent
- The canoe polo athlete has to learn to stick to the game plan and not get carried away because the going gets rough
- Coaches have to learn how to manage and lead an Integrated Support Team (IST)



Photo: Edmond Duggan

Key Outcomes:

At the end of this stage, athletes will:

- Race well under a variety of conditions, maintaining good technique under pressure and fatigue
- Be empowered to understand their role in critical thinking and decision making for their training, performance, equipment, schooling and social life under the guidance of their coach
- Manage their lifestyle to meet training commitments

Athletes in this stage have completed all the objectives and outcomes from the previous stage and are ready to train at a national team level. Yet if necessary there should be opportunities for the athlete to receive remedial support in deficient areas. Athletes are working with their regional coach and national development team coach and performance enhancement team. Athletes in this stage are often on the National Junior team or National Development team and working towards performing at an elite world class level.

Physiological Readiness:

Up to this stage the measurement and control of training programs was very age and physiologically specific. This is an open stage where biological maturation provides a green light for all types of training and technique based upon the sport specific needs of the athlete.

Technical:

Maintain and refine trained technique as individualized progression continues. Athlete now learns to transfer technique to racing.

- Develop and encourage individual style adhering to classical principles for fundamentals
- Refine technical skills to international standard for paddlers targeting that level
- Include high variability of skill drills for refinement of technique
- Successfully train and compete in multiple boats
- Possess thorough knowledge of sport-specific equipment
- Build in the expectation of higher levels of risk commensurate with technical competence

Tactical:

Athlete learns a variety of tactics and strategies in training that are applied during competition. Athlete is trained to critically think and make appropriate decisions in utilizing required tactics during competition. Effectively and independently adapt tactics in training to achieve results, considering factors such as innovations and equipment. Coach and athlete identify tactical deficiencies and are implementing the required adjustments.

Mental Preparation:

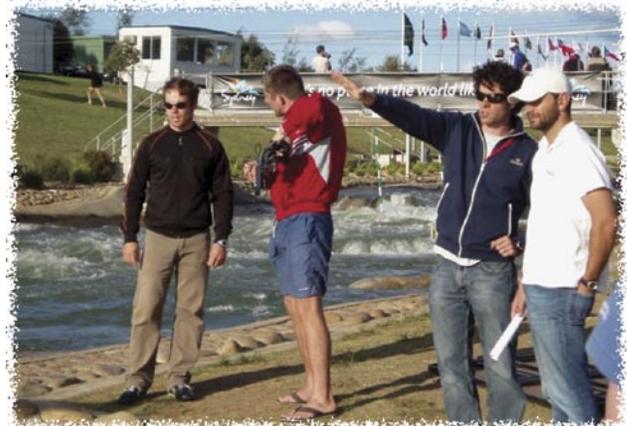
By this stage, the athlete has developed all the skills mentioned in the Transformations stage, and now he/she should be continually refining these skills and developing the “correct level of intensity” for within the demands of the sport (this latter piece is the final piece, and again, not an easy one).

- Instill the use of all integral mental training elements utilized at this stage: goals, relaxation skills, focusing, refocusing, visualization, positive self-talk, creating a safe place (iPod, MP3, meditation), written plans, training, warm-up, competition, post-competition assessment, logistics, time and activity management, mental resilience training, independent decision making, self-directed learning, and self-analysis
- Include a personal sport psychologist when indicated in the IST
- Increase the time spent refining and personalizing ongoing sophistication of the mental training program

Coaching:

At this stage the coach-athlete relationship is more of a partnership. Coaches at this level should have completed Competition Development in their speciality discipline and are continuing with professional development opportunities and National Team initiatives. Coaches should be participating in ongoing professional development workshops.

The mission of the coach is to integrate, in a complex and harmonious blend, the performance factors in order to perform on a regular and consistent basis at identified major events domestically and internationally.



Training Volume:

Athletes in this stage are making a multi-year full time commitment to year round training. They are also typically working on their secondary or post-secondary education and this will affect the volume and intensity of training that they can complete.

During the general preparation and competition season period these paddlers should be doing 10-12 paddling sessions per week of 60-90 minutes in length.

During the off season, paddlers in this stage should be participating in a supervised conditioning and strength building program.

As athletes move through this stage they should be participating in an increased number of centralized training camps, culminating in the athlete spending most of the competitive season with the respective provincial/regional team coach or National Team development coach or. Training should be designed by the Provincial coach and monitored by the national team coach or national team development coach with support from club coaches. Coaches should establish guidelines and be monitoring technical, tactical, physiological and psychological expectations for their respective athletes.

Competition:

As athletes develop through this stage, they are training to compete at the national championships, national team trials, North American competitions, junior world championships and other international competitions that athletes under 23 are eligible to compete at. To reflect their personal development within this stage, the coach and athlete select the appropriate number of minor competitions for “Modeling” their race plans in order to have the best possible performances during major competitions. Toward the end of this stage, athletes should be participating in 4-6 major competitions per year which includes National Team trials. To foster athlete development through this stage of CKC’s LTPD, the Junior Team can compete in international C level races.



- Ensure access to facilities tailored to high performance competition venues and facilities
- Consider changing the athlete's primary residence to accommodate ease of access to training and competition facilities
- Attend provincial, national, and ICF competitions. Competition frequency 4-6 per year and ideally more than 1 boat
- Support expanding the IST to include specialist coaches for specific competition preparation
- Introduce business considerations, including sponsorship, media and promotion management, and equipment procurement
- Have an in-depth knowledge of rules including; national, international and anti-doping

Monitoring:

Athletes in this stage require more specialized monitoring due to the higher physical demands associated with higher levels of training. Sport specific testing should be done in each phase of the competition cycle.

- Athletes should be receiving annual physicals and regular blood analysis as outlined by the team physician and exercise physiology team
- Athletes should be receiving sport specific aerobic power and capacity
- Athletes should be receiving anaerobic power and capacity tests
- Athletes should be receiving strength testing

The results of the testing should be used to make individualized training recommendations for each athlete to help improve performance.

Nutrition:

Athletes should be working with a nutritionist to identify any deficiencies and make the required adjustments. Competition and training meals should be worked out to ensure optimal performance.

Safety:

Athletes abide by seasonal and local regulations in their training. Play smart.

Athletes should have strategies to deal with extreme climates when training and racing. Training in the cold weather/water takes proper planning in order to reduce illness and chance of injury. Hot summer weather means that hydration and temperature reduction strategies be in place during intense training and racing.

Equipment:

All equipment at this point should be personalized and meet national and international standards. Athletes should try new and different boat designs in order to get a better idea of fundamental boat dynamics.

Infrastructure:

Athletes should be starting to train more on artificial courses through the year.

Environment:

Athletes should take an interest in understanding hydrological principles associated with whitewater features and build an awareness of how different water levels and volumes affect features.

Athletes will become advocates and supporters of environmental issues that affect rivers.

Ancillary Capacities:

To optimize the ancillary capacities and identify any deficiencies and make the required adjustments.



6) Training to Win

- i. Learning to Win
- ii. Living to Win

Age: 20 +/-

Foundation:

- EXCELLENCE
- CONSISTENCY
- PROFESSIONALISM



DAVID FORD K-1M
NATIONAL SENIOR SLALOM TEAM: 1988 - 2009
WORLD CHAMPION - 5 TIME OLYMPIAN

Objectives:

The key objective is to place Canadian athletes on the Podium at World Cup, World Championships and Olympic Games.

- Maintain or where possible, improve technical, physical, racing and ancillary capacities
- Full commitment to the pursuit of international excellence
- Refine and maintain all skills and tactical strategies; ensure that they are tailored to the strengths of the athlete so they have the greatest potential to win
- Optimize and integrate all performance factors (10 Ss) taking into account international competition venues and calendar
- Maintain a high level of general and sport specific physical fitness for the athlete
- Refine the optimal performance state, including mental preparation
- Manage all demands related to career, including support staff, sponsors, and media
- Ensure access to sport science specialists and manage the IST to a high degree of professionalism
- Monitor fatigue and recovery rate for the athlete
- Manage the financial sustainability required for full-time commitment
- Maintain role model responsibilities in balancing more complex life demands
- Explore and develop aspects related to a post-high performance sport career

Guiding Principles:

- Gear the training structure to integrate the performance factors to meet specific upcoming competition requirements
- The training structure is a mirror image of the coordinated and goal adapted method. Because of the international competition calendar, training is punctual and temporally focused on special preparation for a major event
- In training, more time should be spent on random conditions (mirror competition requirements) than on controlled conditions (repetitive learning)
- Demand accuracy and diligence in monitoring fatigue to ensure recovery is adequate with frequent preventive breaks permitting recovery to avoid overtraining and injuries
- Support innovative challenges in training to prepare for the uncertainty of competition
- Encourage advanced learning in personal fitness and medical issues.
- Coaches are effective in managing and leading an IST and in encouraging training with international experts
- Apply a single, double, triple or multiple periodization plan, an annual yearly training plan, and competition and recovery plan tailor-made to the international competition calendar and the athlete's needs and contextual reality
- Coaches should be knowledgeable regarding the growth, development and maturation process



Key Outcomes:

In this stage, athletes will:

- have podium performances by winning medals at World Cups, World Championships and Olympic Games
- continue to race consistently at the podium level for more than one quadrennial cycle
 - i. Athletes at this stage are National Team or National Development members looking to reach the semi's and finals at each race
 - ii. Athletes at this stage are National Team members at the peak of their careers with previous experience in World and/or Olympic finals

They are working closely with their personal coach, national team coach and performance enhancement team. All relevant performance capacities have been met and training programs are refined to address their individual strengths and weaknesses.

Most athletes do not medal until several years into this stage. Many athletes will retire when they have achieved success at this level. However, it has been shown that top international athletes can continue to stay at this level until they elect not to continue.

Physiological Readiness

The aerobic and strength windows are often still 'open' during this stage leading to significant gains in these areas. Anaerobic power and capacity will also see significant improvements.



Photo: Edmond Duggan

Technical:

Refine and reinforce technical excellence.

- Ensure that an individual style emerges as the athlete's trademark style
- Consider how different courses present ongoing technical challenges that expand the repertoire of competencies
- Consolidate technical skills to meet international standards of excellence
- Develop discretionary judgment in equipment selection for personal compatibility
 - Use standard equipment and exercises in new and effective ways
 - Increase the extent and frequency of calculated risks taken for speed and efficiency in competition
 - Effectively adapt strategies in innovative ways during training and competition



Photo: Edmond Duggan

Tactical:

Identify competition strategies to ensure the greatest potential for podium performances. This includes refinements to race plans and performance management.

Mental Preparation:

Attention to detail in the training and performance environment by the athlete, the coach and the team to manage distractions.

- Develop a comprehensive understanding of sport and competition demands and how the self and personality integrate into meeting these demands
- Be objectively aware of strengths and weaknesses



- Perfect all integral mental training elements utilized at this stage: goals, relaxation skills, focusing, refocusing, visualization, positive self-talk, creating a safe place (Ipod, MP3, meditation), written plans, training, warm-up, competition, post-competition assessment, logistics, time and activity management, mental resilience training, independent decision making, self directed learning, and self-analysis
- Increase the time spent refining the mental training program, the last 10% of preparation being the most important
- Include a personal sport psychologist or life coach on the IST when indicated

Coaching:

At this stage the coach - athlete relationships are more of a partnership in conjunction with national team coaches. Coaches are NCCP High Performance certified (NCCP 4 and/or 5) and participating in ongoing professional development workshops.

The mission of the coach is to model all aspects training and performance in order to help the athlete reach the podium at major international events.

Training:

Athletes in this stage have made a multi-year full time commitment to year round training. Athletes are involved in national team training camps scheduled throughout the year (functional centralization).

Athletes may elect to travel and train with other international elite paddlers and their coaches based upon their personal needs and connections.



Photo: Edmond Duggan

Fall training and “at home” training periods should be designed by the personal coach in consultation with the national team coach. National team coaches should establish technical, tactical, physiological and psychological expectations for their respective athletes.

Competition:

The competition schedule for Train to Win athletes should be constructed with the goal of achieving optimal performance at World Championships and Olympic Games. This means scheduling an appropriate number of National Team Selection and international competitions as a lead-up to the major competitions.

- Ensure that access to facilities and venues is tailored to high performance competition and training
- Be aware that travel to higher levels of competition is the norm
- Consider periodically changing short and long-term residences throughout the year to accommodate access to training and competition facilities
- Ensure that the competition program accommodates business considerations

Monitoring:

Athletes in this stage require more specialized monitoring due to the higher physical demands associated with the higher levels of training. Athletes should be receiving annual physicals and regular blood work as part of the monitoring process outlined by the team physician and exercise physiology team. In addition, athletes should be receiving sport specific aerobic power and capacity and anaerobic power and capacity tests as part of the monitoring process throughout the year. Sport specific strength testing should also be done as part of the yearly testing outlined by the team physician and performance enhancement team. The results of the testing should be used to make individualized training recommendations for each athlete to help improve performance.

The National Testing Protocol will be utilized to evaluate how athletes are progressing in their training programs.



Nutrition:

Athletes, coaches and the team should be working with a nutritionist to identify any deficiencies and make the required adjustments.

Safety:

There are inherent dangers of international competitions and traveling. Athletes should have strategies to deal with extreme climates when training and racing. Training in the cold weather/water takes proper planning in order to reduce illness and chance of injury. Hot summer weather means that hydration and temperature reduction strategies be in place during intense training and racing.

Equipment:

Athletes should be working with equipment designers and manufacturers to customize equipment for their optimal personal performance.

Infrastructure:

Athletes should be training on artificial courses several months through the year.

Ancillary Capacities:

Identify any deficiencies and make the required adjustments. Communication is critical between the athlete and the performance team. Athletes are considered as leaders at this stage.

7) Active for Life

- i. Competitive for Life
- ii. Adventure for Life
- iii. Enjoy, Escape and Explore for Life

Age: Any age

Foundation:

ADVENTURE – SOCIAL / HEALTH - ENVIRONMENT



Photo: Chuck Lee

Objectives:

To maintain active participation in whitewater sport; to find interesting aspects of whitewater sport to explore and develop skills in; to develop leaders, coaches and organizers; to build the sport.

- Continues to be physically active in paddling and/or other sports and activities
- Develops new skill sets in other whitewater sport disciplines
- Continues to be involved in the paddling community, as an athlete, coach, and official or in other capacities

Guiding Principles:

- An incremental risk learning environment will be provided that allows participants to build skills without undue fear/anxiety that would inhibit the learning process
- Paddlers will become self-aware of risk and safety and be environmentally conscious of the rivers they paddle in
- Maintain a positive social environment where skill development and success are valued and celebrated



Key Outcomes:

Through this stage, paddlers will:

- develop new skills and interests in whitewater paddling including adult recreational slalom, wildwater, freestyle playboating, canoe polo, river running and creekboating
- race well under a variety of conditions, maintaining good technique under pressure and fatigue
- maintain health and well being through involvement in whitewater paddling
- create social networks and groups to paddle with
- attend and assist organize paddling events including races, competitions, festivals and educational workshops
- develop leadership skills and utilize these skills to assist whitewater sport development
- have fun



Photo: Mike Holroyd

Physiological Readiness:

Individuals will be physically mature by the time they reach this stage. However their physical fitness may not allow them to enjoy the sport as much as they could if they were in better shape.

Technical:

The athlete will develop and refine their whitewater paddling technique based on their individualized plan that takes into account the athlete's interests, fitness level, time available and skill set.

The athlete will learn how technique has evolved and changed and be encouraged to adapt their technique to be more effective.

Tactics:

Athletes will be coached on tactical approaches to their whitewater sport interests and on the required adjustments in their planning and execution for their activities. Tactics will be developed or refined based on individualized plan.



Photo: Chuck Lee

Mental Preparation:

Athletes should be encouraged to enjoy the benefits of physical activity and a healthy lifestyle.

Coaching:

At this stage the coaches should be certified at the appropriate water difficulty level and for the whitewater discipline that athlete is paddling in. The coach should be able to communicate effectively with an adult population. In general, the coach will act as a teacher and an advisor to the participants.

The mission of the coach is to facilitate life long participation in the sport for the pleasure and wellness derived.

Training:

Training at this stage should be adapted to the athlete's individual goals. Consideration should be given for the athlete's age and past sporting experience when prescribing exercise.



Competition:

Athletes at this stage should compete in skill appropriate competitions at the local, provincial and national levels.

Monitoring:

It is suggested that athletes at this stage consult their physician before starting a new physical activity program. In addition, clubs should be encouraged to do some kind of pre-screening before prescribing exercise to this population.

Nutrition:

Athletes should be following the guidelines set out in the Canada Food Guide for Healthy Eating.

Safety:

Athletes should be made aware that there are inherent dangers associated with all sport, and it is everyone's responsibility to minimize those dangers. Appropriate equipment should be worn by those who participate.

Equipment:

Equipment should be matched to the athlete's ability level and goals. Beginner athletes should use beginner equipment. More advanced athletes can progress into competitive boats and personalized equipment. After competitive athletes retire, they should be encouraged to upgrade their equipment on a regular basis to keep current.

Adults entering into whitewater sport can be supported through club programs that will assist them to experiment with different boats and gear.

Infrastructure:

Private kayak schools and clubs provide the primary mechanism for individuals to begin to paddle through the Fundamentals and Developmentals stages of the Active for Life stage. Once trained, individuals should be encouraged to join a club or find a paddling group to stay active with.

Environment:

Kayaking provides an excellent medium to educate and inform citizens about the value of natural ecosystems, outdoor recreation and physical activity. Programs should include a component of river education, riparian habitats, water quality and impacts of industrialization, urbanization and cultivation on rivers.



Ancillary Capacities:

Many athletes in this category may be new to physical activity therefore they should be instructed about the benefits of regular physical activity, proper warm-up and cool down, stretching, proper hydration and proper nutrition.

Long-Term Paddler Development Framework for Whitewater Competition

	Active Start		Fundamentals & Foundations		Developmentals		Transformations		Pursuit of Excellence		Training to Win		Active for Life	
	FEMALES	MALES	6 to 11	9 to 12	9 to 12	9 to 13	11 to 16	12 to 17	15 to 20	16 to 21	20+	21+	Anytime	
AGE			6 to 11	9 to 12	9 to 12	9 to 13	11 to 16	12 to 17	15 to 20	16 to 21	20+	21+	Anytime	
PHASES			FUNDAMENTAL Pool and Lake Canoe/Kayak Skills	River Skills; Sport Introduction	River Skills; Sport Introduction		WW Skills Physiological Development; Competition Introduction		Competitive Development		Performance		Health Adventure Competition Enjoyment	
Skill Development			balance; propulsion; directional control; basic paddling skills	river paddling skills	river paddling skills		gross motor refinement; advanced paddle skills; race technique		refine technique; refine decision making skills;		technical maintenance; refine race plans; manage performance		Goal Specific	
TRAINING FOCUS			FUN/ Play/Skill Development				Sport Specific Endurance; Strength; Speed				Improve & Maintain Strength, Speed, Endurance + Ancillary Capacities		Fitness, Fun, Well Being	
CRITICAL WINDOWS OF TRAINABILITY			SPEED 1 - Suppleness / Basic Skills				SPEED 2 - Aerobic Capacity							
VOLUME OF TRAINING			1-2 sessions/week	in-season: 1-2 sessions/week off-season: 1 session/week	in-season: 4-6 sessions/week off-season: 2-3 sessions		9-12 sessions/week year round				individualized		goal Specific	
Mental Preparation			create fun and challenge; build self confidence	build desire to stay involved; build self confidence	develop focus; effective goal setting; breathing & relaxation skills; athlete/coach communication and feedback		focusing and re-focusing; effective goal setting; assessing training & relaxing vs. energizing				continually refining mental skills; developing correct level of intensity; attention to detail; managing distractions			
Monitoring			aerobic capacity; agility; flexibility; height	aerobic capacity; flexibility; height	aerobic capacity; height; general strength		aerobic power & aerobic capacity; anaerobic power & anaerobic capacity; sport specific strength				aerobic power & aerobic capacity; anaerobic power & anaerobic capacity; sport specific strength		general well-being	
COMPETITIONS			Club	Provincial	National		International							



BUILDING THE FUTURE

Vision and Mission

CanoeKayak Canada is pleased to share the LTPD framework with our members. By taking a collective approach and philosophy toward LTPD goals and principles, CanoeKayak Canada strives to provide paddlers of all levels and interests with an optimal environment for unlimited opportunities in whitewater sport.

8 Pillars

Paddlers

- Developmental pathways for paddlers are clearly outlined and available in order to allow the paddlers to reach their full potential.
- Paddler participation and overall retention in the sport has increased.
- Annual training, competition and recovery plans are tailor-made to the paddlers' needs, the competition requirements and the contextual reality.
- Fatigue recovery is monitored adequately.
- Paddlers report positive experiences and values.
- Paddler sport is a means for holistic individual development.

Coaches

- Coaches assist paddlers in achieving optimal athletic potential.
- Paddle sport is recognized as a means for holistic individual development.
- All coaches and instructors have access to quality coach education and professional development opportunities.
- The number of certified coaches and instructors is increased.
- A national database of certified coaches and instructors is created.
- Coaching qualifications across all disciplines are comparable at each level, using NCCP standards and guidelines as a benchmark.
- A legislation system is established that supports certified coaches and instructors.
- Coaches and instructors embrace LTPD principles and report better work satisfaction, experiences, recognition, and rewards for their contribution.
- A strong coaching mentorship and apprenticeship program is created.
- Coaches and instructors who have developed talent are recognized.
- Top coaches are promoted so that they become known nationally and internationally.

Officials

- Officials run competitions in a fair and impartial manner
- Training and certification programs are available to build a base of knowledgeable and competent officials in each discipline.
- Officials are available across the country to adequately host events

Competition

- CanoeKayak Canada conducts a competition review and sets up a structure and calendar that supports development at every stage.
- CanoeKayak Canada conducts a review and analysis of rules and regulations related to competitions.
- The competition calendar reflects a blend of preparatory- and performance-orientated competition for each stage.
- The availability of all-season competition venues is increased.
- A competition structure that supports a natural progression from regional, inter-provincial, and national championships to international championships is developed.



Leadership

- An educational program that supports volunteers in becoming strategic administrators is developed.
- CKC receives funding from the NCCP certification fees that supports an administrative support team
- NCCP database is well maintained and up-to-date
- A youth high performance committee in each discipline, focusing on athlete development for paddlers 21 years of age and under, is developed.
- PSOs are involved in designing a strategic LTPD implementation plan.
- Modern technology is used to establish a database that can provide coaching research information, customer/user feedback, store analysis, and retrieve key research data for targeted markets.
- A communication plan and strategy with all key partners involved in paddler activities is operational.
- A plan to inform schools and communities of the opportunities available for paddling programs is designed.
- Federal and Provincial Governments are lobbied for tax incentives for parents who incur costs associated with their child's involvement in sport.
- CanoeKayak Canada and PSOs integrate performance enhancement teams at Transformation, Pursuit of Excellence, and Training to Win stages.
- Federal and Provincial Governments are lobbied to financially support the implementation of performance enhancement teams.
- CanoeKayak Canada and PSOs provide opportunities for ongoing coach/instructor and official education about LTPD principles.
- Support is provided to provincial executive directors in the development of a rationale to obtain provincial funding for LTPD.
- A strong technical leader is identified in each province and territory for involvement with LTPD implementation and future initiatives.

Facilities

- Swimming pools across Canada are enlisted to provide introductory programs to school children, youth groups, recreation programs and adults
- Communities with kayak clubs develop flatwater training sites with storage facilities, canoe polo pitches and instructional sites
- Communities with kayak clubs develop moving water training sites with storage facilities, eddy features, instructional sites, slalom gates and freestyle waves
- Provincial training and competition sites are constructed that provide national level facilities.
- Indoor winter training facilities are developed
- Olympic class whitewater slalom sites are in place

Parents

- A targeted LTPD information package is developed.
- Increased awareness regarding the importance of using a certified coach and instructor.

Environment

- Whitewater sport works to educate participants, athletes and volunteers about the value of clean water and river habitat
- Whitewater sport will lobby to protect rivers and whitewater environments across Canada.



IMPLEMENTATION

Applying LTAD to Whitewater Sport

CanoeKayak Canada is among more than 60 National Sports Organizations in Canada that are developing a sport-specific Long Term Athlete Development model.

CanoeKayak Canada recognizes that implementing the Long Term Paddler Development plan will require changes at all levels. The impact will vary, depending upon the discipline, and will affect factors such as organizational staffing, allocation of existing resources, competition structure, programming, and leader, instructor coach and official education. Successful implementation will require strong partnerships between CanoeKayak Canada and the provinces/territories, founded on a common vision, strong leadership, and an effective communication plan. In turn, the provinces will need to develop similar partnerships with their stakeholders.

CanoeKayak Canada is currently developing the first phase of the LTPD process.

Phase 1 consists of:

- Designing a sport-specific LTPD model tailor-made to the paddler sport contextual reality. The model seeks to increase participation and ensure a better retention rate and will illustrate a systematic and methodical pathway leading to the pursuit of international excellence.
- Designing a strategic implementation plan.

At the conclusion of Phase 1, CanoeKayak Canada will advance development of Phase 2 and Phase 3.

Phase 2 will consist of:

- Developing the details for each stage of the participant/athlete model taking into account scientific literature as well as the sport-specific literature.
- Introducing the new initiatives related to one or more of the 8 pillars to be implemented in the new model.
- Conducting a competition review and suggesting recommendations for a competition structure that favours athlete/participant development.

Phase 3 will consist of:

- Evaluating the implementation of LTPD.
- Developing annual training, competition and recovery plans for each stage (taking into account the 10 S's).

But the story does not end there. This is a living document that provides a continually improving framework so that CanoeKayak Canada can always deliver the most appropriate training programs and competition structure to paddlers. Canada's LTAD model, as described in *Canadian Sport for Life*, is being benchmarked against the most current developmental principles and will be upgraded regularly. The LTPD model will follow suit.

Implementing LTPD will take time, patience, and a willingness to improve through change.



LTPD - Unique Aspects to the Plan

- Establish a clear and consistent development pathway for whitewater paddlers,
- Guide the examination of the current system to identify strengths, gaps, and inconsistencies,
- Guide coaches in planning training, racing, and recovery programs that are consistent with the principles of growth and maturation,
- Allow athletes to achieve optimal performances, and encourage them to stay in the sport for life,
- Guide coaches in developing remedial programs for late-entry whitewater paddlers,
- Improve recruitment and development of early-entry canoeists and kayakers,
- Help Canadian whitewater athletes to perform better and more consistently at the elite level, across programs, and from year to year.

This overview:

- Describes the principles on which LTPD is based.
- Identifies critical periods of accelerated adaptation to training and how these relate to canoe/kayak.
- Outlines the LTPD framework for canoeing and kayaking, including the objectives, key outcomes, and elements for each stage.
- Highlights some of the practical implications for competitions, equipment, clubs, athletes, parents, recruiting, and how and when to learn different aspects of whitewater sports.
- Outlines some of the steps needed to implement LTPD.
- The overview focuses on the optimal development pathway for an athlete who starts whitewater paddling between 6 and 12 years of age. We recognize that in Canada, many athletes come to whitewater paddling relatively late in their development. Similarly, we recognize that adaptive whitewater paddling is a growing element of the sport and should be encouraged and supported.

LTPD is about making sure that whitewater paddling athletes get optimal training, competition, and recovery throughout their career in order to allow them to:

- Reach their athletic potential.
- Enjoy life-long participation in canoeing and other physical activity.
- Training, racing, and recovery programs are based on an athlete's developmental age rather than chronological age and are designed to optimize development during critical periods of accelerated adaptation to training. LTPD also takes into account the physical, mental, emotional, and cognitive development of all participants.
- LTPD recognizes that athlete development is long term – **there are no short cuts**. Children need to build physical literacy – *the mastering of fundamental movement skills and fundamental*

Conclusion

LTPD is about doing development right. It is about taking a long term, clear, and systematic approach that focuses on athletes and what they need – at all levels.

Whitewater athletes who benefit from the right training, racing and support at the right time will have the foundation they need to reach their athletic potential and enjoy paddling throughout their lives. Good preparation is crucial to an athlete's success.

LTPD is about extending the concept of good preparation to all stages and all aspects of athlete development.

LTPD allows all paddlers and those who support them to see what they should (and should not) be doing throughout their development. It helps individual athletes to identify the pathway that suits them and their goals.

LTPD is a foundation for a Whitewater Competitive system that will be successful in terms of both number of participants and the number of medals at the high performance level. It makes sense to invest in a framework that will develop athletes who enjoy whitewater competition, succeed at the high performance level and stay involved in the sport for the long term.



GLOSSARY

Adaptation A response to a stimulus or series of stimuli that induces functional and/or morphological changes in the body. The level or degree of adaptation depends on the genetic endowment of the athlete.

Physiological research identifies general trends or patterns of adaptation and clearly delineates the various adaptation processes such as development of muscular endurance or maximum strength.

Adolescence Is a difficult period to define in terms of the time of its onset and termination. During this period, most bodily systems become adult both structurally and functionally. Structurally, adolescence begins with acceleration in the rate of growth in stature, which marks the onset of the adolescent growth spurt. The rate of statural growth reaches a peak, begins a slower or decelerative phase, and finally terminates with the attainment of adult stature.

Functionally, adolescence is usually viewed in terms of sexual maturation, which begins with changes in the neuroendocrine system prior to overt physical changes and terminates with the attainment of mature reproductive function.

Ancillary Capacities Refers to the knowledge and experience base of an athlete and includes warm-up and cool-down procedures, stretching, nutrition, hydration, rest, recovery, restoration, regeneration, mental preparation, tapering and peaking.

The more knowledgeable athletes are about these training and performance factors, the more they can enhance their training and performance levels. When athletes reach their genetic potential and physiologically cannot improve anymore, performance can be improved by using the ancillary capacities to full advantage.

Annual Training Competition and Recovery Plan A yearly plan which outlines the appropriate activities with the adequate degree of difficulty, and in the right sequence to reach the training and competition objectives sought.

C-1 // C-2 The one man and two man decked canoes that are paddled from a kneeling position with a single bladed paddle.

Canoe Polo A scored competition between two teams of kayakers that win points by throwing a ball into a net. Game is similar to water polo or soccer.

Childhood Ordinarily spans the end of infancy, the first birthday, to the start of adolescence and is characterized by relatively steady growth and maturation and rapid progress in neuromuscular or motor development. It is often divided into two periods – early childhood (1 to 5 years of age) and late childhood (6 years of age through to the onset of adolescence).

Chronological age Refers to “the number of years and days elapsed since birth.” Growth, development, and maturation operate in a time frame; that is, the child’s chronological age. Children of the same chronological age can differ by several years in their level of biological maturation. The integrated nature of growth and maturation is achieved by the interaction of genes, hormones, nutrients, and physical and psychological environments in which the individual lives. This complex interaction regulates the child’s growth, neuromuscular maturation, sexual maturation, and general physical metamorphosis during the first 2 decades of life.

Coaching The coach’s role and relation (in terms of planning, management, emotional, social, training & competition support) in the life of a developing athlete / participant through the various stages of development.

Cognitive Development Development of the ability to interpret and process information.

Critical Period of Development The point in the development of a specific behaviour when experience or training has an optimal effect on development. The same experience, introduced at an earlier or later time, has no effect on or retards later skill acquisition.



Delivery Vehicles The different mediums, organizations, people implicated in the delivery of the LTAD, its goals, its philosophy and its ways at every stage of development.

Development “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.”

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; for example, the change of cartilage to bone in the skeleton.”

Developmental Age Age measured in terms of the child’s readiness to perform specific tasks based on physical, emotional, social and cognitive criteria.

Downriver A whitewater sport event that is a timed event from a start point down a Class II river to a finish point. Also commonly known as Wildwater which is run on Class III-IV rivers.

Emotional Development The development of self-concept.

Freestyle A judged whitewater event where competitors perform acrobatic maneuvers on a wave or hole in the river.

Fundamental Sport Skills The set of sport skills that form the basis for all sports.

Ideal Performance State The physical, mental and emotional state when an athlete performs his or her best.

K-1 Single person kayak paddled from a sitting position with a double bladed paddle.

Menarche The onset of the first menstrual cycle.

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

Peak Strength Velocity (PSV) The maximum rate of increase in strength during growth spurt. The age of maximum increase in strength is called the age at PSV.

Peak Weight Velocity (PWV) The maximum rate of increase in weight during growth spurt. The age of maximum increase in weight is called the age at PWV.

Physical Development The growth and development of the body’s muscles, bones and energy systems.

Physical Literacy Mastering of fundamental motor skills and fundamental sport skills.

Post-natal Growth Commonly divided into three or four age periods, including infancy, childhood, adolescence and puberty.

Puberty The point at which an individual is sexually mature and able to reproduce.

Readiness The child’s level of growth, maturity and development that enables him/her to perform tasks and meet demands through training and competition. Readiness and critical periods of trainability during growth and development of young athletes are also referred to as the correct time for the programming of certain stimuli to achieve optimum adaptation with regard to motor skills, muscular and/or aerobic power.



Skeletal Age The maturity of the skeleton determined by the degree of ossification of the bone structure. It is a measure of age that takes into consideration how far given bones have progressed toward maturity, not in size, but with respect to shape and position to one another.

Slalom A timed event with penalties that runs down a Class II-IV river. Competitors must negotiate a series of gates suspended over the river. Failure to negotiate properly results in penalties that are added to the finish time.

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

Wildwater A whitewater sport event that is a timed event from a start point down a Class III or IV river to a finish point. Also commonly known as Downriver which is run on Class II rivers.

Windows of Trainability The point in development of a specific behaviour when experience or training has an optimal effect on development. The same experience, introduced at an earlier or later time, has no effect on or retards later skill acquisition.

