Figure 8 PacificSport - Optimal Windows of Trainability (Balyi and Way, 2005)

All Systems Are Always Trainable!
ACTIVE START
Learn fundamental movements and link them together into play

Chronological ages 0 to 6

Provide every young child with an active start to their life

Provide every young child with appropriate safety skills around water

Physical activity is essential for healthy child development. Among its other benefits, physical activity enhances development of brain function, coordination, social skills, gross motor skills, emotions, leadership, and imagination.

- helps children to build confidence and positive self-esteem.
- helps to build strong bones and muscles, improves flexibility, develops good posture and balance, improves fitness, reduces stress, and improves sleep.
- promotes healthy weight.
- helps children learn to move skillfully and enjoy being active.

Physical activity should be fun and a part of the child’s daily life, not something required. Active play is the way young children are physically active.

Organized physical activity and active play are particularly important for the healthy development of children with a disability if they are to acquire habits of lifelong activity.

Because this is a period when children rapidly outgrow their mobility aids, communities need to find effective ways — equipment swaps or rentals, for example — to ensure that all children have access to the equipment they need to be active.

A young child’s safety around water should be a primary objective of every parent, accessing an effective learn to swim program at this stage is a requirement.

Qualities of an effective learn to swim program are:

- Prepared and enthusiastic instructors
- Progression from class to class
- Tracking of progress from session to session – don’t start from scratch each session!
- Appropriate challenge for each individual and high ratio of activity to rest within class time
Activities at this stage should include:

- Provide learn to swim instruction for every child to promote safety around water, and as an effective motor skill activity.
- Provide organized physical activity for at least 30 minutes a day for toddlers and at least 60 minutes a day for preschoolers.
- Provide unstructured physical activity — active play — for at least 60 minutes a day, and up to several hours per day for toddlers and preschoolers. Toddlers and preschoolers should not be sedentary for more than 60 minutes at a time except while sleeping.
- Provide physical activity every day regardless of the weather.
- Start at infancy, provide infants, toddlers, and preschoolers with opportunities to participate in daily physical activity that promotes fitness and movement skills.
- Provide parents and care givers with age-appropriate information.
- Ensure that children acquire movement skills that build towards more complex movements. These skills help lay the foundation for lifelong physical activity.
- Encourage basic movement skills—they do not just happen as a child grows older, but develop depending on each child’s heredity, activity experiences, and environment. For children with a disability, access to age and disability appropriate adapted equipment is an important contributor to success.
- Focus on improving basic movement skills such as running, jumping, twisting, wheeling, kicking, throwing, and catching. These motor skills are the building blocks for more complex movement.
- Be designed to help children to feel competent and comfortable participating in a variety of fun and challenging sports and activities.
- Include games for young children that are non-competitive and focus on participation.
- Ensure that activities are gender-neutral and inclusive so that active living is equally valued and promoted for all children.
Enjoyable, challenging and progressive experiences

Chronological ages - Female: 5 to 8  Male: 6 to 9

This stage is important for:

- basic movement skills agility, balance, coordination
- running, throwing, jumping and catching
- water safety and movement skills
- short speed effort through agility exercise
- strength development using own body weight

Amount of physical activity, including non-swimming (progression by age):

- 1-3 sessions per week rising to 4-6 sessions
- 30-60 minute sessions
- high repetition, low intensity activity focus

Competition

- Formal competition not necessary
- Participation in introductory club-based competitive events with introduction of rules, ethics and fair plan

Venues:

- Learn to Swim providers, gymnastics and athletics programs
- Swimming Canada clubs providing a balanced Fundamentals program
- FUNdamental Sport Clubs
- Schools
Activities at this stage should include:

**PHYSICAL**
- Promote overall physical development and mobility in and out of the pool
- Include running, jumping and throwing skills
- Promote agility, balance, coordination and speed (ABC’S) in and out of the pool
- Develop short duration speed and endurance through FUN games in and out of the pool
- Develop linear, lateral and multi-directional speed in and out of the pool

**TECHNICAL**
- Teach basic swimming skills – all strokes, turns, starts
- Teach basic skills of different sports – aquatic and non aquatic sports
- Provide knowledge of the basic use of swimming equipment

**TACTICAL**
- Introduce simples rules and ethics of sport
- Introduce basic racing opportunities and understanding of competition

**MENTAL**
- Reinforce a positive attitude to sport
- Introduce concept of self confidence
- Introduce concentration skills
- Encourage positive reinforcement from coaches and parents
- Introduce the concept of perseverance

**LIFESTYLE**
- Promote involvement in multiple sports
- Promote and teach safety
- Be based on enjoyment and fun
- Promote fair play
- Foster a positive attitude towards activity and participation
- Promote teamwork and personal interaction skills
LEARN TO TRAIN
Multi Sport Skill Development

Enjoying, challenging and progressive experiences

Chronological ages - Female: 8 to 11  Male: 9 to 12

Readiness to advance determined by skill competency and measured increase in PHV

This stage is important for:

- further development and consistent demonstration of movement skills
- further development and consistent demonstration of all swimming skills
- expert instruction on technical and physical skills
- pre-growth spurt focus on repetition of skill towards mastery
- monitored flexibility training daily
- development of positive attitudes to self, others and sport

Amount of physical activity, including non-swimming (progression by age):

- 4-6 sessions per week
- 60-90 minute sessions
- Pool time (hrs): 4-7
- Pool Volume: 8-14 km
- Participation in 2-3 other sport activities through a year
- high repetition, low intensity skill focus
- some intensity progression to challenge skill acquisition

Competition objectives:

- Modified competition and introduction to competitive structures and events
- Competitive rewards focused on broad skill development and aerobic development
- Competition schedule guideline: 3 below athlete’s level of competitions – 2 at athlete’s level of competitions – 1 above athlete’s level of competition
- Suggested 1-2 cycles through per season

Venues

- Year round swim clubs with multi-sport programming
- Seasonal swim club with 2-3 other sport seasons
- School sports
Activities at this stage should include:

**PHYSICAL**
- Continue to develop Agility, Balance, Coordination, Speed (ABC’S) in and out of the pool
- Continue to develop speed and endurance through fun games in and out of the pool
- Involve medicine ball, Swiss ball and own-body exercises for strength as well as hopping bounding exercises
- Introduce basic flexibility exercises
- Introduce concepts of warm-up and stretching

**TECHNICAL**
- Include a strong emphasis on skill development
- Progressively refined swimming skills – strokes, turns, starts, underwater skills
- Teach basic practice skills – lane etiquette, pace clocks, etc..

**TACTICAL**
- Include modified swimming meets – measuring aerobic skill mastery, short duration speed
- Provide an introduction to basic racing principles – pacing strategies, splitting goals

**MENTAL**
- Introduce concept of mental preparation
- Promote understanding of the role of practice towards goals
- Continue to promote concept of perseverance
- Continue to develop concept of self confidence
- Continue to develop concentration
- Promote positive reinforcement for effort and achievement

**LIFESTYLE**
- Promote involvement in multiple complimentary sports
- Promote sport as a lifestyle commitment
- Provide knowledge of the changes puberty will bring
- Introduce discipline and structure
- Promote an understanding of the relationship between effort and outcome
- Continue to promote teamwork and personal interaction skills
TRAIN TO TRAIN

Building the Engine for Future Performance

Enjoying a lifestyle of sport and activity

Chronological ages - Female: 11 to 14  Male: 12 to 15

Readiness to advance determined by measured steadying of PHV and mastery of sport skills

This stage is important for:

- further development and mastery of sport skills
- aerobic system development (on-set of growth spurt to peak PHV a critical window)
- maintenance and consolidation of skill, speed, and flexibility
- strength development (females immediately after peak PHV/males 12-18 months following peak PHV)
- learning the mental skills required to deal with competition
- ongoing monitored flexibility training

Amount of physical activity, including non-swimming (progression by age):

- 6-12 sessions per week
- 60-120 minute sessions
- Pool time (hrs): 12-24
- Pool Volume: 24-30 km/wk building to 40-50 km/wk
- Participation in 1-2 other sport activities through a year
- high volume, aerobic capacity focus from onset of PHV to peak PHV
- speed intensity following peak PHV

Competition objectives:

- 3 below athlete’s level competitions – 2 at athlete’s level competitions – 1 above
- athlete’s level competition
- Suggested 1-2 cycles through per season
- competitive rewards focus on continued development across multiple distances and strokes
- development of individualized competitive modalities such as warm up, warm down
- introduction to multiple racing tactics

Venues

- year round swim clubs
- seasonal swim club with 1-2 other sport activities
- school sports
Activities at this stage should include:

**PHYSICAL**
- Emphasize general and balanced physical conditioning
- Prioritize aerobic training after the onset of Peak Height Velocity (PHV)
- Initiate strength training in females after PHV and with the onset of menarche.
- Initiate strength training in males 12-18 months after PHV
- Focus on shoulder, elbow, core, spine and ankle stability
- Continue flexibility training
- Include frequent musculoskeletal evaluations during PHV

**TECHNICAL**
- Further develop and consolidate swimming specific skills
- Include an individualized approach to address strengths and weaknesses

**TACTICAL**
- Include early stages of specific race tactical preparation
- Teach and observe different individual racing tactics

**MENTAL**
- Introduce goal setting skills (short and medium term)
- Introduce imagery skills (practicing and improving technique and self-confidence)
- Introduce relaxation skills (deep breathing)
- Teach patience and self-control
- Continue to develop concentration
- Continue to promote positive reinforcement

**LIFESTYLE**
- Teach basic nutrition and hydration needs
- Promote use of training and performance diary/log
- Introduce skills of time management
- Introduce athlete understanding of planning and periodization
- Promote use of rest and recovery techniques
- Continue to promote teamwork and personal interaction skills
- Promote positive communication
- Promote discipline and personal responsibility
- Build awareness of Peak Height Velocity and windows of optimal trainability
TRAIN TO COMPETE

Competitive performance development

Building self confidence

Chronological ages - Female: 14 to 16  Male: 15 to 18

Readiness to advance determined by performance and mastery of competencies

This stage is important for:

- Individualization of physical training approach – based on a post peak PHV assessment
- Advanced physical, technical, tactical skills
- Ability to compete at high levels under various environments
- Maintenance of flexibility
- Development of autonomy, independence and individual responsibility
- Lifestyle skill awareness and development
- Individualized strength development based on a post peak PHV assessment
- Competitive performance state management

Amount of physical activity, including non-swimming (progression by age):

- 8-12 sessions per week
- 90-120 minute sessions
- Pool time (hrs): 16-24
- Pool Volume: 40-50+ km/wk
- Specialization to chosen performance sport – balanced out of training activities
- Individualized training focus with volume and intensity based on specialty and periodization focus

Competition objectives:

- 3 below athlete’s level competitions – 2 at athlete’s level competitions – 1 above athlete’s level competition
- Suggested 1-2 cycles through per season
- Competitive modeling of peak performance objectives
- Fully developed and individualized competitive modalities such as warm up, warm down, nutrition, ancillary capacities
- Refinement and implementation of multiple racing tactics

Venues

- Year round swim clubs
- University swim clubs
Activities at this stage should include:

**PHYSICAL**
- Involve event and individualized specific intensive physical conditioning
- Continue to develop shoulder, elbow, core, spine and ankle stability
- Focus on optimum preparation: tapering and peaking

**TECHNICAL**
- Require a high level of proficiency in all swimming skills
- Require sport-specific technical and racing skills under competitive conditions and at high intensity
- Develop an individualization of skills: ‘personal style’
- Require consistency and control under a variety of environments
- Involve competition simulation training

**TACTICAL**
- Focus on event and distance specific tactical preparation
- Involve principles of aggressive and passive tactical strategies
- Develop an athlete’s ability to plan and assess competition
- Develop an athlete’s ability to adapt to different competitive situations
- Develop an athlete’s ability to observe and adapt to opponents

**MENTAL**
- Promote personal responsibility and involvement in decision-making
- Refine focus and thought control – self talk/verbal cues (dealing with distractions and negative thoughts)
- Refine goal setting skills (short, mid and long term)
- Consolidate performance routines and pre-competition preparation
- Refine imagery skills (competition, different situations/problems, practicing strategies)
- Develop skills for anxiety control and relaxation (Progressive Muscle Relaxation, Hypnosis)

**LIFESTYLE**
- Allow for individualization of ancillary supports
- Involve refined self-monitoring
- Plan career/long term sport options
- Increased knowledge on hydration and nutrition
- Focus on preparation for different environments e.g. heat/cold/rain/altitude
- Refine injury prevention, rest and recovery strategies
- Promote ongoing personal development
- Focus on integration of sport, career and life goals
- Address economic and independence issues
Compete to Win
Peak performance on the day

Optimized program towards peak performance at specific moments

Chronological ages - Female: 16 +  Male: 18 +

High performance career at this level to retirement

This stage is important for:
- Optimized approach built around longer term competitive schedule and annual training plan
- Advanced physical, technical, tactical skills
- Ability to compete at consistent high levels under various environments
- Assume leadership role within group settings
- Regular short breaks within competition and training plans
- Self directed programming with coaching support
- Lifestyle refinement – planning for post high performance career

Amount of physical activity, including non-swimming (progression by age):
- 10-15 sessions per week
- 90-150 minute sessions
- Pool time (hrs): 20-24
- Pool Volume: 40-50+ km/wk depending on specialization
- Specialization to chosen performance sport – balanced out of training activities
- Individualized training focus with volume and intensity based on specialty and periodization focus

Competition
- Advanced competitive schedules
- Competitive modeling of peak performance objectives
- Fully developed and individualized competitive modalities such as warm up, warm down, nutrition, ancillary capacities
- Refinement and implementation of multiple racing tactics

Venues
- Year round swim clubs
- University swim clubs
Activities at this stage should include:

**PHYSICAL**
- Focus on the maintenance and possible improvement of physical capacities with a view to maximizing performance
- Continue to promote shoulder, elbow, core, spine and ankle stability
- Focus on a fully individualized approach
- Provide frequent prophylactic (preventative) breaks

**TECHNICAL**
- Ensure refinement of sports specific skills
- Include event/competition-specific training skills that are automatic/second nature
- Develop the ability to improvise with skills

**TACTICAL**
- Develop effective competition strategies
- Adapt strategies to situation
- Model all possible aspects of performance in training
- Race to strengths, exploit weaknesses of opponents

**MENTAL**
- Promote independent decision-making
- Develop athletes capable of working in a team environment and evaluating advice from outside sources
- Consolidate well developed, refined and individualized mental skills and routines
- Promote refocusing plans/coping strategies
- Promote the will to win and drive for competition
- Consolidate the ability to concentrate and refocus

**LIFESTYLE**
- Increase knowledge on all areas related to personal well being
- Include rest and relaxation. Frequent breaks
- Require well developed self-monitoring
- Require a well developed and integrated support network/structure
- Include a fully integrated sport, career and life plan
SECOND CAREER
ACTIVE FOR LIFE

Second sport career - Sport as a lifetime activity

Opportunity to pursue complimentary sport activity

Chronological age - any age

Transition to second career sport or active lifestyle plan

This stage is important for:
- Consideration of complimentary activities to continue competitive activity
- Review of event / commitment based on post-PHV physical and mental status
- Implementation of active lifestyle plan for de-training process
- Self directed programming
- Lifestyle refinement –post competitive training

Amount of physical activity, including swimming (progression by age):
- Determined by chosen activity and schedule – should commence at 60-80% of training level and can decrease gradually to steady state
- Specialization to second sport career focus or non-specialized active living
- Individualized training focus

Competition
- Dependant on chosen path – recreational competitive opportunities suggested

Venues
- Sport clubs for second career choice
- Recreational competitive sport clubs – Masters, Triathlon
- Health Clubs, etc…
- Outdoor activity
Transition to a second sport career may involve re-introduction to a previous stage, with new sport-specific requirements. For those moving to retirement, and an active lifestyle, these important activities should be considered:

**PHYSICAL**
- Continued active lifestyle through sport participation
- Endurance training
- Strength training
- Flexibility training

**TECHNICAL**
- Retain learned skills and develop new ones

**TACTICAL**
- Recreational or masters oriented perspective to competition

**MENTAL**
- Relaxation
- Readjustment to new active living environment

**LIFESTYLE**
- Pursue personal and family goals more strongly
- Pursue further education/career development
- Possible engagement in administration, coaching, media/PR
- Seek transition support, if required
- Reset goals