Volleyball Canada

Volleyball Development Matrix

VERSION: May 8, 2023
Additional links and resources to be added by 2023

A Special Thank You To Our Contributors

MAIN WRITERS
James Sneddon
Kyle Paquette
Jason Boivin
Michael Cook

SUPPORTING CONTRIBUTORS
Dawna Sales, Ian Halliday, Kerry MacDonald, Ed Drakich, Ryan MacDonald, Julien Boucher, Nicole Ban, Louis-Pierre Mainville, Josh Nichol, Ashlen Leonard, Richard Sylvester, Melissa Healy, Alain G. Marion, Emily Riley

TRANSLATION
Keylingo

LAYOUT/DESIGN
paul@pauledwardsdesign.com

Table of Contents

Volleyball in Canada

One Sport Three Disciplines

PHOTOS: FIVB/WorldParaVolley

About this Resource

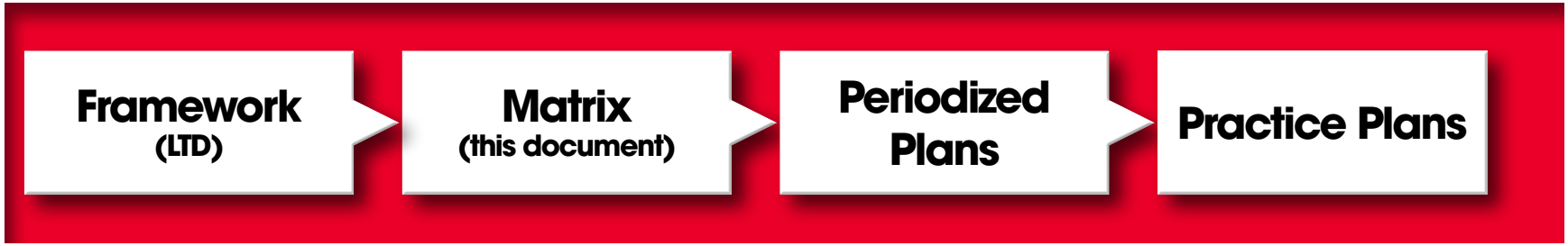
Volleyball Canada's Development MATRIX is a document to help guide coaches and steer the National Coaching Certification Program (NCCP) content. It lays out in detail what a player should be able to do at each stage of their Long-Term Development. It builds upon the FRAMEWORK document:

A Roadmap for Volleyball in Canada – Long Term Development 3.0

This resource, the DEVELOPMENT MATRIX, provides the next layer of information for coaches. The MATRIX answers the following questions:

- **What do I teach?**
- **When do I teach it?**
- **What does success look like?**

The MATRIX is a part of the coach's toolbox to plan a practice. Below is a flow chart of resources and tools that guide our work with the players. Volleyball Canada and the Provincial/Territorial Associations have provided guidelines for the first three steps (Framework, Matrix, Periodized Plans). The coach can then reflect on these recommendations to determine how they could be applied to their practice plans.

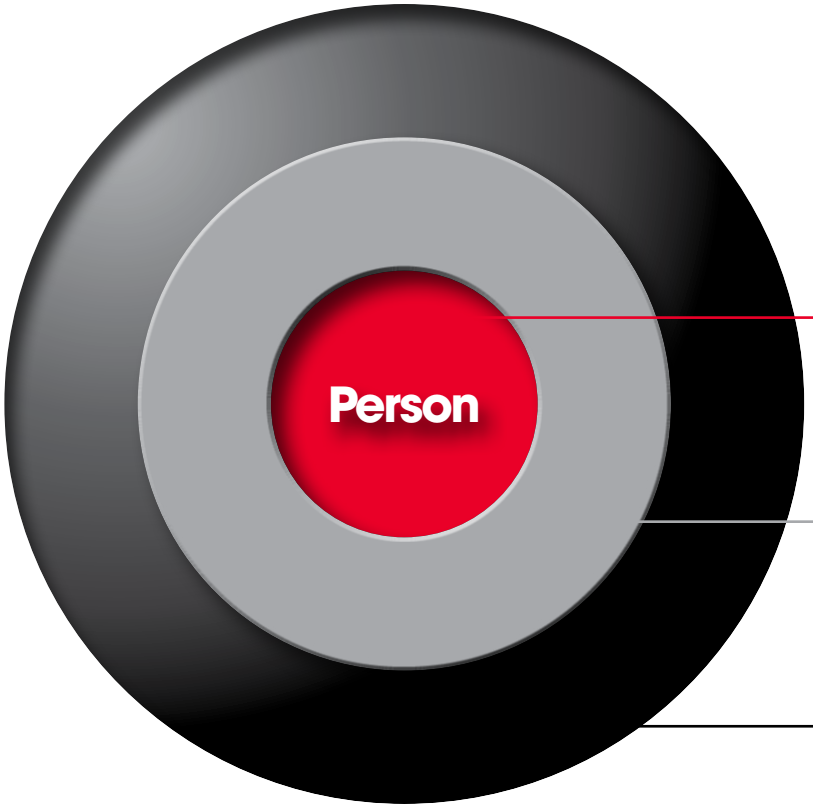


The Matrix provides guidelines on WHAT to deliver and WHEN to best to meet the needs of developing players. Training on HOW to apply the various items listed in the Matrix is delivered through the National Coaching Certification Program (NCCP) and other coach education resources and opportunities.

Volleyball Development Matrix

Person Centred

A person-centred approach to the Volleyball Development Matrix recognizes that basic human needs are the essential building blocks of development. Coaches can often overlook these foundational objectives and assume they are taken care of elsewhere – or feel that the role of the coach is limited to developing skills and systems. This mindset can be detrimental to the person, the athlete, and the player. Volleyball Canada invites coaches to prioritize the COMMON NEEDS of the individual, their ability to CONNECT, to CARE, and to have COURAGE throughout the volleyball season and in their daily lives.



Person

COMMON NEEDS
CONNECTION
CARE
COURAGE

Athlete

SPEED
STRENGTH
SUPPLENESS
STAMINA

Player

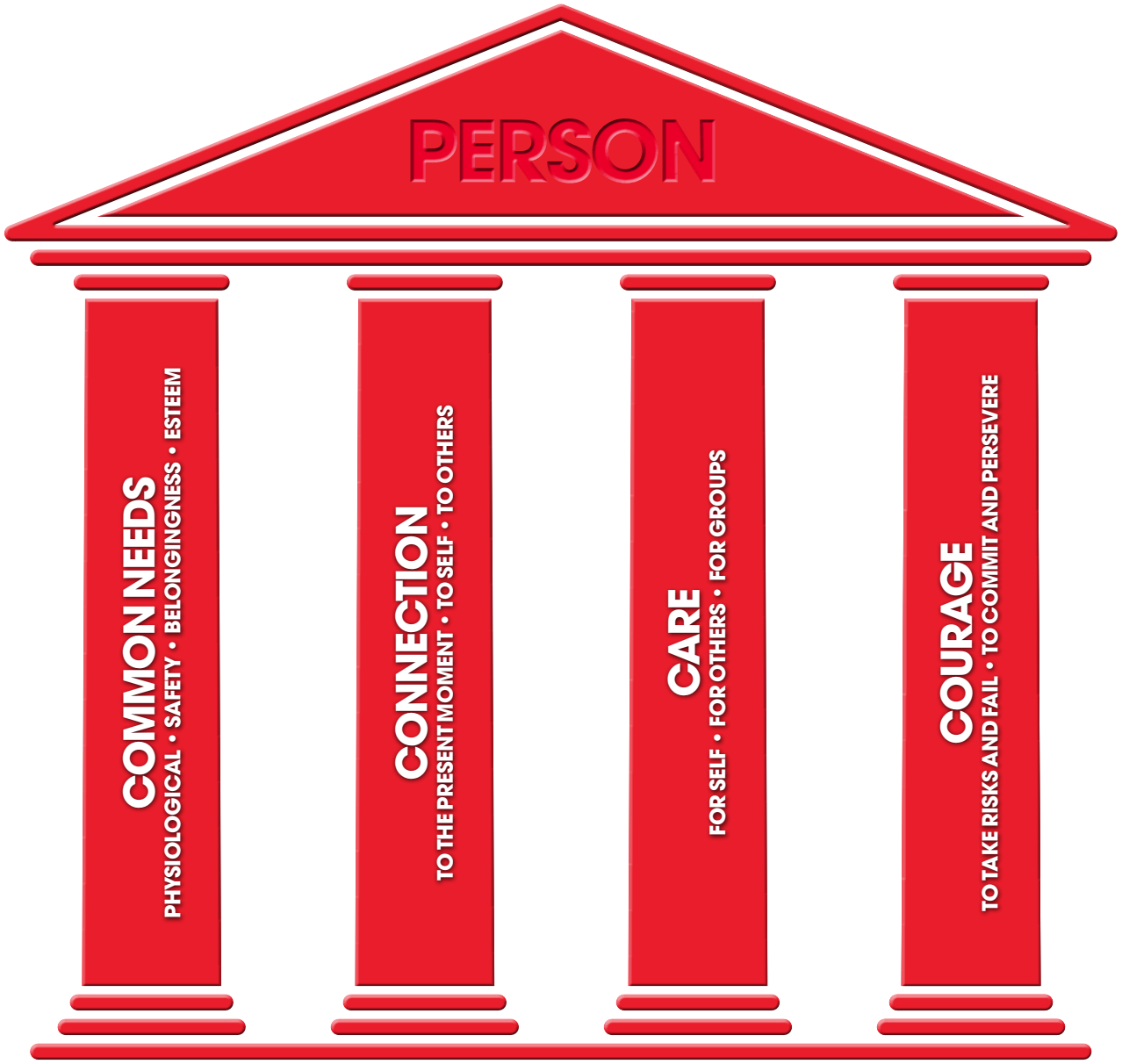
SEEING
SEEKING SOLUTIONS
SKILLS
SYSTEMS

The PERSON Pillar

The PERSON pillar has 4 main dimensions.

Each dimension is divided into 2-4 elements.

The list of dimensions and elements are not meant to be exhaustive, but rather a prioritized list that captures the essential building blocks for participant wellbeing and fulfillment.



The information found within the PERSON pillar can be applied across all LTD stages.

ELEMENTS	DESIRED STATE	SKILLS OR ACTIONS NEEDED
COMMON NEEDS		
PHYSIOLOGICAL	Athletes have access to clean water, clean air, as well as adequate nutrition, hydration, and sleep.	Coaches advocate for these basic needs; they report potentially harmful situations to competent authorities.
SAFETY	Athletes have access to appropriate housing, physical/emotional/psychological safety, and health care.	
BELONGINGNESS	Athletes have meaningful and positive relationships with family members and friends.	Coaches provide for these needs within the coaching context
ESTEEM	Athletes demonstrate appropriate levels of prestige and feelings of accomplishment.	
CONNECTION		
TO THE PRESENT MOMENT	Athletes demonstrate mindfulness and the ability to focus on the task at hand and recognize when they are distracted from the present moment.	Mindfulness, Compartmentalization, Prioritization
TO SELF	Athletes demonstrate appropriate self-awareness, understanding of identity, and the ability to align their actions and decisions with their morals, values, and beliefs.	Self-awareness, Reflection, Self-assessment/ monitoring
TO OTHERS	Athletes demonstrate interpersonal effectiveness to develop relationships in support of mutual fulfillment and performance objectives. The team is clear on its values. The individual athletes willingly adhere to the team values and derive a benefit in doing so.	Empathy, Communication, Vulnerability/ openness
CARE		
FOR SELF	Athletes demonstrate self-compassion and apply self-regulatory skills to manage varied conditions and stages of development in life and sport.	Self-compassion, Reflection, Planning
FOR OTHERS	Athletes demonstrate care and concern for others in support of the other person's well-being and pursuit of their performance objectives.	Leadership, Empathy, Acceptance/Forgiveness
FOR GROUPS	Athletes demonstrate a sense of care and respect for broader groups (i.e., team, club, province, country, and outside groups) and support these groups and/or advocate on their behalf.	Cultural awareness, Respect, Advocacy
COURAGE		
TO TAKE RISKS AND FAIL	Athletes demonstrate a willingness to fully engage in learning experiences that may involve uncertainty, perceived risks, and failure.	Managing arousal, emotions, and stress, Reframing
TO COMMIT AND PERSEVERE	Athletes demonstrate resilience and optimism in support of maintaining full engagement in situations of adversity and ease.	Ambition, Commitment, Optimism

The table below guides coaches in supporting the PERSON. The information is designed to help the coach identify where an athlete is at relative to the 'desired state', and provides suggestions for reflection and reinforcement. Volleyball Canada has developed a Person Pillar Workbook - for Players. Coaches can incorporate the activities from the workbook into their season by assigning the activities throughout the year. Additional resources are under development to support coaches and athletes with activities and strategies to develop these important skills.

ELEMENTS	DESIRED STATE	INDICATORS OF DESIRED STATE	INDICATORS OF UNDESIRED STATE	REFLECTION QUESTIONS FOR COACHES	REINFORCING COMMENTS FOR COACHES
COMMON NEEDS					
PHYSIOLOGICAL	Athletes have access to clean water, clean air, nutrition, hydration, and sleep.	Athlete appears to be healthy and well-rested. Athlete often shows up to practice with high-quality snacks and a water bottle.	Athlete seems undernourished and regularly behaves in a lethargic manner. Athlete rarely brings any snacks or a water bottle to practice. *Note: Be aware of communities that have boil water advisories.*	No reflection questions are needed here. Rather, the coach takes steps to provide for the person's needs, or seeks professional help.	No reinforcing comments are needed here. Rather, the coach takes steps to provide for the person's needs, or seeks professional help.
SAFETY	Athletes have access to appropriate housing, physical/emotional/ psychological safety, and health care.	Athlete appears to have accesss to appropriate housing, physical/ emotional/psychological safety, and shows no signs of psychological or physical abuse.	You become aware that an athlete does not have access to appropriate housing, physical/ emotional/psychological safety. Athlete expresses not wanting to go home after practice because of safety issues. Athlete presents signs of physical abuse (ie. bruises, injuries)		
BELONGINGNESS	Athletes have meaningful and positive relationships with family members and friends.	Athlete's family, if available, shows a supportive interest in their sport participation (ex.: Rides to and from practice, attendance at games) Athlete appears to have kind and supportive friends on the team and/or outside of the team.	Athlete seems uncomfortable when parents are watching a game. Athlete doesn't seem to have many friends on the team and/ or outside of the team. Athlete's friends seem unsupportive and unkind.	I've noticed that [insert indicator]. Are you noticing something similar? *Note: Just because you see something doesn't make it true or real.* What are some of the reasons why this might be happening? What can we do to improve in this area?	I've noticed that [insert indicator]. This is great! Keep it up. I noticed you've been making efforts to [insert indicator]. Great work today! I've seen you [insert indicator] and it is having a great impact on your/the team's success/ improvement. Way to go!
ESTEEM	Athletes demonstrate appropriate levels of prestige and feelings of accomplishment.	Athlete seems comfortable maintaining eye contact and communicating with others (asking questions, talking to teammates, expressing needs). Note: Certain athletes who are neurodiverse may struggle to maintain eye contact and communicate. Athlete seems to believe they can achieve their goals. Athlete appears comfortable with other athletes' success.	Excessively low levels: Athlete struggles with eye contact and communication (asking questions, talking to teammates, expressing needs). Note: Certain athletes who are neurodiverse may struggle to maintain eye contact and communicate. Athlete doesn't seem to believe they can achieve their goals. Excessively high levels: Athlete is always speaking, appears to overprioritize their importance, appears to lack full effort in the practice environment.		

ELEMENTS	DESIRED STATE	INDICATORS OF DESIRED STATE	INDICATORS OF UNDESIRED STATE	REFLECTION QUESTIONS FOR COACHES	REINFORCING COMMENTS FOR COACHES
CONNECTION					
TO THE PRESENT MOMENT	Athletes demonstrate mindfulness and the ability to focus on the task at hand and recognize when they are distracted from the present moment. Skills needed: Mindfulness, compartment-alization, prioritization	Athlete appears to consistently maintain their attention on court/in the game between every point. *Note: Some athletes who are neurodiverse* may struggle with this aspect.* Athlete appears to refocus and reset after a missed play. The team appears to be focused on their preparation for practice.	Athlete's attention appears to drift away from the court/game between points (ex: looking to friends, family, coaching staff between points). *Note: Some athletes who are neurodiverse may struggle with this aspect.* Athlete seems focused on a missed play while the next point starts. The team is talking about their evening plans as they warmup for practice.	I've noticed that [insert indicator]. Are you noticing something similar? *Note: Just because you see something doesn't make it true or real.* What are some of the reasons why this might be happening? What can we do to improve in this area?	I've noticed that [insert indicator]. This is great! Keep it up. I noticed you've been making efforts to [insert indicator]. Great work today! I've seen you [insert indicator] and it is having a great impact on your/the team's success/ improvement. Way to go!
TO SELF	Athletes demonstrate appropriate self-awareness, understanding of identity**, and the ability to align their actions and decisions with their morals, values, and beliefs. Skills: Self-awareness, reflection, self-assessment	Athlete's identity appears to extend beyond being an athlete. For example, they have healthy interests in other relationships, pursuits, etc. Athlete appears to be primarily internally driven by motivators such as enjoyment, pursuit of mastery, connection to others. When athlete's fail, they have the ability to reflect on their role in the failure and to take on an appropriate amount of responsibility to adapt. Athlete is not easily swayed by others. Athlete appears to be aware of their thought patterns	Being an athlete seems to be this athlete's only identity. For example, they have dropped all other pursuits or relationships. Athlete seems to be primarily externally driven by motivators such as fame, money, recognition, parental pressure, or self-worth derived from accomplishments/success. When these athlete's fail, they may find excuses or place blame externally to try to protect their self-worth. Athlete seems to be easily influenced by others. Athlete doesn't seems to be aware of their thought patterns.		
TO OTHERS	Athletes demonstrate interpersonal effectiveness to develop relationships in support of mutual fulfillment and performance objectives. Skills: Empathy, communication, vulnerability/ openness	The team is united in their goals. The team is communicating between points. Friendship groups within teams make efforts to include other players in their social environments. Athlete actively listens when their teammates speak. Athlete can assertively and effectively share their thoughts with others. Athlete often welcomes and accepts feedback.	The team acts more as a group of individuals. Athletes seem focused only on themselves. A group of athletes deliberately excludes other athletes in off-court environments. Athlete often interrupts and does not seem to consider others' perspectives. Athlete struggles to share their thoughts in a way that is condusive to building relationships. Athlete often seems to get defensive when given feedback.		

**Neurodiversity refers to the range of differences in individual brain function and behavioral traits, regarded as part of normal variation in the human population (used especially in the context of autistic spectrum disorders, or ADHD).*

***Coaches can support a 'connection to self' by being aware of and respectful toward various identity frameworks. This may include, for example, the Indigenous Holistic Model and honouring cultural and spiritual practices to foster an inclusive experience.*

ELEMENTS	DESIRED STATE	INDICATORS OF DESIRED STATE	INDICATORS OF UNDESIRED STATE	REFLECTION QUESTIONS FOR COACHES	REINFORCING COMMENTS FOR COACHES
CARE					
FOR SELF	Athletes demonstrate self-compassion and apply self- regulatory skills to manage varied conditions and stages of development in life and sport. Skills: Self-compassion, reflection, planning	Athlete usually maintains positive body language and outlook even when things are not going well. Athlete bounces back after making a few mistakes. Athlete seems to consistently show up to practice with enthusiasm, motivation, and energy. While some players go sight-seeing inbetween two games, this athlete decides to take a nap. After a tournament, an athlete seems to priorize recovery and appears to be acting like their usual self.	When things are not going well, the athlete seems to visibly get down on themselves. Athlete's performance seems to derail after making a few mistakes. Athlete appears to lack enthusiam, energy, and/or motivation during a practice. Despite needing time to recharge inbetween two games, this athlete decides to go sight-seeing with some teammates. After a tournament, an athlete seems more irritated, emotional, or stressed than usual.	I've noticed that [insert indicator]. Are you noticing something similar? *Note: Just because you see something doesn't make it true or real.* What are some of the reasons why this might be happening? What can we do to improve in this area?	I've noticed that [insert indicator]. This is great! Keep it up. I noticed you've been making efforts to [insert indicator]. Great work today! I've seen you [insert indicator] and it is having a great impact on your/the team's success/ improvement. Way to go!
FOR OTHERS	Athletes demonstrate care and concern for others in support of the other person's well-being and pursuit of performance objectives. Skills: Leadership, Empathy, Acceptance/ Forgiveness	Athlete attentively listens to their discouraged teammate and validates what they are feeling. Athlete gives their frustrated teammate a pat on the back or shows other types of encouragement. A veteran player on the team takes the time check on how a new player is doing. Athlete appears to take ownership after saying something offensive and apologizes to the person in question. Athlete demonstrates the ability to forgive a teammate for an offense.	Athlete appears to be checking their phone while their teammate expresses something they're struggling with. Athlete tells their frustrated teammate to step it up after making a mistake. Veteran players take little interest in the newer players on the team. Athlete does not seem to take ownership for offensive behaviour or genuinely apologize to the person affected. Athlete appears to hold a grudge over being hurt by a teammate.		
FOR GROUPS	Athletes demonstrate a sense of care and respect for broader groups (i.e., team, club, province, country, and outside groups) and support these groups and/or advocate on their behalf. Skills: Cultural awareness, Respect, Advocacy	Athlete asks questions about another player's traditional clothing to learn more about their culture. Athlete makes jokes that are not at the expense of others. An athlete addresses a teammate for making a homophobic comment and helps them to understand its inappropriate nature. The members of the men's team attend a rally for the women's team to get equal funding. Athlete treats all their teammates and opponents the same, regardless of their differences. Athlete appears to demonstrate a respect for their teammate's story about their religious holiday. The team puts together a drive for local food bank.	Athlete appears to bully another athlete for showing up to a competition in their culture's traditional clothing. Athlete makes a racist joke in the locker room. After an athlete makes a homophobic comment, no one in the locker room addresses it. The men's team is aware that the women's program receives less funding and does nothing. An athlete seems to choose not to set the ball to the one member of the team who speaks a different language. An athlete appears uninterested in their teammate's story about their religious holiday. The team is unaware of or indifferent towards underpriviledged groups in their community.		

ELEMENTS	DESIRED STATE	INDICATORS OF DESIRED STATE	INDICATORS OF UNDESIRED STATE	REFLECTION QUESTIONS FOR COACHES	REINFORCING COMMENTS FOR COACHES
COURAGE					
TO TAKE RISKS AND FAIL	Athletes demonstrate a willingness to fully engage in learning experiences that may involve uncertainty, perceived risks, and failure. Skills: Managing arousal, emotions and stress, reframing	Near the end of a close game, this athlete seems relaxed and maintains their level of play. Athlete seems to welcome the opportunity to serve with the game on the line. During a team discussion, athlete often expresses their point of view. Athlete tries out for a team even though they are unsure if they will make it. Athlete calls out a teammate who makes a racist comment. Athlete chooses to embrace the discomfort of trying a new position.	Near the end of a close game, this athlete seems nervous and their level of play often deteriorates. When the game is on the line, this athlete seems reluctant to serve, or executes an overly conservative serve. During a team discussion, athlete rarely expresses their point of view. Athlete doesn't want to try out for a team because they don't seem to think they can make it, despite having sufficient skills. Athlete chooses not to call out a teammate who makes a racist comment for fear of reprisals. Athlete either refuses to try playing a new position or doesn't make a full effort during the transition.	I've noticed that [insert indicator]. Are you noticing something similar? *Note: Just because you see something doesn't make it true or real.* What are some of the reasons why this might be happening? What can we do to improve in this area?	I've noticed that [insert indicator]. This is great! Keep it up. I noticed you've been making efforts to [insert indicator]. Great work today! I've seen you [insert indicator] and it is having a great impact on your/the team's success/ improvement. Way to go!
TO COMMIT AND PERSEVERE	Athletes demonstrate resilience and optimism in support of maintaining full engagement in situations of adversity and ease. Skills: Ambition/ motivation, optimism, commitment	Athlete sets goals to improve for next year after not making their provincial team. Athlete shows up early to practice a certain element they struggled with in their last competition. After losing the first two sets, the team demonstrates positive body language and full engagement starting the third set. Athlete is often able to find the positives in a game, regardless of the situation. Athlete is often able to focus on the process more than the outcome of the match.	After not making their provincial team, this athlete decides they won't try again, despite having the skills to make the team. After struggling in competition, this athlete misses the next practice. At the start of the third set, after losing the first two sets, the team seems to have stopped trying. Athlete typically focuses on the things that are going wrong in a game. Athlete is heavily focused on and affected by the outcome of a match.		

The ATHLETE Pillar

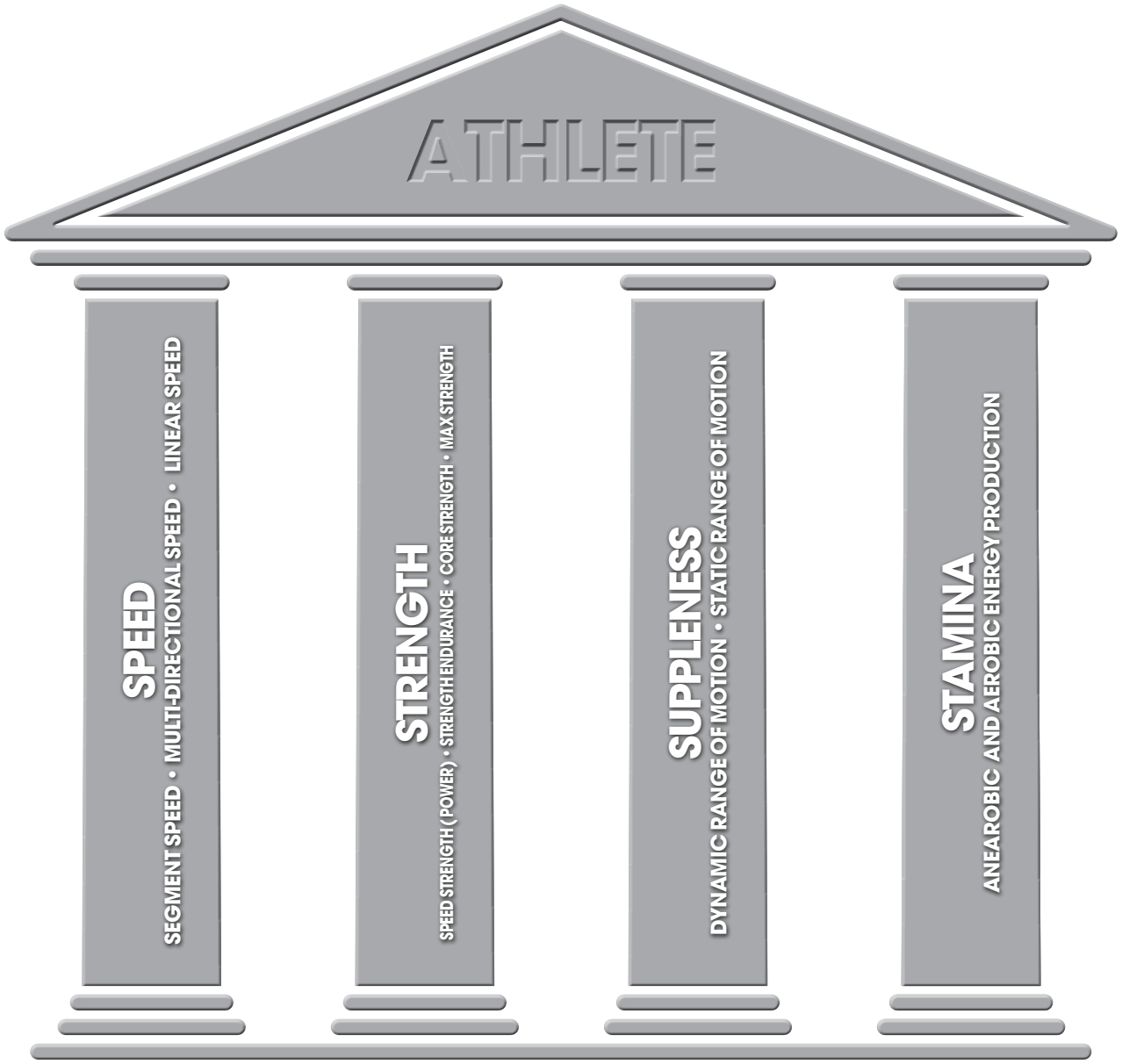
The ATHLETE pillar has 4 main dimensions.

Each dimension has 2-4 specific training objectives.

The dimensions are generally prioritized in order, beginning with speed and strength as the top priorities.

Three additional S's are not listed here as training objectives but are equally important. They are: Sustenance, Sleep and Structural Tolerance.

Sustenance and Sleep are key elements of the recovery process; they also support growth. Improved Structural Tolerance is a musculoskeletal adaptation resulting from a gradual increase in training loads over time. Adequate training loads, progressions, recovery, and variety are key to a sound athletic development, and help to prevent excessive fatigue, overtraining, and burnout.



Speed

- **Exercises are integrated within games and play, such as tag games.** Should be primarily developed through fun-focused activities towards the end of warmup. This is an excellent time to focus on the motor skills and technique of sprinting and changing of direction.

Tag & Chase Games

Strength

- **Relatively minimal emphasis on strength in this stage.** Fun-based movement activities which can include body weight exercises are developed through sports, games, gymnastic style programs and other unstructured play. Participation in multiple sports is critical.

Suppleness

- **This stage is a window of opportunity for developing flexibility.** It is a priority to establish foundational habits of warm-up and cool down in this stage. Use dynamic stretching exercises as part of the warm-up and static stretching exercises during the cool down. Activities should be designed in a fun and gamified manner.

  Some ideas to apply suppleness to practices include:
  - Use music, such as the length of a certain section of a song to hold stretches. A player picks the song and the stretch then stretch together as a team.
  - Combine a stretch with a hard challenge, so the stretch becomes a rest.
  - Combine stretch time with practice wrap-up.
  - Simon Says format.

Stretching Examples

Stamina

- **Integrated into daily training**. Maximum volleyball training three times per week plus participation in other sports or activities three times a week.

Speed

- **Speed can be trained year-round and in every LTD stage.** For the Train to Train stage, speed is best trained within the practice setting, for 5-10 minutes every practice, after warm-up. Athletes must exert maximum effort for no more than 5 seconds, and have a full recovery before starting the next action/movement. Multi-directional and Segment speed can be developed through games that incorporate agility, balance, coordination. Remember to reduce total/overall volume for athletes in the midst of their growth spurts.

Multi-directional activities

Segment speed activities

Strength

- **Important phase for monitoring growth and building a foundation of strength**. The onset of the adolescent growth spurt and the time of Peak Height Velocity (PHV) are key markers and growth should be individually tracked. The number of on-court jumps should be reduced to avoid excessive stress on lower limbs. When athletes are in their fastest growth period, controlled strength and conditioning sessions should be the predominant source of intensity. During PHV, other aspects such as landing mechanics, balance, coordination, or agility activities (as per multi-directional activities under speed) should be emphasized. Towards the end of the growth spurt, a greater emphasis can be placed on weightlifting for strength gains. Athletes must first be taught how to safely execute the recommended lifts using light weights.

  Early stage (11-14 years old): One 30-minute formal weightroom session per week learning the proper techniques and procedures of basic lifts, and two on-court sessions (before the cool down, 10-15 minutes of basic resistance training exercises using the athlete's own body weight).

  Late stage (15-16 years old): 1-2 strength training sessions per week (45 min) outside of practice, and 2 on-court sessions (10-15 minutes at the end of practice).

On-court examples

Weight room lifting examples

Suppleness

- **Participants should have pain free mobility through the joint.** Athletes can independently lead warm-up and cool down activities. Warm-up can include mini-games like 1 v 1, 2 v 2 to encourage the development of 'reading' and gaining additional contacts. Later in this stage (13-16) the addition of a pre-practice mobility routine, and dynamic stretch routine is established for warmup, as well as static stretching, foam roller and ball massage routines for cool down.

Pre-practice mobility routine

Dynamic stretch routine

Cool down and roller

Stamina

- **Integrated into daily training.** Stamina is developed though the weekly volleyball training activities, and any addiitonal unstructured play.

Speed

- **Speed can be trained year-round and in every LTD stage.** For the Learn to Compete stage, speed can be trained within the practice setting, for 5 minutes every practice, after warm-up, as a minimum. In addition, athletes can complete two 30-minute sessions per week as part of their Strength and Conditioning regimen. For on-court speed training, athletes must exert maximum effort for no more than 5 seconds, and have a full recovery before starting the next action/movement. Multi-directional and Segment speed can be achieved through the simulation of game-like actions.

Multi-directional activities

Segment speed activities

Strength

- **Strength and recovery programs are individually tailored to a greater degree.** As athletes complete their growth spurt, greater emphasis is placed on weightlifting for strength gains. A certified Strength and Conditioning Coach provides tailored plans that include all 4 strength training objectives for the athletes. Strength exercises are completed outside of practice 2-4 times/week. Exercises such as Front Squat, Trap Bar Deadlift, Pullups, and Pushups are technically mastered and progressively loaded as the athlete develops. As athletes master the technique, maximal strength can be estimated safely for each of these key exercises from tests performed with submaximal loads. At this stage the athlete could also begin to incorporate loaded jumping and Olympic weightlifting techniques.

Lifting examples

Suppleness

- **Participants should have pain free mobility through the joint.** Warm-up and cool down activities are independently lead by the athletes. Warm-up can include mini-games like 1 v 1, 2 v 2 to encourage the development of 'reading' and gaining additional contacts. It is recommended to include a pre-practice mobility routine and dynamic stretch routine prior to a ball warm up. As part of the cool-down, athletes lead static or PNF stretching, as well as foam roller and ball massage routines. Athletes begin to self-assess muscle tightness and use ball massage or other devices outside of practice or book massage or physio appointments.

Pre-practice mobility routine

Dynamic stretch routine

Cool down and roller

Stamina

- **Stamina is developed though the weekly volleyball training activities.** Athletes include more systematic aerobic training during their off season programs as a way to enhance recovery and improve endurance.

Train to Compete

Athletes generally at provincial, junior national or early national level.

Speed

- **Speed can be trained year-round and in every LTD stage.** Speed can be trained within the practice setting, for 5 minutes every practice, after warm-up, as a minimum. In addition, athletes can complete two 30-minute sessions per week as part of their Strength and Conditioning regimen, based on identified on-court deficiencies. For on-court speed training, athletes must exert maximum effort for no more than 5 seconds, and have a full recovery before starting the next action/movement. Multi-directional and Segment speed can be achieved through the simulation of game-like actions. A combination of many of these training objectives can be achieved through the simulation of game-like actions. Some sample training methods are: Sprint Training, Skipping, Plyometrics, Ultra-short interval training.

Multi-directional activities

Segment speed activities

Strength

- **Strength and recovery programs are individually tailored to a greater degree.** At this stage, athletes should have completed several years of consistent physical training. A certified Strength and Conditioning Coach provides tailored plans that include all 4 strength training objectives for the athletes. Strength training occurs outside of practice 2-4 times/week. Exercises should now begin to align with on-court deficiencies while still continuing to develop all aspects of strength. Athletes should now have mastered lifting techniques and feel confident with all resistance training exercises. Using tests performed with submaximal loads, maximal strength should be estimated at least twice a year; training loads for specific exercises should then be adjusted accordingly. At this stage, where possible, load velocity and jump performance profiling could be conducted.

Lifting examples

Suppleness

- **Participants should have pain free mobility through the joint.** Warm-up and cool down activities are independently lead by the athletes. Warm-up can include mini-games like 1 v 1, 2 v 2 to encourage the development of 'reading' and gaining additional contacts. It is recommended to include a pre-practice mobility routine and dynamic stretch routine prior to a ball warm up. As part of the cool-down, athletes lead dynamic or PNF stretching activities, as well as foam roller and ball massage routines. Athletes regularly self-assess muscle tightness and use ball massage or other devices outside of practice or book massage or physio appointments.

Pre-practice mobility routine

Dynamic stretch routine

Cool down and roller

Stamina

- **Stamina is developed though the weekly volleyball training activities.** Athletes incorporate aerobic training as part of an individualized yearly training program as a way to enhance recovery and improve endurance.

Athletes competitive at the highest level: Olympics, Paralympics, and World Championships

At these stages of development players should have acquired the foundations of each of the 4 Ss and be working directly with Strength and Conditioning staff and Therapy specialists to optimize their individual daily routines. Greater emphasis is placed on creating player independence in assessing and correcting physical weakness and mobility issues. An individualized remedial training program may be required in the case of athletes who have had limited experience with strength and conditioning training earlier in their career.

Programs are lead by national team and professional IST staff with a highly individualized focus.

General

Volleyball coaches, referees, and administrators fall into this phase of LTD. Therefore, the leaders within the sport system ideally maintain a healthy lifestyle to be at their best within these roles, and be role models for younger individuals. Below are some key expectations or recommendations for this stage, taken from the resource manual Active for Life: Durable by Design.

30's

Effort begins to switch from growth to maintenance. Professional athletes often retire around this age, while amateurs may find that injuries, work, and family commitments increasingly take up their time. New parents frequently suffer a decline in physical activity (Rhodes et al., 2013). Therefore, it is critical for adults to prioritize their time to include rest, respite from child rearing, activity and competition outlets, and social connections.

40's and 50's

At this stage muscle strength and endurance begin to insidiously erode, while recovery from minor injuries takes longer and major injuries may permanently limit movement. Engaging in strength training 1-2 times/week can help maintain strength and body composition. This is also an important time to consider transitioning from high to low impact sports.

50's and 60's

When thoughts may turn towards retirement, physical activity can be a means of optimizing well-being and quality of life. For some, activity is a goal unto itself; if, for instance, the individual wants to compete in a sporting event such as a triathlon or marathon. For others, physical activity is a means to an end. For instance, maintaining regular physical activity during the week can help prevent injuries at the ice rink on the weekend. While for others, engaging in exercise classes or group events can be an important component in developing and maintaining social networks.

70's, 80's, 90's and beyond

Regular physical activity is vital in managing physical, cognitive, and emotional well-being. Studying the effects of sedentary behaviour on human physiology is like watching a movie in fast forward; the biologic age appears to advance faster than expected from the chronological age. This area of research over the past decade has led insights into the impact movement, or inactivity, has on humans. Longer and more frequent sitting time is associated with increased abdominal girth, cardiovascular disease, dementia, and all cause mortality. Regular activity on the other hand is associated with increased cardiovascular fitness, lower risk of heart disease, stroke, dementia, diabetes, and osteoporosis. Resistance training has been shown to increase brain activity and lift one's mood.

Sustenance

Adapted from Sport for Life: ADM Resource Dec 2016

	Active Start (0-5)	FUNdamentals (~6-9)	Learn to Train (~9-12)	Train to Train (~13-16)	Learn/Train to Compete (~17-21)	Train to Win (21+)	Active for Life
Nutrition	Good and basic nutrition supplied by parents and care givers.	Adults guide in selecting children's own "activity" snacks. Assist with food preparation at home.	Prepare and pack own snacks to eat at sport activity Help plan meals Understand what is quality food and what are 'fun' foods.	Food intake linked to demands of training and recovery. Develop pre, during, and post-competition nutrition plan. Trial and adjust nutrition plan.	High quality food intake linked to demands of the context of training. Develop nutrition plan for extended periods on the road and hotel living Ensure adequate nutrition when competing outside North America. Pre, during and post-competition food intake well trialed and well tolerated Monitor bio-markers for deficiencies (for example, iron for female athletes).	Active monitoring of bio-markers to ensure high quality nutrition and prevent nutritional deficiencies. Plan meals for peak nutrition at major events and transport own food if necessary.	Ensure adequate food intake for health and sport performance.
Hydration	Ensure adequate hydration for participants. Water or diluted fruit juice. Take precautions in conditions of high temperature and humidity. Note: Some athletes with a disability particularly those with high spinal cord injuries do not have the ability to sweat, and for them, water intake and thermal regulation is critical.			Develop hydration plan for training and competition. Learn to monitor hydration status through urine colour. Monitor temperature and humidity and adjust fluid intake accordingly.	Develop, trial and adjust hydration plan for competition – especially multi-day events. Adjust hydration based on measured temp/humidity, fluid loss and travel. Measure specific gravity of urine. Consider "electrolyte" drinks matched to sport demands.	Develop, trial, record and adjust hydration plan for competition – especially multi-day events. Adjust hydration based on measured temp/humidity, fluid loss and travel. Measure specific gravity of urine. Use specific sport drinks to meet metabolic demands where appropriate.	Ensure adequate hydration for health, safety and sport performance.
Suplements	Actively discourage supplement use unless prescribed for a medical condition by physician.		Emphasize high quality nutrition over food supplements (across all stages).	In collaboration with nutrition expert, determine if there is a need for supplements. If supplements for peak performance are necessary, use only World Anti-Doping Agency (WADA) compliant products.	Consider WADA compliant supplements based on nutritional needs of athletes – to prevent specific deficiencies that have been identified.	Use WADA compliant supplements for peak nutrition.	At the participant's discretion, but should be based on the advise of recognized health professionals.

CONTINUED...

	Active Start (0-5)	FUNdamentals (~6-9)	Learn to Train (~9-12)	Train to Train (~13-16)	Learn/Train to Compete (~17-21)	Train to Win (21+)	Active for Life
Menstruation	Not applicable		Female athlete prepared for the onset of menstruation. Consider iron supplements if appropriate.	For female athletes, screen menstrual history and current status. Athlete monitor their menstruation and concerns are referred to appropriate medical support.	Female athlete monitor menstruation. If there are concerns with menstrual status (e.g. Oligomenorrhea and Amenorrhea), refer athletes to appropriate medical support.		
Bone Health	Ensure adequate, high quality nutrition including calcium intake. In the event of hormonal disruption in females (cessation of menstrual cycle), medical assistance should be sought to ensure bone health.						
Body Composition & Disordered Eating	Focus on healthy eating and matching energy intake with energy expenditure, not focussing on body composition. Treat body composition as an OUTCOME of quality nutrition and training, NOT a target. Understand the role of coaches as potential triggers of disordered eating (undue focus on athlete weight). Raise awareness and learn the signs of disordered eating among athletes and coaches . Develop strategies to identify disordered eating in self and teammates and strategies to seek help. Understand where help can be obtained (see resources below). IOC consensus statement: beyond the Female Athlete Triad – RED-S, http://goo.gl/Ame8FV; and IOC Nutrition for Athletes, http://goo.gl/v9PMgd.						

Sleep

Post-exercise recovery and regeneration (PERR) is as important as the training regimen to the complex adaptive process of increasing athletic performance. A critical component of PERR is sleep. Sleep constitutes the passive recovery, regeneration and rest process.
The table below is taken from SLEEP, RECOVERY, AND HUMAN PERFORMANCE A Comprehensive Strategy for Long-Term Athlete Development by Charles H. Samuels, MD, CCFP, DABSM & Brent N. Alexander, M.Sc. To review the full document click HERE.

LTD Stage Specific Sleep Recommendations	Sleep Recommendations			
	Duration (hrs/night)	**Quality**	**Phase**	**Key Points**
Active Start (Females & Males 0-6 years)	13-16	Establish and maintain a sleep/nap routine Ensure a comfortable/safe sleep environment Avoid stimulation 1-2 hrs before bed; minimize "screen time"	Consolidate nighttime sleep period Decrease naps to 1-2/day in the first year Natural light exposure first thing in the morning	Establish stable sleep routines and a bedtime routine Use a sleep transition object Introduce independent sleep initiating behaviors
Fundamentals (Females 6-8, Males 6-9)	10-11 + 30 min nap between 2-4pm	Maintain a regular sleep/nap routine Ensure a comfortable sleep environment Establish independent sleep initiating behaviors Monitor quality of sleep for sleep disorders	Establish a neutral sleep pattern between 9pm and 8am Encourage predictable afternoon nap/rest Establish reliable meal routines (breakfast is the most important meal of the day)	Reinforce 15-30 min bedtime routine Avoid stimulation 1-2 hours before bed, control "screen time" Good nutrition and meal routines reinforce sleep routines
Learn to Train (Females 8-11, Males 9-12)	9.5-10 + 30 min nap between 2-4pm	Maintain a regular sleep/nap routine Ensure a comfortable sleep environment Monitor quality of sleep for sleep disorders	Maintain neutral sleep pattern Get early morning light exposure for 30 min. daily Maintain reliable nutrition routines (breakfast is critical)	Maintain 15-30 min. bedtime routine Monitor and control "screen time" Monitor caffeine intake
Train to Train (Females 11-15, Males 12-16)	9 + 30 min nap between 2-4pm	Ensure a comfortable sleep environment Initiate regular napping strategy Monitor for excessive sleepiness and fatigue Monitor quality of sleep for sleep disorders	Maintain a regular sleep/nap routine Get early morning light exposure for 30 min. daily Monitor for a delayed sleep phase (difficulty falling asleep and waking up for school) Maintain reliable nutrition routines (breakfast is critical)	Reinforce the importance of sleep routine Monitor for cumulative sleep debt (<9 hours/night or <56 hours/week) Monitor caffeine intake Do not train on an unrested body
Train to Compete (Females 15-21 +/-, Males 16-23 +/-)	8-10 + 30 min nap between 2-4pm	Ensure a comfortable sleep environment when travelling and competing Monitor for competition stress and anxiety, insomnia Monitor for excessive sleepiness and fatigue Monitor quality of sleep for sleep disorders	Maintain regular sleep/nap routine Monitor for a delayed sleep phase (difficulty falling asleep and waking up for school) Get early morning light exposure for 30 min. daily Maintain reliable nutrition routines (breakfast is critical)	Focus on reducing sleep debt. Get 56-70 hours of sleep/week Do not train if unrested and sleep deprived Avoid technology (screen time) before bed If your sleep is poor seek help
Train to Win (Females 18+, Males 19+)	8-10 + 30 min nap between 2-3pm	Ensure a comfortable sleep environment when travelling and competing Monitor for competition stress & anxiety, insomnia Monitor quality of sleep for sleep disorders	Maintain regular sleep/nap routine Monitor for a delayed sleep phase (difficulty falling asleep and waking up for school) Get early morning light exposure for 30 min. daily Maintain reliable nutrition routines (breakfast is critical)	Focus on reducing sleep debt. Get 56-70 hours of sleep/week Do not train if unrested and sleep deprived Avoid technology (screen time) before bed If your sleep is poor get help
Active for Life (Any age participant)	7-9 + 30 min nap between 2-4pm	Maintain a regular sleep/nap routine keep your sleep debt to a minimum Ensure a comfortable sleep environment If quality of sleep is poor seek help.	Maintain a regular sleep schedule Get early morning light exposure for 30 min daily Maintain reliable nutrition routines (breakfast is the most important meal of the day)	Get your sleep! Maintain meal routines and always eat breakfast Learn to nap Do not train if you are fatigued or sleep deprived

Structural Tolerance

Structural tolerance is the ability to withstand a training load without the incidence of injury or excessive fatigue. In order to develop structural tolerance athletes must experience a progressive and carefully planned increase in both the volume (amount/duration) and intensity of training over time. Coupled with inadequate recovery, sudden and dramatic increases in practice, competition, or physical training hours from week to week, month to month or season to season can result in injury, excessive fatigue, overtraining and burnout. The table below represents a model progression of total activity hours over a sample athletes' volleyball career. This model considers the changing ratio of practice to competition hours, as well as physical training hours but does not consider other sports. Note that some athletes may enter a volleyball program without the necessary training background and progressions; these athletes may need a different training load compared to their teammates and coaches should plan accordingly.

The table on the following page provides greater detail on how to build structural tolerance. On page 46, a comprehensive series of sample Periodized Plans is also included for coaches to consider.

LTD Recommendations	13U	14U	15U	16U	17U	18U	21U
Weeks in a Season	22-30 (26)	22-30 (28)	28-34 (32)	28-34 (32)	32-40 (37)	32-40 (40)	38-46 (45)
Volleyball Practice Hours	100	120	140	155	135	150	185
Volleyball Competition Hours	75	85	120	135	200	225	280
Physical Training Hours	0	0	45	75	155	180	180
Total Activity Hours	175	205	305	365	490	555	645

Structural Tolerance

	FUNdamentals (~6-9)	Learn to Train Early (~8-10)	Learn to Train Late (~10-12)	Train to Train Early (~12-14)	Train to Train Late (~14-16)	Learn to Compete (~17-19)	Train to Compete (~19-21)
INJURY PREVENTION	Exposure to Fundamental Movement Skills	Learns appropriate volleyball warm-up and cool down including stretches	Athletes can lead a group through warm-up and cool down	Learn the use of foam roller and ball to increase mobility	Lead a routine with foam roller and ball and proper cool down	Learn functional movement tests and work with trainer to develop mobility and stability exercises	Can self-assess and address mobility and stability issues and uses strength training to prevent overuse injuries*
SEASON LENGTH	8-12 weeks	12-18 weeks	16-24 weeks	22-30 weeks	28-34 weeks	32-40 weeks	40-48 weeks
PRACTICES PER WEEK	1-2 @ 40-60 min	2-3 @ 45-60 min	2-3 @ 60-70 min	A) 2-3 practices/week B) Indoor: 3-4 @ 90 min B) Beach: 3-4 @ 60 min	A) 2-3 practices/week B) Indoor 3-5 @ 90-120 m B) Beach: 3-5 @ 60-90 min	A) 2-3 practices/week B) Indoor: 4-7 @ 120 min B) Beach: 4-7 @ 90 min	A) 2-3 practices/week B) Indoor: 5-8 @ 120-150 B) Beach: 5-8 @ 90 min
				Two options for practice amounts are presented above to demonstrate the workload associated with different pathways. The minimum number of practices per week required to develop skills and progress toward "personal excellence" is 3x/week. A maximum range of training sessions in these stages is listed above. However, more training is not always better. The quality of the practice environment and the athletes' training background are critical factors.			
MATCHES PER WEEK	1 @ 40-60 min (10 min games)	1 @ 60 min (10 min games)	1 @ 60 min	1 @ 60 min (best of 3 sets) OR 1 tournament/month	1.5 @ 60 min (best of 3 sets) OR 1 tournament every 3 weeks	1.5 @ 90 min (best of 5) Beach: 2 tournaments/month or 4-6 matches every other week.	1 @ 90 min (1 match/week or 1 tournament/month) Beach: 2 tournaments/ month or 4-6 matches every other week.
PRACTICE/ COMPETITION RATIO*	Instruction 15% Adult-led Play 35% Free Play 50%	70/30	65/35	60/40	60/40	40/60	40/60
PHYSICAL TRAINING PER WEEK	N/A	N/A	N/A	Integrated into practices. Optionally one 30 min weight room session.	2-4 @ 30-45 min (some sessions may be integrated into practice)	3-4 @ 30-60 min	4 @ 60 min
OTHER SPORTS	4+ Sports/Activities Sport 25% of year Activity 75% of year	2-3 organized sports or unstructured activities	2 organized sports or unstructured activities	1-2 other sports outside of the Indoor and Beach seasons	Indoor and/or Beach and other unstructured activities during the off-season	Indoor and/or Beach	Indoor and/or Beach
MAXIMUM TOTAL ACTIVITY	Athletic participation 4-6 times per week. If a child has a favourite sport, participation up to twice per week in that activity is suggested so long as there is also participation in many other sports to ensure healthy and lifelong participation in sport.	Sport-specific training three times per week plus participation in other sports or activities three times a week.		Maximum 6 sessions/week (e.g. 3-4 practices, 1-2 matches).	Max 7 sessions/week (1 session = 90 min of a practice, match, or work out). For example: 4 practices + 2 physical training + 1 match = 7.	Max 11 sessions/week (1 session = 60-120 min of a practice, a match, or a work out). For example: 6 practices + 3 physical training + 2 matches = 11.	
			All athletes should have 5 hours between practices if doing two practices a day and have 1 full day off per week. Coaches in this stage should monitor the total number of activities the players participate in order to build the players' capacity to withstand training and minimize burnout and injuries. Coaches should also monitor the estimated volume of jumps for each practice. The number of jumps should gradually increase to meet the demands of training and competition events. Sharp increases in jumps from day-to-day or week-to-week greatly increase the risk of chronic or acute injuries. Training load can be recorded and monitored within the practice plan with great specificity or with simple symbols (↓,↑,→).				

**Competition ratio includes competition-specific training found within practice.*

Physical Assessment Protocols

The following links provide detailed instructions for conducting physical assessments. Some assessments can be done individually by the athletes, or by a coach with minimal training, while other assessments must be completed by a trained professional. As a best practice, Volleyball Canada recommends clubs engage professionally certified Strength and Conditioning coaches to support the development of the Athlete Pillar. Assessments can begin in the late Train to Train stage or the Learn to Compete stage.

- INDOOR
- BEACH
- SITTING

PAIN SCALE

As a part of physical testing and the ongoing physical development regimen, coaches must monitor the pain level of their athletes. Volleyball Canada recommends using the pain scale below. If at any time an athlete experiences pain at level 2 for longer than 3 consecutive days, the athlete must be directed to a medical professional.

0. No pain - I have no pain.
1. Minimal - The pain is hardly noticeable.
2. Mild - I have a low level of pain. I am aware of it only when I pay attention to it.
3. Uncomfortable - The pain bothers me, but I can ignore it most of the time.
4. Moderate - I am consistently aware of the pain but I can continue most activities.
5. Distracting - I think about the pain most of the time. I can't do some activities because of pain.
6. Distressing - I think about the pain all of the time. I can't do many activities because of pain.
7. Unmanageable - I'm in pain all the time. It keeps me from doing most activities.
8. Intense - My pain is so severe that it is hard to think of anything else.
9. Severe - My pain is all that I can think about. I can barely talk or move because of the pain.
10. Unable to move - I can't move because of pain. I need immediate help to alleviate this pain.

Volleyball Canada Combine

To support the collection of meaningful data for short- and long-term analysis, Volleyball Canada has developed a series of Physical Testing Combines, offered annually. Athletes looking to sign up for these combines can check out this webpage.

Physical Assessment Normative Data

INDOOR / Men

	Team	Rating	Spike Reach	Block Reach	Pro Agility	Attack Velocity	Spin Velocity	Reactive Strength Index	Counter Move-ment Jump
			cm	cm	sec	kmph	kmph		
SETTERS	SENIOR	Best	372.11	358.10	3.10		109.00		
		Average	345.75	319.67	3.25		94.00		
		Minimum	335.30	312.39	3.45		80.00		
	JUNIOR	Best	354.33	335.28	3.08				
		Average	338.19	314.33	3.23	N/A	TBD		
		Minimum	322.58	300.99	3.44				
	YOUTH	Best	340.36	316.23	3.36		95.00		
		Average	336.55	314.64	3.40		84.00		
		Minimum	332.74	312.42	3.43		72.00		
LEFTSIDES	SENIOR	Best	353.10	322.61	3.06	112.00	114.00		
		Average	346.46	319.52	3.21	108.75	107.29		
		Minimum	340.40	315.00	3.33	107.00	102.00		
	JUNIOR	Best	367.03	331.47	3.00	113.67	118.00		
		Average	351.75	323.01	3.23	105.17	106.64		
		Minimum	341.63	313.69	3.52	94.00	99.30		
	YOUTH	Best	350.52	327.66	3.31	101.00	90.00		
		Average	342.90	320.68	3.49	93.33	86.91		
		Minimum	334.01	312.42	3.69	89.00	80.00		
OPPOSITES	SENIOR	Best	373.40	342.90	3.13	115.00	116.00		
		Average	363.25	331.45	3.36	115.00	88.25		
		Minimum	353.10	319.99	3.55	115.00	10.00		
	JUNIOR	Best	382.27	347.98	3.22	107.00	107.33		
		Average	363.32	333.42	3.27	107.00	107.33		
		Minimum	347.98	323.85	3.36	107.00	107.33		
	YOUTH	Opposites combined with Left Sides at this age.							

	Team	Rating	Spike Reach	Block Reach	Pro Agility	Attack Velocity	Spin Velocity	Reactive Strength Index	Counter Move-ment Jump
			cm	cm	sec	kmph	kmph		
LIBEROS	SENIOR	Best	312.40		3.16				
		Average	312.40		3.27				
		Minimum	312.40		3.38				
	JUNIOR	Best	347.98	326.39	3.16		92.67		
		Average	318.48	293.66	3.23		92.67		
		Minimum	302.26	283.21	3.30		92.67		
	YOUTH	Best	341.63	314.96	3.42	98.00			
		Average	330.62	309.46	3.57	98.00			
		Minimum	322.58	306.07	3.71	98.00			
MIDDLES	SENIOR	Best	365.80	335.31	3.10	98.00	117.00		
		Average	353.30	327.89	3.24	93.83	107.00		
		Minimum	349.30	323.85	3.29	87.00	92.00		
	JUNIOR	Best	372.11	339.09	3.10	102.00	111.30		
		Average	340.38	314.60	3.30	90.73	103.99		
		Minimum	309.88	281.94	3.73	83.00	98.00		
	YOUTH	Best	350.52	328.93	3.33	100.00	92.00		
		Average	343.32	323.22	3.53	92.40	86.00		
		Minimum	332.74	317.50	3.72	85.00	82.00		

Volleyball Canada does not recommend these tests for the early Train to Train stage due to the significant influence the rate of individual maturation may have on results. These tests can be introduced at the late Train to Train stage. During the Train to Train stage, athlete success should be measured through individual progress, not by comparing test results to normative data.

Best: Best result ever recorded. Average: Average score on the test. Minimum: Minimum acceptable level.

Physical Assessment Normative Data

INDOOR / Women

	Team	Rating	Spike Reach	Block Reach	Pro Agility	Attack Velocity	Spin Velocity	Reactive Strength Index	Counter Move-ment Jump
			cm	cm	sec	kmph	kmph		
SETTERS	SENIOR	Best	311.15	285.75	3.29				
		Average	299.59	281.77	4.1				
		Minimum	292	277	5.89				
	JUNIOR	Best	316.23	295.91	3.3	78.3	74		
		Average	306.31	284.46	3.6	76.33	71.54		
		Minimum	288.29	270.51	3.86	74	69		
	YOUTH	Best	290.83	274.32					
		Average	287.02	273.69					
		Minimum	283.21	273.05					
LEFTSIDES	SENIOR	Best	320.04	306.07	3.18		121		
		Average	310.66	292.61	4.69		110.6		
		Minimum	304.8	278	5.63		103		
	JUNIOR	Best	322.58	302.26	3.16	83.7			
		Average	305.99	288.63	3.53	76.13			
		Minimum	292.1	279.4	3.88	69			
	YOUTH	Best	306.07	290.83					
		Average	298.87	283.21					
		Minimum	292.1	279.4					
OPPOSITES	SENIOR	Best	325.12	296.01	3.17				
		Average	324.23	293.4	3.17				
		Minimum	322.58	292.1	3.17				
	JUNIOR	Best	323.85	297.18	3.25	81.7	78.67		
		Average	313.58	291.15	3.61	77.45	73.37		
		Minimum	295.91	279.4	4.03	71.7	63.3		
	YOUTH	Opposites combined with Left Sides at this age.							

	Team	Rating	Spike Reach	Block Reach	Pro Agility	Attack Velocity	Spin Velocity	Reactive Strength Index	Counter Move-ment Jump
			cm	cm	sec	kmph	kmph		
LIBEROS	SENIOR	Best	296	277.01	3.28				
		Average	289.79	272.44	4.22				
		Minimum	284.48	269.24	5.15				
	JUNIOR	Best	295.91	274.32	3.16	82.7	75.7		
		Average	288.08	269.66	3.44	80.9	72.23		
		Minimum	276.86	260.35	3.68	79	68.7		
	YOUTH	Best	283.21	267.97					
		Average	282.58	267.34					
		Minimum	281.94	266.7					
MIDDLES	SENIOR	Best	320.04	306.07	3.31				
		Average	309.17	292.09	5.17				
		Minimum	288	273.99	5.67				
	JUNIOR	Best	335.28	304.8	3.15	86.7	75.3		
		Average	313.28	292.93	3.57	77.01	69.61		
		Minimum	302.26	279.4	3.98	68.7	63		
	YOUTH	Best	328.93	312.42					
		Average	314.54	297.18					
		Minimum	300.99	287.02					

Volleyball Canada does not recommend these tests for the early Train to Train stage due to the significant influence the rate of individual maturation may have on results. These tests can be introduced at the late Train to Train stage. During the Train to Train stage, athlete success should be measured through individual progress, not by comparing test results to normative data.

Best: Best result ever recorded. Average: Average score on the test. Minimum: Minimum acceptable level.

Physical Assessment Normative Data

BEACH

Sex	Position	Program	Availability (%)	Hex Bar 3RM (% BW)	Force Plate CMJ (cm)	Reactive Pro Agility (s)	8m Return (s)	Approach (cm)	RHIET (s)
FEMALE	Blocker	Next Gen	90	133	32	6.50	4.00	290	88
		Senior	90	175	38	6.30	3.90	300	85
	Defender	Next Gen	90	150	35	6.25	3.90	285	84
		Senior	90	200	43	6.15	3.85	285	82
MALE	Blocker	Next Gen	90	175	40	6.00	3.90	325	82
		Senior	90	200	50	5.75	3.60	332	75
	Defender	Next Gen	90	175	45	5.75	3.65	320	78
		Senior	90	200	55	5.55	3.50	325	72

Physical Assessment Normative Data

SITTING

TEAM	RATING	Seated Height	Seated Spike Reach	Seated Block Reach	Wingspan	Seated T-Test (left)	Seated T-Test (right)	Seated 5m Sprint	Seated 3kg Med Ball Throw	Bench Press Predicted 1RM	Back Squat Predicted 1 RM	Barbell-Deadlift Predicted 1RM
		cm	cm	cm	cm	s	s	s	cm	kg	kg	kg
WOMEN	Best	97.00	150.00	148.00	178.00	9.44	9.67	1.90	515	54.11	84.18	
	Average	90.64	138.54	136.29	166.39	12.58	17.10	2.42	429	42.69	61.27	
	Minimum	82.50	125.00	126.00	151.50	19.29	12.60	4.12	325	30.00	49.09	
MEN	Best	106.00	165.00	160.00	203.00	8.03	9.00	1.32	487	134.09		170.45
	Average	96.50	149.00	146.00	185.00	10.79	10.40	1.84	388	85.00		123.18
	Minimum	86.00	142.00	137.00	175.00	13.38	11.80	2.40	332	61.36		84.09

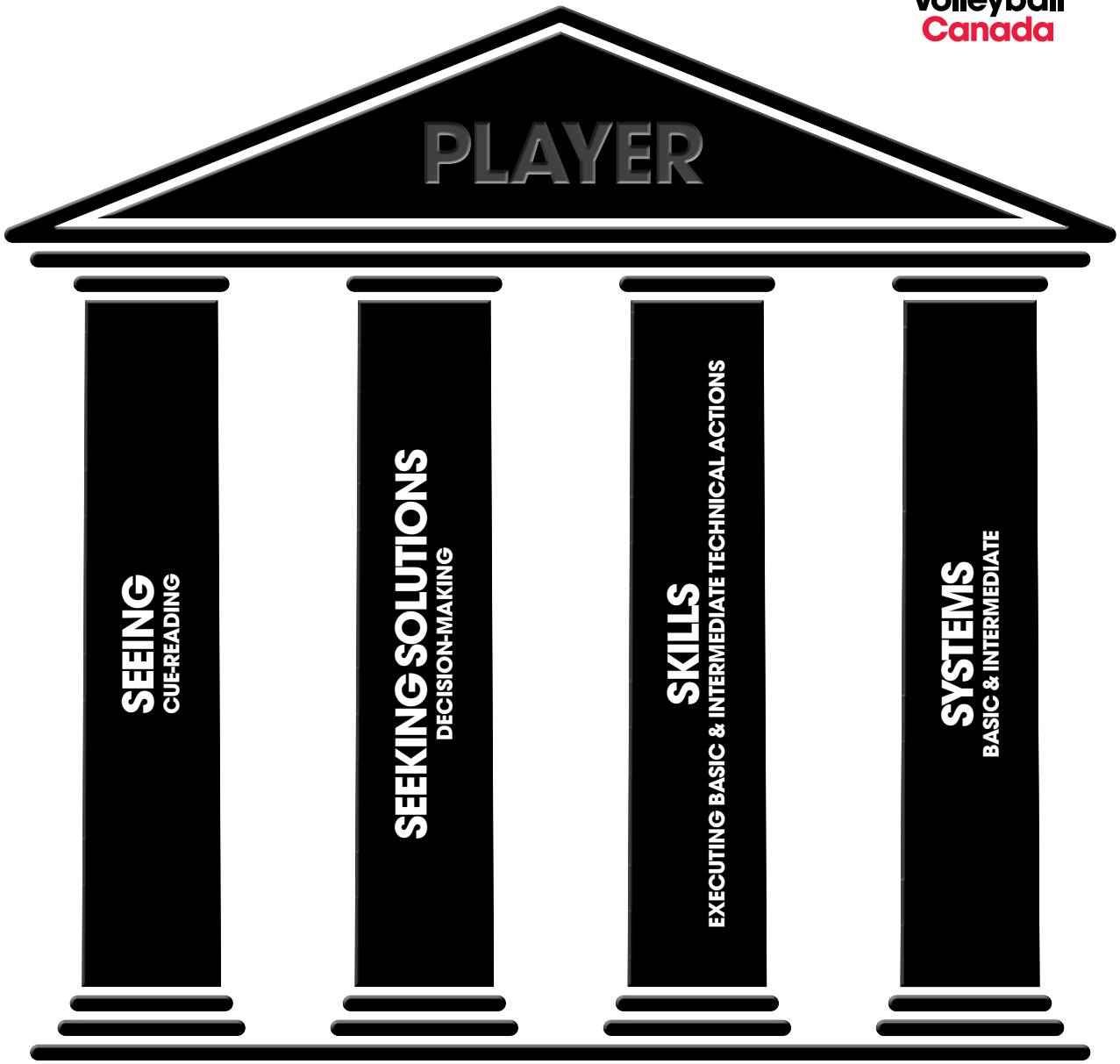
Best: Best result ever recorded. Average: Average score on the test. Minimal : Minimal acceptable level.

The PLAYER Pillar

The Player Pillar has 4 main dimensions that are closely linked to each other. During play, most situations players are involved in can be viewed as a “problem to solve”. To do so, they must first **see** or **read certain cues** that provide meaningful information, then **make timely decisions** about what to do next, and lastly **skillfully execute** the appropriate technical actions. To achieve success, the actions of each player must also be integrated into a **system of play** to ensure individuals connect with each other and perform as a unit.

All this happens very quickly during play… As a result, developing these abilities in a “seamless way” will occupy the majority of time during a practice, with the Athlete and Person pillars being integrated throughout.

Developing the player’s ability to effectively “put together” the cue reading and decision-making components of basic skills, and then to implement them in the context of basic systems, is a priority before introducing intermediate skills and systems. However, athletes need not master all the components associated to a skill before new ones can be introduced.



Initiate / Aquire Basic Skills & Systems

Initiation: The first contact the athlete has with a particular skill.

Acquisition: Athlete can perform a rough form of the skill (they lack rhythm and flow). Form deteriorates further when under pressure or in competition.

Skills

TOSS	As a Serve, Pass or Set
CATCH	A Serve or Pass
ATTACK	Standing Arm Swing
	Jump and Attack
SERVE	Standing Float
	Spin
	Underhand Serve (optional)
PASS	Forearm Pass
	Overhead Pass
SET	Front Set
	Back Set
BLOCK	Blocker Movements
DEFEND	Basic Dig
	Overhead Dig

Note that each skill above has a set of associated cues and decisions that requires training, which is taught in NCCP workshops.

Systems*

POSITIONING AND HANDLING THE BALL	Players play 1 v 1. They can control the oncoming ball and maintain a rally using catch-throw-hit over the net. Players are at the net for offence and away from the net for defence.
MOVING AND COOPERATING	Players play 2 v 2. They can maintain a rally with their partner. Players can catch/toss to the net, throw along the net, hit over the net. Players can toss the ball with an arc to their target. Setters release early to the net to prepare for the set.
BUILDING AN ATTACK	Players play 3 v 3. They can maintain a rally using 3 contacts, including one catch-throw, one set, and a hit over the net. Players can move to make an effective toss followed by an attack. Players can set the ball with an appropriate trajectory and height (tempo). On serve reception or defence, the closest free player to the passing target becomes the setter (typically the player on the right). Players can attack from a variety of positions and reset themselves for defence. Introduce quick attacks.
PASSING AND DEFENDING	Players play 3 v 3. They can maintain a rally using 3 contacts, including a forearm pass, up to one catch/throw, and a hit over the net. Blocking movements (max 1 blocker) and defensive cue-reading are introduced. Players can adjust their defensive position for a variety of attacks.
DEVELOPING A STRUCTURED & ORGANIZED GAME	Players play 3 v 3 or 4 v 4. They can maintain a rally with their team using 3 consecutive contacts using volleyball skills with no bounces. Introduce serving rotations. Players can read and move for free balls consistently. Begin to designate a setter on serve reception. Offensive plays target weaknesses or gaps in the opponent.

Players progress to more complex playing formats as they reach a 70% success rate.

Period of the adolescent growth spurt
Around 11-15 for females and 12-16 for males

Consolidate BASIC Skills & Systems
Acquire INTERMEDIATE Skills & Systems at the end of the stage

Basic and Intermediate Skills

Intermediate Skills are **Bolded*

SERVE	Float
	Jump Float (Indoor only)
	Jump Float - Step (Indoor only)
	Jump Spin - Power (Indoor only)
	Jump Spin - Control (Indoor only)
PASS	Forearm Pass
	Overhead Pass
VOLLEY	Free Ball Pass
	Non-setter 2nd ball set
SET & ATTACK	14 (High Ball)
	73 (Back Set)
	51 (Quick Attack)
	Backcourt sets (A, B, C)
	Combinations (X's and Tandems)
	41, 61, 31
	Step Around (61 & 71)
	Fast Outside sets (12) & (72)
	Fast B (pipe), and Fast C
ATTACK	Line, Cross-court
	Tip, Roll
	Tool off blocker's hands
	Rebound Spike for Continuation
BLOCK	Middle movements
	Outside blocker movements
	2 person blocking movements & defensive movements within a Bunch Read & Spread System
	3 person blocking movements & defensive movements within a Spread System
	3 person blocking movements & defensive movements within a Bunch Read System
	Blocking the serve (Sitting only)
DEFEND	Basic Dig
	Ball Pursuit and Retrieval
	Overhead Dig
	Dive, Roll, Pancake

Note that each skill above has a set of associated cues and decisions that requires training, which is taught in NCCP workshops.

Acquisition: Athlete can perform a rough form of the skill (they lack rhythm and flow). Form deteriorates further when under pressure or in competition.

Consolidation: Athlete can perform the skill with correct form. Control and rhythm are good in easy/stable conditions. Some elements of performance can be maintained under pressure or in competitions but performance is inconsistent.

**Systems are taught in the DEV Coach Workshop*

SYSTEMS	BASIC	INTERMEDIATE
Offensive Systems	6-6	4-2, 6-3, 6-2, 5-1
Serve Reception	"W" Formation	W,4-person, 3-person
Defensive Systems	Spread Block System	
Blockers	1-blocker	1 and 2-blocker
Defenders	6-up	6-back
Coverage	2-3	2-3 or 3-2
Transition	All movements from one cycle of action to another	

Consolidate BASIC Skills & Systems
Acquire INTERMEDIATE Skills & Systems at the end of the stage

Basic and Intermediate Skills

Intermediate Skills are **Bolded*

SERVE	Float
	Jump Float
	Jump Spin - Power
	Jump Spin - Control
PASS	Forearm Pass
VOLLEY	Free Ball Pass
SETTING	Release from reception and footwork
	Setting from a pass 4-5 m off the net
	Calling the shot
	Forearm set after hard dig (spin)
	Cover after call
	Emergency setting with forearms
	Diving sets

ATTACK	Live (over)
	Cross-court
	Transition attack (after dig, get into position while wiping sand off hands)
	Knuckle/Pokey (line short only)
	Joust
	Deception line or cross shot
	Cutty - high contact point
BLOCK	Blocking Line, Cross, Ball
	Peeling Line
	Digging Short roll behind blocker
	Peeling Cross
	Joust, Knuckle or spike sets on top of the net
	Set a blocked ball

Acquisition: Athlete can perform a rough form of the skill (they lack rhythm and flow). Form deteriorates further when under pressure or in competition.

Consolidation: Athlete can perform the skill with correct form. Control and rhythm are good in easy/stable conditions. Some elements of performance can be maintained under pressure or in competitions but performance is inconsistent.

DEFEND	Hard driven
	Double axe handle dig
	Direct set after block touch
	High knuckle dig (from a peel)
	Diving or stride sliding for a ball
	Digging backwards when charging the net

Note that each skill above has a set of associated cues and decisions that requires training, which is taught in NCCP workshops.

Boys: approx. 17 to 19 years
Girls: approx. 16 to 18 years

Refine BASIC Skills & Systems
Consolidate INTERMEDIATE Skills & Systems

Basic and Intermediate Skills

Intermediate Skills are **Bolded*

SERVE	Float
	Jump Float (Indoor only)
	Jump Float - Step (Indoor only)
	Jump Spin - Power (Indoor only)
	Jump Spin - Control (Indoor only)
PASS	Forearm Pass
	Overhead Pass
VOLLEY	Free Ball Pass
	Non-setter 2nd ball set
SET & ATTACK	14 (High Ball)
	73 (Back Set)
	51 (Quick Attack)
	Backcourt sets (A, B, C)
	Combinations (X's and Tandems)
	41, 61, 31
	Step Around (61 & 71)
	Fast Outside sets (12) & (72)
	Fast B (pipe), and Fast C

ATTACK	Line, Cross-court
	Tip, Roll
	Tool off blocker's hands
	Rebound Spike for Continuation
BLOCK	Middle movements
	Outside blocker movements
	2 person blocking movements & defensive movements within a Bunch Read & Spread System
	3 person blocking movements & defensive movements within a Spread System
	3 person blocking movements & defensive movements within a Bunch Read System
	Blocking the serve (Sitting only)
DEFEND	Basic Dig
	Ball Pursuit and Retrieval
	Overhead Dig
	Dive, Roll, Pancake

Note that each skill above has a set of associated cues and decisions that requires training, which is taught in NCCP workshops.

Consolidation: Athlete can perform the skill with correct form. Control and rhythm are good in easy/stable conditions. Some elements of performance can be maintained under pressure or in competitions but performance is inconsistent.

Refinement: Athlete can perform the skill with ideal form, speed, precision and control. The performance is very consistent, even under very demanding conditions. Only minor fine-tuning may be necessary. All components of the movement have been automated, which allows the athlete to make rapid adjustments during play.

**Systems are taught in the AVD DEV Coach Workshop*

SYSTEMS	INTERMEDIATE
Offensive Systems	4-2, 6-3, 6-2, 5-1
Serve Reception	W,4-person, 3-person
Defensive Systems	Bunch-Read System
Blockers	1 and 2-blocker
Defenders	6-back
Coverage	2-3 or 3-2
Transition	All movements from one cycle of action to another

Boys: approx. 17 to 19 years
Girls: approx. 16 to 18 years

Refine BASIC Skills & Systems
Consolidate INTERMEDIATE Skills & Systems

Basic and Intermediate Skills

Intermediate Skills are **Bolded*

SERVE	Float
	Jump Float
	Jump Float - Step
	Jump Spin - Power
	Jump Spin - Control
PASS	Forearm Pass
VOLLEY	Free Ball Pass
SETTING	Release from reception and footwork
	Setting from a pass 4-5 m off the net
	Calling the shot
	Forearm set after hard dig (spin)
	Cover after call
	Emergency setting with forearms
	Diving sets

ATTACK	Live (over)
	Cross-court
	Transition attack (after dig, get into position while wiping sand off hands)
	Knuckle/Pokey (line short only)
	Joust
	Deception line or cross shot
	Cutty - high contact point
BLOCK	Blocking Line, Cross, Ball
	Peeling Line
	Digging Short roll behind blocker
	Peeling Cross
	Joust, Knuckle or spike sets on top of the net
	Set a blocked ball

Consolidation: Athlete can perform the skill with correct form. Control and rhythm are good in easy/stable conditions. Some elements of performance can be maintained under pressure or in competitions but performance is inconsistent.

Refinement: Athlete can perform the skill with ideal form, speed, precision and control. The performance is very consistent, even under very demanding conditions. Only minor fine-tuning may be necessary. All components of the movement have been automated, which allows the athlete to make rapid adjustments during play.

DEFEND	Hard driven
	Double axe handle dig
	Direct set after block touch
	High knuckle dig (from a peel)
	Diving or stride sliding for a ball
	Digging backwards when charging the net

Note that each skill above has a set of associated cues and decisions that requires training, which is taught in NCCP workshops.

Athletes generally at provincial, junior national or early national level.

Refine INTERMEDIATE Skills & Systems

Basic and Intermediate Skills

Intermediate Skills are **Bolded*

SERVE	Float
	Jump Float
	Jump Float - Step
	Jump Spin - Power (Indoor only)
	Jump Spin - Control (Indoor only)
PASS	Forearm Pass
	Overhead Pass
VOLLEY	Free Ball Pass
	Non-setter 2nd ball set
SET & ATTACK	14 (High Ball)
	73 (Back Set)
	51 (Quick Attack)
	Backcourt sets (A, B, C)
	Combinations (X's and Tandems)
	41, 61, 31
	Step Around (61 & 71)
	Fast Outside sets (12) & (72)
	Fast B (pipe), and Fast C

ATTACK	Line, Cross-court
	Tip, Roll
	Tool off blocker's hands
	Rebound Spike for Continuation
BLOCK	Middle movements
	Outside blocker movements
	2 person blocking movements & defensive movements within a Bunch Read & Spread System
	3 person blocking movements & defensive movements within a Spread System
	3 person blocking movements & defensive movements within a Bunch Read System
	Blocking the serve (Sitting only)
DEFEND	Basic Dig
	Ball Pursuit and Retrieval
	Overhead Dig
	Dive, Roll, Pancake

Note that each skill above has a set of associated cues and decisions that requires training, which is taught in NCCP workshops.

Consolidation: Athlete can perform the skill with correct form. Control and rhythm are good in easy/stable conditions. Some elements of performance can be maintained under pressure or in competitions but performance is inconsistent.

Refinement: Athlete can perform the skill with ideal form, speed, precision and control. The performance is very consistent, even under very demanding conditions. Only minor fine-tuning may be necessary. All components of the movement have been automated, which allows the athlete to make rapid adjustments during play.

**Systems are taught in the ADV DEV Coach Workshop*

SYSTEMS	INTERMEDIATE
Offensive Systems	6-2, 5-1
Serve Reception	4-person, 3-person, 2-person
Defensive Systems	Bunch-Read System
Blockers	2 and 3-blocker
Defenders	6-back
Coverage	2-3 or 3-2
Transition	All movements from one cycle of action to another

Athletes generally at provincial, junior national or early national level.

Refine INTERMEDIATE Skills & Systems

Basic and Intermediate Skills

Intermediate Skills are **Bolded*

SERVE	Standing Float
	Jump Float
	Jump Spin - Power
	Jump Spin - Control
PASS	Forearm Pass
VOLLEY	Free Ball Pass
SETTING	Release from reception and footwork
	Setting from a pass 4-5 m off the net
	Calling the shot
	Forearm set after hard dig (spin)
	Cover after call
	Emergency setting with forearms
	Diving sets

ATTACK	Live (over)
	Cross-court
	Transition attack (after dig, get into position while wiping sand off hands)
	Knuckle/Pokey (line short only)
	Joust
	Deception line or cross shot
	Cutty - high contact point
BLOCK	Blocking Line, Cross, Ball
	Peeling Line
	Digging Short roll behind blocker
	Peeling Cross
	Joust, Knuckle or spike sets on top of the net
	Set a blocked ball

Consolidation: Athlete can perform the skill with correct form. Control and rhythm are good in easy/stable conditions. Some elements of performance can be maintained under pressure or in competitions but performance is inconsistent.

Refinement: Athlete can perform the skill with ideal form, speed, precision and control. The performance is very consistent, even under very demanding conditions. Only minor fine-tuning may be necessary. All components of the movement have been automated, which allows the athlete to make rapid adjustments during play.

DEFEND	Hard driven
	Double axe handle dig
	Direct set after block touch
	High knuckle dig (from a peel)
	Diving or stride sliding for a ball
	Digging backwards when charging the net

Note that each skill above has a set of associated cues and decisions that requires training, which is taught in NCCP workshops.

At these stages of development many players have refined all the basic and intermediate skills and are now developing creative variations of these skills. However, it is also common for some athletes to require some retroactive training to fill skill gaps not acquired in previous stages. In addition, a small amount of skill maintenance activities may have to be included on an as-needed basis during the season - or even planned more prominently - when athletes deviate from sound mechanics.

Programs are lead by national team and professional coaches with a highly individualized focus on technical and tactical applications for specific competitions within the quadrennial plan.

Skills Assessment - Protocols

A process for improvement

Assessing skills can help the coach monitor progress over the course of a season. Utilizing a standard set of skill assessments can also help clubs, Provincial/Territorial Volleyball Associations and Volleyball Canada determine if the current key components of coach education, competition schedules, school/club infrastructure, etc., are helping to collectively improve Canadian volleyball within the high-performance context.

However, assessing skills can be a challenging task in volleyball since skill execution varies dramatically based on the strengths and weaknesses of the opponent. Furthermore, individual skills within one's own team can be drastically impacted by the skill level of positional players, such as the setter's impact on hitting efficiency.

Within Volleyball Canada's high performance programs, skill assessments are conducted against the top individuals and teams in the world. The tables on the following pages list some statistical benchmarks for Youth, Junior and Senior National Teams when playing against top 6 international teams, and are part of Volleyball Canada's Gold Medal Profile. These statistical benchmarks support the development of a gap analysis, which in turn, refines our focus in adapting our coach education and high-performance pathway programs.

As an example, in 2021, the women's indoor national program identified a significant gap in the skill of passing, and a secondary/corresponding gap in serving. As a means to alleviate this gap across the Canadian volleyball landscape, clubs and schools can make a few key changes to their practices as described HERE.

Measuring skill proficiency for LTD stages younger than the Learn to Compete stage is also a challenging task given the difficulty of comparing teams and individuals within clubs across such a vast country as Canada. However, one annual event, the Canada Cup, offers a good opportunity to evaluate skill proficiency when Canada's Provincial Teams compete against one another. At this event, Volleyball Canada collects the same statistical items as those collected internationally. Provincial Team programs can use this data to develop their own gap analysis and compare this data year over year to measure internal program improvement.

For club/school coaches in the Train to Train and Learn to Compete stages who are interested in measuring the skill development of their players over the course of a season, Volleyball Canada has developed a set of standardized skill tests for the 14U, 16U, and 18U categories. The drills listed within these tests are designed to be as game-like as possible, but also contain some limitations. Nonetheless, these tests are a great way to monitor and celebrate individual skill development. Also, coaches in these stages must always keep in mind that the single most important measure of success is that athletes enjoy their volleyball experience and want to continue to play the following season.

Skills Assessment - Normative Data

Indoor / Men

Best: Best result ever recorded. Average: Average score on the test. Minimum: Minimum acceptable level.

PLAYERS		FLOAT SERVES			SPIN SERVES			RECEPTION			
Team	Rating	ACES %	ERRORS %	Point Score %	%ACES	%ERRORS	Point Score %	EXCELLENT %	ERROR %	Pass Efficiency %	Pass Score 3-Scale (0/3)
SENIOR	Best	10%	2%	38%	13%	19%	33%	69%	2%	49%	2.55
	Average	6.50%	3.50%	34.00%	8.50%	23.00%	31.00%	59.50%	5.50%	44.50%	2.44
	Minimum	3%	5%	30%	4%	27%	29%	50%	9%	40%	2.32
JUNIOR	Best	14%	9%	35%	25%	20%	55%	65%	5%	41%	2.43
	Average	9.50%	12.00%	30.50%	20.00%	25.00%	38.50%	55.00%	10.00%	38.00%	2.34
	Minimum	5%	15%	26%	15%	30%	22%	45%	15%	35%	2.24
YOUTH	Best	21%	7%	44%	25%	60%	54%	45%	12%	34%	2.29
	Average	14.00%	14.00%	36.50%	20.00%	40.50%	40.50%	40.00%	18.50%	30.00%	2.19
	Minimum	7%	21%	29%	15%	21%	27%	35%	25%	26%	2.09

PLAYERS		SPIKES - OPPOSITES			SPIKES - OUTSIDES			SPIKES - MIDDLES		
Team	Rating	KILL %	ERROR %	EFFICIENCY %	KILL %	ERROR %	EFFICIENCY %	KILL %	ERROR %	EFFICIENCY %
SENIOR	Best	50%	6%	30%	55%	6%	37%	60%	3%	53%
	Average	47.50%	8.00%	29.00%	51.00%	7.50%	33.00%	59.00%	4.50%	51.00%
	Minimum	45%	10%	28%	47%	9%	29%	58%	6%	49%
JUNIOR	Best	55%	9%	45%	64%	9%	46%	78%	6%	75%
	Average	48.50%	13.00%	33.50%	50.50%	13.00%	31.50%	68.50%	9.50%	72.50%
	Minimum	42%	17%	22%	37%	17%	17%	59%	13%	70%
YOUTH	Best	39%	12%	25%	56%	5%	44%	54%	9%	48%
	Average	35.00%	16.50%	22.00%	51.50%	9.00%	34.50%	49.50%	10.50%	43.50%
	Minimum	31%	21%	19%	47%	13%	25%	45%	12%	39%

PLAYERS		BLOCKS					DIGS		
Team	Rating	Blocks/Set TEAM	Blocks/Set MIDDLES	Blocks/Set LEFT SIDE	Blocks/Set RIGHT SIDE	Blocks/Set SETTERS	"digs/Set TEAM"	"digs/Set LIBERO"	"digs/Set OTHERS"
SENIOR	Best	3.04	1.11	0.58	0.42	0.64	3.8	1.14	0.96
	Average	2.55	0.84	0.53	0.4	0.46	3.43	1.1	0.9
	Minimum	2.05	0.57	0.48	0.38	0.28	3.05	1.05	0.83
JUNIOR	Best	2.98	1.48	0.76	0.86	0.47	3.19	1.3	1.05
	Average	2.78	1.23	0.65	0.82	0.35	3.09	1.2	1.01
	Minimum	2.57	0.98	0.54	0.78	0.23	2.99	1.1	0.97
YOUTH	Best	2.7	1.06	0.42	0.8	0.51	8.05	2.32	2.07
	Average	2.45	0.86	0.37	0.72	0.41	7.7	2.11	1.83
	Minimum	2.19	0.65	0.31	0.64	0.31	7.35	1.9	1.59

Skills Assessment

Indoor / Women

Best: Best result ever recorded. Average: Average score on the test. Minimum: Minimum acceptable level.

PLAYERS		FLOAT SERVES			SPIN SERVES			RECEPTION			
Team	Rating	ACES %	ERRORS %	Point Score %	%ACES	%ERRORS	Point Score %	EXCELLENT %	ERROR %	Pass Efficiency %	Pass Score 3-Scale (0/3)
SENIOR	Best	11%	4%	39%	8%	14%	29%	40%	7%	55%	2.37
	Average	8.00%	8.00%	33.00%	5.00%	21.00%	25.50%	34.50%	10.00%	42.50%	2.24
	Minimum	5%	12%	27%	2%	28%	22%	29%	13%	30%	2.1
NEXTGEN	Best	15%	5%	35%	5%	17%	27%	37%	9%	52%	2.29
	Average	11.00%	11.00%	29.00%	3.50%	20.50%	24.00%	32.00%	12.50%	41.00%	2.17
	Minimum	7%	17%	23%	2%	24%	21%	27%	16%	30%	2.05
YOUTH	Best	19%	9%	28%	5%	18%	25%	35%	9%	49%	2.21
	Average	14.00%	16.00%	24.50%	3.00%	23.00%	22.00%	28.50%	14.00%	38.50%	2.11
	Minimum	9%	23%	21%	1%	28%	19%	22%	19%	28%	2.01

PLAYERS		SPIKES - OPPOSITES			SPIKES - OUTSIDES			SPIKES - MIDDLES		
Team	Rating	KILL %	ERROR %	EFFICIENCY %	KILL %	ERROR %	EFFICIENCY %	KILL %	ERROR %	EFFICIENCY %
SENIOR	Best	43%	5%	27%	48%	6%	37%	56%	3%	72%
	Average	41.00%	7.00%	25.00%	44.50%	9.00%	32.50%	52.00%	4.50%	68.50%
	Minimum	39%	9%	23%	41%	12%	28%	48%	6%	65%
NEXTGEN	Best	39%	8%	25%	47%	7%	33%	49%	5%	62%
	Average	35.00%	11.50%	23.00%	43.00%	10.50%	31.00%	45.50%	7.00%	60.50%
	Minimum	31%	15%	21%	39%	14%	29%	42%	9%	59%
YOUTH	Best	29%	9%	23%	37%	9%	31%	41%	6%	59%
	Average	25.50%	13.50%	20.00%	35.00%	13.50%	28.00%	35.00%	8.50%	55.00%
	Minimum	22%	18%	17%	33%	18%	25%	29%	11%	51%

PLAYERS		BLOCKS					DIGS		
Team	Rating	Blocks/Set TEAM	Blocks/Set MIDDLES	Blocks/Set LEFT SIDE	Blocks/Set RIGHT SIDE	Blocks/Set SETTERS	"digs/Set TEAM"	"digs/Set LIBERO"	"digs/Set OTHERS"
SENIOR	Best	2.48	1.08	0.59	0.42	0.29	8.12	2.08	1.39
	Average	1.95	0.99	0.49	0.33	0.24	7.51	1.77	1.27
	Minimum	1.41	0.89	0.39	0.23	0.18	6.9	1.45	1.15
NEXTGEN	Best	2.23	0.9	0.54	0.31	0.25	9.8	3.05	1.89
	Average	2.22	0.85	0.46	0.28	0.22	8.43	2.97	1.75
	Minimum	2.2	0.8	0.38	0.25	0.18	7.05	2.89	1.61
YOUTH	Best	2.19	0.85	0.4	0.26	0.2	10.03	2.95	2.43
	Average	1.99	0.75	0.28	0.2	0.18	9.88	2.58	2.27
	Minimum	1.79	0.65	0.15	0.13	0.15	9.72	2.2	2.11

Skills Assessment

Beach / Men

Best: Best result ever recorded. Average: Average score on the test. Minimum: Minimum acceptable level.

PLAYERS		ATTACKING - BLOCKERS			ATTACKING - DEFENDERS			ATTACKING - SPLIT		
Team	Rating	KILL %	ERROR %	EFFICIENCY %	KILL %	ERROR %	EFFICIENCY %	KILL %	ERROR %	EFFICIENCY %
SENIOR	Best	63.1	8.6	494	64.1	9.1	446	55.2	8.3	399
	Average	56.9	11.8	437	55.4	12.8	387	52.5	9.3	366
	Minimum	50.7	14.1	315	46.7	16.1	296	51.9	11.4	312
NEXTGEN	Best	68.7	6.8	540	61.54	9	502	57.66	8.2	455
	Average	63.2	9.3	464	57	11.4	443	54.5	12.1	422
	Minimum	56.7	14.9	377	47.3	16.9	342	50.6	14.8	358
YOUTH	Best	71.6	5.2	563	57.1	6.7	473	65.6	8.1	511
	Average	68.4	6.8	446	53.2	9.8	414	54.6	14.9	438
	Minimum	59.3	13.6	354	44.6	15.3	303	48.3	16.6	340

PLAYERS		FLOAT SERVES			SPIN SERVES			RECEPTION	
Team	Rating	ACE %	ERROR %	Point Score %	ACE %	ERROR %	POINT SCORE %	GOOD PASS %	ERROR %
SENIOR	Best	7.6	6.8	37.1	11.5	16.9	37	74.6	3.4
	Average	6.9	10.7	34.9	7.6	19	32	67.8	5.9
	Minimum	2.6	12.8	31.3	4.5	21	28	60.2	11.9
NEXTGEN	Best	12.9	7.1	41.3	15.4	9.2	42.2	81.3	4.8
	Average	9.6	11.3	37.6	8.2	12.3	35.1	70.4	8.2
	Minimum	3.8	12.4	29.9	4.3	18.3	28.9	59.5	13.7
YOUTH	Best	11.1	4.3	50.2	16.6	12.8	53.4	86.8	5.6
	Average	8.7	7.2	44.3	11.4	17.3	48.1	73.8	10.7
	Minimum	2.4	12.6	33.1	8.6	21.4	32.4	59.7	16.3

PLAYERS		BLOCKS		DIGS		
Team	Rating	Blocks/Set	Blocks/Set Split	DIG/Set Blocker	Dig/Set Defender	DIG/Set Split
SENIOR	Best	2.73	1.16	1.86	5.89	3.9
	Average	1.64	0.97	1.15	3.93	3.12
	Minimum	1.20	0.76	0.43	2.95	1.61
NEXTGEN	Best	3.03	1.29	2.06	4.91	3.04
	Average	1.82	1.08	1.28	3.33	2.26
	Minimum	1.33	0.84	0.48	1.97	1.46
YOUTH	Best	2.08	1.03	2.78	6.93	4.76
	Average	1.42	0.86	2.00	5.35	3.98
	Minimum	0.76	0.68	1.20	3.99	3.18

Skills Assessment

Beach / Women

Best: Best result ever recorded. Average: Average score on the test. Minimum : Minimum acceptable level.

PLAYERS		ATTACKING - BLOCKERS			ATTACKING - DEFENDERS			ATTACKING - SPLIT		
Team	Rating	KILL %	ERROR %	EFFICIENCY %	KILL %	ERROR %	EFFICIENCY %	KILL %	ERROR %	EFFICIENCY %
SENIOR	Best	60.7	5.4	494	57.4	7	479	55.6	8.1	407
	Average	54.6	8.8	404	53.4	9.7	384	52.4	9.2	379
	Minimum	50.4	10.4	324	47.6	12.7	302	46.5	11.1	297
NEXTGEN	Best	65	6.8	540	61.54	9	502	59.74	10.1	430
	Average	59.8	9.3	464	54	11	443	53	12.1	397
	Minimum	54.4	14.7	377	47.6	16.9	342	46.5	15.3	334
YOUTH	Best	62.3	5.2	458	56.88	9.1	325	58.68	8	397
	Average	58	6.8	396	46.6	12	287	47.6	9.3	374
	Minimum	51.4	16	302	39.5	16.5	243	40.6	18.1	254

PLAYERS		FLOAT SERVES			SPIN SERVES			RECEPTION	
Team	Rating	ACE %	ERROR %	Point Score %	ACE %	ERROR %	POINT SCORE %	GOOD PASS %	ERROR %
SENIOR	Best	11.5	2.1	42.6	11.7	7.6	39.5	78.2	4.2
	Average	7.1	6.5	37.8	8.6	11.9	34.8	65.3	8.8
	Minimum	2.8	8.3	34.9	4.3	16.1	32.1	56.9	12.2
NEXTGEN	Best	14.9	4.3	45.7	15.1	12.9	43.8	83.3	4.9
	Average	7.4	7.6	40.8	8.9	16.1	39	75.2	9.9
	Minimum	2.1	11.9	37.7	3.6	20.5	36.1	64.5	13.6
YOUTH	Best	17.7	5.6	43.9	18.6	7.8	44.7	88.4	5.6
	Average	11.6	7.6	38.3	13.4	17.1	39.6	79.4	11
	Minimum	2.4	12.6	31.2	3.6	21.9	32.4	68.2	15

PLAYERS		BLOCKS		DIGS		
Team	Rating	Blocks/Set	Blocks/Set Split	DIG/Set Blocker	Dig/Set Defender	DIG/Set Split
SENIOR	Best	1.51	1.36	2.44	6.71	5.4
	Average	1.2	0.98	1.91	5.08	4.72
	Minimum	0.95	0.7	1.21	4.49	3.71
NEXTGEN	Best	1.78	1.63	2.79	6.44	6.7
	Average	1.47	1.25	2.26	5.76	5.5
	Minimum	1.22	0.97	1.56	5.17	3.91
YOUTH	Best	0.87	0.62	4.14	7.39	7.74
	Average	0.77	0.52	3.61	5.76	6.11
	Minimum	0.55	0.3	2.91	5.07	5.42

Skills Assessment

Sitting

Average: Average score on the test.

PLAYERS		SPIKES - POS 4					SPIKES - POS 2					SPIKES - MIDDLES					SPIKES - BACK ROW				
Team	Rating	Total	Kill%	Blo%	Err%	Eff%	Total	Kill %	Blo%	Err%	Eff%	Total	Kill%	Blo%	Err%	Eff%	Total	Kill%	Blo%	Err%	Eff%
WOMEN	Average	655	35%	8%	372	16%	372	39%	9%	10%	20%	619	40%	8%	8%	24%	208	29%	8%	21%	-
MEN	Average																				

PLAYERS		FLOAT RECEPTION							SPIN RECEPTION						
Team	Rating	Total	Exc%	Pos%	Err%	Eff%	eSO%	3pt	Total	Exc%	Pos%	Err%	Eff%	eSO%	3pt
WOMEN	Average	1008	19%	36%	14%	22%	44%	1.68	183	14%	32%	13%	19%	43%	1.62
MEN	Average														

PLAYERS		BLOCKS / SET					DIG / SET					
Team	Rating	Total	P4	MID	P2	SER	Total	Direct	Blo	Cover	Emerg	Err
WOMEN	Average	3.06	0.44	0.75	0.77	1.01	17	7.68	1.68	2.15	0.38	5.49
MEN	Average											

PLAYERS		FLOAT SERVES					SPIN SERVES				
Team	Rating	Total	Kill%	Blo%	Err%	PS%	Total	Kill %	Blo%	Err%	PS%
WOMEN	Average	1105	17%	4%	16	50%	420	21%	8%	17%	46%
MEN	Average										

Program Planning & Periodized Plans

In simple terms, planning is about determining how time, resources, and priorities will be managed. In sport, plans can be developed for the short (single session or day), mid (one or more weeks), or long term (a season, a year… and even a few years in the case of elite athletes). The planning of sport programs lasting several weeks or longer often reflects the concept of periodization. The term periodized plan refers to the somewhat complex temporal organization and mapping out of the training and competition activities, as well as other significant events, with the aim of enhancing athletic development and achieving peak performance for major competitions. There are many types of periodized plans. As the name implies, a season plan does not cover the entire year, but spans over a shorter period, typically from a few weeks before the first event until the end of the competitive season. A yearly training plan/program (YTP) goes further, and outlines the types of activities athletes should do to prepare during the off-season, and how they may transition and recover after the last competition. Quadrennial plans are even more complex, and aim at modelling how a succession of YTPs could be used to enhance preparation and improve performances over an Olympic cycle. Regardless of the type of periodized plan, the key challenges program designers face are arguably how to (1) achieve an "optimal vertical integration" between the physical, technical, tactical, and mental aspects of performance throughout the process, (2) determine the most effective ratio of training and competition activities, while knowing that some competitions can be viewed as "preparation events", and (3) ensure sufficient recovery amidst all of this.

A critical element underlying periodized planning is the Adaptation Principle. According to this principle, athletes need to be progressively exposed to a sufficient amount of training stress to improve, but enough time and adequate conditions must also be in place to ensure recovery. This is the only way to adapt and get better in the long term. It is also important to keep in mind that improvements resulting from training are not constant and linear. Progress can be fast initially, but a plateauing effect may be observed after a while, so performance may stagnate if the stimulus or "training load" is not adjusted periodically. In addition, because adaptations are also reversible, performance may even decrease if the "load" is too weak or if it is not applied frequently enough. Careful consideration must therefore be given to all these aspects when developing the periodized plan, as the longer an athlete has been training for, the more tricky it gets to keep improving. Therein lie the challenges alluded-to earlier… And this quickly brings up practical coaching questions: "How much training, then, is necessary to achieve the desired outcome of consolidating basic skills? How long does it take?" While many athletes differ in their rate of improvement, it can typically take 3 months or more for an athlete training 2-3 times a week to move from the "acquired" stage of skill development to "consolidating" a particular skill. Clearly, this means that we need to be conservative in planning the number of skills we target for a season, and ultimately understand that all plans may need to be adjusted at regular intervals.

A brief word on competition: while it is a critical piece of the sport experience and an important component of every periodized plan, it is often given too much emphasis, particularly during the first few years of an athlete's development. This can have a detrimental effect on individual skill development, on building an athletic base of strength and power and, most importantly, on providing a fun and enjoyable sport environment. Balance, perspective, and discernment should therefore be key factors guiding decisions about the number and the level of competitions athletes should be involved in, and more is not necessarily better…

Following a Person-Centered approach, a seasonal or yearly periodized plan should consider all the facets of the individual's life, which includes the non-volleyball sports young people may play, their education, family, and social life. By taking into account these elements and the other aspects mentioned previously, two important goals can be achieved: (1) a balanced development through sport, and (2) a reduced risk of injuries, excessive fatigue, and burnout.

With all this in mind, Volleyball Canada has developed several examples of periodized plans across the LTD stages for coaches to consider when planning their practices. For younger age groups, we feel that planning should only be done on a seasonal basis. The level of detail contained within these plans can appear overwhelming to some coaches, particularly those who are just beginning. Therefore, as a best practice scenario, within each Club an experienced certified Performance Coach should be offering support on how to concretely transpose and apply the priorities listed in the periodized plan into practice plans. A helpful tool for building practice plans is also available on the following page.

13U	14U	15U	16U	17U	18U	21U

Practice Planning - Putting It All Together

By reviewing the basic principles within the Long Term Development Framework, examining the Person Pillar, the Athlete Pillar and the Player Pillar in the Volleyball Development Matrix, and reflecting how all these elements can be prioritized in a periodized plan, the coach is now thoroughly prepared to build out the practice plan.

To support this process and to create a linkage with the evaluation criteria of the National Coach Certification Program (NCCP), Volleyball Canada has provided a tool and resource to support practice planning (see below). By using this tool, coaches will familiarize themselves with the same practice planning template used in evaluations toward NCCP certification.

The excel spreadsheet is also a resource that contains a variety of drills and activities to drop into the practice plan. The Drill Bank provides some good examples of game-like activities for different levels of play. However, the games and drills are not exhaustive and are meant only to be a starting point for coaches to develop their own favourite activities to suit the needs of their players.

PRACTICE PLAN BUILDER AND DRILL BANK **VIDEO EXPLANATION**

In the spirit of Kaizen (continuous improvement), please send us your great drills, ideas or resources to coaching@volleyball.ca.

Glossary

The purpose of this glossary is to outline a series of key concepts related to performance in Volleyball and to define some training terms used throughout this document and Volleyball Canada's NCCP material.

Performance - The result, manner, or quality of carrying out a task. What is accomplished, contrasted with capability (Webster dictionary). Performance therefore refers to what the athlete can do now, and it can fluctuate over time.

Volleyball demands – The factors that impact performance. In Volleyball, they can be grouped into three main categories: cue reading, decision-making, and skill execution.

Cue-reading - The ability to detect relevant information during the action. For instance: own position relative to others on the court; position of teammates and opponents; ball speed and trajectory; a sign that indicates what a player may do next; etc.

Decision-making - The ability to process the information gathered during play and choose the right options for action (what to do, where, when, and how) - and do so in a timely fashion.

Execution - The ability to perform effectively and efficiently the various offensive or defensive skills or actions that are required by specific game situations, i.e., to carry them out in a way that is mechanically sound, with the adequate degree of speed, power, range of motion, control, and accuracy, as well as with consistency throughout the game. Execution is supported by a range of athletic and mental abilities.

Athletic abilities – The physical attributes that support performance from a motor and metabolic (energy production) perspective. Some important athletic abilities are described in the following pages.

Mental abilities – The aspects that affect how an athlete behaves while performing. To achieve success, appropriate levels of arousal, focus, self-control, stress management, and resilience must be demonstrated throughout each game. Mental abilities may influence the expression of other performance factors/attributes.

Fatigue – A decrease in power output (intensity), a decline in the quality of execution, or an increase in the frequency and/or magnitude of errors that can be observed over time during an exercise bout, a training session, or a competition. Fatigue may be caused by a variety of physiological or neurological factors, and it typically occurs as a result of performing a high-intensity effort, a prolonged effort or task, or a series of efforts or tasks over and over again within a given time frame. Fatigue is a normal consequence of many training or competition activities. Adequate recovery strategies (time; rest; sleep; hydration; nutrition) are necessary to avoid a state of excessive fatigue and a drop in the athlete's performance capabilities.

Overtraining – A persistent state of fatigue that can occur over time because of incomplete recover, excessive training loads (too intense or too frequent), or a combination of these factors. Overtraining is characterized by a decrease or a stagnation of performance, and the athlete's incapacity to adapt to the training stimuli. A host of physiological, psychological, or biochemical signs and symptoms can be associated with overtraining, but those can vary between individuals. However, a decrease in the athlete's general sense of "well-being", chronic fatigue, pain in the muscles upon rising, and a poor quality of sleep could be signs that precede overtraining. The type of fatigue and perturbations that accompany overtraining are are not reversible in the short term. When an athlete suffers from overtraining, an extended period of time—several weeks or even months—may be required for recovery. Under such conditions, training must be significantly reduced et must resume very progressively.

Intensity – The power output (amount of work per unit time) associated with a task or effort. The concept of intensity can also be viewed relative to the overall demands of a sport: in addition to the physical and metabolic demands of the task, one can also factor in the technical challenges associated with it, as well as the perceptual (cue reading) and cognitive (decision-making) requirements, as well as the prevailing conditions (e.g., available time).

Endurance (athletic ability) – The ability to delay the onset of fatigue while performing a task under a given set of conditions. Conditions may relate to variables such as exercise mode (i.e., running; cycling; swimming; etc.), type of effort (continuous; intermittent), effort intensity and duration, nature of recovery periods if provided (passive or active; length and intensity of active recovery periods), environmental conditions (ambient temperature and humidity; altitude; wind; etc.), or the status of the individual (trained/untrained; nutritional and hydration status at the start of the activity; fatigue resulting from prior efforts; health; etc.).

> **Note:** During exercise, the concept of endurance may therefore be applied to efforts of various intensities (e.g., short duration all-out efforts, or prolonged low to moderate intensity efforts), the key variable being the length of time the effort can be sustained or the number of times it can be repeated without a decrease in power output.

Maximum Strength (athletic ability) -The highest level of tension or force generated by a muscle or muscle group during a maximum contraction, regardless of the duration of the contraction. Because most sport movements involve some type of acceleration (change in speed per unit time), an alternative definition can be the highest level of tension or force generated by a muscle or muscle group during a maximum contraction at a specified velocity.

Speed-Strength (athletic ability) - The ability to perform a muscle contraction or to overcome a resistance as fast as possible, for instance when accelerating a limb or an object. Typically, such contractions are very brief. The term "explosive strength" is often used as a synonym.

Strength Endurance (athletic ability) - The ability of a muscle or muscle group to perform repeated contractions at intensities below maximum strength. While this concept is typically used in situations where 15 to 30 repetitions of a movement are performed during training, it can be applied to any sub-maximal load and to movements performed at different velocities.

Core Strength - The strength of the muscles that stabilize and control the pelvis, the trunk, and the spine. An adequate level of core strength is required to assume and maintain an optimal trunk posture and to generate high level of power while performing many Volleyball skills that involve rotations.

Speed (athletic ability) - The ability to perform a single movement in the shortest possible time, to perform a series of movements at the highest rate possible within a short time frame, or to cover a given distance in the shortest possible time during an all-out effort of short duration (8 seconds or less). This athletic ability is closely related to speed-strength and to maximal anaerobic power.

Agility (athletic ability) - The ability to execute movements or to move rapidly, with precision, and with ease. Also, the ability to change direction quickly and efficiently while moving.

Balance (athletic ability) - The ability to achieve and maintain stability. There are three types of balance: (1) static balance: adopting a controlled and stable body position at rest; (2) dynamic balance: maintaining control during movement or stabilizing the body by performing muscular contractions to offset the effect of an external force; and (3) the ability to keep an object or another body under control either statically or while movement occurs.

Coordination (athletic ability) - The ability to perform movements in the correct order and with the right timing. In volleyball, this ability should be considered from two angles: (1) the way the athlete moves on the court, and (2) the actions involving the ball (eye-hand coordination). The latter refers to motor control involving eye movement, the processing of visual information, and the action of one or of both hands.

Flexibility (athletic ability): The ability to move a joint through its complete range of motion (ROM). Many factors impact ROM, including distensibility of the joint capsule, adequate warm-up, muscle viscosity, and tightness of ligaments and tendons ((American College of Sports Medicine, 201 4). The assessment of flexibility typically involves some form of stretching action aimed at determining the ROM.

Static stretches - A stretch during which the person stands, sits or lies still, extends a body part relatively slowly and with control until the ROM is reached, and then holds the position for a period of time (typically 15 to 45 seconds). No external forces are applied in this case.

Dynamic Stretches – A stretch where the amplitude results from performing movements actively but in a controled manner. Such movements may involve twisting, lunging, or swinging, and often replicate how body parts typically move when some sport-specific actions are executed.

Energy – In Physics, the capacity for doing work.

Metabolism – The processes that occur within cells and that produce energy through various biochemical reactions. During exercise, muscle cells may get the energy they need to contract and perform work from a variety of sources and pathways. Energy production can occur at a very fast rate anaerobically (i.e., without the need for oxygen), or at a somewhat slower rate aerobically (i.e., with oxygen being involved). During exercise, aerobic and anaerobic processes complement each other to meet the "energy production demands", and are somewhat intertwined. While it is beyond the scope of this document to review how the anaerobic and aerobic metabolic pathways work, it remains important to know a few essential points about them. The key variables that impact to what degree energy will be produced aerobically or anaerobically are intensity, effort duration, whether the effort is continuous or intermittent and in the case of intermittent efforts, the length of the pauses and whether they are active or passive. As a rule of thumb, the higher the intensity is, the shorter the length of the effort will be, and the more energy will be obtained from the anaerobic pathways. With this is mind, active muscles typically get most of the energy they need from the anaerobic energy production pathways during the first few seconds of an effort (particularly if it is intense and was preceeded by a pause), or whenever intensity increases significantly or suddenly and exceeds the rate at which aerobic pathways can provide energy. On the other hand, most of the energy is supplied by the aerobic metabolism at rest, during low to moderate intensity exercise, or after 45 seconds or so during an intense exercise. The intermittent nature of Volleyball, as well as the high intensity, speed, and power associated with most actions performed during play, make it a sport where anaerobic energy pathways play a key role. This being said, aerobic energy producing systems should also be developed to an adequate level.

Maximal oxygen consumption - The highest amount of oxygen the muscle cells of a person can utilize to produce energy aerobically during an intense effort involving large muscle groups (e.g., running, cycling; arm cranking; etc.). The corresponding abbreviation is VO2 max where V refers to the volume and O2 to oxygen. A person's VO2 max can be improved significantly as a result of training, though the upper limit is genetically determined. The key factors determining VO2 max are maximal cardiac output (the maximum amount of blood the heart can pump per unit time), the amount of oxygen that can be carried by the blood, and the ability of muscle cells to use the oxygen delivered to them to produce energy. Two common ways of expressing VO2 max are liters per minute (L/min), or ml/kg/min to account for the body mass of the athlete. For a given VO2 max expressed in L/min, a person with a lower body mass will have a higher VO2 max expressed in ml/kg/min.

Maximal aerobic power - The work output that can be generated at an intensity corresponding to VO2 max. The corresponding abbreviation is MAP. In addition to VO2 max, a person's MAP is also determined by his or her efficiency at producing the required movements during effort. If individuals A and B both have the same body mass and VO2 max, but B has a superior technique and is therefore more mechanically efficient, their MAP will be higher.

Maximal anaerobic power - The highest work output that can be generated by a person during an all-out effort. Because intensity will be very high, fatigue will manifest itself quickly, typically within a few seconds.

Anaerobic endurance – The ability to delay the onset of fatigue and minimize the decline in power output during a very intense effort whose intensity is significantly superior to MAP, and where a high percentage of the energy is provided by the anaerobic pathways. Protocols for estimating anaerobic endurance typically require the person to exercise at very high intensity for 30 to 90 seconds. In some publications, the term anaerobic capacity is used as a synonym.

Neutral sleeping position - Sleeping with the spine straight, from the head and neck all the way down.


Volleyball
Canada