

CANADIAN SPORT INSTITUTE PACIFIC

PERFORMANCE HEALTH

HANDBOOK



CANADIAN SPORT INSTITUTE PACIFIC

PERFORMANCE HEALTH

HANDBOOK

Published November 2016



INTRODUCTION

Dear Athletes,

With the globalization of sport, athletes are achieving greater performances than at any time in history. In this extremely now competitive landscape, taking care of the innumerable small details that can lead to enhanced performance becomes even more important. Training, environment, and health are the cornerstone, but the added benefits of recovery, sport science, and medicine bring that extra boost in performance.

The Canadian Sport Institute Pacific and the provincial network of PacificSport Centres are leaders in providing the support, expertise and education that the athlete and coach require at each stage of their development and sport careers. We hope the knowledge in this guide will help you bridge the gap to elite world-class performance.

We are proud to be supporting and working with both elite British Columbia athletes and future British Columbia champions.

Yours in sport and success,

Dr. Kirsten Barnes, PhD

Lead, Mental Performance
Canadian Sport Institute Pacific

Dr. Jeremy Sheppard, PhD

Director, Performance Services
Canadian Sport Institute Pacific

Dr. Trent Stellingwerff, PhD

Lead, Innovation and Research
Canadian Sport Institute Pacific



TABLE OF CONTENTS

Keeping Healthy	4
Medical Screening Recommendations.....	4
Review of Vaccines Needed	5
Medical Screening Recommendations for athletes with a disability.....	6
Maintaining High Quality Nutrition.....	8
Sport-Specific Nutrition.....	11
Asthma & Exercise-Induced Bronchoconstriction.....	15
Prevention of the Common Cold.....	16
Treatment of the Common Cold.....	17
Massage Therapy and High Performance.....	19
Sleep - Best Practices for Athletes.....	20
Sleep & Travel.....	21
Traveller's Diarrhea.....	22
Hydration	26
Hydration Plan.....	28
Concussions	29
Mental Performance	32
Optimizing Performance Through Mental Toughness.....	33
Acknowledgments.....	35

KEEPING HEALTHY

As a Canadian Sport Institute Pacific athlete, one of your goals is to stay as healthy as possible. These recommendations will help you to reach optimal health and will help keep other team members healthy.

KEEPING HEALTHY CHECKLIST

- ☐ Optimal nutrition.
- ☐ Regular and sufficient sleep with good sleep hygiene.
- ☐ Optimal hydration.
- ☐ Annual medical and dental screening.
- ☐ Vaccinations kept up to date.
- ☐ Cold infection prevention.
- ☐ Medications and supplements, if needed.
- ☐ Regular monitoring of health (daily / weekly).

MEDICAL SCREENING RECOMMENDATIONS

Medical Screening	Yearly
Blood Work (CBC and iron parameters if indicated)	1-2 times/year
Dental Exams	1-2 times/year
Vaccines	
Chicken Pox (if no prior chicken pox infection)	2 in lifetime
Diphtheria	Every 10 years
Flu Shot	Yearly
Hepatitis A	2 in lifetime
Hepatitis B	3 in lifetime
Measles, Mumps, and Rubella (MMR)	2 (none needed if born prior to 1957)
Tetanus	Every 10 years
Other travel vaccines as necessary (e.g. Dukoral, Typhoid, Yellow Fever)	

REVIEW OF VACCINES NEEDED

It is important to understand that many illnesses that are rare in Canada, due to our robust childhood vaccine program, are still common in many parts of the world.

The following is a list of basic vaccines all athletes should have:

- Chicken Pox / Varicella: highly recommended if you have never had Chicken Pox. This will protect you and your team – especially when travelling.
- Diphtheria and Tetanus: needed once every 10 years. It is routinely given in school at age 14 and due again at age 24. The current recommendation is to include Pertussis (Whooping Cough) with the booster at age 14 or 24.
- Flu Shot: highly recommended yearly to protect you and the team. It is given in late fall each year.
- Hepatitis A: highly recommended in two doses and good for life. This is not routinely given at school and is not covered by your provincial health care.
- Hepatitis B: highly recommended in three doses and good for life (those born after 1982 should have received this in school or by their GP).
- Measles, Mumps, and Rubella (MMR): two full MMR vaccines need to have been given for those born during or after 1957. Those born before 1957 have a presumed natural immunity.
- Meningitis C: given routinely in school and recommended if not previously given. Alternatively, Menactra or Menveo are Meningitis vaccines that cover more strains than you may be exposed to with international travel. Menactra or Menveo costs approximately \$130 and is not covered by provincial health plans.



You may require more vaccines if you are travelling outside North America or Europe. For a list of Canadian travel medical clinics:

- [Canadian Travel Clinics.](#)
- [Cliniques santé-voyage au Canada.](#)

More information about travel can be found at:

- [Health Tips for Canadians Travelling Abroad.](#)
- [CDC Travel.](#)

MEDICAL SCREENING RECOMMENDATIONS FOR ATHLETES WITH A DISABILITY

THINGS TO DO DAILY:

- Self skin checks (including feet).
- Check status of cushion.

THINGS TO DO EVERY YEAR: CHECK-UP WITH FAMILY DOCTOR:

- Medication review: make particular note of any medications used for pain and spasticity (including narcotics and cannabinoids) as some may require a Therapeutic Use Exemption (TUE) to use in training and/or competition.
- Check weight and blood pressure.
- Annual blood work should include a complete blood count with kidney function and electrolytes.
- Cardiac risk assessment including cholesterol and fasting blood sugar.
- Review autonomic Dysreflexia (AD) protocol where applicable (i.e. if injury is above T6).
- Flu immunization – especially if T8 or higher.
- Kidney ultrasound.
- Urology assessment with Cystoscopy and/or Urodynamics (requires a referral to an Urologist).
- Discuss sexual function (e.g. need for medications, fertility, specialist referral, etc.)
- Discuss any changes in spasticity / muscle tone. Annual urine analysis.

THINGS TO DO EVERY TWO YEARS:

- Review changes in life situation (e.g. coping, adjustment, life satisfaction).
- Females: Gynecological exam and PAP smear (beginning at age 21).
- Males: Digital prostate exam beginning at age 40 (PSA level if cancer history in family, or at discretion of GP).

THINGS TO DO EVERY TWO TO THREE YEARS: FOLLOW UP WITH PHYSIATRIST +/- REHAB TEAM

- Full history and physical review.
- Assess equipment, posture, and seating.
- Assess ROM, contactures, function, motor sensory.
- Bone density / bone scan at discretion of physiatrist.
- Males: Testosterone levels.
- If concerns arise, see rehab doctor and/or team doctor sooner.

THINGS TO DO EVERY FIVE YEARS:

- Vital capacity (earlier if indicated).
- Pneumonia vaccination booster: one dose, then booster at 5 years.

THINGS TO DO EVERY TEN YEARS:

- Tetanus booster.



Canadian BMX Cyclist Tory Nyhaug
Photo by Kevin Light

MAINTAINING HIGH QUALITY NUTRITION

Maintaining great nutrition is critical to overall health, development, and performance. It is the foundation from which you live, train, and compete. Poor eating equals poor foundation; great eating equals solid foundation! Getting nutrition right is a great investment and can help you to:

- Adapt and recover from training.
- Enhance immunity.
- Achieve a healthy body composition.
- Recover from injury.
- Cope with daily stressors.
- Maintain/Increase energy and stamina.

PLANNING

Once a week, sit down and plan your meals and grocery list for the week. Creating a weekly menu will ensure that you eat well – even when you are tired or have limited time. Include vegetables, fruits, high quality fats, lean proteins, whole grains, calcium rich foods including milk and yogurt, and fermented/probiotic rich foods such as kefir, sauerkraut, or tempeh.

Look at your training schedule and plan for travel friendly snack foods you can eat on the way to, at, or from training. Use planned leftovers, pre-prepared meals, or convenience foods such as pre-washed greens, frozen vegetables, canned fish, or rotisserie chicken on days when you have limited or no time to cook.

EVERYDAY EATING

- Start every day with breakfast – your brain, organs, and muscles will thank you. This meal will rev up your metabolism and prevent night time food feasts due to excessive hunger from inadequate calorie intake.
- Plan to eat 4-6 well-balanced meals, snacks, or mini-meals each day.
- Ensure adequate fuel for endurance, sprint, and skill-based training, and for restoration of muscle and liver glycogen post-training.
- Build and repair with protein. Optimize whole-body protein synthesis including red blood cells, antibodies, mitochondria, and lean mass (muscle protein synthesis) by consuming protein at each meal or snack throughout the day (0.4g per kg of body weight each meal). Including protein in your bedtime snack will stimulate overnight muscle protein synthesis and overall long-term skeletal muscle adaptation. Choose high quality proteins such as eggs, fish, beef, pork, bison, chicken, lentils (and other dried beans), yogurt, milk, and milk alternates.

- Include a variety of high quality carbohydrates each day. Try fibre and nutrient-rich grains such as quinoa, brown rice, barley, multigrain pasta, sprouted/whole-grain breads, oatmeal, multi/whole grain cereals, dairy products, legumes, and beans.
- Manage exercise-induced oxidative stress and facilitate recovery from training (muscle and immune system repair) by including antioxidant rich foods. Beyond the potential risks associated with supplement use, antioxidant supplements cannot take the place of whole food antioxidant nutrients as high-dose supplements have been shown to decrease adaptation to training. Eat a variety of vibrantly coloured fruits, vegetables, herbs, and spices (turmeric, curry powder, pepper, ginger, garlic, chili peppers, basil, cinnamon, rosemary, and thyme) as the best sources of antioxidants. A typical athlete needs 3-4 servings of fruit and 5-6 servings of vegetables each day – or approximately 3 pieces or 2-3 cups of chopped fruit along with 4-6 cups of cooked/raw vegetables/salad.
- Do not forget to include high quality fats at each meal for fuel, fat-soluble vitamin absorption, hormone production, and healthy cell wall and brain structure. Good sources include olives, avocados, fatty fish, nuts, seeds, butter, and coconut oil.



Canadian Sport Institute Pacific's Susan Boegman with athletes in the Dr. Gord Sleivert Sport Performance Lab
Photo by Emma Allen

USOC: ATHLETE'S PLATES (CLICK IMAGES FOR FULL PDF)

The more you train, the more carbohydrate fuel your muscles need. A simple and effective way to adjust your carbohydrate intake to your training load is by carefully adjusting your mealtime plates. The **Easy Training Plate** below can be used as a guide for how much carbohydrate to eat during low-volume, skill-based training, recovery days, during a taper, or the offseason. This plate can also be used when you are managing body weight, or if you compete in sports requiring less energy for training.

As your training volume increases, so does your need for available energy. The **Moderate Training Plate** can be used when you are training twice a day focusing on technique in one workout and on endurance/strength in the other. The moderate day is a great baseline to easily adjust your food intake up (hard training / prep for competition) or down (light training / taper).

The **Hard Training Plate** is a great way to eat when you have 2 or more demanding daily training sessions, a large volume or intensity training block focus, or in preparation for competition. If your competition requires extra fuel from carbohydrates (event > 60min), use this sample plate to load up a couple of days before, throughout, and after the competition. A skilled performance dietitian can help you understand how to adjust or periodize your carbohydrate intake to match intake with training type and goals.

Approximate Daily Macronutrient Needs		
Macronutrient	Situation	Recommendation*
Carbohydrates	Low-intensity exercise or skill-based activities	3-5g per kg of body weight
	Moderate exercise program (approx. 1 hour/day)	5-7g per kg of body weight
	Endurance program (moderate-to-high intensity exercise of 1-3 hours/day)	6-10g per kg of body weight
	Extreme commitment (moderate-to-high intensity exercise of more than 4-5 hours/day)	8-12g per kg of body weight
Protein	To optimize muscle protein synthesis	0.25-0.4g per kg of body weight per meal
	Adolescent athletes	1.5-2g per kg of body weight
	To facilitate fat loss	2.3-2.5g per kg of body weight
	Injury recovery	2-2.5g per kg of body weight
Fat	Daily (choose high quality options)	1-2g per kg of body weight <i>For weight loss aim for closer to 1g per kg of body weight</i>

**These recommendations are highly individual. A sport dietitian can help tailor to best meet the athlete's training and body composition goals.*

SPORT-SPECIFIC NUTRITION

Fueling before, during, and after training will provide energy for your training and help you to recover optimally so you can train at your best and prevent illness and injury.

With any supplement, athletes are always responsible for their choices. As per the [CSI Pacific Supplement Policy](#), be sure to check any medication or supplement you are using against the [WADA prohibited list](#). You should also refer to [nsf.org](#) or [informedchoice.org](#) - two companies that test batches of supplements for banned substance contamination. While there is no 100% "banned-substance free" guarantee, supplements that are tested by either of these companies represent a much lower risk than those not tested.



Fuel	Before Training or Competition	During Training or Competition	Recovery
Carb	1-4g per kg of body weight eaten 1-4 hours before exercise	<p>Training < 75 minutes</p> <ul style="list-style-type: none"> • Mouth rinse with a carb beverage <p>Training 1-2 hours</p> <ul style="list-style-type: none"> • Up to 30g per hour <p>Training 2-3 hours</p> <ul style="list-style-type: none"> • 30-60g per hour <p>Hard exercise > 2.5 hours</p> <ul style="list-style-type: none"> • 90g per hour if consuming a multi-transportable carb blend (e.g. glucose and fructose) <p>30g = 1 banana or 500mL sports drink</p>	<p>Recovery carbohydrate intake should be based on level of training. As long as total daily carbohydrate fuel needs are met, use regularly scheduled meals and snacks for post-training recovery from technical training, low-volume periods, taper, or recovery weeks</p> <p>Plan on 1-1.2g per kg of body weight per hour for the first 4-6 hours after high volume / high intensity training and on multiple training session days (e.g. < 8 hours between training). Can divide into frequently consumed snacks (every 15-30 minutes)</p>
Protein	A small amount, approx. 20g, as part of a pre-exercise balanced snack or meal as tolerated	During weight training, a small amount of protein may increase muscle protein synthesis in the hours after. No benefit shown during endurance training.	<p>Protein consumed in scenarios of low-carb availability and/or restricted energy intake in the immediate recovery period can enhance glycogen repletion at rates of 0.8g per kg of carbs along with 0.4g per kg of protein</p> <p>Aim for 0.25-0.4g per kg of body weight in the 2 hour period after exercise as a balanced meal or recovery snack</p>
Fat	A small amount before training if adequate time to digest or when preparing for a very long session	No	A moderate amount is okay. After the first hour is preferred
Fluids	5-10mL per kg of body weight in the 2-4 hours before exercise as tolerated	Follow an individualized hydration plan to prevent excessive dehydration and changes in electrolyte balance. Consult with a sport dietitian or sport physiologist.	Sweat losses are highly individual. Rehydrate 150% of losses or 1.5L of fluid for every kg of weight loss whenever possible
Sample Foods	Oatmeal or whole grain cereal with milk Yogurt and fruit Toast and nut butter Egg and fruit Meat sandwich and fruit Smoothie Stir-fry	<p>'Real foods' such as:</p> <ul style="list-style-type: none"> • Dates • Banana <p>'Sport products' such as:</p> <ul style="list-style-type: none"> • Homemade sport drink • Infinit Jet Fuel, Eload, Gatorade • Gels, gummies 	<p>Infinit Revive/Recharge/Explode</p> <p>1% chocolate milk</p> <p>Elevate Me / Clif bar and yogurt</p> <p>Smoothies made with milk/yogurt and fruit</p> <p>Kashi Go Lean or Optimum cereal and milk</p> <p>Yogurt, oatmeal, and berries</p> <p>Stir-fry</p> <p>Potato/Yam, meat, and vegetables</p> <p>Pasta and meat/vegetable sauce</p>
Notes	Use familiar foods/fluids Try easy to digest liquid supplements or low-fibre, carb-rich foods for pre-race jitters Experiment with quantity/timing in training before competition	Carbohydrates will help keep blood glucose levels up when glycogen deplete – amounts needed are specific to individuals.	<p>Replenish glycogen stores, repair muscle and tissue, and rehydrate</p> <p>May need more or less carbohydrate or protein depending on body weight, body composition goals, and training intensity.</p> <p>Eat as soon as possible post-training/competition</p>

MINDFUL EATING

Beyond the management of fueling, nutrient provision, and hunger management, eating should be an enjoyable experience. Plan to eat healthy food that you find enjoyable and eat it with awareness. Eating while texting or watching television may lead to overeating. Unless you are having trouble maintaining a healthy weight (too lean), you are not growing optimally, or you are working on gaining lean body mass, eat only until satisfied rather than full. Paying attention to your hunger and fullness levels is essential to managing your food intake – especially when transitioning to light/taper training or body composition management. Use The Hunger Scale below to reflect upon your hunger and fullness before, during, and after eating and aim to stay within the green zone.

The Hunger Scale

1.	You're so hungry you'll eat anything
2.	You can't ignore your hunger and everything looks and sounds good to eat
3.	Your stomach is growling and you have hunger pangs
4.	You can feel you're getting hungry and it's time to think about what to eat
5.	You're neither hungry nor full
6.	Just right; you're satisfied but could easily eat more
7.	Totally satisfied; hunger is gone and you won't be hungry for hours
8.	You're full and don't want anything else to eat
9.	You feel stuffed and uncomfortable
10.	You're painfully full and may even feel sick

©2013 Appette for Health (AppforHealth.com)

REGARDING SWEETS AND FATS

- Sweets and sodas are high in carbohydrate, but lack nutrients, and are a poor substitute for fresh fruit, vegetables, or grains. Dried fruits, dark chocolate, or honey get a 'thumbs up' for satisfying a sweet tooth, but limit your intake of nutrient-poor sweets such as candy, pop, table sugar, sweetened cereals plus high-fat sweets such as cake, pie, ice cream, chocolate bars, etc.
- Fats, oils, and sauces contain a lot of calories. During growth or heavy training phases, fat calories can ensure you meet your energy needs, but be sure to meet your carbohydrate and protein needs as well. Use mayonnaise, cream sauces, or gravies in moderation.

REGARDING SPORT FOODS

- While sports drinks, bars, and gels have a role in improving performance, adaptation, and recovery, they are meant for use before, during, and immediately after exercise to help with hydrating, energizing, and immediate recovery. They are not meant as a replacement for eating good quality, real foods. Eat and drink them in moderation.
- Sport Drinks: can help maintain hydration and carbohydrate replacement for optimal performance. Look for a product that includes 14-15g of carbs in 250mL along with 100mg sodium.
- Sport Bars: provide athletes a compact source of calories, carbohydrate, and protein before, during, or after training sessions when other solid foods are not well-tolerated or available. Choose a bar that contains 30-100g of carbohydrate and 6-20g of protein. Before training, choose a bar that is higher in carbohydrate, moderate in protein (10-15g) and low in fat (< 6g) 3-4 hours before exercise, and then choose a bar that is lower in carbohydrate (30-40g), protein (< 8g), and fat (< 3g) 1-2 hours before exercise. The higher carbohydrate and protein bars are appropriate after exercise.
- Sport Gels: can help to maintain blood sugar levels during training and competition. Most gels will contain at least 22g of carbohydrate. Some will include electrolytes, vitamins, and minerals.

REGARDING SWEETENED DRINKS AND YOUR TEETH

- Use sport drinks, fruit juices, and soft drinks in moderation because they can cause dental erosion. Water is the best drink for light workouts.
- Drink sport drinks while they are cold. Warm temperatures speed erosion.
- If possible, use a straw to reduce contact between the drink and teeth. Do not hold the drink your mouth or swish it around unless you are strategically using a carbohydrate mouth rinse.
- Do not brush your teeth immediately after consuming a sport drink. The acid in sport drinks makes teeth softer and brushing can cause protective enamel to be lost.

Quality nutrition is not rocket science! It is however about commitment to simple, high quality, mindful eating, and taking the time to plan and be prepared. For further clarification and questions, please speak to your personal or team dietitian.

ASTHMA & EXERCISE-INDUCED BRONCHOCONSTRICTION

Asthma, also known as Exercise-Induced Bronchospasm (EIB) or Airway Hyper-Responsiveness (AHR), is a condition causing narrowing of the small airways in the lungs. Many things can trigger asthma including:

- The common cold.
- Pollen and seasonal allergies.
- Poor air quality (e.g. chlorine and its derivatives, pollution).
- Cold dry air.
- Cat or dog dander.
- Anti-inflammatory pills (in approximately 10% of people with asthma).
- History of allergies and eczema or family members with asthma.

Remember

- If a spray inhaler (as opposed to powdered) is used, an aerochambre / spacer should be used with your inhaler to improve delivery to your lungs. Clean monthly by soaking in warm water with dish soap, rinse and air dry overnight.
- If these symptoms are not managed appropriately and controlled through treatment, they may ultimately affect performance.

Bronchodilators (Ventolin, Terbutaline, and long acting Salmeterol and Formoterol) are 'rescue inhalers' – also known as B2-agonists. They work to open up the lungs' small airways. They are taken to treat acute asthma symptoms or taken preventatively prior to training and competing. Their effects start working within 15-30 minutes. Their use should be under the recommendation of a physician.

- If you require more than 5 puffs per week (total) to keep wheezing and chest tightness under control, it is very important that you see your physician because you may need additional treatment.
- Carry this inhaler with the spacer in your equipment bag at all times.
- Inhaled Ventolin (Salbutamol), Serevent (Salmeterol), and Oxeze (Formoterol) are conditionally allowed in competition and do not require a Therapeutic Use Exemption (TUE) when used as prescribed. Using these medications in excess of the normally prescribed dose may lead to a positive test. Bricanyl (Terbutaline) and Maxair (Pirbuterol) do require a TUE as of 2016.
- Any bronchodilators taken orally or more than 10 puffs per day require a TUE.

Side Effects of Bronchodilators: This medication may make you feel a bit jittery, like you have had coffee to drink. It can give you tremors and fast heart rate. Most people do not feel this effect with one puff.

Glucocorticosteroid Inhalers work to reduce inflammation in the airways. Inflammation can occur when you have a cold or are repeatedly exposed to such triggers as mentioned above. These inhalers take 3-7 days to be effective. These are not anabolic steroids and work very differently from them.

- If you have asthma that is symptomatic even when you are not exercising, many of you will require this inhaler daily.
- If you develop a cold, are travelling to an area with air pollution, or will be exposed to something that triggers your asthma (e.g. dogs, cats, pollens), your MD will direct you on how to increase the dose of your inhaler (typically double).
- These inhalers are permitted and do not require a TUE as of 2016. If you have been instructed to take this treatment, it is important to be consistent by taking it daily throughout your competitive season. Inflammation can return with the cessation of treatment even if only for short periods of time.

PREVENTION OF THE COMMON COLD

- Hand washing before eating and drinking is the most important thing done to prevent a cold.
- Get the appropriate amount of sleep. Studies have also shown that you are 3 times more likely to get sick when you get less than 7 hours of sleep per night.
- Avoid sharing towels, water bottles, cups, etc.
- Keep your distance (2m) from people who appear to have a cold, who are coughing, or if you have a cold.
- If you cough, cough into your elbow instead of your hands.
- Room sharing may need to be modified if a roommate is ill.
- If using a supplement containing Ginseng, remember there are both banned and recommended types.

Common cold symptoms include any of the following (in contrast to the flu which has a sudden onset of fever, chills, muscle aches, headache and either cough or gut upset):

- | | |
|---|-----------------|
| • Nasal congestion and sneezing. | • Sore throat. |
| • Cough. | • Headache. |
| • Mild fever (lasting the first one to two days). | • Muscle aches. |

TREATMENT OF THE COMMON COLD

The common cold includes acute symptoms such as sore throat, nasal and sinus congestion, cough, fever (short duration), muscle aches, and fatigue. Extra sleep, rest during the day, plenty of fluids, and wholesome food are key to recovering from a cold quickly.

MEDICATIONS FOR THE TREATMENT OF SYMPTOMS ASSOCIATED WITH THE COMMON COLD

Caution: There are many different companies that sell products for the treatment of the common cold (e.g. Tylenol™ and Dristan™). Some products contain active ingredients that are not permitted in competition. It is important to read labels as the products and their ingredients do change over time. You must check all ingredients on [Global Dro](#) to be sure they are safe and either approved for out of competition or in competition or both. When possible, try to review your choices with a pharmacist, who knows you are a tested athlete and make them aware of the global DRO website.

These active ingredients are found in some common cold preparations and are permitted in competition:

- Phenylephrine: an oral decongestant, can help reduce nasal congestion.
- Chlorpheniramine: an antihistamine, can help with allergy symptoms.
- Diphenhydramine: an antihistamine, can help with allergy symptoms.
- Guaifenesin: an antitussive, can help reduce cough.
- Acetaminophen: an analgesic, can help reduce pain.
- Ibuprofen: an analgesic, can help reduce pain.
- Oxymetazoline and xylometazoline: nasal spray decongestants, can help reduce nasal congestion.

These active ingredients are found in some common cold preparations and are **NOT** permitted in competition:

- Ephedrine.
- Pseudoephedrine.

FOR COUGH

- Humidifier in room or run a hot shower in room.
- Warm fluids with lemon and/or consuming a tsp of honey can help soothe a cough.

FOR COUGH

- Warm fluids with lemon and/or honey can help soothe a cough.

Antibiotics are not recommended for common cold symptoms including acute nasal congestion.

Follow-up with a physician if the following symptoms are present:

- Fever above 40°C.
- Fever lasting more than 3 days.
- Fever with a rash.
- Fever following recent overseas travel.
- Fever that starts or returns more than 7 days after cold symptoms began.
- Cold symptoms lasting more than 10 days.
- Chest wheezing.

[Click here for additional information from the World Anti-Doping Agency \(WADA\) in regards to the use of pseudoephedrine by athletes.](#)

MASSAGE THERAPY AND HIGH PERFORMANCE

WHAT IS MANUAL THERAPY?

Manual therapy refers to the different disciplines that can assess and treat an athlete for musculoskeletal injury or issue affecting performance. There are many disciplines, but the most common in Canada are physiotherapy, chiropractic, massage and athletic therapy. Each discipline has its specific styles of assessment and treatment but in general they all have a common goal of identifying poor function either locally at a muscle or joint or globally across many joints.

Evidence suggests manual soft tissue modalities can reduce pain associated with sport injuries and complement existing rehab/prehab programs. By contributing their specialized knowledge of soft tissue, manual therapists can also help facilitate existing rehabilitation or training programs. When incorporated into an overall training program manual therapists can assist an athlete to either return to the field of play quicker or maintain an optimal level of training and competing.

MANUAL THERAPY AND HIGH PERFORMANCE SPORT

A manual therapist plays a vital role in an Integrated Support Team (IST). Focusing on soft tissue health, manual therapists can be a resource for stretching, function, and musculoskeletal health. As a paramedical healthcare provider, manual therapists prescribe functional and therapeutic exercises and homecare to assist in an athlete's health and performance goals.

THERAPY CONSULTANCY AND ASSESSMENT

The aim of assessment and consultancy with a manual therapist is to:

- Identify individual sport-specific needs in joint and/or soft tissue injuries and function.
- Develop and implement individual and team recovery and injury prevention protocols with the other IST members.
- Identify pre-existing soft tissue and functional deficiencies or injuries.
- Apply appropriate modalities to assist the athlete to return to play with minimal intervention.

Working with a therapist should incorporate a global integration of an athlete's healthcare needs and goals. By working with other healthcare providers and coaching staff, a treatment plan can be effectively designed and implemented.

SLEEP - BEST PRACTICES FOR ATHLETES

The 2 biggest impactors of recovery are probably basic nutrition and sleep. A good sleep depends on length of sleep, quality of sleep, and circadian sleep phase. Optimal sleep will reduce the risk of over-training or under-recovery. It will enhance resistance to illness (by 3-6x!) and will reduce the risk of injury with some data suggesting a reduction in injury risk by 50% when moving from 6-9 hours of sleep. A cumulative lack of sleep can lead to changes of mood, concentration, motivation, endurance, and recovery which can all negatively impact performance. As general rules: 1, talk to your MD / Team MD, if you simply cannot fall asleep, wake up, or continue to have difficulty; and 2, if you need sleeping pills occasionally, try them before competition or travel so you know how they affect you. Good sleep depends on good sleep habits – here are a few tips:

SLEEP LENGTH

- 8 -10 hours per night.
- Napping may be needed to reduce sleep deprivation.
- Optimal napping is 30 minutes between 2:00pm and 4:00pm (if not achieving 8-10 hours per night, then try an afternoon nap of ~90 minutes a few days each week).

SLEEP QUALITY

- Protect the first and longest deep sleep (core sleep) in the first 2-4 hours. Use eye shades, earplugs, or noise-reducing headphones if needed.
- Establish a pre-bed relaxation routine.
- Avoid screen time / technology (light) 1 hour before bed.
- Avoid visualization or race video immediately before sleeping.
- Avoid caffeine within 4 hours of bed.
- Minimal use of alcohol.
- Avoid hard/intense workouts 2-4 hours prior to bed.
- If you suffer from a 'busy mind' prior to sleep, write down your thoughts and forget them until morning so you can relax and let your brain go to sleep.
- Turn the digital clock face away from you – all you need is a reliable alarm.
- Keep your room cool and fresh.
- Put your mattress on the floor if you need extra firmness.
- If having trouble sleeping pre-competition, use relaxed breathing or meditation. This helps in many ways and will allow you to calm your mind. Remember, lots of champions do not sleep on the night before they win.
- Get early morning light exposure daily for 30 minutes.

SLEEP CIRCADIAN PHASE

- Practice a routine of sleeping and napping at the same time daily.

SLEEP & TRAVEL

JET LAG: *Physiologic changes when the body shifts into a new time zone.* The direction (east vs. west) and number of time zones are factors affecting jet lag. Symptoms include heartburn, diarrhea, abdominal pain, sleep disturbance, trouble concentrating, and intermittent fatigue.

TRAVEL FATIGUE: *Physiologic, psychologic, and environmental effects of acute travel (e.g. long day of north/south travel) or accumulated travel over a season.* The distance and frequency of travel and length of travel season are all factors affecting travel fatigue. Symptoms include fatigue, recurrent illness, mood changes and loss of motivation.

JET LAG PREVENTION RECOMMENDATIONS

Pre-Travel

- Get enough sleep before to reduce sleep debt.
- Don't stay up late packing – pre-pack so the night before travel is not stressful.
- Reduce training volume and intensity prior to departure.
- Choose evening departures for long, eastbound flights.
- Arrange a layover if crossing more than 10 time zones.

In-Flight

- Adjust your watch to destination time as soon as you board the plane.
- Keep well hydrated.
- Create a comfortable environment on flight (e.g. pillows, etc.).
- Use eyeshades and earplugs or noise-reducing headphones to reduce stimulation.
- Minimal use of electronic devices.
- In-flight meals should be on destination schedule.
- Sleep should be on destination schedule.
- If sedative used, best if short acting (ask your MD if issues).

Post-Flight

- Scheduled light therapy.
- Scheduled light avoidance.
- Melatonin: 3-5mg 30 minutes before bed for 2-3 nights OR traditional sedative (ask your MD if issues).
- Napping for 30 minutes between 2:00pm-4:00pm.
- Caffeine use just before or upon waking from a nap.
- Reduce volume, intensity, and frequency of training during the first few days.

Interventions	Direction of Travel			
	East		West	
	< 3 Time Zones	≥ 3 Time Zones	< 4 Time Zones	≥ 4 Time Zones
Light	As required: • Mid-morning light exposure (30-60min) • Mid-afternoon light avoidance	Initial 2 days of arrival: • Mid-morning light exposure (30-60min) • Mid-afternoon light avoidance	As required: • Late afternoon light exposure (30-60min) • Late evening light avoidance	Initial 2 days of arrival: • Late afternoon light exposure (30-60min) • Late evening light avoidance
Caffeine	50-200mg as required	50-200mg – mornings upon waking and in the minutes before nap	50-200mg as required	50-200mg – late afternoons and in the minutes before nap

*Note: www.jetlagrooster.com is a great website to plan jetlag interventions.

TRAVELLER'S DIARRHEA

Traveller's Diarrhea (TD) is an infectious diarrhea usually caused by a virus or a bacteria. The diarrhea usually clears on its own in 1-4 days, but you can be infectious for up to 48 hours after diarrhea symptoms clear, and it can spread easily to teammates by poorly washed hands, contaminated countertops, door handles, electronic arm rests, etc. If the TD is moderate to severe, you can develop dehydration and electrolyte imbalance that may affect performance. Immunity to most common viruses lasts up to 3 months.

Whenever travelling, always be careful about consuming contaminated food and water. Diseases from food and water are the leading cause of illness in travellers which can be a significant impediment to performance. To ensure that you compete at your highest level, and do not spend all your time in the bathroom, follow these tips for safe eating and drinking.

PREVENTION OF TRAVELLER'S DIARRHEA

There are things that can be done to reduce the risk of TD. It is not possible to eliminate the risk altogether.

- There are things that can be done to reduce the risk of TD. It is not possible to eliminate the risk altogether.
- In regards to all food: "Boil it, cook it, or leave it."
- Drink only bottled water and make sure you personally crack the seal on any bottle of water you are going to consume. Avoid fountain drinks and ice cubes. If possible use bottled water for brushing teeth.
- Wash your hands frequently with soap or sanitizing agent (with at least 60% alcohol) – especially before eating or drinking.
- Do not eat food from street vendors.
- Caution with buffets – hot food must be kept hot and cold food must be kept on ice.
- Caution with seafood – especially shellfish as it spoils very quickly.
- Fruits and vegetables: "If you can peel, you can eat it." Caution with watermelon as it may be injected with tap water.
- Dukoral oral vaccine taken 2 weeks prior to departure to a developing country reduces your risk of TD and severity of an infection by approx. 25%, but only provides protection for 3 months. The vaccine must be refrigerated. The vaccine and a powdered sodium hydrogen carbonate buffer (comes in a separate package in the kit) are mixed with cool water immediately before taking. The complete immunization requires 2 doses taken at least 1 week apart (can be up to 6 weeks apart) with the last dose taken at least 1 week prior to travel. It is important to remember that the vaccine is not a substitute for good hygiene or taking proper care in selection of food and water.
- Hepatitis A vaccine given as 2 injections, 6 months apart – lasts for life.
- Typhoid vaccine is recommended and should be completed 1-2 weeks prior to travel. You can receive this vaccine by either an oral or an intramuscular injection. Immunity lasts 2 (IM) to 5 (oral) years.



PREVENTION TIPS

- 2 tablets of Pepto-Bismol taken 4 times daily reduces the risk of TD. This should be sampled for a few days prior to any important event or training to ensure it is well tolerated. Side effects include sticky, black stools; dark, stained tongue; and occasional ringing in the ears. These all disappear after Pepto-Bismol is stopped. Avoid if you have the flu or have Aspirin allergy.
- Probiotic (Florastor is a common brand): 1 capsule, twice daily, 3 days before trip, and continued during the length of the trip. Florastor offers some protective effect against TD and has been shown to help treat TD. The side effects are negligible. It is not a prescription medication and can be purchased at most pharmacies in Canada.

ANTIBIOTICS FOR TRAVELLER'S DIAHRREA

Occasionally antibiotics* need to be taken preventatively when travelling to a developing country if a known infection is circulating amongst the team, hotel, and/or dorm, etc. It is not advisable to take antibiotics frequently because of side effects and resistance that can easily develop.

**Use antibiotics only at MD's discretion.*

TREATMENT OF TRAVELLER'S DIARRHEA:

1. Keep hydrated with frequent small sips of oral rehydration fluids up to 1.5L/kg of body weight lost: 1) Ceralyte or 2) Gastrolyte or 3) 500ml Gatorade LowCal + 1 capful Elete or 1/2 scoop Gu Hydration Drink powder or 4) 1 capful of Elete or 1/2 scoop Gu Hydration Drink powder + 2 teaspoons of sugar in 500ml of water.
2. Imodium only if more than 6-8 watery loose stools in 12 hours.
3. One Florastor twice daily.
4. Antibiotics at the physician's discretion.
5. Diet: foods easy to digest with gut upset such as potatoes, rice, oatmeal, bananas, applesauce and toast.
6. Diet: avoid high fat foods, dairy, cola, fruit drink beverages, magnesium and iron supplements, and high fibre foods such as wheat bran, nuts, legumes, and fruit (other than bananas, mangoes, and papaya).

Seek medical attention if you develop a fever over 38.5°C, have bloody stools, have severe abdominal pain, profuse diarrhea, are unable to hold any fluids down for more than 24 hours, or have more than 6 unformed stools per day for 48 hours.

For more info, click the following link at the [Centers for Disease Control and Prevention's website](#).



Canadian Rugby Sevens Player Jen Kish
Photo by Kevin Light

HYDRATION

Hydration states are very individual and change based on exercise duration/ intensity, sun exposure, humidity, air temperature, heat acclimatization, sweat rate, and fluid intake. Loss of fluids and electrolytes through sweat, vomiting, or diarrhea can increase core temperature and impair normal physiological function and performance.

Aerobic and cognitive performance starts to be impaired in some individuals with as little as 2-3% body weight loss during exercise in certain weather conditions, but is better tolerated in the cold. Fluid losses of 3-4% of body weight will further impair strength and anaerobic performance. This level of dehydration will also decrease the ability of the gastrointestinal tract to absorb both fluids and carbohydrates just when you need them the most. Extreme dehydration (> 5%) can cause more serious medical conditions and should be avoided - especially when exercising in the heat. Often, the drive to drink will not kick in until you are already dehydrated, meaning a replacement of only 30-70% of sweat losses. As a result, it is important to develop a plan to ensure optimal hydration to help support daily training and recovery.

Times when fluid requirements are higher	Times to be mindful of your hydration status
Heat	Travel
Humidity	Altitude Training
Hard Training	Surgery
Beginning of Heat Acclimatization	Illness
	Recovery Days

MONITORING HYDRATION STATUS

There are a number of simple ways to monitor your own hydration status:

- Urine Colour: 1) Aim for urine the colour of lemonade or straw. If darker – drink up! 2) **Note:** Taking vitamins with riboflavin will make your urine yellow in colour.
- Weight Change: 1) Measure your body weight before and after training. Every 1kg of weight loss should be replaced by 1.5L of fluid over 3-4 hours after training. 2) **Note:** A 2-3% change in body weight can impair performance!

Using a refractometer, your sport dietitian, physiologist, or physician can also monitor your hydration via urine specific gravity or USG (measure of the concentration of solutes in the urine).

PEE CHART & FLUID REPLACEMENT

	Urine-Specific Gravity	Dehydration Status	Fluid Replacement Plan*
1	< 1.015	Fully hydrated	Maintain normal hydration.
2	≥ 1.015 < 1.020	Borderline dehydration	Maintain normal hydration.
3			
4	≥ 1.020 < 1.025	Mild dehydration	1 tsp. of Elete, 1 NUUN tab or 1 Gu Hydration drink tab in 500mls water, followed by an additional 500mls of any fluid* - drink over 1 hour. Afterward, maintain normal hydration.
5			
6	≥ 1.025 < 1.030	Moderate dehydration	1 tsp. of Elete, 1 NUUN tab or 1 Gu Hydration drink tab in 500mls water, followed by an additional 750mls of any fluid*- drink over 1.5 hours. Afterward, maintain normal hydration.
7			
8	≥ 1.030	Severe dehydration	2 tsp of Elete, 1 NUUN tab or 1 Gu Hydration drink tab in 1L water followed by an additional 1L of any fluid*- drink over 2 hours. Afterward, maintain normal hydration.

*Recommendations above are based on 75kg athletes. Large and lean athletes (> 90kg) will naturally be higher on the USG scale due to large muscle turnover, as compared to lighter athletes (< 60kg) who will be on the lower end. Develop individualized baselines over time.

MEASURING SWEAT LOSS AND SWEAT RATE

- Equipment required: weight scale (accurate to 0.1kg) and timer.
- Measure body weight to nearest 0.1kg (with minimal dry clothing) prior to exercise.
- Measure weight of fluids (water bottle and fluids) to nearest 0.1kg.
- Start timer as exercise begins – drink fluids as per normal.
- Record time at cessation of exercise.
- Take post-exercise body weight (dry body off and change into minimal, dry clothing).
- Measure water bottle and remaining fluids.

Calculation	Sample Calculation
Deficit = (pre-weight – post-weight) x 1000 • Pre-Weight: _____kg • Post-Weight: _____kg • Deficit: _____kg x 1000 = _____mL	• Pre-Weight: 51.0kg • Post-Weight: 50.0kg • Deficit: _____kg x 1000 = 1000mL
% body mass lost = (deficit / 10) / pre-weight	(1000mL / 10) / 51.0kg = 1.96% decrease in body weight
Fluid intake = pre-fluids – post-fluids • Pre-Fluids: _____kg OR mL • Post-Fluids: _____kg OR mL • Fluid Intake: _____kg OR mL	• Pre-Fluids: 1.0kg (OR 1000mL) • Post-Fluids: 0.25kg (OR 250mL) • Fluid Intake: 0.75kg (OR 750 mL)
Sweat loss = deficit (mL) + fluid intake (mL)	1000mL + 750mL = 1750mL
Time = duration = # of minutes / 60 minutes (per hour)	45 minutes / 60 minutes = 0.75 hours
Sweat rate = sweat loss / time	1750mL / 0.75 hours = 2333.33mL per hour -> 2.33L / hour

HYDRATION PLAN

It is important to speak to a sport dietitian or physiologist to set up an individual hydration plan to ensure needs are met. Remember to **practice** the plan during training and adjust as needed.

BEFORE EXERCISE

- Most individuals dehydrate overnight by at least 1L. Keep a water bottle beside your bed to consume fluids as needed during the night.
- Start drinking as soon as you wake up.
- Carry a water bottle with you all the time and sip on water regularly throughout the day.
- Drink at least 500mL of fluid at meals. Consuming drinks with some sodium or eating salty foods can help stimulate thirst and retain fluid consumed.

DURING/AFTER EXERCISE

- Drink during and after training. Set yourself the goal of at least one full water bottle during and after each training session.
- Water is always a great choice; however, sport drinks can be beneficial as they combine fluid, electrolytes (including sodium), and carbohydrates for rehydration and energy.
- Drink cold fluids that you like and experiment with different flavours.
- Cold fluids, or an ice slush, may reduce the rise in core temperature and improve performance in hot environments.

Notes: 1) Low-sodium fluids such as water or juice may switch off your desire to drink before you have fully rehydrated. Plan to drink with your meals for better fluid retention. 2) Be careful not to over-hydrate in the later portion of the day as waking more than once in the night to pee may compromise your regeneration and recovery.

BEST HYDRATION OPTIONS

During training, drink water or sports drinks containing carbohydrate and sodium such as:

- INFINIT Jet Fuel or Eload.
- Gatorade or Gatorade G2 (lower sugar content).
- Water with added Gu Hydration powder or Elete Electrolyte drops.

After training, drink recovery drinks containing carbohydrates, protein, and sodium such as:

- Infinit Revive, Recharge, or Explode.
- Water with a protein and carbohydrate-rich snack or meal.

CONCUSSIONS

Concussions are brain injuries caused by excessive, rapid movement of the brain inside the skull. This movement causes damage that changes how brain cells function. This leads to symptoms that can be physical (headaches, dizziness), cognitive (problems remembering or concentrating), or emotional (feeling depressed). You, your coach, and your IST can use the Pocket Concussion Recognition Tool (page 28) initially to recognize and manage a concussion. The goal is to get you back to your sport as early and safely as possible without long term negative effects on performance and well-being.

If you have suffered a whip lash injury or hit your head and have any of the symptoms below, you may have a concussion. Tell your coach, therapist or physician. You should be removed from training, should seek medical evaluation and should not be left alone nor drive a motor vehicle.

Presence of any of the following signs & symptoms may suggest a concussion:

• Loss of consciousness.	• Dizziness.	• Nervousness or anxious.
• Seizure or convulsion.	• Blurred vision.	• Sadness.
• Amnesia.	• Balance problems.	• Confusion.
• Headache.	• Sensitivity to light.	• Drowsiness.
• "Pressure in head".	• Sensitivity to noise.	• More emotional.
• Neck pain.	• Feeling slowed down.	• Irritability.
• Nausea or vomiting.	• Feeling like "in a fog".	• Difficulty concentrating.
• Difficulty remembering.	• "Don't feel right".	• Fatigue or low energy.

POCKET CONCUSSION RECOGNITION TOOL

Concussion should be suspected if 1 of more of the following visible clues, signs, symptoms, or errors in memory questions are present.

1. Visible clues of suspected concussion

Any one or more of the following visual clues can indicate a possible concussion:

- Loss of consciousness or responsiveness.
- Lying motionless on ground / slow to get up.
- Unsteady on feet/Balance problems or falling over/Incoordination.
- Grabbing/Clutching of head.
Dazed, blank or vacant look.
- Confused/Not aware of plays or events.

2. Signs and symptoms of suspected concussion

- Loss of consciousness.
- Seizure or convulsion.
- Balance problems.
- Nausea or vomiting.
- Drowsiness.
- More emotional.
- Irritability.
- Sadness.
- Headache.
- Dizziness.
- Confusion.
- Feeling slowed down.
- "Pressure in head".
- Blurred vision.
- Sensitivity to light.
- Amnesia.
- Difficulty remembering.
- Difficulty concentrating.
- Sensitivity to noise.
- "Don't feel right".
- Neck pain.
- Nervous or anxious.
- Feeling like "in a fog".
- Fatigue or low energy.

3. Memory function

Failure to answer any of these questions correctly may suggest a concussion:

"What venue are we at today?"
"Which half is it now?"
"Who scored last in this game?"

"What team did you play last week/game?"
"Did your team win the last game?"

Any athlete with a suspected concussion should be IMMEDIATELY REMOVED FROM PLAY and should not be returned to activity until they are assessed for a concussion by someone experienced in this assessment. Athletes with a suspected concussion should not be left alone and should not drive a motor vehicle.

It is recommended that in all cases of suspected concussion the player is referred to a medical professional for diagnosis and guidance as well as return to play decisions, even in the symptoms resolve.

RED FLAGS

If ANY of the following are reported then the player should be safely and immediately removed from the field. If no qualified medical professional is available, consider transporting by ambulance for urgent medical assessment:

- Athlete complains of neck pain.
- Increasing confusion or irritability.
- Repeated vomiting.
- Seizure or convulsion.
- Weakness or tingling/burning in arms or legs.
- Deteriorating conscious state.
- Severe or increasing headache.
- Unusual behaviour change.
- Double vision.

Note: In all cases the basic principles of first aid (danger, response, airway, breathing, circulation) should be followed. Do not attempt to move the athlete (other than required for airway support) unless trained to do so. Do not remove helmet (if present) unless trained to do so.

RETURN TO PLAY GUIDELINES:

If you have had a concussion, you should not return to training/play/competition the same day of the injury. When returning to play, you should follow a stepwise, symptom-limited program under the guidance of your team physician or therapist so that it can be individualized for you and your sport. Symptom-limited means symptoms do not worsen with a given level of physical activity or mental task.

GRADUATED RETURN TO PLAY PROTOCOL:

Rehabilitation stage	Functional exercise at each stage of rehabilitation	Objective of each stage
1. No activity	Symptom-limited physical and cognitive rest	Recovery
2. Light aerobic exercise	Walking, swimming or stationary cycling keeping intensity <70% maximum permitted heart rate. No resistance training	Increase HR
3. Sport-specific exercise	Skating drills in ice hockey, running drills in soccer. No head impact activities	Add movement
4. Non-contact training drills	Progression to more complex training drills (e.g. passing drills in football and hockey). May start progressive resistance training	Exercise, coordination and cognitive load
5. Full-contact practice	Following medical clearance participate in normal training activities	Restore confidence and assess functional skills by coaching staff
6. Return to play	Normal game play	

There should be approximately 24 hours (or longer) at each stage. **If** you have no symptoms at rest and during the activity of a stage, you can proceed to the next stage. Resistance training should only be added in the later stages. Recovery can be enhanced by work with a 'concussion' physiotherapist focusing on neck and inner ear rehabilitation.

Note: While 80%-90% of concussions get better in a 7-10 day period, sometimes they last much longer. If you have had a concussion in the past, it may take longer for you to recover from each additional concussion. Medical clearance must be given before returning to full training and/or competition.

MENTAL PERFORMANCE

WHAT IS MENTAL PERFORMANCE?

- Mental Performance service provision is grounded in the fields of sport, performance psychology, organizational behaviour, and clinical/counselling psychology.
- Mental Performance addresses the psychology of sport performance and plays a key role within the high performance sport environment for all those involved from individual athletes and teams to coaches and support staff.
- Considerable evidence gathered over several decades has demonstrated that a performer's mental state has a vital impact on performance. Training the mind for success is an essential ingredient alongside the physical, technical, and tactical training and preparation to achieve high performance goals in competition.
- Mental Performance is about developing and training your mental approach in the same way that you train your body. Your mind and body need to be in sync as you push toward your limits of physical preparation and exertion in competition.
- Mental training, when incorporated into your overall training program, creates athletes who are mentally tough.

MENTAL PERFORMANCE SERVICE PROVISION

Collectively, Mental Performance consultants and registered counsellors working in sport can provide services in 4 key areas:

1. Optimizing performance environment.
2. Optimizing Mental Performance skills for training and competing.
3. Mental health support and lifestyle wellness.
4. Optimizing leadership performance and organization dynamics.

The aim of Mental Performance service is to educate and support the development and enhancement of mental skill capacity by:

- Identifying individual and team sport-specific needs in mental training.
- Developing and implementing individual and team mental training programs within the overall performance plan.
- Researching and integrating new mental training methods, techniques, and skills.
- Integrating and transferring theoretical/conceptual information into practical applications for the training and competitive environment.
- Supporting individuals in a high performance lifestyle including balancing training and recovery needs with other competitive lifestyle demands.
- Supporting and building productive relationships between athletes, coaches, and IST to optimize performance.

The approach goes beyond dealing with the 'problem' and aims to support and enhance the performance of individuals as a whole person in their training and competitive environments. Mental Performance consultancy also addresses the challenges and factors in decision-making for the demands of life outside of sport which can impact performance.

OPTIMIZING PERFORMANCE THROUGH MENTAL TOUGHNESS

Mental toughness or resilience is a frequently used term. On the day of competition, athletes may refer to their mental toughness as being the deciding factor for optimizing performance. Often, at the highest level, very little physical, technical, or tactical components separate the very best.

Mental toughness can be described as the natural or developed psychological edge that enables you to cope better than your opponents. It can affect training, competition, and life demands as well as help you remain determined, focused, confident, and in control under pressure. Mental toughness consists of 6 key components*:

1. Belief.
2. Motivation.
3. Focus.
4. Handling pressure.
5. Dealing with physical and emotional pain.
6. Lifestyle.

**Adapted from Jones, G., Hanton, S. & Connaughton, D. (2002). What is this thing called Mental Toughness? An investigation of Elite Sport Performers. The Journal of Applied Sports Psychology, 14, 205-218.*



Canadian Sport Institute's staff celebrating after Canada's bronze medal victory in women's rugby sevens at the Rio 2016 Olympics

The following chart describes several of the mental toughness attributes with example skills that the Mental Performance service staff assist athletes with.

The Attributes	The Mental Skills
Self-Belief <ul style="list-style-type: none"> Unshakeable belief in your ability to achieve competition goals Unique qualities and abilities that make you better than your opponents 	<ul style="list-style-type: none"> Daily training and racing logs; "what have I done and how it went". Write down evidence of the things you have achieved that day
Motivation <ul style="list-style-type: none"> Insatiable desire and internalized motivation to succeed Ability to bounce back from performance setbacks with an increased determination to succeed 	<ul style="list-style-type: none"> Effective goal setting in all aspects of your training is key (technical, tactical, physical, mental, lifestyle) Break down challenges into daily efforts
Focus <ul style="list-style-type: none"> Able to switch it on and off as required Not be distracted by competitor's performances Remain fully focused on the task in the face of competition-specific distraction Regain psychological control following unexpected events 	<ul style="list-style-type: none"> Where does your focus go during training and competition? Developing effective self-talk (remaining positive) and re-focusing strategies when distracted Create purpose in every session What do you do during 'down' time?
Handling Pressure <ul style="list-style-type: none"> Thrive on the pressure of competition Accept that anxiety is inevitable in competition and that you can cope 	<ul style="list-style-type: none"> Developing strategies to cope effectively with pressure - mental imagery, physical relaxation, behavioural pre-competition routines and planning as well as effective 're-framing' 'What if' scenario preparation
Dealing with Physical and Emotional Pain <ul style="list-style-type: none"> ...resulting from 'failure' Able to push back or through the pain while still maintaining technique and effort in training and competition Being determined to carry out what you know you have to do 	<ul style="list-style-type: none"> Training for competition; doing more or going harder in training, pushing the limits within your program to prepare for competition Developing your self-awareness; Physically and mentally challenge yourself but avoid long term set backs
Lifestyle <ul style="list-style-type: none"> Managing your personal life Balancing: having other thing(s) to do 	<ul style="list-style-type: none"> Goals and plans to help create the life balance that is best for you Use the people around you for support

For the most part, a Mental Performance session is a coaching session. Specifically, mental training is about training the mind. In other words, in mental training sessions, athletes work on using the mind in a specific way. The Mental Performance service provider will evaluate which 'exercises' or activities match the athlete's mental need(s) and then supervise practice of the mental training exercise providing the athlete with feedback.

The Mental Performance service staff will meet with the athlete in an office, in the field of play, or sometimes over Skype/phone. The athlete may meet with the Mental Performance staff as an individual or as a member of a team. During the session, a number of different activities take place. For example, a communication is exchanged between the athlete(s) and the Mental Performance service provider regarding performance. Specifically, the thoughts, emotions, feelings, and behaviours that contribute toward a past and/or future performance are typically discussed. Other activities include the athlete's practice in mental skill activities to further develop aspects of mental toughness or areas of concern under the supervision of the Mental Performance service staff. A schedule for regular mental skill practice is established between the athlete and the Mental Performance service provider.



ACKNOWLEDGMENTS

Numerous sport science and sport medicine professionals have assisted with the development of this and previous versions of the Athlete Performance Health Handbook. Canadian Sport Institute Pacific would like to thank the following contributors for their valuable time and expertise.

Ashley Armstrong, RD
Dr. Kirsten Barnes, PhD
Susan Boegman, RD
Dr. Hap Davis, MD
Amy Dearden
Lance Doucet
Dr. Heather Finlayson, MD
Jennifer Gibson, RD
Dr. Darren Gray, MD
Rebecca Hall
Dr. Sharleen Hoar, PhD
Dr. Susan Hollenberg, MD
Stacey Hutton, MKin, CEP, Sport Physiologist
Dr. Erik Jaeger, MD
Liz Johnson, MSc, CEP, Sport Physiologist
Dr. Jane Labreche, PhD
Eugene Liang, RMT
Dana Lis, RD
Dr. Paddy McCluskey, MD
Emma McCrudden, RD
Dr. Janet McKeown, MD
Dr. Penny Miller, MD
Wendy Pethick, MSc, CEP, Sport Physiologist
Dr. Bruce Pinel, PhD
Dr. Charles Samuels, MD
Dr. Jeremy Sheppard, PhD
Dr. Gord Sleivert, PhD
Dr. Trent Stellingwerff, PhD
Cristina Sutter, RD
Drew Todd
Noah Wheelock

* Bolded indicates contributors to 2016 version



INSTITUT
CANADIEN
DU SPORT

PACIFIC
SPORT

FUNDING PARTNERS

Canada



viaSPORT
BRITISH COLUMBIA



CANADIAN SPORT INSTITUTE PACIFIC

LOCATIONS

PISE
4371 Interurban Road
Victoria, BC
V9E 2C5

**RICHMOND OLYMPIC
OVAL**
1 Athletes Way
Vancouver, BC
V5Y 0B1

WHISTLER ATHLETES CENTRE
1090 Legacy Way
PO Box 659 Whistler, BC
V01 1B0