



ATHLETE HEALTH & PERFORMANCE
HANDBOOK





AUTHOR'S NOTE

THE PURPOSE OF THIS GUIDE IS TO

1. Make recommendations to optimize your health and maximize your performance.
2. Provide information about common health concerns seen in athletes.
3. Provide nutrition, mental performance and massage therapy information pertinent to the high performance athlete.

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INTRODUCTION

Dear Athletes,

You train innumerable hours a day, nearly every day of the week, and travel to the ends of the earth to prove yourself against the best. You come home with national/world titles, personal bests, and sometimes disappointments... only to do it all over again, day in and day out, month after month, in pursuit of your dream.

Canadian Sport Centre Pacific and the provincial network of PacificSport Centres are committed to providing you with every advantage needed to compete on the world stage. We hope the knowledge you gain from this guide will help advance your abilities and bridge the performance gap from participant to podium.

We are proud to be *Powering Sport Performance* around the province in support of you – British Columbia's future champions.

Wishing you a successful season.

Yours in sport,

Dr. Gord Sleivert

Vice President
Canadian Sport Centre Pacific



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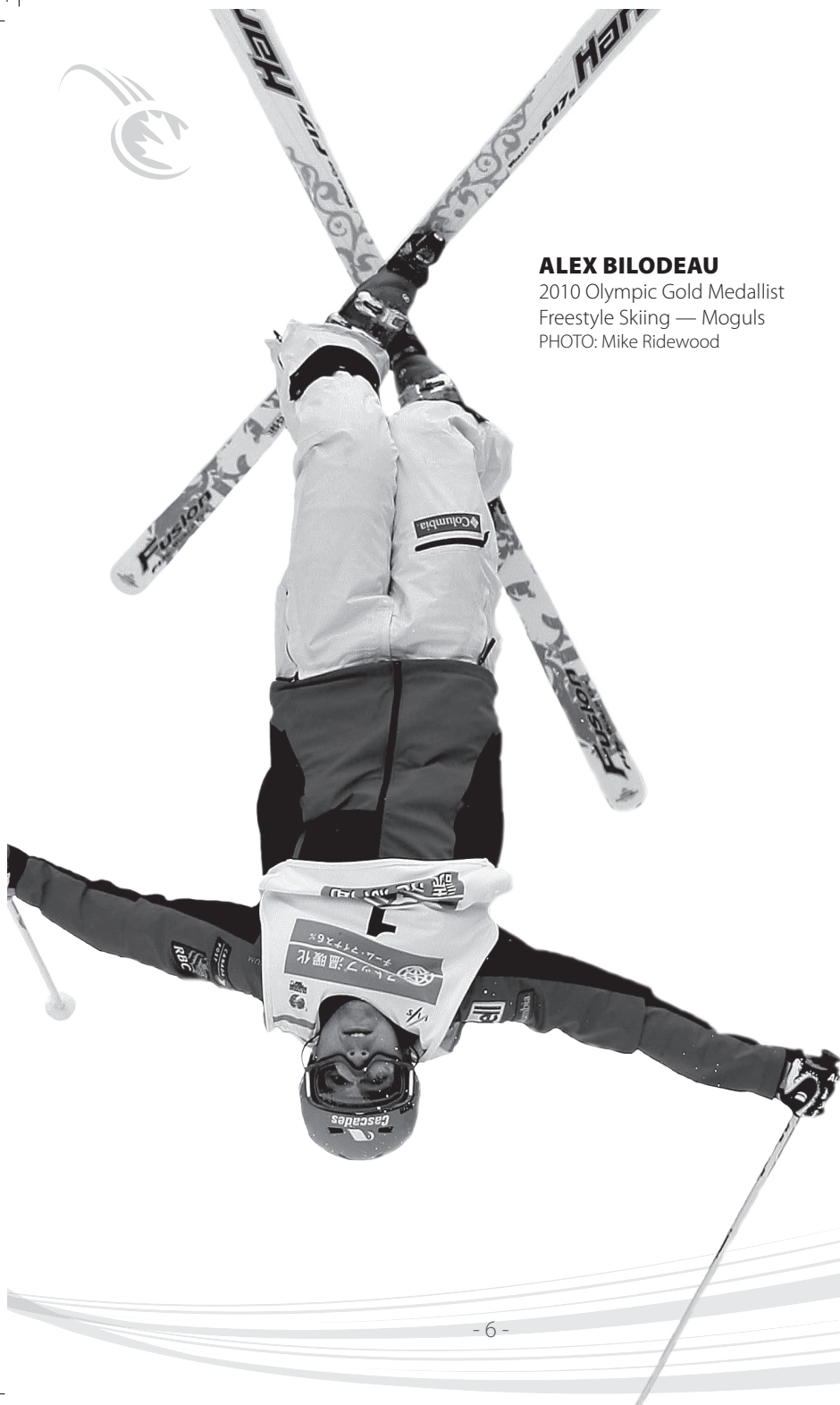
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ALEX BILODEAU

2010 Olympic Gold Medallist

Freestyle Skiing — Moguls

PHOTO: Mike Ridewood



SECTION ONE: STAYING HEALTHY

Dr. Janet McKeown MD, CCFP, Dip. SportsMed

KEEPING HEALTHY

As a Canadian Sport Centre athlete, one of your responsibilities is to stay as healthy as possible. These recommendations will help you to reach optimal health for optimal performance *and* will help keep your teammates healthy.

1. **Cold prevention** — see page 26 for more info.
2. **Vaccines** — keep up to date.
3. **Nutrition** — well balanced, healthy diet and 1000 IU Vitamin D daily. See page 10 for more info.
4. **Hydration** — drink water daily to maintain pale or lemonade coloured urine.
5. **Regular and sufficient sleep with good sleep hygiene** — see sleep information on page 29 of this handbook.
6. **Medications** — ensure you have enough of your routine medications before travelling.
7. **Check ups** — have a medical exam yearly and a dental check up 1-2 times yearly. Please see the note for your physician and the medical exam form at the end of this guide.



REVIEW OF VACCINES NEEDED

Dr. Janet McKeown, Dr. Susan Hollenberg

Below is a list of basic vaccines all athletes should have. You may require more if you are travelling outside North America or Europe. Search the following link for a list of Canadian travel medical clinics:

Canadian Travel Clinics

<http://www.phac-aspc.gc.ca/tmp-pmv/travel/clinic-eng.php>

- **Tetanus & diphtheria** — needed once every 10 years. It is routinely given in school at age 14; due again at age 24. The recommendation now is to include pertussis (whooping cough) once with the booster either at age 14 or 24.
- **Measles, Mumps and Rubella** — Two full MMR vaccines need to be given for those born after 1957. Those born before 1957 have a presumed natural immunity.
- **Chicken Pox/Varicella** — highly recommended if you have never had chicken pox. This will protect you and the team especially when travelling.
- **Hepatitis A** — highly recommended in two doses and good for life (this is not routinely given at school). Hep A is not covered by provincial health care plans.
- **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).
- **Flu shot** — highly recommended yearly to protect you and the team. The flu shot also contains H1N1 protection.
- **Meningitis C** — given routinely in school and recommended if not previously given. Alternatively Menactra is a meningitis vaccine that covers more strains you may be exposed to during international travel. This is not needed for the places athletes normally travel to. Menactra is approximately \$130 and is not covered by provincial health plans.



MEDICAL SCREENING RECOMMENDATIONS

Recommended Medical Screening	Frequency	2011	2012	2013
Medical Exam	Yearly			
Dental Exam	1-2 times/year			
Vaccines				
Tetanus and Diptheria	Every 10 years			
Flu Shot	Yearly			
Measles, Mumps and Rubella (MMR) (2 vaccines, none needed if born before 1957)				
Chicken Pox Vaccine (x2) or had the disease				
Hepatitis A	2 in lifetime			
Hepatitis B	3 in lifetime			
Other travel vaccines given (e.g. Typhoid, Yellow Fever, Dukoral)				



MAINTAINING HIGH QUALITY NUTRITION

Susan Boegman – Registered Sport Dietitian

Maintaining great nutrition is critical to overall health, development and performance. It is the foundation from which you live, train and compete.

POOR EATING: POOR FOUNDATION! GREAT EATING: SOLID FOUNDATION!



Getting nutrition right is a great investment and can help you to:

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

THE INVESTMENT

Planning

Once a week, sit down and plan your meals and grocery list for the week. Creating a weekly menu will ensure you eat well, even when you are tired or have limited time. Include vegetables, fruits, whole grains, lean proteins, yogurt and high quality fats.



MAINTAINING HIGH QUALITY NUTRITION

Look at your training schedule and plan your week

- Travel friendly snack foods that you can eat on the way to, at or from training.
- Leftovers, make ahead meals, or convenience foods like 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 and muscles will thank you. This meal will rev up your metabolism and prevent night-time food feasts.

Plan to eat 5–6 balanced meals, snacks or mini-meals

- **Include carbohydrates for energy and skill** – the more you train the more you need (try fibre rich grains such as quinoa, brown rice, barley, multigrain pasta, sprouted or whole grain breads, steel-cut oatmeal, multi or whole grain cereals, dairy products, legumes and beans).
- **Eat your antioxidants** – vegetables and fruits (any and all).
- **Build and repair with protein** – choose high quality proteins such as eggs, fish, lean beef, bison, chicken, lentils and other dried beans, whey proteins, milk and milk alternates, soy. etc...
- **Don't forget high quality fats** – olives, flax, olive and canola oil, avocado, fish, nuts and seeds, soybeans.
- **Eat healthy food that you enjoy and eat with awareness.** Eating while texting or watching TV may lead to over eating! Unless you are having trouble maintaining a healthy weight or are not growing optimally, eat until *satisfied* rather than *full*.

A WORD ABOUT SWEETS AND FATS

Sweets and sodas are high in carbohydrates but lack nutrients and are a poor substitute for fresh fruit, vegetables or grains. Fruit preserves, dried fruits or dark chocolate get a thumbs up for satisfying a sweet tooth but limit your intake of high fat sweets such as cakes, pies, ice cream, chocolate bars etc.

Fats, oils, and sauces can pack a lot of calories. When growing or in a heavy training phase, these extra calories need to come from carbohydrates and proteins first. Don't overdo it on butter, mayonnaise, cream sauces, or gravies as the energy from these foods can take the place of carbohydrate and protein energy. Put them on the side and use in moderation.



MAINTAINING HIGH QUALITY NUTRITION

SPORT SPECIFIC NUTRITION

Performance eating before, during and after training will provide energy for each session and help you recover optimally, train at your best and prevent illness and injury.

FUELING	BEFORE TRAINING OR COMPETITION	DURING TRAINING	RECOVERY
CARBS	Yes - 1 to 3 hrs before training as per digestive ability.	Yes - if training for 90 mins or longer. 30+ g/hour	Yes - 1 g per kg of body weight within 0-60 mins after training. Can be divided into 2 snacks.
PROTEIN	Yes - a small amount 2-4 hours before training if adequate time to digest.	During weight training only. 10g protein at start of training may help strength gains.	Yes - 10-20+ g for immediate recovery and again in a follow up balanced meal or snack.
FAT	Yes - a small amount 4-6 hours before training if adequate time to digest.	No	A moderate amount after the first hour.
FLUIDS	250-500ml 1-2 hours before	150-300ml every 15-20 minutes or between breaks in training or play. Water if <90 mins.	150% of losses. Approximately 500-750ml within 1 hour.
SAMPLE FOODS	<ul style="list-style-type: none">• Oatmeal or cold, whole grain cereal with milk• Toast & nut butter• Turkey sandwich• Energy/granola bar	Sports drinks such as: <ul style="list-style-type: none">• Infinit Jet Fuel• Eload• Gatorade• gels, etc.	<ul style="list-style-type: none">• Infinit Revive / Recharge• 1% chocolate milk• Smoothie, yogurt+ fruit• Kashi Go Lean or Optimum cereal & milk• Elevate Me/Clif Bar
NOTES	<ul style="list-style-type: none">• Top up energy stores & choose easy to digest.• Eat 1-4 hours before training or competition & experiment with quantity/timing.• Use familiar foods/fluids• Try liquid supplement for pre-race jitters.	Carbohydrates will help keep blood glucose levels up when glycogen depletes. Amounts needed are specific to individuals.	Replenish glycogen stores, repair muscle & tissue, rehydrate. May need more or less carbohydrate or protein depending on weight, body composition goals and training intensity. <i>Eat as soon as possible after training or competition!</i>



MAINTAINING HIGH QUALITY NUTRITION

A WORD ABOUT SPORT FOODS

While sports drinks, bars, and gels have a proven role in improving athletic performance, they are meant for use before, during, and immediately after exercise to help with hydrating, energizing, and recovering. They are not meant as a replacement for eating good quality, real foods. Eat them in moderation.

Hydration

Muscles contract to power an athlete during training and competition. The contractions produce heat that the body must get rid of to avoid overheating. The body produces sweat as a cooling agent which causes a loss of body water.

See page 33 for more information on hydration.

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.



IAN CHAN

Paralympic Bronze & Silver Medallist
Wheelchair Rugby
PHOTO: Bogetti-Smith





SECTION TWO: ANTI-DOPING

Dr. Janet McKeown, Jane Labreche

ASTHMA & EXERCISE INDUCED BRONCHOCONSTRICTION (EIB)

Inhaler Protocol for Athletes

Asthma or 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, these include:

1. The common cold
 2. Pollen & seasonal allergies
 3. Poor air quality (eg. chlorine and it's derivatives , pollution)
 4. Cold dry air
 5. Cat or dog dander
 6. Anti-inflammatory pills
 7. Predisposed history of allergies and eczema or family members with asthma
- 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. Air dry overnight.
 - Each athlete is advised to bring a copy of their TUE approvals to all competitions.
 - If these symptoms are not managed appropriately and controlled through treatment, they can ultimately affect performance.



ASTHMA & EXERCISE

BRONCHODILATORS

Bronchodilators (ventolin, terbutaline, and long acting salmeterol and formoterol) are 'rescue inhalers', also called B₂ agonists. They work to open up the lung's small airways. They are either taken to treat acute asthma symptoms or taken prior to training and competing to prevent symptoms. Their effects start working within 15–30 minutes. Bronchodilators should be recommended by a physician.

- If you require more than five puffs a week (total) to keep wheezing and chest tightness under control on a regular basis, it is *very* important that you see your physician because you may need additional treatment.
- **SIDE EFFECTS:** 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.
- Carry this inhaler with the spacer in your equipment bag at all times.
- Ventolin/Salbutamol and Serevent/Salmeterol **do not require a TUE.** All other B₂ agonists (bricanyl/terbutaline, oxeze/formoterol, maxair/pirbuterol) **do require a TUE.**



ASTHMA & EXERCISE

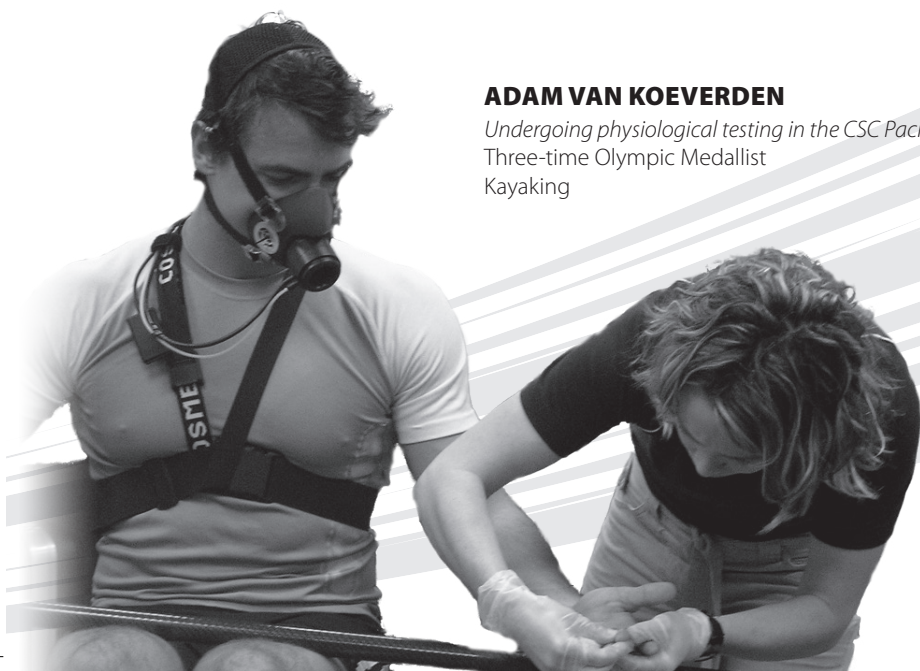
GLUCOCORTICOSTEROID INHALERS

Glucocorticosteroid inhalers work to reduce inflammation in the airways. Inflammation can occur when you have a cold or are repeatedly exposed to triggers mentioned on page 15. These inhalers take up to 14 days to be effective. (These are *not* anabolic steroids and work very differently from them.)

1. Many take this inhaler daily, usually given as one puff morning and evening.
2. If you develop a cold or are travelling to an area with air pollution, or will be exposed to something that triggers your asthma like dogs, cats, or pollens, your MD will direct you how to increase the dose of your inhaler (usually double).
3. These inhalers do not require a TUE form unless used in combination with a bronchodilator that is not permitted, eg. Symbicort.
4. If you have been instructed to take this treatment, it is important to be consistent, taking it daily throughout your competitive season. Inflammation can return by stopping treatment even if only for short periods of time.

ADAM VAN KOEVERDEN

Undergoing physiological testing in the CSC Pacific Lab
Three-time Olympic Medallist
Kayaking





DIURETICS AND MASKING AGENTS

Dana Lis, Jennifer Gibson & Susan Boegman

Masking agents are prohibited. They include diuretics probenecid, plasma expanders (e.g. glycerol; intravenous administration of albumin, dextran, hydroxyethyl starch and mannitol) and other substances with similar biological effect(s).

Diuretics include acetazolamide, amiloride, bumetanide, canrenone, chlorthalidone, etacrynic acid, furosemide, indapamide, metolazone, spironolactone, thiazides (e.g. bendroflume-thiazide, chlorothiazide, hydrochlorothiazide), triamterene, and other substances with a similar chemical structure or similar biological effect(s) (except drospirinone, pamabrom and topical dorzolamide and brinzolamide, which are not prohibited).

Some medications taken for menstrual cramps (eg. Midol) contain diuretics. Diuretics are also commonly used for the treatment of high blood pressure.

Plasma expanders, glycerol, mannitol and dextran are commonly found in foods as an additive and in medication such as cough syrup. Not to worry; the amount found in food and medications is much too low to act as a masking agent so will not cause you to test positive (CCES). For a 60 kg athlete it would take ingesting over 60 pieces of sugar free gum at once to reach the glycerol limit. Mannitol and dextran, although found in foods, are only prohibited if administered intravenously. Eating it will not cause a positive test.

Glycerol, which has been used in the past as part of a hyper-hydration protocol in hot climates is now banned.

To hydrate optimally and eliminate the risk of accidental doping:

- Read the labels of your sports drinks and when travelling, pack your usual drinks/foods with you.
- If you typically use glycerol when training or competing in a hot climate increase your sodium and fluid intake instead.
- Connect with a CSC Pacific Sport Dietitian to design an optimal and individualized hydration protocol.



AVOIDING THE USE OF BANNED SUBSTANCES

Dr. Janet McKeown, Susan Boegman, Dana Lis, Cristina Sutter

WADA

Each year there are changes to the WADA Banned Substance List. It is very important athletes check one of the following online references with *any* new medication taken (prescription or not) to make sure the medication contains no prohibited/banned substances:

2010 WADA Prohibited List

<http://stage.wada-ama.org/en/News-Center/Publications/Prohibited-List>
or contact the Canadian Center for Ethics in Sport: cces.ca

Global Drug Reference Online globaldro.com

(includes Canadian, British or American medications with links to Australian, Irish and South African sites)

Canadian Centre for Ethics in Sport cces.ca

Toll-Free Info Line 1-800-672-7775 (in North America, business days, 09:00-17:00)

Email substanceinquiries@cces.ca (business days, 09:00-17:00)

Anti-Doping Specialists *(Contact CSC Pacific for an introduction)*

Andrea Wooles (Canadian Cycling Association IST Coordinator), Dr. Suzanne La-brecque (Medical Officer), Dr. Janet McKeown (Medical Officer) Cristina Sutter (Sport Dietitian), Susan Boegman (Sport Dietitian) Dr. Ben Sporer (Physiologist)

SUPPLEMENT STRATEGY

There is always a risk of supplements being contaminated with substances that can cause a failed anti-doping test but a sound supplement strategy can help athletes make balanced decisions about which, if any, supplements they should take. Advice around supplement strategies is based on the most recent evidence about which supplements can safely, ethically, and legally support health and performance. Advice should also help athletes avoid accidental positive testing through taking high-risk supplements. **Any athlete considering taking a supplement should check with a Sport Dietitian, Sport Medicine Physician or a Sport Physiologist prior to taking the supplement.**

For details, see supplement listings on the following pages.



AVOIDING THE USE OF BANNED SUBSTANCES

Supplements safe to use in sport are those that have been batch tested through Canadian Sport Centre or have the following NSF certification stamp on the bottle.



Lists of safe products can be found through these websites:

NSF Certified for Sport nsfsport.com

InterActive & INFINIT Custom Fuel Program fuelingcanada.com

HFL Sport Testing Program informed-choice.org

Koelner koelnerliste.com

The **CCES Substance Classification Handbook** applies the WADA list to the Canadian market, and can be downloaded at:
www.cces.ca/pdfs/CCES-PUB-SubstanceClassification-E.pdf

There are two groups of supplements to consider:

- 1. Nutritional Supplements** These will not aid performance unless there is a deficiency in the diet.
- 2. Nutritional Ergogenic Aids** These may improve performance if taken in sufficient quantities, irrespective of the athlete's nutritional status.

One supplement recommended to be taken daily by all athletes to support health and possibly performance is **Vitamin D** (recommended dosage 1000 IU per day, year-round).



AVOIDING THE USE OF BANNED SUBSTANCES

The following is a list of supplements and ergogenic aids used for some athletes in specific situations. They **may** support health and/or performance in these situations and are **NOT PROHIBITED**.

- B-Alanine *
- Caffeine *
- Calcium
- Carbohydrate (glucose polymer) drink
- Cherry Juice (concentrate of Montmorency tart cherries)
- Coenzyme Q10
- COLD-FX (sourced through Canadian Sport Centres)
- Creatine* (when using a tested 'clean' product only)
- Energy bars
- Ferrous sulphate or gluconate**
- Fish Oil (1-3g per day)
- Garlic
- "Greens" products
- Glucosamine Sulphate (maximum dose 1,500mg per day)
- Liquid meal replacement
- Whey protein
- Melatonin***
- Multivitamin and minerals (at doses no greater than 100% RDA)
- Probiotics
- Recovery drinks
- Sodium bicarbonate*
- Sodium citrate *
- Sport drinks
- Vitamin C (maximum 1000mg per day)
- Vitamin B12 (tablets or injection **)
- Vitamin E (maximum 400 IU per day) (only short-term for recovery)

*/**/*** Recommended only for athletes in specific situations. Can cause problems if used incorrectly.

* Only after discussion with Coach & Physiologist.

** Only on the advice of Physician/Dietitian/Physiologist for specific dosages and protocols.

*** Only after discussion with Physician or Sleep Specialist.



AVOIDING THE USE OF BANNED SUBSTANCES

The following is a list of supplements and ergogenic aids used by some athletes. They have no or limited supporting evidence for benefit on health or performance. They are NOT PROHIBITED.

- Beetroot juice (more evidence needed)
- Bee pollen
- Branched chain amino acids (and other free-form amino acids)
- Carnitine
- Chromium picolinate
- Colostrum
- Cordyceps
- Cytochrome C
- Ginkgo biloba
- HMB (contamination with steroids caused an accidental positive in 2008)
- Inosine
- Nitric oxide supplements
- Oxygen boosters
- Pyruvate
- Rhodiola rosea
- Ribose
- ZMA



AVOIDING THE USE OF BANNED SUBSTANCES

THE FOLLOWING PRODUCTS MUST BE AVOIDED

Supplements containing any of the following are very high risk for adverse athlete health and producing a positive doping control test.

THIS IS A QUICK REFERENCE LIST OF HIGH-RISK PRODUCTS. ALWAYS CHECK THE WADA LIST AS WELL (or contact a physician for more information).

- Androstenedione
- Ginseng (except the purified extract, Panax quinquefolius [North American ginseng] used in batch-tested COLD-FX)
- DHEA
- Ephedra
- Geranamine
- 19-norandrostenedione
- 19-norandrostenediol
- Strychnine
- Tribulus terrestris and other herbal testosterone supplements

NOTE: Products that provide a “money-back guarantee” that they are clean are not a good choice – any positive doping test that results will still be valid and you may be



BEN RUTLEDGE

2008 Olympic Gold Medallist

Rowing — Men's 8+

PHOTO: R. Nadler



AVOIDING THE USE OF BANNED SUBSTANCES

CANADIAN CENTRE FOR ETHICS IN SPORT

The information provided below has been taken from the CCES "FAQ Supplements" publication. Please refer to the following website to view the entire document:
www.cces.ca/pdfs/CCES-PUB-SupplementFAQ-E.pdf

Q: Why are there risks of inadvertent doping due to supplements?

A: In many countries, the manufacturing of dietary supplements is not appropriately regulated by the government. This means that supplements can contain prohibited substances. For example, the ingredients on the inside of the bottle may not match those listed on the outside label or package. In some cases, the undeclared substances found in the supplement can include one that is prohibited under anti-doping regulations.



KRISTI RICHARDS

2006 & 2010 Olympian
2007 World Champion
Freestyle Skiing — Moguls
PHOTO: Mike Ridewood



AVOIDING THE USE OF BANNED SUBSTANCES

Q: What is the safest source of supplements?

A: There is always an increased risk of doping when supplements are purchased through non-traditional means such as: the internet, through magazines or directly from a non-licensed supplier. Products purchased from a trusted retailer or directly from a reputable manufacturer are likely to be associated with lower risk of inadvertent doping. If possible, determine if the manufacturer produces anything containing substances from the WADA Prohibited List – if so, there will be a higher risk of cross-contamination.

If you decide to use supplements, you should buy from companies with good reputations who use good manufacturing practices, such as major multinational pharmaceutical companies. During doping control sessions it is vital that you declare all medications, including topical creams and supplements that you are using.



SECTION THREE: HEALTH INFORMATION

Dr. Janet McKeown, Dr. Penny Miller, Cristina Sutter, Susan Boegman, Dana Lis

Prevention of the Common Cold:

- Hand washing before eating/drinking is the most effective way to prevent a cold.
- Avoid sharing towels, water bottles, cups etc.
- Keep your distance (two metres) from people who appear to have a cold or if you have a cold.
- If you cough, do so into your elbow instead of your hands.
- Room sharing may need to be modified if one roommate is ill.
- Vitamin C 250–1000 mg daily, may decrease your risk of getting a cold.
- There may be some benefit to taking COLD-FX daily.

Common Cold symptoms include any of the following:

- Nasal congestion and sneezing
- Cough
- Mild fever (lasting the first 1-2 days)
- Sore throat
- Headache
- Muscle aches

(in contrast to the flu which has a sudden onset of fever, chills, muscle aches, headache and either cough or gut upset)

TREATMENT OF THE COMMON COLD

Extra sleep, rest during the day, plenty of fluids and wholesome food are key to recovering from a cold quickly. If you have cold symptoms, the following medications can be taken for some relief:

For Fever and Muscle Aches

- a. Advil (400-600 mg every 6-8 hrs, as needed with food) OR
- b. Tylenol (1000 mg every 4-6 hours, not to exceed 4000 mg/day)

For Nose and Sinus Congestion

- a. Otrivin Nasal Spray (1-2 times into each nostril every 8-10 hours if needed)
- b. Saline Nasal Spray
- c. Regular/Extra Strength Tylenol Sinus OR Tylenol Cold (2 tablets every 6-8 hours)

For Cough

- a. Robitussin Cough Gels (two capsules every 6-8 hours if needed)
- b. Humidifier in room or run a hot shower in the room



PREVENTION & TREATMENT OF THE COMMON COLD

For Sore Throat

- a. Herbon's Zinc Lozenges OR Jamieson Zinc Lozenges with Vitamin C. These will soothe the throat and may lessen your cold symptoms.
- b. Cepacol Lozenges OR honey. These will soothe the throat.

Cold medications with the active ingredients: phenylephrine, chlorpheniramine, diphenhydramine, DM or guaifenesin are NOT prohibited.

PSEUDOEPHEDRINE IS PROHIBITED IN COMPETITION

You should follow up with a physician if the following symptoms are present:

- Fever above 40°C
- Fever lasting more than three days
- Fever with a rash
- Fever following recent overseas travel
- Fever that starts or returns more than seven days after cold symptoms begin (this may be bronchitis, pneumonia or sinusitis)
- Cold symptoms lasting more than 10 days
- Chest wheezing
- Sudden onset of headache, fever and aches
- If only symptoms are sore throat, fever & aches (this may be a strep throat or mono)

It is not recommended to exercise if you have a fever. It is OK to exercise if you have a cold with no fever.



MASSAGE THERAPY & HIGH PERFORMANCE

Eugene Liang, RMT

What is Massage Therapy?

- Massage therapy is the manual manipulation of soft tissue with the goal of optimizing sport specific range of motion, reducing pain and assisting recovery.
- 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, RMTs can also help facilitate existing rehabilitation or training programs.
- Massage therapy, when incorporated into an overall training program, can assist an athlete to either return to the field of play quicker, or maintain an optimal level of training and competing.

Massage and High Performance

- A massage therapist is a vital role in an Integrated Support Team.
- Focusing on soft tissue health, massage therapists can be a resource for stretching, function and musculoskeletal health.
- As a secondary or paramedical healthcare provider, massage therapists prescribe functional and therapeutic exercises and homecare to assist in an athlete health and performance goals.

Massage Therapy Consultancy and Assessment

The aim of assessment and consultancy with a massage therapist is:

- Identifying individual sport-specific needs in soft tissue injuries and function.
- Developing and implementing individual and team recovery and injury prevention protocols.
- Identify pre-existing soft tissue and functional deficiencies or injuries.
- Applying appropriate modalities to assist the athlete to return to play with minimal intervention.

Working with a massage 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 then be effectively designed and implemented.



SLEEP — BEST PRACTICES FOR ATHLETES

Dr. Hap Davis, Dr. Charles Samuels, Dr. Janet McKeown

Good sleep depends on good sleep habits. Here are a few tips:

- Your sleep progresses in a regular set of stages. Each is important. You can protect the first and longest deep sleep (Core Sleep) by using earplugs or noise reducing headphones when you go to bed with noisy roommates. (This occurs in the first 2-4 hours.)
- Practice a routine of sleeping at the same time every night with 1-2 hours of down time before bed. It's not just getting to sleep that matters; it's getting quality sleep, especially in the first 2 to 4 hours of your sleep period.
- Set up a pre-bed relaxation routine and do this nightly.
- Avoid intake of caffeine within 4 hrs of bed time (coffee, tea, chocolate, pop).
- No or minimal alcohol. Alcohol will have a negative effect on your sleep.
- Avoid workouts within 2-4 hrs prior to bed time.
- Practice cat napping before you travel and see what works for you; try 10, 20, and 30 minute naps. These don't replace long naps.
- Use earplugs/noise reducing headphones and eyeshades when noise and light bother you.
- 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.
- Avoid visualization or race video immediately before sleeping unless you are absolutely sure you sleep well after calming yourself by reviewing your plan.
- E-mail, texting, movies, TV, video games and playing cards can each be arousing and interfere with sleep. Be honest with yourself and assess whether you fall asleep well after these. Usually allow at least 30 minutes between stopping the activity and closing your eyes.
- Keep your room cool and fresh.
- Put your mattress on the floor if you need extra firmness.
- Nap when you need a nap.
- For jet lag, get outdoors in the day to quicken the shift of your circadian rhythm.
- If you cannot sleep at 3 am, 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.
- Never use another athlete's prescription or other sleeping pills. If you occasionally need sleeping pills, try them before travelling so you know how they affect you.
- Talk to your MD/team MD if you simply cannot fall asleep, wake up or continue to have difficulty sleeping.
- Your MD/team MD can help you with a safe sleeping medication if needed.



TRAVELLER'S DIARRHEA

Dr. Janet McKeown, Dr. Susan Hollenberg, Dana Lis, Cristina Sutter, Susan Boegman

RECOMMENDATIONS FOR COMPETITION AND TRAINING CAMPS

Traveller's Diarrhea (TD) is an infectious diarrhea usually caused by a virus or a bacteria. The diarrhea usually clears on its own in 1-2 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 and contaminated counter tops, door handles, 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 three months.

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.

Use the following tips to reduce your risk of getting TD:

1. "Boil it, Cook it or Leave it"
2. Drink purified water or commercially bottled beverages (with seal intact) and pasteurized milk.
3. Wash your hands frequently with soap or a sanitizing agent, especially before eating or drinking.
4. Do not eat food from street vendors.
5. Caution with buffets. Hot food must be kept hot and cold food must be kept on ice.
6. Caution with seafood, especially shellfish as it spoils very quickly.
7. Fruits and vegetables: "If you can peel it, you can eat it" (caution on watermelon as it may be injected with tap water!)
8. Dukoral oral vaccine taken two weeks prior to departure to a developing country reduces your risk of TD and severity of an infection by approximately 25%. It only provides protection for three months.
9. Hepatitis A vaccine given as two injections six months apart.
10. Typhoid Vaccine is recommended for some destinations.



TRAVELLER'S DIARRHEA

Prevention Tips

1. Two tablets of Pepto-bismol taken four 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 is stopped. Avoid if you have the flu or have an Aspirin allergy.
2. Florastor, a probiotic: one capsule twice daily, three days before trip, continued during the length of the trip. Florastor offers some protection 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.
3. Occasionally antibiotics need to be taken preventatively when travelling to a developing country if a known infection is circulating amongst the team/hotel/dorm etc. It is not advisable to take antibiotics frequently because side effects and resistance can easily develop.

Treatment of Traveller's Diarrhea (see flow sheet on next page)

1. Keep hydrated with frequent small sips of oral rehydration fluids up to 1.5 L per kg of body weight lost (see hydration section): 1. Ceralyte or 2. Gastrolyte or 3. 16 oz Gatorade LowCal + Elete filled to tip of cap or 4. one capful of Elete + 2 teaspoons of sugar in 16 oz of water.
2. Imodium if more than 6-8 watery, loose stools in 12 hours.
3. Florastor twice daily.
4. Antibiotics at the physician's discretion.
5. Diet: if you have an upset gut, choose foods easy to digest such as potatoes, rice, oatmeal, bananas, applesauce and toast.
6. Diet: Avoid high fat foods, dairy, high fibre foods such as wheat bran, nuts, legumes, fruit (other than bananas, mangoes, papaya), cola or fruit drinks.
7. Supplements: avoid magnesium & iron.

SEEK MEDICAL ATTENTION if you experience:

- fever over 38.5 °C
- bloody stools
- severe abdominal pain
- profuse diarrhea
- are unable to hold any fluids down for more than 24 hours
- experience more than six unformed stools a day during 48 hours



TRAVELLER'S DIARRHEA — FLOW SHEET

Travelling to a Developing Country

Travelling to a Developed Country

Prevention Recommended

Dukoral Oral Vaccine + Hepatitis A Vaccine

Optional: **Florastor** (1 tablet twice daily) and/or
Pepto-Bismol (2 tablets 4 times daily)

If TD symptoms develop (diarrhea, bloating, gut cramps)

- **Hydration** frequent small sips of oral rehydration fluids (see page 35)+
- **Imodium** two 2mg tablets initially and 1 tablet after each BM if number of BMs interfering with competition or training +
- (Optional) **Pepto-Bismol** 2 tablets 4 times daily +
- (Optional) **Florastor** 1 capsule twice daily for 3-5 days +
- *At MD's discretion:* **Azithromycin** (500mg/day 1 then 250mg/day until diarrhea stops or **Ciprofloxacin** (500mg twice daily until diarrhea stops)

If you experience fever over 39°C OR blood in stool OR are unable to hold any fluids down for more than 24 hours

SEEK MEDICAL ATTENTION



HYDRATION

Dr. Janet McKeown, Susan Boegman, Dana Lis, Cristina Sutter

Hydration states vary with training, racing, sun exposure, humidity, air temperature, heat acclimatization and fluid intake. Loss of fluids and electrolytes through sweat, vomiting or diarrhea can increase core temperature, impair normal physiologic function and performance. Dehydration is one of the main reasons an athlete will feel fatigue when training or competing and staying hydrated is critical for both performance and recovery, especially in the heat.



Freestyle skier Eddie Hicks hydrates during at lactate test in the CSC Pacific performance lab.

Aerobic and cognitive performance is impaired with a fluid loss of 2-3% of body mass in warm weather conditions but is better tolerated in cold weather conditions. Strength and anaerobic performance is also impaired with fluid loss. 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 can cause more serious medical conditions.



HYDRATION

DEHYDRATION PREVENTION

Fluid and sodium losses vary considerably between athletes with sweat and sodium losses higher in hot, humid conditions. Your drive to drink will not kick in until you are already dehydrated and thus athletes typically replace only 30–70% of sweat losses. As a result, it is important to follow a hydration plan that includes when and what you will drink through the day to ensure optimal hydration.

Making it Happen — Sample Hydration Plan

- Start drinking as soon as you wake up.
- Plan for a beverage at each meal and snack.
- Carry a water bottle and sip fluids throughout the day – refill if necessary.
- Drink during and after training – set yourself the goal of at least one full water bottle during and after each training session.
- If your urine looks like lemonade you are doing a good job. Darker? Drink up!
- FYI – taking vitamins with B12 will make your urine yellow in colour.

Assessment of your hydration status is determined by:

1. Morning body weight after urinating.
2. Urine specific gravity with 1st urine of the morning. See chart on next page.
3. Other tests by a physician if severely dehydrated.



HYDRATION CHART & OPTIONS

Monitor hydration status daily with your physiologist, dietitian or physician to ensure you are consistently fully hydrated. If not, add fluids as per below.

Hydration Status w/ Urine Specific Gravity	Amount to Drink	Best Fluid Options
Fully Hydrated <1.015	Keep up the good work!	All fluids are ok
Mild Dehydration 1.015 – 1.020	Maintain routine hydration + 500 ml/d	All fluids are ok. Aim to drink fluids with meals and between meals. Lightly salty food.
Moderate Dehydration 1.021 – 1.030	Maintain routine hydration + 1000 ml/d	Fluids with meals. Choose sports drinks and salty food or use Elete electrolytes.
Severe Dehydration > 1.030 Seek medical attention if distressed.	Maintain routine hydration + 1500 ml/d	Fluids with meals. Choose sports drinks and salt food or use Elete electrolytes.

***Low sodium fluids such as water or juice may switch off your desire to drink before you have fully rehydrated.**

BEST HYDRATION OPTIONS

During training: Water or sports drinks containing carbohydrate and sodium such as:

- Infinit Jet Fuel or Chill
- Gatorade or Gatorade G2 (lower sugar content)
- Pure Sport Workout or Eload

After Training: Recovery drinks containing carbohydrates, protein & sodium such as:

- Infinit Revive or Recharge
- Pure Sport Recovery
- Water with protein and carbohydrate food
- Cerasport

With Vomiting or Diarrhea: see Traveller's Diarrhea treatment section on page 30.



CONCUSSIONS

Dr. Janet McKeown, based on Thinkfirst.ca guidelines (current standard of care)

If you have suffered a whip lash injury or hit your head and have any of these symptoms, you may have had a concussion. Tell your coach, therapist or physician immediately. You should be removed from training, should seek medical evaluation and should not be left alone nor drive a motor vehicle. Prompt identification and attention to 'return to play guidelines' will enable you to recover and return to your sport safely.

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

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



CONCUSSIONS

Signs to watch for:

If you've had a concussion, problems could arise over the first 24-48 hours. You should not be left alone and must go to a hospital at once if you:

- Have a headache that gets worse
- Are very drowsy or can't recognize people or places
- Have repeated vomiting
- Behave unusually or seem confused
- Are very irritable
- Have seizures (arms and legs jerk uncontrollably)
- Have weak or numb arms or legs
- Are unsteady on your feet; have slurred speech

Return to 'Play' Guidelines

Athletes should not be returned to train/play the same day of injury. When returning athletes to play, they should follow a stepwise symptom-limited program, with stages of progression. For example:

1. Rest until asymptomatic (physical and mental rest)
2. Light aerobic exercise (e.g. stationary cycle)
3. Sport-specific exercise
4. Non-contact training drills (start light resistance training)
5. Full contact training after medical clearance
6. Return to competition (game play)

There should be approximately 24 hours (or longer) for each stage and the athlete should return to stage one if symptoms reoccur. Resistance training should only be added in the later stages.

MEDICAL CLEARANCE MUST BE GIVEN BEFORE RETURN TO FULL TRAINING AND/OR COMPETITION.



MENTAL PERFORMANCE MAXIMIZED

Dr. Kirsten Barnes, Dr. Bruce Pinel

What is Mental Performance?

- 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 towards your limits of physical preparation and exertion in competition.
- Mental training, when incorporated into your overall training program, creates athletes who are mentally tough.

What is Mental Toughness?

- Mental toughness is a frequently used term. On the day of competition, athletes may refer to their mental toughness as being the deciding factor. 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 effect training, competition and life demands as well as help you remain determined, focused, confident and in control under pressure. Mental toughness consists of six key components: belief, motivation, focus, handling pressure, dealing with physical and emotional pain and lifestyle (Jones et al., 2002).



MENTAL TOUGHNESS ATTRIBUTES & SKILLS

THE ATTRIBUTES	THE MENTAL SKILLS (what you can do)
Self Belief <ul style="list-style-type: none">• Unshakable 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 & 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 & 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 setbacks.
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.

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.



MENTAL PERFORMANCE CONSULTANCY

The aim of mental performance consultancy is to appropriately educate and support the development and enhancement of mental skills to increase mental toughness 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.

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.

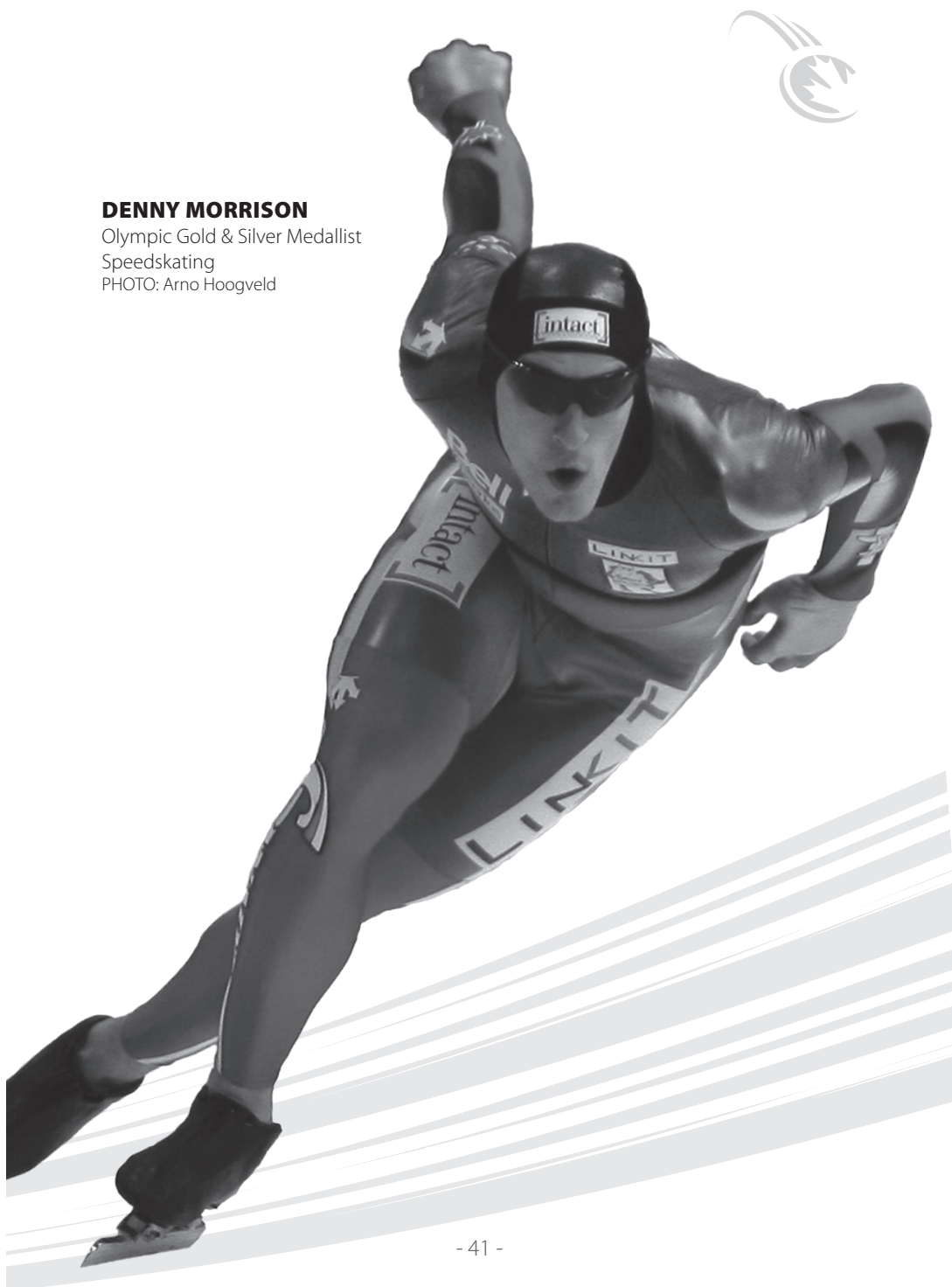
For more information visit the Mental Performance section of the CSC Pacific website.

DENNY MORRISON

Olympic Gold & Silver Medallist

Speedskating

PHOTO: Arno Hoogveld





APPENDIX

ACCESSING A SPORT MEDICINE PHYSICIAN

Finding an accessible physician who understands your sport and athletic aspirations can be a challenge. A family physician (MD CCFP), especially one with a Diploma in Sport Medicine (DipSportsMed), can be your gateway to accessing routine medical care, sport-specific health screening and specialist care. By establishing your health care under such a physician in your home-based community or a physician in two home based communities, you will lay the foundation for optimal medical care.

To find a physician (or other health care provider) in your BC community, go to:

Sport Med BC Practitioner Directory (sportmedbc.com/directory.php)

Schedule an appointment once a year to go over a medical screening assessment; best done during your down season. This is done to screen for things that may affect your health and your performance. See the documents at the back of this handbook for a copy of this assessment (pages 1,3,4 for those athletes without a disability, pages 1-4 for athletes with a disability). Page four, with your permission only, goes back to your Team Manager. The other pages stay with your physician and are kept confidential.

All provinces across the country accept health cards from other provinces except Quebec. If you are using a Quebec health card in BC, you will be asked to pay for your care and then submit your receipts to RAMQ.



APPENDIX

WHAT TO EXPECT FROM YOUR FAMILY & SPORT MEDICINE PHYSICIAN

Appointments for routine illnesses

1. Annual sport screening assessment (some MDs will charge a fee).
2. Annual screening blood work if deemed necessary by your physician.
3. Referral to specialists if needed (eg. Orthopaedic surgeon).
4. Referral to physiotherapist, massage therapist, chiropractor, acupuncturist.
5. Vaccines for most routine travel. Travel to developing countries may require you to follow up at a specific Travel Medical Clinic.
6. Respect of your confidentiality as with any physician.

What your physician may provide

1. Same day appointments.
2. Phone or email rapport with your coach or team manager regarding certain medical conditions with your permission.
3. Phone or email access for urgent concerns.
4. Assist in expediting referral to a specialist.
5. Assist in expediting imaging such as CT, ultrasound or MRI if appropriate.

What your physician expects from you

1. Provide a contact phone number for your MD or specialist to contact you including when you are out of town.
2. Cancel appointments when not able to make them.
3. Bring your health card to each medical appointment including when getting blood work done.

THE FOLLOWING PERFORATED PAGES WILL BE HELPFUL WHEN ATTENDING MEDICAL EXAMINATIONS:

1. Physician Introductory Letter for PPE for CSC Pacific Athletes.
2. Pre-participation history and medical exam evaluation form.
This form is based on the ACSM Evaluation Form.

Please detach each form and fill in prior to your appointment.