SPORTS NUTRITION

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Objectives

- Macronutrient Requirements
- Nutrient Deficiencies
- Special Diets
- Performance Enhancing Supplements
- Naturopathic Medicine

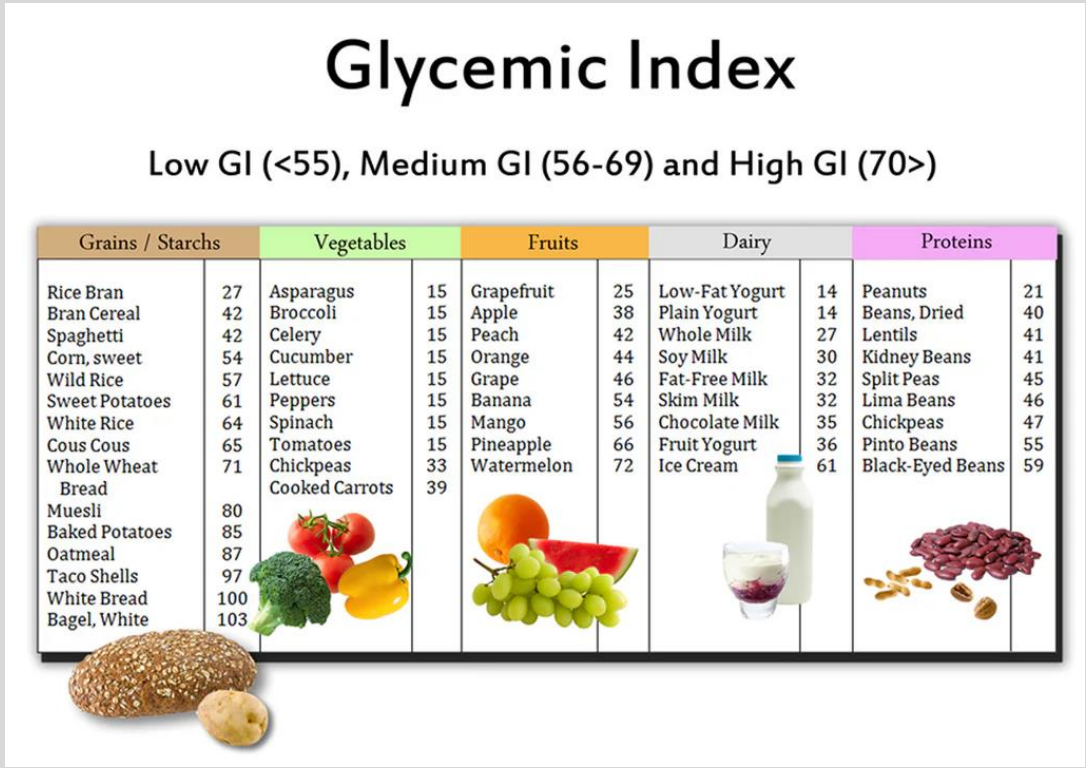
MACRONUTRIENT REQUIREMENTS

Carbohydrates

- Acceptable Macronutrient Distribution Range (AMDR)
  - 45-65% of daily calorie requirements
  - <25% of total calorie intake from refined sugars
- Role in Performance
  - Ideal for higher intensity, shorter duration
  - Quickest fuel source, but limiting factor for endurance performance
  - Prevents fatigue onset
- Dose
  - Consume 30-60 g of moderate glycemic index foods, 2-3 hours before competition. Take at a 2:1 or 1:1 ratio of carbs to protein, and with 500-1000 mL of water.
  - Within a 2-hour window after exercise, consume a meal with 100 g of carbs and 40 g of protein to muscle glycogen and improve rate of recovery.

Carbohydrates

- Glycemic Response to Carbohydrates
  - With high glycemic load foods, blood glucose will spike rapidly, leading to a release of insulin, and drop blood sugar levels below fasting ranges, causing “rebound hypoglycemic.”
  - Symptoms include insulin resistance and weight gain, chronic inflammation, increases CVD risk
  - With low glycemic load foods, the glucose spike is lower and slower, having positive impacts of satiety, glycemic control, insulin sensitivity, and thus weight management; improves blood pressure and cholesterol levels; and reduces the risk of disease (heart disease, stroke, T2D).



Fat

- Acceptable Macronutrient Distribution Range (AMDR)
  - 20-30% of daily calorie requirements
- Role in Performance
  - Unlimited source of fuel
  - Unsaturated fatty acids promote reduction in LDL-cholesterol
  - Improves cardiovascular health and reduces blood pressure
  - Supports cognitive function, mental clarity, and focus

Fat

- According to Health Canada, general guidelines suggest
  - 2-3 tbsp of unsaturated fat daily
  - 2 servings of fish weekly
  - Minimize saturated and trans fats
- Recommended Dietary Allowance (RDA)
  - 19-50 years of age: men 17 g/d; women: 12 g/d
  - >50 years of age: men 14 g/d; women: 11 g/d
- Dose
  - Take 2-3 g/d of omega 3 FA.

Protein

- Acceptable Macronutrient Distribution Range (AMDR)
  - 10-35% of daily calorie requirements
- Role in Performance
  - Improves repair and recovery
  - Increases muscle hypertrophy (anabolic effect)
  - Improves immunity
- Recommended Dietary Allowance (RDA)
  - 0.8 g of protein per kg of bodyweight – to maintain basal metabolic functioning
  - 1.2-1.4 g/kg – endurance athletes
  - 1.4-1.7 g/kg – strength athletes

Protein

- Essential Amino Acids
  - Phenylalanine
  - Valine
  - Threonine
  - Tryptophan
  - Isoleucine
  - Methionine
  - Histidine
  - Leucine
  - Lysine
- Nonessential Amino Acids
  - Alanine
  - Arginine
  - Asparagine
  - Aspartate
  - Cysteine
  - Glutamate
  - Glutamine
  - Glycine
  - Proline
  - Serine
  - Tyrosine

NUTRIENT DEFICIENCIES

Dehydration

- Mild Dehydration
  - Dry lips and mouth (common in sports due to mouth breathing)
  - Thirst
  - Low urine output
- Moderate Dehydration
  - Very dry mouth
  - Thirst
  - Sunken eyes
  - Tenting of skin
  - Low or no urine output
- Severe Dehydration (requires immediate hospitalization)
  - Blue lips
  - Cold hands and feet
  - Lethargic
  - Rapid and weak pulse, rapid breathing

Dehydration

- According to the American College of Sports Medicine, as little as 1% loss of body weight (i.e. 1.5 lbs in a 150 lb individual) can impact mental and physical performance by significantly reducing blood volume and disrupting electrolyte balance. Greater than 2% body weight loss increases the risk of nausea, vomiting, diarrhea, and gastrointestinal upset .
- Symptoms
  - Reduced endurance and strength
  - Impaired fine motor skills
  - Impaired mental alertness
  - Increased work effort perception
- Check In
  - Take weight before and after workouts (particularly in extreme heat)
  - Urine should be clear to pale yellow (not dark yellow)

Dehydration

- Recommendation
  - Consume 1.5 L of water for every kg of body weight lost during post-training/competition
  - Meals post workout generally compensate for lost electrolytes during a workout, although endurance events (>90 min) will require an increase of 1 g of sodium per hour to compensate for electrolyte imbalance
  - Generally, aim for a daily water intake of at least 2-3 L; add lemon or a pinch of salt for extra flavour, electrolytes, and improved water absorption

- Homemade Electrolyte Replacement
  - 1 ½ cups water
  - ¼ or ½ lemon, juiced
  - 1 tsp of honey or maple syrup
  - ¼ tsp baking soda
  - ¼ tsp sea salt

Iron

- Role in Performance
  - Essential for hemoglobin and energy production
  - Essential for oxygen transport
  - Important for bone marrow, muscle, and organ function

- Symptoms
  - Chronic fatigue
  - Frequent injuries
  - High exercise heart rate
  - Irritability
  - Loss of endurance
  - Low immunity
  - Low power output

Iron

- Why are endurance athletes more prone to iron deficiency?
  - Dietary iron recommendations are 1.3 to 1.7 times higher for endurance athletes than non-athletes. The body adapts to a high training load by increasing the total amount of RBCs and the accompanying need for more iron.
  - Increased body temperature associated with exercise or muscle contraction acidosis can damage RBC.
  - There is also a phenomenon called “foot-strike hemolysis”, where repeated jarring foot-strikes can physically break down RBCs.
  - Additional contributing factors are heavy sweating, minor gastrointestinal bleeding from intestinal lining damage (common with strenuous exercise) and menses.
- Testing
  - <15 ug/L: diagnostic of iron deficiency
  - 15-30 ug/L: probable iron deficiency
  - >30 ug/L: iron deficiency unlikely
  - >100 ug/L: normal iron stores
  - >600 ug/L: consider test for iron overload

Iron – Heme Sources

- Dietary Sources
  - Beef or chicken/turkey
  - Canned sardines in oil
  - Clams, mussels, or oysters
  - Halibut, haddock, perch, salmon, or tuna
  - Ham
  - Veal
- Recommendation
  - Take 1 capsule (10 mg) 1-3 times daily
  - Preferred choice
  - Better absorbed and fewer side effects than iron salts

Iron – Non-Heme Sources

- Dietary Sources
  - 1 cup of cooked beans
  - 1 oz of pumpkin, sesame, or squash seeds
  - 1/2 cup of canned lima beans, red kidney beans, chickpeas, or split peas
  - Medium baked potato, stalk of broccoli, or green pepper
  - 1 cup of spinach
  - 1 oz of peanuts, pecans, walnuts, pistachios, roasted almonds, roasted cashews, or sunflower seeds
  - 1/2 cup of dried apricots, seedless raisins, peaches, or prunes
  - 1 cup of cooked enriched egg noodles, pasta, or rice
- Recommendation
  - Take 1 capsule (25 mg) 1-3 times daily of ferrous bisglycinate chelate, with vitamin C, and away from calcium and caffeine, for better absorption
  - Ferrous fumarate, ferrous sulphate, and ferrous gluconate
  - Poorly absorbed
  - Side effects include nausea, cramping, constipation, and diarrhea

Magnesium

- Role in Performance
  - Involved in hundreds of essential metabolic reactions, including metabolism of carbs, fats, protein, and energy synthesis
  - Assists with buffering lactic acid and promoting recovery
  - Reduces heart rate and carbon dioxide production during intense exercise
  - Elevates testosterone levels and muscle strength
  - Enhances peak oxygen uptake and total work output
  - Improves cardiovascular efficiency
- Symptoms
  - Delayed onset muscle soreness (DOMS)
  - Disrupted recovery and sleep
  - Immune system depression
  - Inadequate force production
  - Muscle cramping
  - Potentially, heart arrythmias during intense exercise

Magnesium

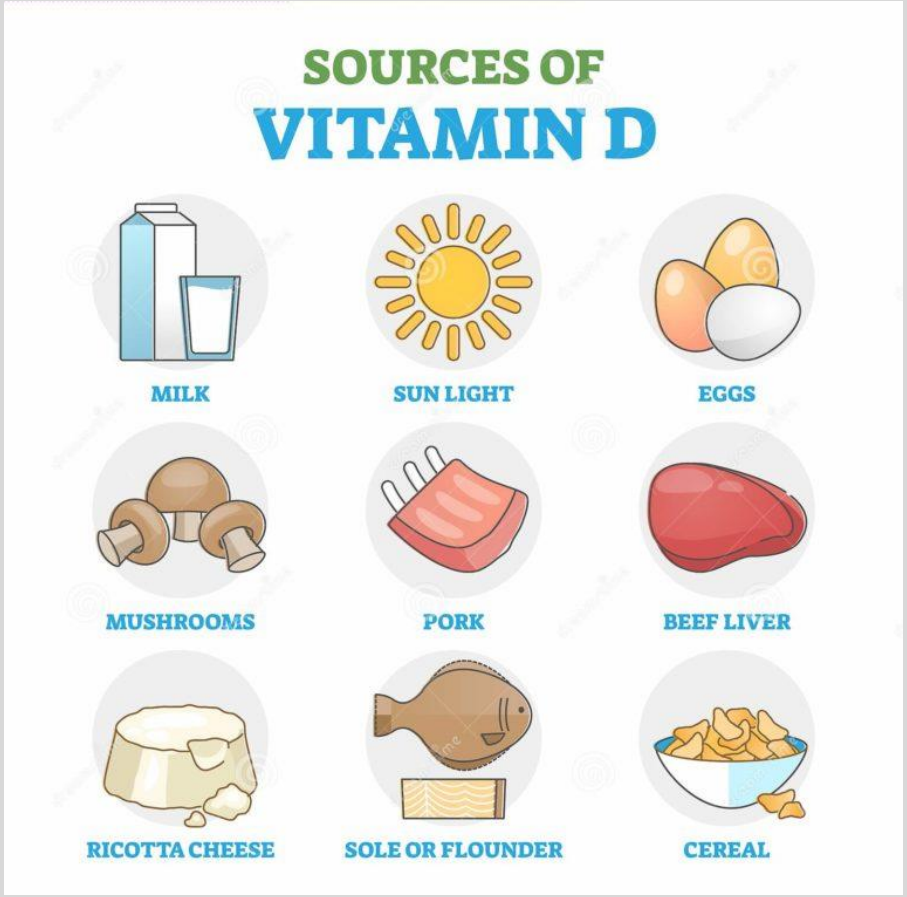
- Dietary Sources
  - Nuts and seeds
  - Vegetables
  - Whole grains
- Recommended Dietary Allowance (RDA)
  - 200 mg/d for ages <10 years, and 400 mg/d for ages >10 years
- Dose
  - Oral magnesium bisglycinate daily (450-750 mg)
  - Transdermal magnesium sulfate (Epsom salt) baths (2-4 cups in warm water)
  - Topical magnesium chloride for localized applications

Vitamin D

- Role in Performance
  - Researchers suggest that 135 nmol/L of vitamin D is associated with peak athletic performance
  - Vitamin D receptor (VDR) in muscle tissue provides a direct pathway for vitamin D to support skeletal muscle structure and function
  - Important for inflammation reduction, mood regulation, and energy levels
  - Increases the number and size of Type II (fast twitch) muscle fibers when deficiency is corrected
  - Plays crucial role in regulating calcium and phosphate levels supporting bone health and the immune system
- Risk Prevention
  - Cancer
  - Cardiovascular Disease
  - Cognitive Impairments
  - Hypertension
  - Influenza
  - Major Depressive Disorder
  - Multiple Sclerosis
  - Type II Diabetes

Vitamin D

- Symptoms
  - Bone pain
  - Arthralgias or myalgias
  - Fatigue
  - Muscle twitching (fasciculations) and weakness
  - Fragility fractures leading to osteoporosis
  - Irritability and mood disorders
- Dietary Sources
  - Salmon, herring, sardines
  - Cod liver oil or canned tuna
  - Egg yolks
  - Mushrooms
  - Fortified milk, soy milk, orange juice, cereal, or oatmeal



Vitamin D

- Testing
  - Upper limit linked to toxicity: 25-hydroxyvitamin D >50 ng/mL
  - Adequacy for bone and overall health: 25-hydroxyvitamin D >20 ng/mL
  - Mild deficiency: 25-hydroxyvitamin D <20 ng/mL
  - Moderate deficiency: 25-hydroxyvitamin D <10 ng/mL
  - Severe deficiency: 25-hydroxyvitamin D <5 ng/mL
  - Test vitamin D in early spring, when levels are at their lowest

- Recommendation
  - Recommended dietary allowance (RDA): 600 IU/d (15 mcg) for females and males aged 1-70 years
  - Take 1000 IU/d with food (fat) to raise serum levels 10 nmol/L over 3 months.
  - If athletes' level is <30 ng/mL, take 6000 IU/d for 8 weeks.

Zinc

- Role in Performance
  - Assists with wound healing
  - Reduces inflammation and improves immunity
  - Cofactor in testosterone production, thus improving muscular strength
  - Endurance athletes who avoid meat products, restrict fat intake, or limit calorie consumption, will likely be deficient
  - Increases appetite in those suffering from relative energy deficiency in sport (REDS) or an eating disorder
  - Lost in sweat
- Recommendation
  - Recommended dietary allowance (RDA): 5 mg/d for ages 4-8 years, and 10 mg/d for ages 9-18 years
  - Take 25-50 mg/d for maintenance, or 75-100 mg/d during acute infections

SPECIAL DIETS

Dairy-Free Diet

- Definition
  - Dairy sensitivity either caused by a milk allergy (IgE mediated) or lactose intolerance (IgG mediated), which is the insufficient production of lactase enzyme.
- Symptoms
  - Allergy – Shortness of breath, swelling, hives, anaphylaxis (life threatening)
  - Intolerance – Bloating, gas, digestive upset, diarrhea
- Avoid
  - Milk, yogurt, cheese, butter

Dairy-Free Diet

- Recommendation
  - Limit lactose-containing foods and drinks
  - Take lactase enzyme supplements
  - Eat calcium-rich foods like leafy greens, broccoli, soybeans, and some seafood
  - Supplement with calcium, vitamin D3, and vitamin K2

Gluten-Free Diet

- Definition
  - Grain food consumption is a trigger of gluten related disorders: celiac disease, non-celiac gluten sensitivity (NCGS) and wheat allergy.
  - Gut permeability naturally increased with exposure to heat and during intense exercise. Anyone with a gliadin sensitivity can increase this permeability.
  - Theoretically performance should be enhanced by minimizing inflammation, preventing leaky gut, and increasing nutrient absorption.
  - Due to caloric and carbohydrate needs, many athletes will get more gluten in 1 day, than a non-athlete consumes over a 3-day period. At the very least, every athlete could probably benefit from reducing gluten content in diet.
- Symptoms
  - Bloating, gas, digestive upset, diarrhea
- Avoid
  - Barley, bulgar, couscous, rye, semolina, wheat

Gluten-Free Diet

- Recommendation
  - Sweet potatoes, yams, winter squash (such as acorn), other root veggies
  - Quinoa, GF oats, whole-grain rice and wild rice blends
  - Muffins and other baked goods made from nutrient packed gluten-free grains (look for amaranth, buckwheat, sorghum, or teff flours)
  - Dried fruit
  - Legumes

Vegan/Vegetarian Diet

- Definition
  - Includes fruits, vegetables, whole grains, nuts, seeds, legumes, herbs, and spices
  - Avoids red meat, poultry, fish, eggs, and dairy products
  - Common mistakes: not eating enough calories, or whole plants, and consuming increased ultra-processed foods

Vegan/Vegetarian Diet

- Risks
  - Nutritional deficiencies include protein, iron, omega-3s FAs, vitamin B12, vitamin D, calcium, and zinc
  - Cause abnormal hormones in compensation for dietary inadequacy
  - Progress to anemia, causing fatigue, dizziness, difficulty breathing, and arrythmias
  - Progress to higher fracture risk and osteoporosis

- Benefits
  - Reducing the risk of cancer, heart disease, stroke, and diabetes
  - Improving gut microbiome
  - Lowering cholesterol
  - Stabilizing blood sugar

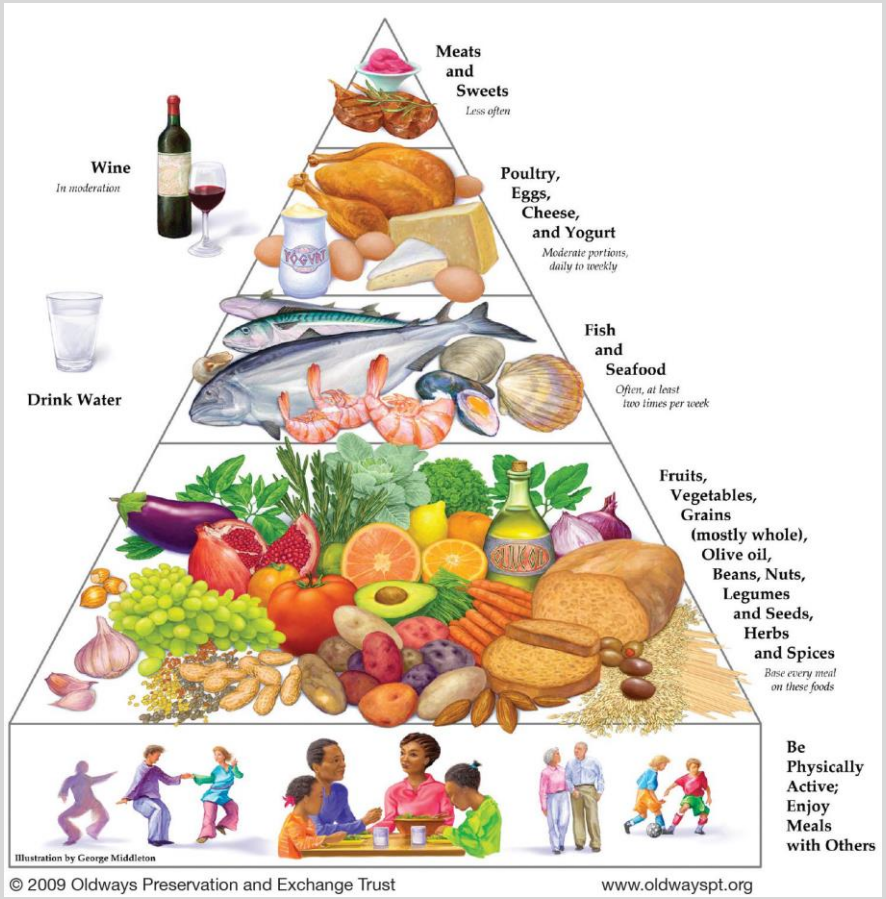
Mediterranean Diet

- Definition
  - Daily consumption of non-refined cereals and other products (e.g., whole grain bread, whole grain pasta, and brown rice), fresh fruits, vegetables, nuts, and low-fat dairy products;
  - Olive oil as the principal source of lipids;
  - Moderate intake of alcohol, preferably red wine, with meals;
  - Moderate consumption of fish, poultry, potatoes, eggs, and sweets;
  - Monthly consumption of red meat; and
  - Regular physical activity

Mediterranean Diet

- Actions
  - Antioxidant
  - Anti-inflammatory
  - Cardioprotective
  - Lipid-lowering effect

- Benefits
  - Lower risk of CVD and CHD
  - Lower risk of cancer and stroke
  - Lower risk of adiposity, T2D, and metabolic syndrome
  - Lower overall risk of all-cause mortality



PERFORMANCE ENHANCING SUPPLEMENTS

Essential Amino Acids

- Role in Performance
  - Increases protein synthesis, muscle hypertrophy, and muscle strength
  - Anti-catabolic
  - Improves exercise recovery and energy
  - Insulin mimetic
  - Supports mitochondrial growth
  - Increases immune support
- Dose
  - Take ~15 g BID, in divided doses, pre- and post-workout.

- Essential Amino Acids
  - Phenylalanine
  - Valine
  - Threonine
  - Tryptophan
  - Isoleucine
  - Methionine
  - Histidine
  - Leucine
  - Lysine

Arginine

- Role in Performance
  - Ideal for high intensity, short duration
  - Increase nitric oxide (NO) and vasodilation
  - Growth hormone (GH) secretagogue
  - Increase protein synthesis
  - Anti-catabolic
  - Increase immune function

- Dose
  - Take 8 g/d post-workout for exercise recovery, or 8-21 g/d pre-workout for endurance performance.

Beta Alanine

- Role in Performance
  - Increase muscle hypertrophy and strength
  - Increase muscle power output
  - Increase exercise capacity
  - Decrease muscle fatigue
  - Proton buffering
  - Anti-catabolic

- Dose
  - Take 2-6 g/d. Take with carbohydrates for better absorption.

Carnitine

- Role in Performance
  - Increases maximal oxygen uptake
  - Improves muscle recovery
  - Decreases heart rate and lactic acid production
  - Fat metabolism (glycogen sparing)

- Dose
  - Take 2 g/d for muscle recovery.

Glutamine

- Role in Performance
  - Increases muscle hypertrophy
  - Anti-catabolic
  - Improves immune function
  - Improves gut integrity
  - Increases glycogen re-synthesis and exercise recovery

- Dose
  - Take 5 g/d post-workout in recovery drink.

D-Ribose

- Role in Performance
  - Increases muscle power and strength
  - Increases muscle hypertrophy
  - Improves exercise recovery
  - Increases energy and muscular endurance

- Dose
  - Take 100-500 mg/kg of bodyweight. Take with carbohydrates for better absorption.

Caffeine

- Role in Performance
  - Ideal for moderate intensity, long duration
  - Increases cAMP, which stimulates hormone sensitive lipase
  - Increasing lipolysis, decreasing glycogenesis (uses fat for energy, rather than muscle)
  - Delays fatigue in endurance athlete (>60 minutes)
  - Reduces perception of pain

- Dose
  - Take 1-3 mg/kg of bodyweight, 30-60 minutes before competition. Note, if you regularly drink coffee, you must have a 5 day wash out period due to habituation.

CoQ10

- Role in Performance
  - Increases energy
  - Improves endurance performance and exercise recovery
  - Antioxidant
  - Supports heart health

- Dose
  - Take 200 mg/d with food.

Creatine

- Role in Performance
  - Increases muscle mass and strength
  - Increases single and repetitive sprint performance
  - Enhances glycogen synthesis and aerobic capacity
  - Increases work capacity and training tolerance
  - Enhances recovery
  - Improves cognitive function

- Dose
  - In the short term, take 25 g/d with carbohydrates (post-workout) for 3 days, as a loading dose.
  - For long term use, take 5 g/d with carbohydrates (post-workout) for 30 days, as a maintenance dose.

Rhodiola

- Role in Performance
  - Increases oxygen uptake and utilization
  - Increases energy
  - Delays muscle and mental fatigue
  - Increases muscular endurance and power
  - Improves exercise recovery and acclimatization
  - Antioxidant

- Dose
  - Take 200 mg 30-60 minutes before a training session, or 400 mg before competition.
  - Adaptogen (chronic): 100-600 mg/d
  - Adaptogen (acute): 300-1800 mg/d

NATUROPATHIC MEDICINE

Naturopathic Principles

1. First, Do No Harm (Primum Non Nocere)
2. The Healing Power of Nature (Vis Medicatrix Naturae)
3. Identify and Treat the Cause (Tolle Causam)
4. Doctor as Teacher (Docere)
5. Treat the Whole Person (Tolle Totum)
6. Prevention (Praevenic)

Schad Naturopathic Clinic

Services

- Acupuncture
- B12 Injections
- Body Work (Massage, Cupping)
- Botanical Medicine & Compounding
- Diagnostic Physical Exams and Lab Work
- Electrotherapies
- Homeopathic Medicine
- Hydrotherapy
- Lifestyle & Education
- Manipulations & Mobilizations
- Nutrition & Supplements
- Traditional Chinese Medicine

Rates

- Adult – $48.00
- Pediatric (under 18) – $37.00
- Senior (over 65) – $37.00
- Student – $20.00

Availability

Sports Medicine and Pain Management Shift

- Monday with Dr. Viinberg

General Care Shift

- Tuesday with Dr. Ragbir
- Thursday with Dr. Fontes
- Friday with Dr. Brooks

Appointments available for booking at 3pm, 4pm, 5pm, & 6pm!

In-person or virtual visits offered for Ontario residents

Contact

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Schad Naturopathic Clinic

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North York, ON

Call: 416-498-9763

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Website: https://ccnmclinics.ca/schadclinic/book-appointment