

Fueling Young Athletes for Health, Growth & Performance

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ABOUT ME:

- I work with **>15 high-performance sports**, from XCSki to volleyball and figure skating to combat sports; from developing teens to Olympians!
- My goal is helping athletes make nutrition **simple, practical and realistic**.
- How? 1:1 support, cooking skills, grocery store tours, body composition testing, hydration testing, travelling to camps & competitions...



AGENDA:

1. Sport Demands: Figure Skating
2. Growth + Training: Why Needs Are Higher
3. Nutrition Foundations for Young Athletes
4. Low Energy Availability & RED-S
5. How Parents Can Support
6. Q&A



SPORT DEMANDS: **FIGURE SKATING**

- Repeated **high-intensity, explosive efforts**: jumps, spins, lifts and footwork
- Requires **strength, power, balance, coordination and flexibility**
- Long training days with **multiple on-ice + off-ice sessions**
- High need for **focus, reaction time and technical precision**
- Performance can be affected by **fatigue, low energy and poor concentration**
- Many athletes are still **growing and developing** while training at high volumes



SPORT DEMANDS: **FIGURE SKATING**

- Nutrition directly impacts:
 - Training **quality, power & technical** execution
 - **Recovery** between sessions
 - Growth, puberty & **development**
 - **Bone health & injury risk**
 - Focus, **concentration** & decision-making
 - **Consistency** across long training days

Growth & Training

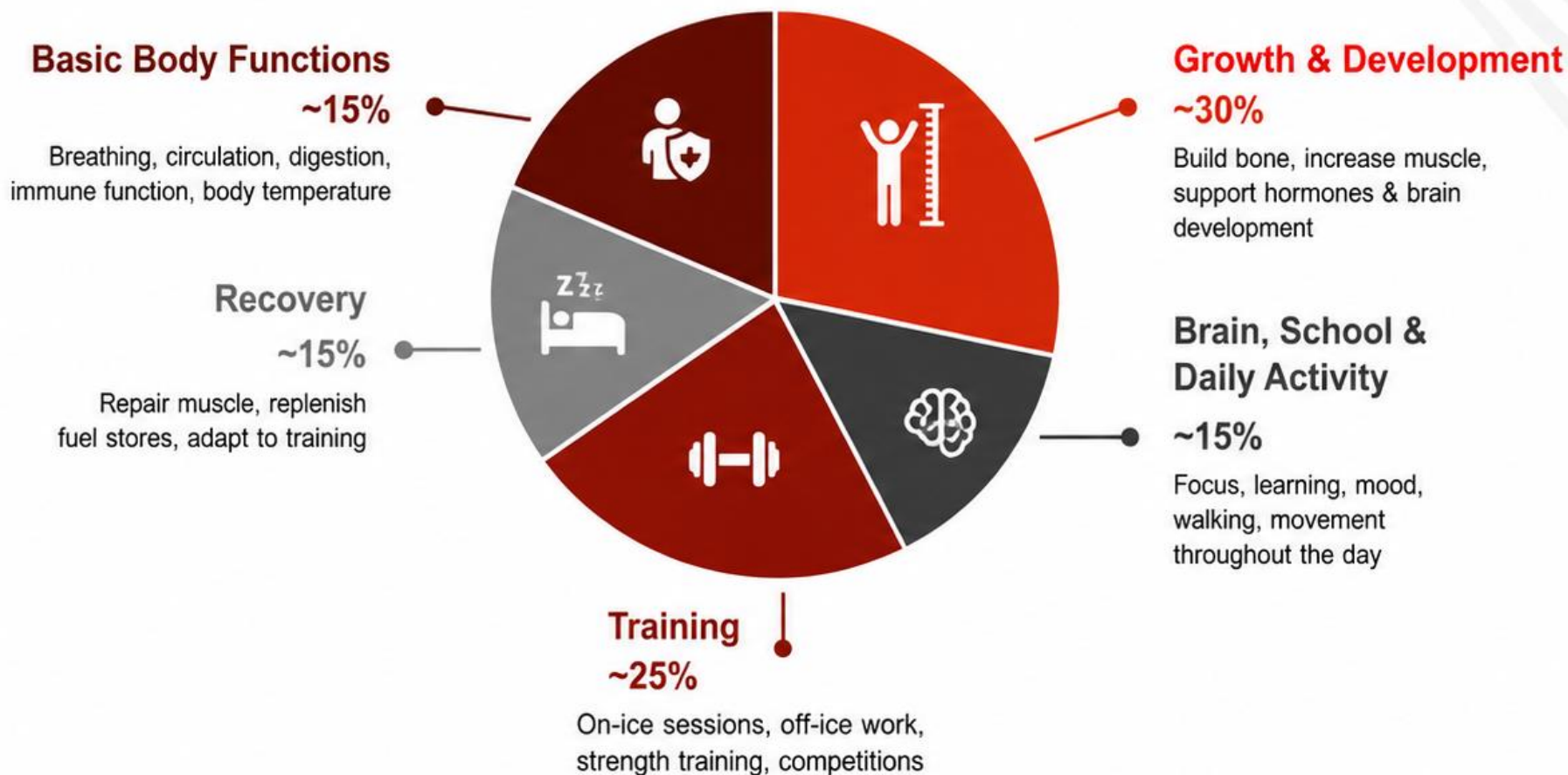
Why **Needs Are Higher**

GROWTH & TRAINING

- **Growth** significantly increases energy needs
- Adolescence is a key time for building **bone, muscle & hormones**
- **Training volume** adds additional fuel demands
- Busy **school + sport schedules** can limit eating opportunities
- Bigger appetites and more frequent eating can be **normal and necessary**

Where an Athlete's Energy Has to Go

Illustrative example — needs vary by age, growth stage and training load



KEY TAKEAWAY: Food doesn't just fuel sport. It also has to support **growth**, **recovery**, **learning** and **basic body functions**.

Nutrition Foundations **for Young Athletes**

SPORT NUTRITION PYRAMID

SUPPLEMENTS

Use with purpose.
Quality and consistency
matter most.



- Protein powder
- Creatine
- Omega-3
- Vitamin D
- Iron
- Multivitamin
- Probiotics
- Electrolyte tablets/capsules

SPORT FOODS

Convenient fuel to support
training and performance
when whole foods are
not practical.



- Sports drinks
- Energy gels & chews
- Energy & protein bars
- Hydration mixes
- Quick snacks (e.g., rice cakes, granola bars, fruit snacks)
- Easy-to-digest carbs
- Caffeine (if used)

WHOLE FOODS

The foundation.
Fuel, nutrients and
variety for daily health,
training and recovery.



- Fruits & vegetables
- Grains (rice, pasta, oats, bread, quinoa, potatoes)
- Protein (meat, fish, eggs, dairy, tofu, beans, lentils)
- Healthy fats (nuts, seeds, avocado, olive oil)
- Fluids (water, milk, soy milk)
- Variety & balance

MACRONUTRIENTS

CARBS



FUEL

Primary energy source for training, high intensity efforts & the brain.

PROTEIN



BUILD & REPAIR

Supports muscle repair, adaptation & recovery from training.

FAT



SUPPORT & PROTECT

Supports brain function, hormone production & longer-term energy.

FLUID



HYDRATE & PERFORM

Regulates body temperature, transports nutrients & keeps everything running efficiently.

SOURCES OF CARBOHYDRATES

Starch



**Some
Dairy
Products**



Fruit



Added Sugar



SOURCES OF PROTEIN

Animal proteins



Plant proteins



SOURCES OF FAT

**Anti-inflammatory
(Omega 3, 9)**



**Inflammatory
(Omega 6, Trans,
Saturated)**



SOURCES OF FLUID

Water



Tea & Coffee



Juice & Smoothies



Pop & Sport Drinks



Soup/Stew



Dairy



Vegetables & Fruits



Easy/No Training Day



FATS - 2 tsp.

Oils
Avocado
Mayonnaise
Nuts, seeds
Butter
Margarine

FLAVOURS

Salt, pepper
Herbs, spices
Vinegar
Salsa
Mustard

Canada's food guide

Food guide snapshot



ATHLETE PLATES

Easy/No Training Day



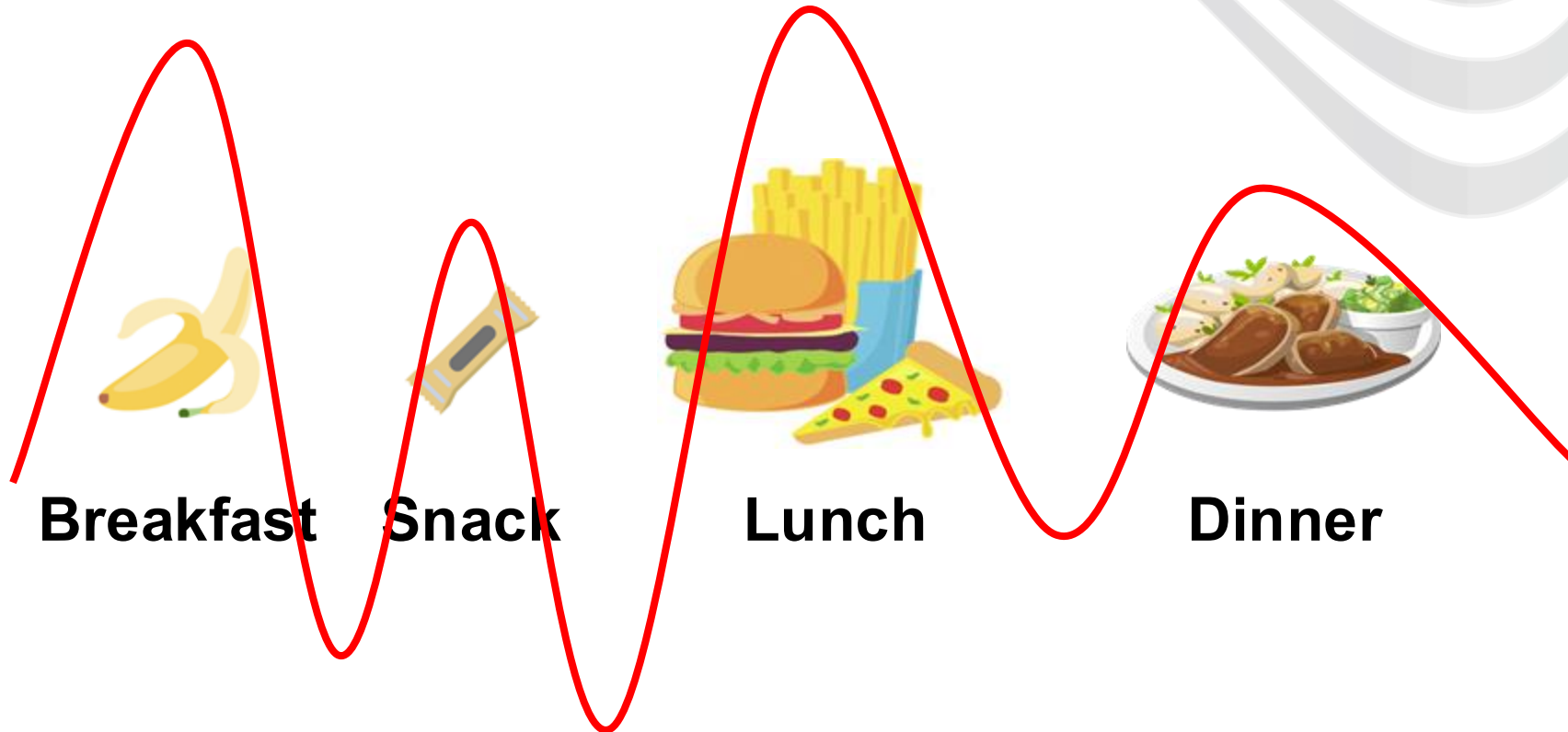
Training Day



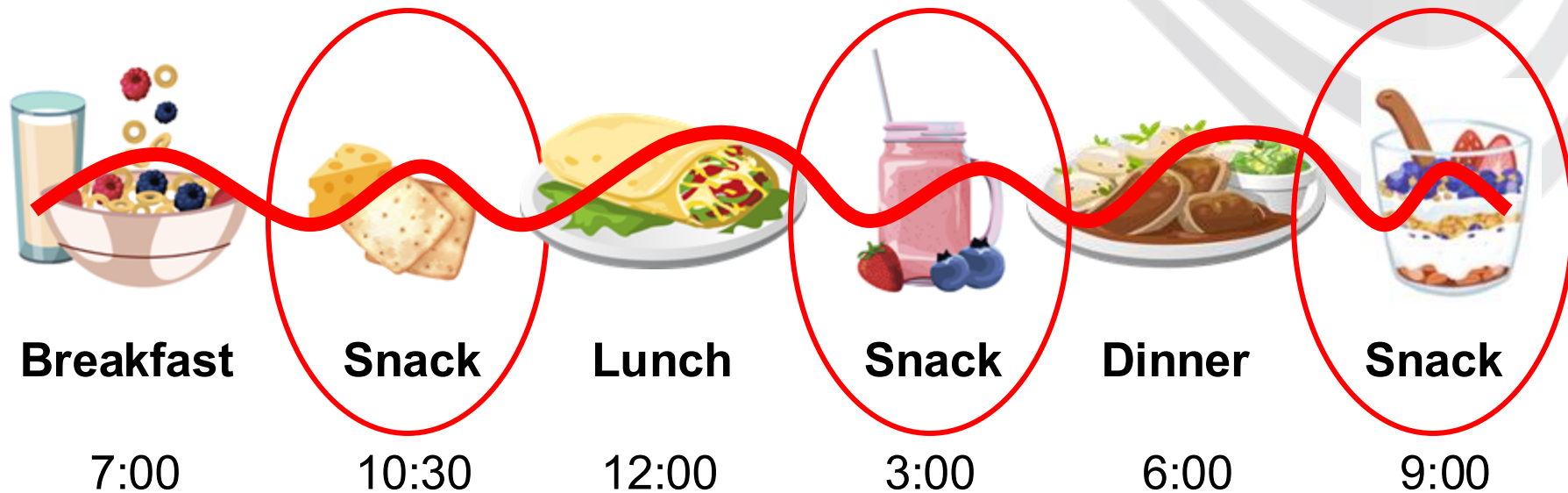
Hard Training Day



MEAL TIMING & ENERGY

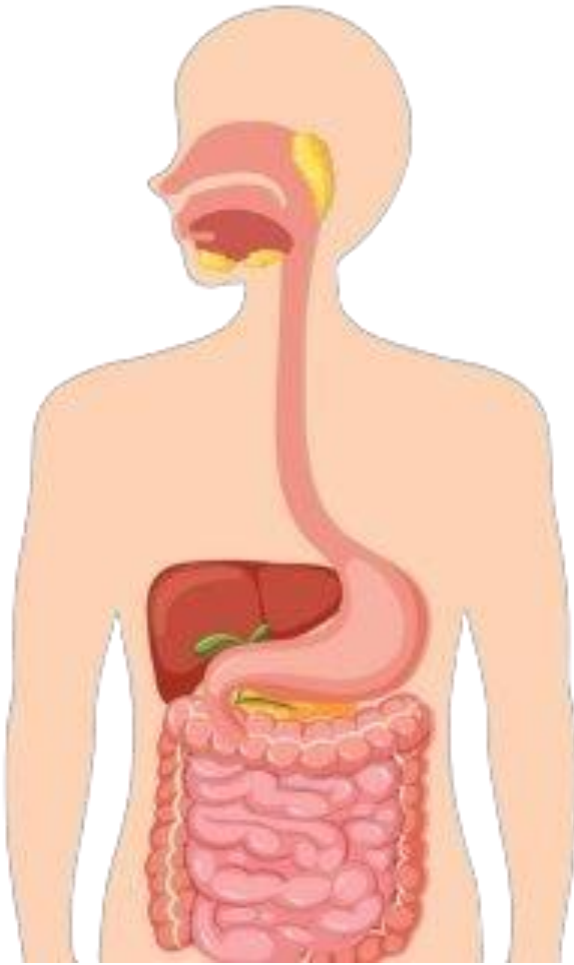


MEAL TIMING & ENERGY

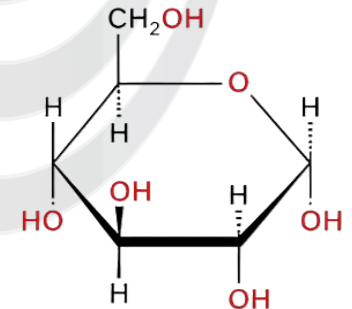


Eat at least **every 2-4 hours** to maintain energy levels and blood sugar balance

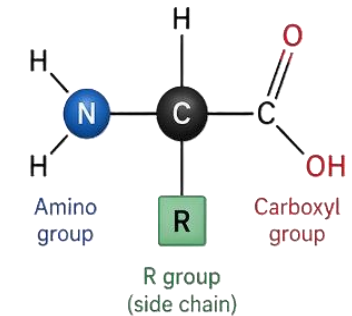
DIGESTION:



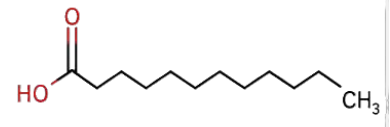
Carbohydrate: < 2 hrs



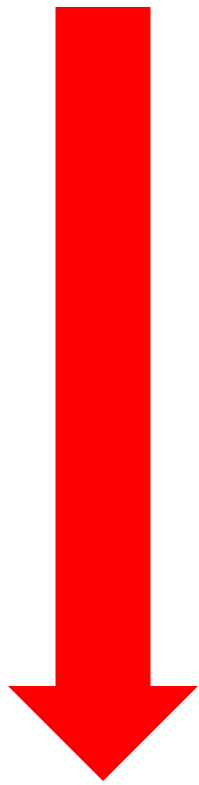
Protein: 2-4 hrs



Fat: >4 hrs



PRE-WORKOUT: 3-2-1- MODEL



Hours Before

3

CARBS + PROTEIN + FAT

2

CARBS + PROTEIN

1

CARBS



PRE-WORKOUT: 3-2-1- MODEL

3 HOURS BEFORE

Pasta & Sauce
Stir-Fry with Rice
Turkey Sandwich
Chicken Caesar Salad
Oatmeal + Fruit
Burrito Bowl
Chicken + Potatoes

2 HOURS BEFORE

Smoothie
Yogurt + Granola
Cereal & Milk
Egg & Toast
Cheese & Crackers
Trail Mix + Fruit
PB + Rice Cakes

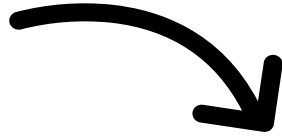
1 HOUR BEFORE

Fruit (Fresh, Dried)
Juice
Crackers
Granola Bar
Applesauce Pouch
Rice Krispie Square
Fruit Gummies
Sports Drink

HYDRATION & PERFORMANCE

2%

The level of
dehydration
which impacts
performance

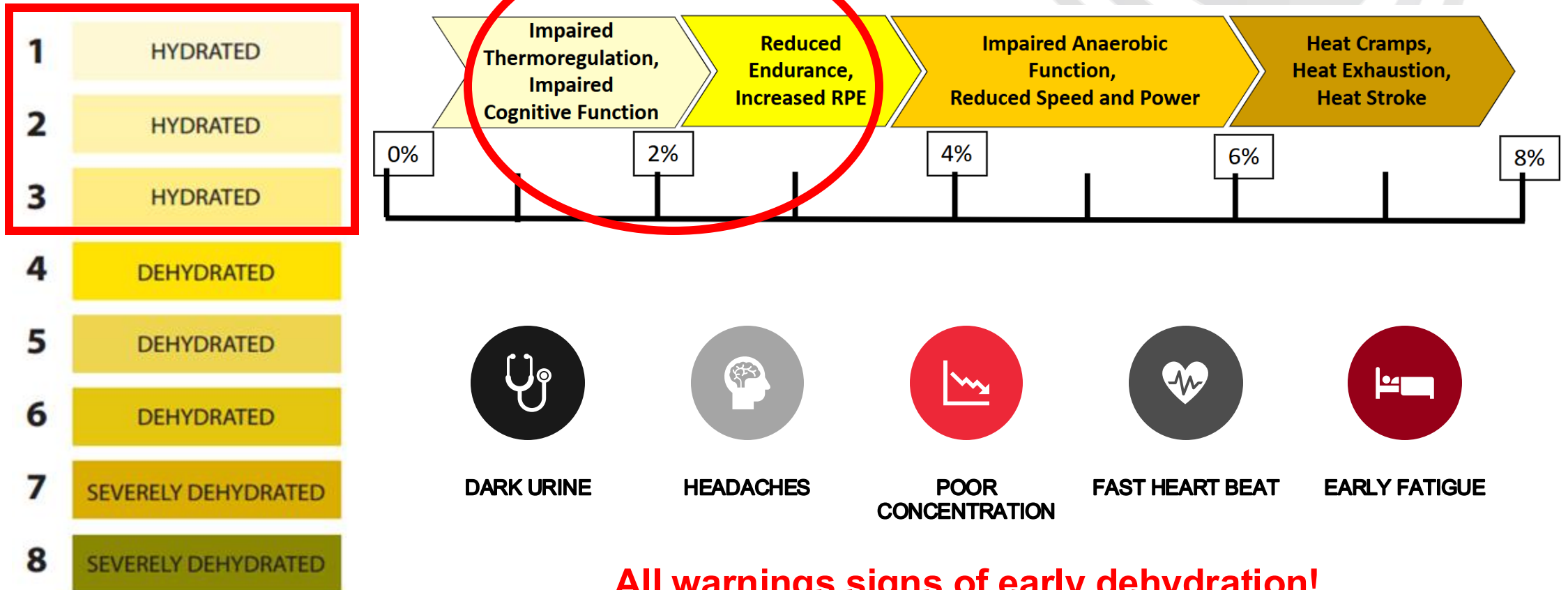


Performance can
decrease by up to
10% at this level!

3%

The level of
dehydration that
causes you to
sense thirst

HYDRATION & PERFORMANCE



All warnings signs of early dehydration!

CARBS = YOUR MAIN HIGH-INTENSITY FUEL

CARBS POWER YOUR TRAINING, HELP YOU PERFORM LONGER AND RECOVER BETTER!

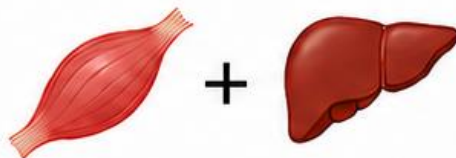
1 EAT CARBS BEFORE TRAINING

Fills your fuel tank.



2 YOUR BODY STORES CARBS IN YOUR MUSCLES + LIVER

This stored fuel is called glycogen.



3 DURING TRAINING, YOU USE THAT STORED FUEL

The longer/harder you train, the more you use.



4 AFTER ABOUT 60-90+ MIN OF HARD TRAINING...

Your fuel tank may start getting low.

→ Energy, focus and quality of training can drop.



FULL

Eat carbs



3/4 FULL

Start training



1/2 FULL

Keep going



LOW

Top up your fuel!

LONG SESSION?
TOP UP YOUR FUEL!



SPORTS DRINK



FRUIT



GRANOLA BAR



CRACKERS



APPLESAUCE



OTHER EASY CARBS
(TAILORED TO YOU!)

DURING EXERCISE...

- For exercise 1.0-2.5 hrs:
 - 30-60 g of carbs per hour of exercise
- Examples of 30g of carbs:
 - 500mL sport drink
 - 1 banana
 - 1 cup of pretzels
 - 1 granola bar
 - 2 Go-Go Squeez packs
 - 2-3 Welch's Fruit Snacks



THE 3 R'S OF RECOVERY:

Refuel

Carbohydrate

Rebuild

Protein

Rehydrate

Fluid

Eat within 60 minutes of exercise for the most benefit!

RECOVERY MEAL/SNACK IDEAS:

Recipe idea:	Carbs (60g+)	Protein (20-40g)
Bagel sandwich	Whole grain bagel	3-4 oz deli turkey OR tofu slices + cheese + shelf-stable milk box
Greek yogurt bowl	1 cup granola + berries or banana	1.5 cups Greek yogurt
Chicken & rice burrito	Large tortilla + $\frac{3}{4}$ cup rice	3-4 oz. chicken + cheese
Overnight oats	1 cup oats + fruit + honey	1 scoop protein powder + milk
Pasta salad	1.5 cups pasta + veggies	Chickpeas or chicken
Snack box	1-2 cups fruit + whole grain crackers	1 cup cottage cheese

PORTABLE OPTIONS:



Low Energy Availability **& RED-S**

TRUE OR FALSE?

High-performance Canadian athletes generally meet their energy needs for health and performance.

- Canadian study:
 - 8 different Canadian Sport Institutes
 - 320 athletes (male and female)
 - Athletes met protein but **not carb or calorie requirements**.

WHAT IS **ENERGY AVAILABILITY** (EA)

Energy left over for essential body functions after training and activity.

Energy



Training



Bodily functions:

- Bone health
- Hormone production
- Metabolism
- Immune function
- Cardiovascular health
- Growth and maturation

WHO IS AT **RISK**?

- Athletes in **aesthetic / weight-sensitive sports**
- Athletes with **high training volumes**
- **Growing adolescents**
- Athletes who intentionally or unintentionally **eat less than their training requires**
- Risk can occur in **all genders**
 - Menstrual changes may provide an early clue in girls/women
 - Signs in boys/men can be less obvious and easier to miss

Anyone can be at risk when training demands consistently exceed energy intake.



REAL LIFE EXAMPLE

Adolescent high-performance figure skater

What you SEE:

- Training **2-3 on-ice sessions + 1-2 off-ice sessions** per day
- Reports good energy and performance
- Eats regular meals, **generally "eats well"**
- Breakfast often **high protein, low carb** (3-5 eggs, yogurt, only sometimes bread)
- Fuel **intake varies** across long training days, depending on scheduling

What made us LOOK CLOSER:

- Previous **bone stress fracture, multiple ankle sprains**
- Vitamin D below desired range
- Very high weekly training volume
- **Est'd carb intake around 4-6 g/kg/day**
 - Hard training days require closer to 5-8 g/kg/day
- Still **growing & developing**

Important context:

- Athlete **does not LOOK under-fueled** (weight stable)
- **No major performance complaints**
- Nutrition pattern is generally quite good
- **Small gaps can become more important when training load is very high**
- LEA/RED-S is not identified from one sign alone; **we look for patterns** across health, fueling and performance.

RED-S: HEALTH CONSEQUENCES & FLAGS

Relative Energy Deficiency in Sport



Low energy availability → Affects every system in the body → **Impacts health, performance and wellbeing**



MENTAL HEALTH

- Increased risk of anxiety & depression
- Irritability, mood swings
- Poor motivation, concentration & decision making



GASTROINTESTINAL HEALTH

- Nausea, bloating, stomach pain
- Poor appetite, constipation, diarrhea
- Increased risk of GI illness



BONE HEALTH

- Decreased bone mineral density
- Increased risk of stress fractures
- Reduced bone strength, delayed healing



MENSTRUAL & REPRODUCTIVE HEALTH

- Menstrual dysfunction (irregular or missed periods)
- Anovulation, reduced fertility
- Increased risk of pregnancy complications



MUSCLE HEALTH

- Loss of muscle mass & strength
- Poor endurance, early fatigue
- Increased risk of muscle injuries, delayed recovery



CARDIOVASCULAR HEALTH

- Resting bradycardia (low HR)
- Low blood pressure
- Decreased stroke volume, irregular heartbeat



IMMUNE HEALTH

- Increased susceptibility to illness
- Frequent colds & infections
- Longer recovery from illness



ENDOCRINE HEALTH

- Disrupted thyroid function
- Altered cortisol, insulin & growth hormone
- Hormonal imbalances



HAEMATOLOGICAL HEALTH

- Low haemoglobin
- Iron deficiency & anemia
- Reduced oxygen carrying capacity, fatigue



METABOLIC HEALTH

- Decreased resting metabolic rate
- Impaired glucose regulation
- Electrolyte imbalances, impaired thermoregulation

COMMON FLAGS TO WATCH FOR

- | | |
|-----------------------------|-------------------------------|
| • Unexplained fatigue | • Menstrual changes |
| • Decreased performance | • Poor recovery |
| • Frequent illness / injury | • Feeling cold often |
| • Poor concentration | • Dizziness / lightheadedness |
| • Loss of appetite | • Weight changes |



RED-S CAN AFFECT ANY ATHLETE

Early recognition, adequate fueling and professional support are essential for health, performance and long-term wellbeing.



KEY TAKEAWAY

Adequate energy availability supports every system in the body.
Fuel for health. Fuel for performance.



REAL LIFE EXAMPLE

25-year-old national team endurance athlete

What you SEE:

- Missed periods (amenorrhea x 4 yrs)
- **Poor sleep** (waking multiple times/night)
- Frequent urination (limits fluid intake)
- **Brain fog, low focus**
- Dizziness on standing
- **Trains 3-5 hrs without fueling**
- **Low appetite/eats "healthy", low carb**

What's happening internally:

- Very low estrogen
- Low LH
- Low-normal T3
- Elevated cholesterol & LDL
- Very low RHR (32-35 bpm)
- Low BP (103/962 mmHg)

Important context:

- Multiple systems affected
- **Can happen even when weight looks "normal" (BMI 22.6 kg/m²)**
- **Athlete is high-performing and does not "look unwell"**
- Eating "healthy" ≠ fueling adequately

EARLY SIGNS TO BE AWARE OF:

PHYSICAL	PERFORMANCE	BEHAVIORAL
• Persistent fatigue • Frequent illness • Recurrent injuries or bone stress injuries • Feeling cold often • In girls: irregular or missing periods	• Plateau or decline • Decreased power • Slow recovery • Reduced consistency in training	• Skipping meals or snacks • Avoiding carbs • Increasing food rules • Anxiety around eating • Sudden body image concerns

How Parents Can Support

WHAT TO DO IF YOU'RE **CONCERNED**:

- Start with **curiosity**, not accusation
- Focus on **energy, mood and performance** – not weight or aesthetics
- Involve **coach + medical team** early
- Consult a **registered dietitian** and/or physician
- **Early conversations** are easier than late interventions



LANGUAGE MATTERS



AVOID:

- That's a lot of food.
- Do you really need seconds?
- You've been eating a lot lately.
- You need to eat healthier.
- That food is bad/junk vs clean/healthy.
- I wish I had your metabolism/I shouldn't be eating this.
- You look so tiny/you've leaned out/you have the perfect body.

INSTEAD:

- You've got a big training day, let's make sure you're fueled.
- Your needs can change as you grow and train more.
- What could we add to make this more balanced?
- Different foods have different jobs.
- *Comments may be interpreted as performance expectations, even if intended as compliments.*

CREATE A **PERFORMANCE FOOD** ENVIRONMENT

- Stock carb-rich snacks
- Fuel regularly - Normalize snacks (including before bed) & dessert
- Model balanced eating
- Eat together when possible
- Keep weight out of conversations
- Avoid "good vs bad" food labels



5 TIPS FOR **PROTECTING EA**

**Eat every 2-4
hours**



Regular meals
and snacks

**Eat around
training**



Fuel before and
after

**Eat to match
training
volume**



Increase intake
on heavy days

Plan ahead



Reduce missed
fueling
opportunities

**Work with a
registered
dietitian**



Individualized
support

Thank you!

Any **questions**?



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