

# Nutritional Strategies to Improve Performance

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## Disclaimers

1. Topics discussed in this talk are based on substantial and not conclusive evidence of benefit.
2. Evidence is derived from: 1) systematic review of RCTs, 2) at least one properly designed RCT, 2) well-designed controlled trials without randomization, or 3) well-designed cohort or case-control analytic studies
3. Prior to implementing any of the dietary recommendations mentioned in this talk please discuss them with your health care provider(s) to prevent any potential harm.
4. These recommendations are subject to change and modification as scientific evidence evolves.

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Nutrition in Medicine is a Human Factors Issue

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## Poor Nutrition & Hydration Status Affects Our Work Performance

- Irritability & frustration (Lemaire, Wallace et al. 2011; Bushman, Dewall et al. 2014)
- Decreased alertness (Lemaire, Wallace et al. 2011; Neely, Landstrom et al. 2004)
- Reduced motivation (Neely, Landstrom et al. 2004)
- Impaired episodic memory, concentration & executive function (Lemaire, Wallace et al. 2011; El-Sharkawy, Bragg et al. 2016)
- Difficulty concentrating (Lemaire, Wallace et al. 2011)
- Less Forgiving (Danziger5, Levav et al. 2011;habat-Simon, Shuster et al. 2018)
- Impaired risk tolerance & decision making (de Ridder, Kroese et al. 2014;Singh and Launer 2018; habat-Simon, Shuster et al. 2018;Danziger5, Levav et al. 2011;habat-Simon, Shuster et al. 2018)

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## Evidence-based nutritional strategies to mitigate fatigue and improve performance

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## Hydration

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### Hypohydration

- Reduced vigilance
- Reduced attention span
- Reduced visual focus and acuity
- Impaired decision making
- Impaired sleep quality
- Increased perception of task difficulty
- Increased frequency of errors
- Increased lapses in memory



Watson, Whale et al. 2015; Benton, Jenkins et al. 2016; Ganio, Armstrong et al. 2011; Armstrong, Ganio et al. 2012; Stachenfeld, Leone et al. 2018, Aristotelous, P., G. et al 2018

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### Time-release fluids



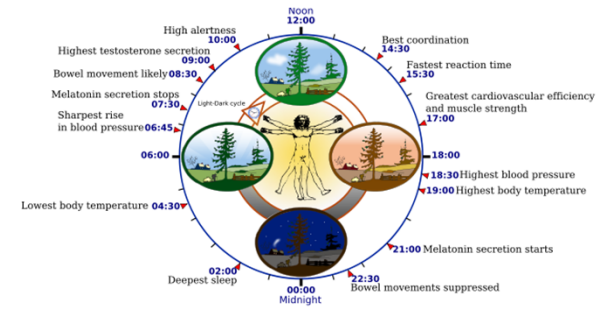
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### Three Nutrition Factors Affecting Our Health and Wellness

- When ←
- What
- How much

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### Circadian Rhythm



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### Your "circadian rhythm type"

- <https://www.cet-surveys.com/index.php?sid=61524>

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### Metabolic Differences for Same meals: AM vs PM

- 2 times higher diet induced thermogenesis (Morris, Garcia et al. 2015)
- Lower triglycerides and blood glucose (Al-Naimi, Hampton, et al. 2004).
- Lower total and LDL cholesterol and increased fat oxidation (Hibi M, Masumoto A et al, 2013)
- Switching 5% of total energy from dinner to breakfast can reduce the risk of death from diabetes by 4% and from cardiovascular disease by 5% (Han T, Gao J, Wang L, Li C et al 2020. )

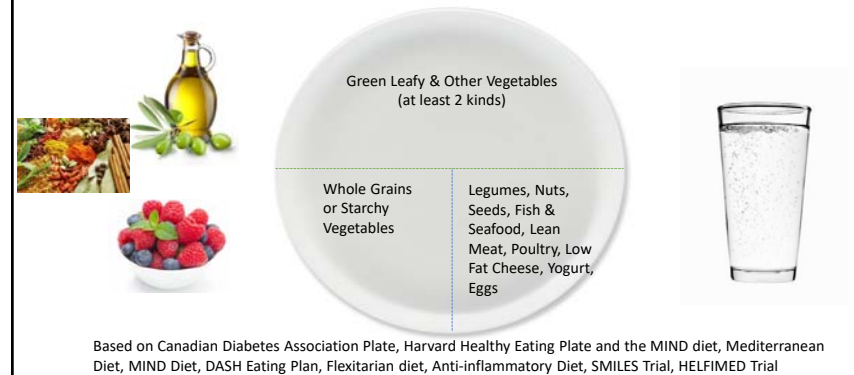
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### Three Nutrition Factors Affecting Our Health and Wellness

- When
- What ←
- How much

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### Meal Composition



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Portfolio Diet Created by Dr. David JA Jenkins at University of Toronto and St. Michael's Hospital:

[https://www.stmichaelshospital.com/media/hospital\\_news/2018/07/06.php](https://www.stmichaelshospital.com/media/hospital_news/2018/07/06.php)

The Brain Health Food Guide:

<https://www.baycrest.org/getattachment/0c3275c8-2419-4f12-ad71-a890d5f70265/Brain-Health-Food-Guide.aspx>

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### Healthy Comfort Eating: Replacement For Unhealthy Comfort Eating.

- Adding 1 fruit and 1 serving of vegetables to baseline diet can significantly improve energy levels after 2 weeks. (Conner, Brookie et al. 2017)
- All-cause mortality risk is decreased by 6% and 5% for each additional daily serving of fruits and vegetables, respectively (Wang et al., 2014).
- Improved sleep duration, quality and reduced sleep-related impairment (peuhkuri, Sihvola et al. 2012, Katagiri, Asakura et al. 2014, Noorwali, Cade et al. 2018, Hamidi MS, Shanafelt TD, 2019)
- 3 observational studies: Consumption of 1-2 cups of green leafy vegetables and cruciferous vegetables/day per associated with better cognitive performance (Morris, Wang et al. 2017; Kang, Ascherio et al. 2005; Morris, Evans et al. 2006)

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### Three Nutrition Factors Affecting Our Health and Wellness

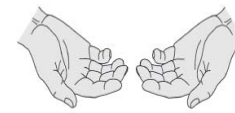
- When
- What
- How much ←

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### Portions Sizes For Fruits/Grains, Vegetables, Meat & Alternatives, Fats



**FRUITS\*/GRAINS & STARCHES\*:**  
Choose an amount the size of your fist for each of Grains and Starches, and Fruit.



**VEGETABLES\*:**  
Choose as much as you can hold in both hands.



**MEAT & ALTERNATIVES\*:**  
Choose an amount up to the size of the palm of your hand and the thickness of your little finger.



**FATS\*:**  
Limit fat to an amount the size of the tip of your thumb.

*The Canadian Diabetes Association:* <https://www.diabetes.ca/diabetescanadawebsite/media/managing-my-diabetes/tools%20and%20resources/handy-portion-guide.pdf?ext=.pdf>

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### Caffeine

- Increases alertness, attention, memory & reduces reaction time in sleep deprived individuals
- Effective dose : 40- 400 mg



- Alerting effects peak about 75-90 min after ingestion
- Alerting effects last about 5 hrs
- Increases sleep latency
- Impairs sleep quality up to 12 hours after ingestion

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### Strategic Use of Caffeine

15-60 mg



40-80 mg



- Have smaller amounts
- Use to reduce sleep inertia (Van Dongen, Price et al. 2001, Hilditch, Dorrian et al. 2016)
  - Before a nap (Caff-Nap) (Schweitzer, Randazzo et al. 2006)
  - Waking up before your natural waking up time
- Use to reduce sleepiness after meals and snacks (Kassis, Katz et al. 2013)

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**ALCOHOL AND CALORIES** How many calories are Canadians getting via booze?

THE AVERAGE CANADIAN DRINKER CONSUMES 250 CALORIES PER DAY IN THE FORM OF ALCOHOL, OR

**11%**

OF OUR RECOMMENDED DAILY CALORIE INTAKE.

THAT'S LIKE EATING AN EXTRA BAG OF CHIPS EVERY DAY.

WHEN WE BINCE DRINK, WE CONSUME CLOSER TO 550 CALORIES PER OCCASION IN THE FORM OF ALCOHOL, OR

**25%**

OF OUR RECOMMENDED DAILY CALORIE INTAKE.

THAT'S MORE CALORIES THAN A DOUBLE CHEESEBURGER.


Source: Sheth A, Reimer TS, Bouchard T, Hahn B (2019). Calorie Intake from Alcohol in Canada: Why New Labeling Requirements are Necessary. Canadian Journal of Dietetic Practice and Research. <https://doi.org/10.3181/ajph.2019.095>

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**Summary**


1. Keep hydrated
2. Try to eat according to your circadian rhythm
3. Limit all eating to a 12-hour window
4. Eat three meals that look like this:
5. Eat most of your calories before 3 pm
6. Eat your dinner before 8 pm
7. Use caffeine strategically



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**Thank you**

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