

Effects of Time Restricted Eating on Clinical & Metabolomic Outcomes in People with Cancer: A Systematic Review

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Background

Time Restricted Eating (TRE): A rhythmic eating pattern that involves limiting ones eating hours to a set window (i.e. 6-12 hours) on a daily, or near daily basis often aligning with circadian rhythm (i.e. eating during active daytime hours)¹⁻⁴

Metabolic Changes Resulting from TRE: After 12 hours fasting: Hepatic glycogen depleted, serum glucose levels decrease by 20%^{5,6} → reliance on non-hepatic glucose, fat-derived ketone bodies, and free fatty acids as energy sources⁷

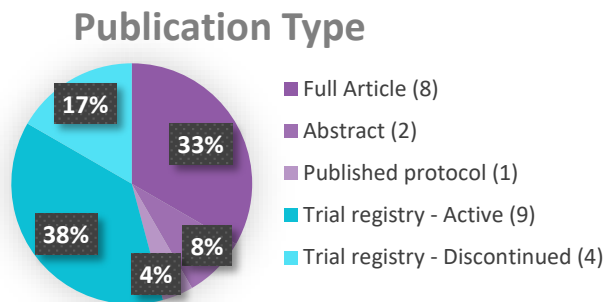
Methods

(PROSPERO CRD42023386885)

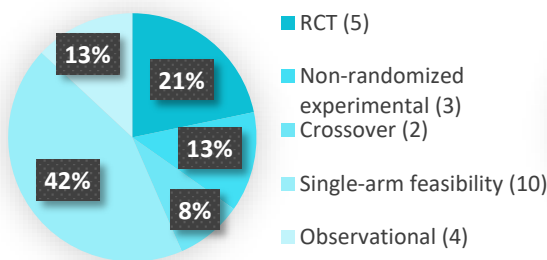
- Systematic literature review identifying interventional trials on TRE in people with cancer.
- Included: published original study designs, protocols, and clinical trial registries.
- Six databases searched from inception to January 4, 2023.

Results

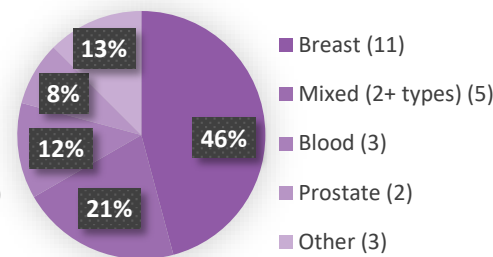
13,900 search results;
24 entries were included:⁸⁻³¹



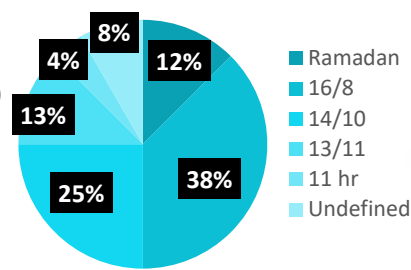
Study Design



Cancer Type



Fasting Regimen



Country

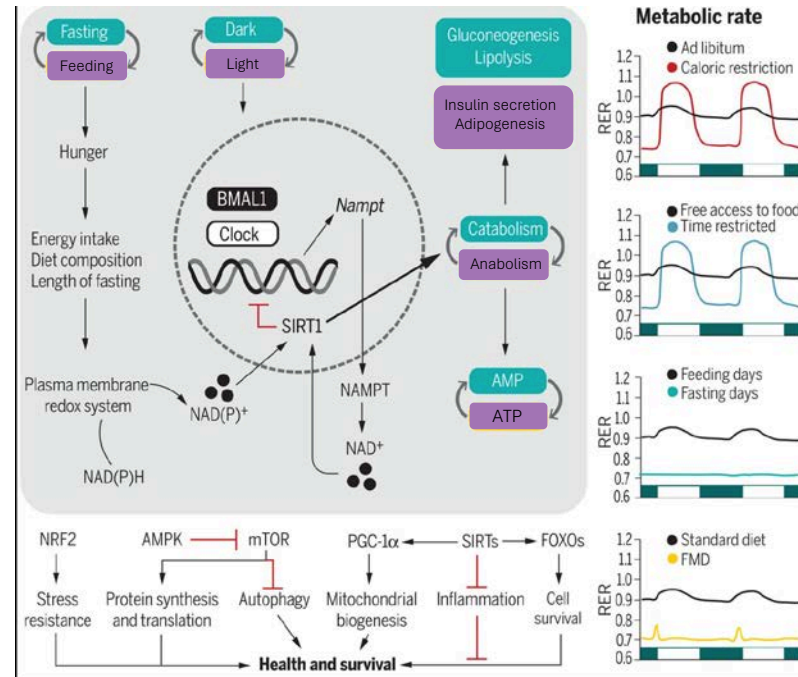
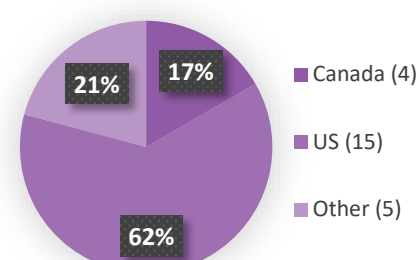


Figure 1. "Integration of the circadian rhythms and feeding-fasting cycles with metabolism"⁷
RER - the ratio of CO₂ produced and O₂ used during breathing. A higher RER indicates the use of carbohydrates for energy, while a lower RER indicates the use of lipids.

TRE May Reduce the Risk of Prostate and Breast Cancer Recurrence

1. Palomar-Cros et al. 2021 evaluated 607 prostate cancer cases and 848 controls: Fasting ≥ 11 hrs overnight → lower odds of developing PCa (OR=0.77, 95% CI 0.54 - 1.07). Breakfast after 8:30AM: increased odds of developing PCa compared to eating before 8:30AM (OR=1.30, 95% CI 0.92 - 1.85)
2. Marinac et al. 2016 analyzed data from 2413 women with early stage, invasive breast cancer: Fasting < 13 hrs / night increased the risk for Br Ca recurrence compared to fasting ≥ 13 hrs / night (hazard ratio, 1.36; 95% CI, 0.95 - 1.56)
3. Yassin et al. 2021 evaluated Ramadan fasting among CML patients receiving TKIs: Reduced (p > 0.05) mean values of WBC, neutrophils, BCR-ABL. Mean values for platelets, hemoglobin, basophils and eosinophils were maintained.
4. Alshammari et al. (2022) prospectively assessed 37 patients with CRC: CEA declined 40.9% when fasting >20d, compared to -12.4% in those who fasted <20d.



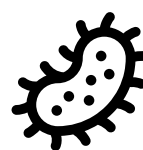
Mean adherence:
70-100%^{8,9,17-19,,23,29,}



Reduction in:^{23,29,18}
- waist circumference
- visceral adipose tissue



Improvement in:^{19,22,23}
- fatigue,
- chemotherapy side effects,
- physical/functional well-being,
- sleep.



No results



Mean caloric deficit:
450 kcals (22%)¹⁷
202 kcals (10.5%)¹⁹



Decrease in absolute
CVD risk¹⁸

Significance & Next Steps

The field of TRE in cancer is in its infancy. Evidence suggests a potential benefit of TRE in people with cancer on clinical cancer outcomes, cancer risk factors, and QOL, although the number of studies and sample sizes are limited, preventing comparison across studies. Our team has completed 2 feasibility trials (NCT05708326, NCT04626843) on intermittent fasting in patients with CLL/SLL. With the generous support of Michael Smith Health Research BC and Lotte & John Hecht Memorial Foundation, we will be embarking on larger trial in 2024.

Want to learn more?

References + Contact information ↓



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