

The effects of time-restricted eating and weight loss on bone metabolism and health: a 6-month randomized controlled trial

Maria Papageorgiou ¹, Emmanuel Biver ¹, Julie Mareschal ², Nicholas Edward Phillips ^{2,3}, Alexandra Hemmer ², Emma Biolley ², Nathalie Schwab ^{4,5}, Emily N. C. Manoogian ⁶, Elena Gonzalez Rodriguez ⁷, Daniel Aeberli ⁸, Didier Hans ⁷, Caroline Pot ⁹, Satchidananda Panda ⁶, Nicolas Rodondi ^{4,5}, Serge Ferrari ¹, Tinh-Hai Collet ^{2,10}

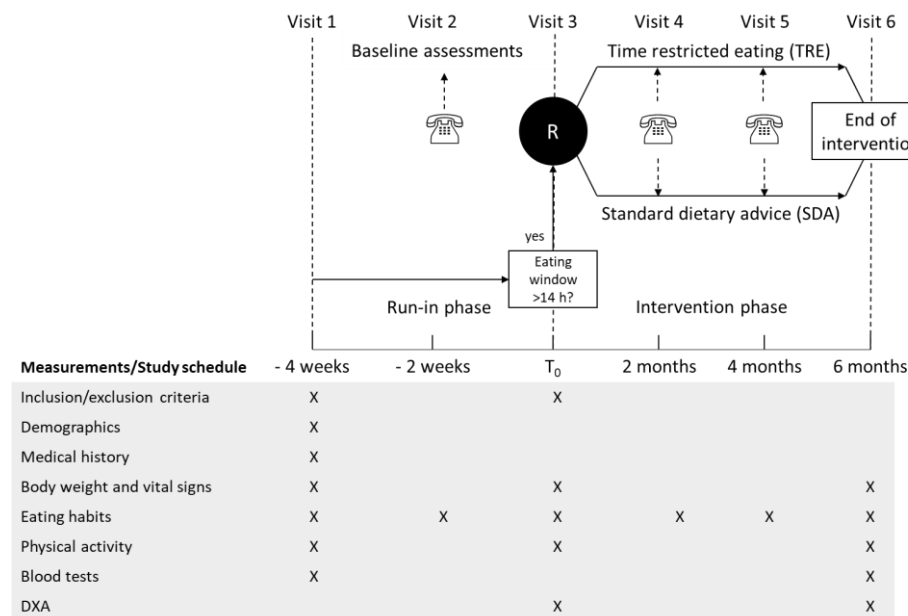


Figure S1: Study and measurement schedule

Abbreviations: DXA: dual energy X-ray absorptiometry (for assessing body composition and total body bone mineral content/density), SDA: standard dietary advice, TRE: time-restricted eating.

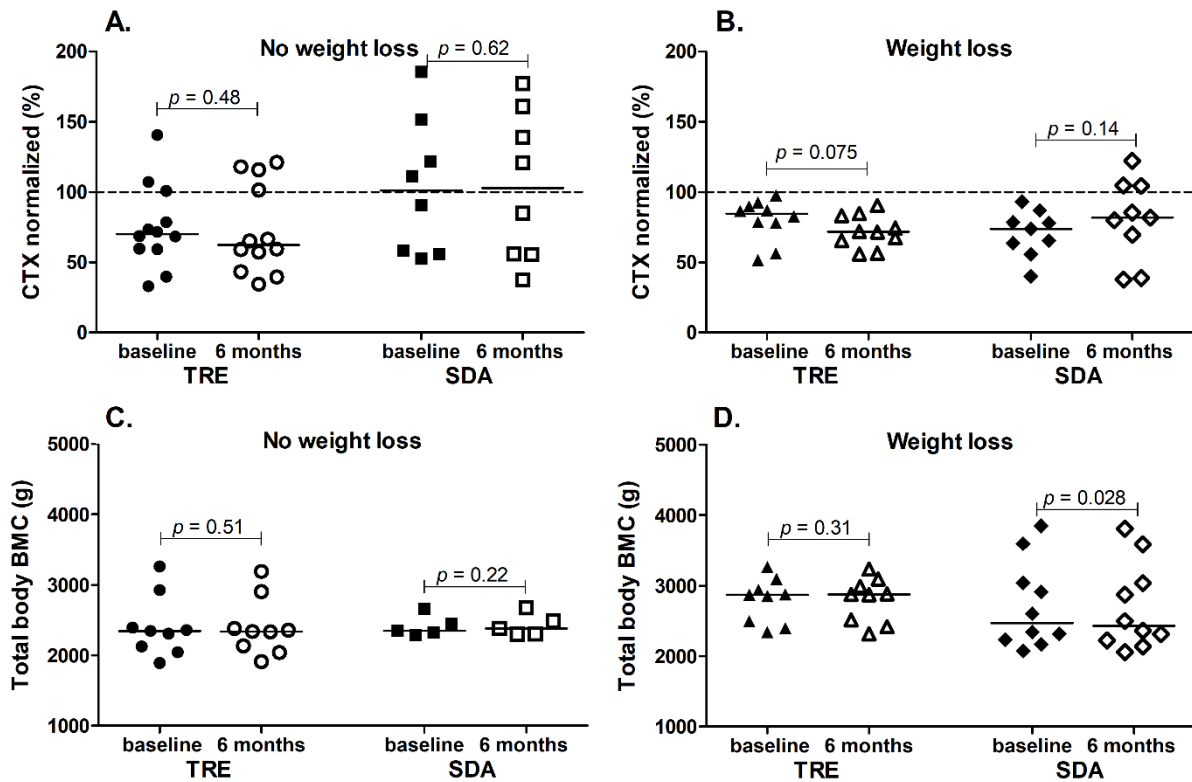


Figure S2: CTX normalized levels and total body BMC at baseline and 6-month follow-up in weight loss responders and non-responders by intervention group (TRE vs. SDA).

Individual data are presented and solid black lines signify the median in each group. TRE weight loss non-responders (baseline; black circles; follow-up: white circles), SDA weight loss non-responders (baseline; black squares; follow-up: white squares), TRE weight loss responders (baseline; black triangles; follow-up: white triangles), SDA weight loss responders (baseline; black rhombus; follow-up: white rhombus). Normalized CTX levels were calculated by dividing the absolute value for CTX by the upper cut-off for defining reference levels for age, sex and menopausal status provided by our local laboratory.

Abbreviations: BMC: bone mineral content, BMD: bone mineral density, DXA: dual-energy X-ray absorptiometry, P1NP: procollagen type 1 N-terminal propeptide β -CTX: β -carboxyterminal cross-linked telopeptide of type I collagen, SDA: standard dietary advice, TRE: time-restricted eating

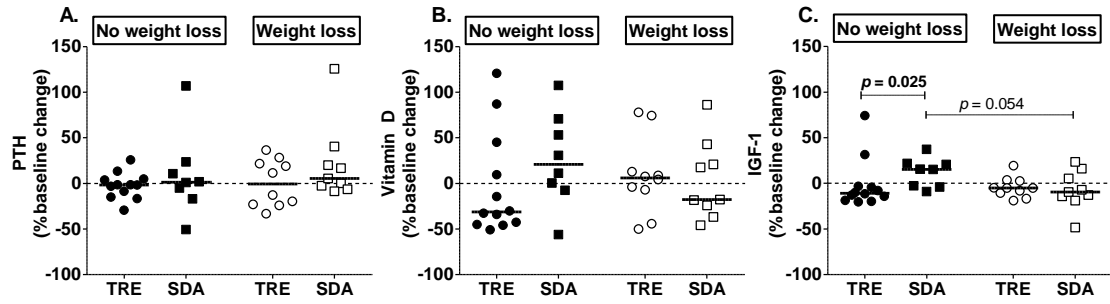


Figure S3. Changes in bone-related hormones in weight loss responders and non-responders by intervention group.

Individual percent change in PTH (Panel A), vitamin D (Panel B), and IGF-I (Panel C) from baseline, where the solid black lines represent the median in each group: TRE weight loss non-responders (black circles), SDA weight loss non-responders (black squares), TRE weight loss responders (white circles), SDA weight loss responders (white squares). Only significant p -values (≤ 0.05) are indicated for legibility. Abbreviations: IGF-I, insulin-like growth factor-1 levels, PTH: parathormone, SDA: standard dietary advice, TRE: time restricted eating