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2010 Best Practice Award - Winning Submission

Title	The effects of intermittent or continuous energy restriction on weight loss and metabolic disease risk markers: a randomised trial in young overweight women
Applicant	Dr Michelle Harvie Research Dietitian, Nightingale and Genesis Prevention Centre Wythenshawe Hospital, South Moor Road Manchester, M23 9LT
Team	Genesis Breast Cancer Prevention Team
Abstract	This study links the fields of obesity, diabetes, cardiovascular disease, diabetes, and dementia prevention and has tested a novel potential dietary therapy for obesity management and disease risk reduction.
Background	The problems of adherence to energy restriction in humans are well known.
Objective	To compare the feasibility and effectiveness of IER with CER for weight loss, insulin sensitivity and other metabolic disease risk markers.
Design	Randomised comparison of a 25% energy restriction as IER (~2266 kJ/day for 2 days/week) or CER (~6276 kJ/day for 7 days/week) in 107 overweight or obese (mean [±SD] body mass index 30.6 [±5.1] kg/m2) premenopausal women over 6 months. Weight, anthropometry, biomarkers for breast cancer, diabetes, cardiovascular disease and dementia risk; insulin resistance (HOMA), oxidative stress markers, leptin, adiponectin, IGF-1 and IGF binding proteins 1 and 2, androgens, prolactin, inflammatory markers (high sensitivity C-reactive protein and sialic acid), lipids, blood pressure and brain derived neurotrophic factor were assessed at baseline and after 1, 3 and 6 months.
Results	Last observation carried forward analysis showed IER and CER are equally effective for weight loss, mean (95% confidence interval [CI]) weight change for IER was -6.4 (-7.9 to -4.8) kg vs.-5.6 (-6.9 to -4.4) kg for CER (P value for difference between groups = 0.4). Both groups experienced comparable reductions in leptin, free androgen index, high sensitivity C-reactive protein, total and LDL cholesterol, triglycerides, blood pressure and increases in sex hormone binding globulin, IGF binding proteins 1 and 2. Reductions in fasting insulin and insulin resistance were modest in both groups, but greater with IER than CER; difference between groups for fasting insulin -1.2 [-1.4 to -1.0] µU/ml, and insulin resistance -1.2 [-1.5 to -1.0] µU/mmol/L (both P=0.04).

Conclusion IER is as effective as CER in regards to weight loss, insulin sensitivity and other health biomarkers and may be offered as an alternative equivalent to CER for weight loss and reducing disease risk.

The study was undertaken in collaboration with the other authors:

- Mary Pegington, Anthony Howell, Gareth Evans; Genesis Prevention Centre, University Hospital of South Manchester NHS Foundation Trust, UK
- Mark P. Mattson, Bronwen Martin, Roy G. Cutler, Tae G. Son, Stuart Maudsley, Olga D. Carlson, Josephine M. Egan;Laboratory of Neurosciences, National Institute on Aging Intramural Research Program, Baltimore, USA
- Jan Frystyk, Allan Flyvbjerg ;Clinical Institute of Medicine & Department of Endocrinology and Internal Medicine, Aarhus University Hospital, Denmark
- Bernice Dillon; Department of Statistics University Hospital of South Manchester, UK
- Jack Cuzick; CRUK Centre for Epidemiology, Mathematics and Statistics, Wolfson Institute of Preventive Medicine, Queen Mary's School of Medicine, London, UK
- Susan A Jebb; MRC Human Nutrition Research Group, Cambridge, UK

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