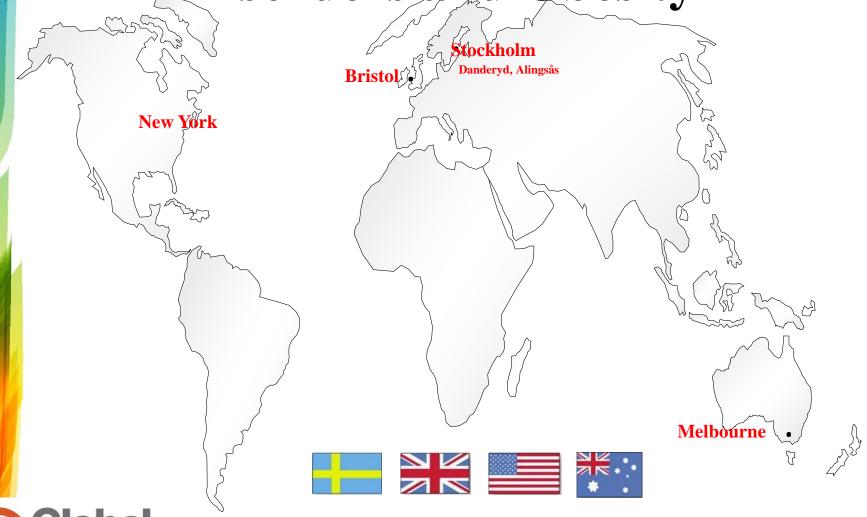
Mandometer Treatment for Eating Disorders and Obesity



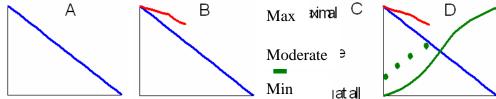


Cecilia Bergh, PhD Mando Group AB and Karolinska Institute

Mandometer®

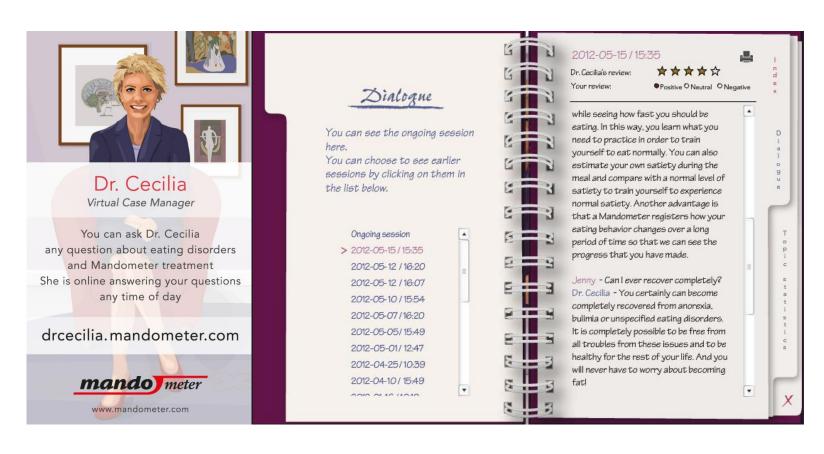


- A. A curve is shown on the screen (blue line).
- B. When you eat the eating speed is shown (red curve).
- C. The Mandometer asks how satiated you are.
- D. You adapt your eating speed and satiety (green filled circles) to training curves.

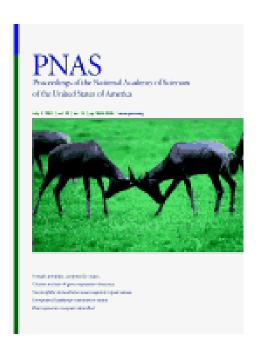




A Virtual Clinician







Randomized controlled trial of a treatment for anorexia and bulimia nervosa. Bergh, Brodin, Lindberg, Södersten. *PNAS* 2002;**99**:9486-91.





RESEARCH

Treatment of childhood obesity by retraining eating behaviour: randomised controlled trial

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ABSTRACT

Objective To determine whether modifying eating behaviour with use of a feedback device facilitates weight Design Randomised controlled trial with 12 month

Setting Hospital based obesity clinic. Participants 106 newly referred obese young people aged

Interventions A computerised device, Mandometer, providing real time feedback to participants during meals to slow down speed of eating and reduce total intake:

Main outcome measures Change in body mass index (BMI) standard deviation score (SDS) over 12 months with assessment 18 months after the start of the intervention. Secondary outcomes were body fat SDS, metabolic status, quality of life evaluation, change in portion size, and eating speed.

Results Using the last available data on all participants (n=106), those in the Mandometer group had significantly lower mean BMI SDS at 12 months compared with standard care (haseline adjusted mean difference 0.74. 95% confidence interval 0.11 to 0.36). Similar results were obtained when analyses included only the 91 who attended per protocol (baseline adjusted mean difference 0.27, 0.14 to 0.41; Pc0.001), with the difference maintained at 18 months (0.27, 0.11 to 0.43; P=0.001) (n=87). The mean meal size in the Mandometer group fell by 45 g (7 to 84 g). Mean body fat SDS adjusted for baseline levels was significantly lower at 12 months (0.24, 0.10 to 0.39; P=0.001). Those in the Mandometer group also had greater improvement in concentration of high density lipoprotein cholesterol (P=0.043). Conclusions Retraining eating behaviour with a feedback device is a useful adjunct to standard lifestyle adification in treating obesity among adolescents. Trial registration ClinicalTrials.gov NCT00407420.

INTRODUCTION

Childhood obesity is increasing almost universally with little evidence to support any specific treatment programme. A recent Cochrane review concluded any specific weight management treatment programme over another but that combined behavioural therapy lifestyle interventions seemed to have an advantage over standard, self care dietary, or activity

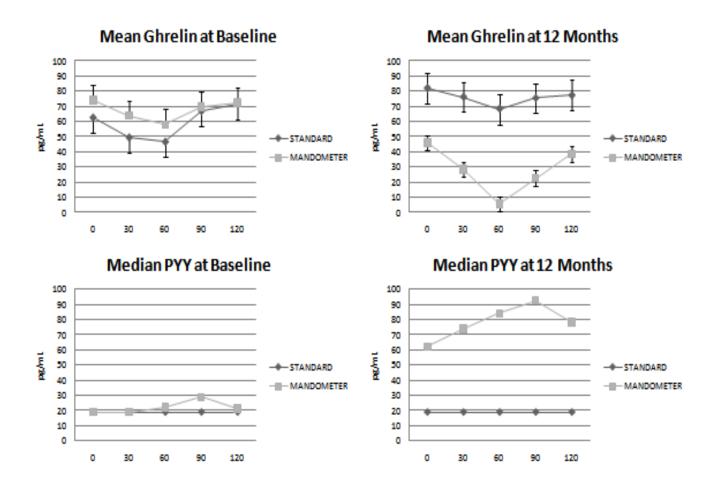
The Bristol Care of Childhood Obesity Clinic (COCO) was established in 1999 and uses simple dietary and activity based lifestyle modification to improve body composition in obese children and adolescents. The clinic has had some success in children, with improvement in body mass index standard deviation score [BMI SDS] [mean change in BMI SDS over 12 months =0.3]," but adolescents have proved more difficult to positively influence than younger children. We carried out a randomised controlled trial with a novel esting device, the Mandometer, compared with the clinic's standard care in young people aged 9-17.

The Mandometer was developed at the Section of Applied Neuroendocrinology and Mandometer Clinic, Karolinska Institutet, Stockholm, Sweden. It is a portable weighing scale connected to a small computer that can generate a graph representing food removal from the plate, with weight of food (grams) on the y axis and time [minutes] on the x axis. The user puts a measured portion of food determined by a therapist on the scale and the computer records and displays, in real time graphics, the weight loss from the plate as the user eats: time zero on the graph effectively displays total portion size. Removing food from the plate generates a gradually developing line on a screen that can be compared and matched to a pre-set. eating line displaying the speed at which the therapis wants the user to eat. Deviation from the training line by eating too quickly or slowly elicits a spoken reques from the Mandometer to slow down or eat faster. At regular intervals, a rating scale appears on the screen and the user rates their level of fullness: from 0 (no satiety) to 100 (maximum satiety). That rating appears as a dot on the screen, yielding a "development of satiety" curve and allowing comparison of the development of fullness to a "normal" fullness curve agai pre-set on screen. During training the user gradually that there was not enough evidence to recommend following these training lines and curves (fig 1). A short

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Treatment of childhood obesity by retraining eating behaviour: randomized controlled trial. Ford, Bergh, Södersten et al. BMJ 2010; **340**:b5388.





Normalizing Eating Behavior Reduces Body Weight and Improves Gastrointestinal Hormonal Secretion in Obese Adolescents. Galhardo et al., *J Clin Endocrin and Metabolism*, December 7, 2011 as doi:10.1210/jc.2011-1999.







Mandometer benefits

- •An non-invasive treatment.
- •Patients claim not being hungry while losing weight.
- •Mandometer training resulted in the same feelings of satiety despite eating less.
- •No food items excluded.
- •Relearning natural eating behavior and identifying biological signals for hunger and satiety.
- •Preventing medical problems.



Mandometer Consumer

Smartphone Apps:

Wireless scale

- Mandometer®
- SatietyMeter®
- Dr. Cecilia

