

# Obesity Digest

In this regular section, Matt Capehorn picks out recent key papers published in the area of obesity. To compile the digest, a PubMed search was performed for the 3 months ending April 2015 using a range of search terms relating to obesity. Articles have been chosen on the basis of their potential interest to healthcare professionals and are rated according to readability, applicability to practice and originality.



## Can you “outrun a bad diet”?

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There was a recent article in the *British Journal of Sports Medicine* that gained a great deal of press coverage because it suggested that exercise was not a very good way to lose weight, and that “you cannot outrun a bad diet” (Malhotra et al, 2015). In many ways, I totally agree with this statement. I have long argued that exercise is an inefficient way of losing weight, unless you are doing a sufficient amount, with sufficient regularity (e.g. 30–60 minutes of aerobic-style exercise three to five times per week), to raise your metabolic rate enough to induce a calorie deficit without necessarily needing a corresponding reduction in calorie intake. Simply encouraging our patients to walk the dog in the evening after our consultation will not be sufficient. They may walk the dog for a mile, but they probably only use up 100 kcal. If, as a reward, they then treat themselves to a chocolate bar for being so virtuous, that is an intake of more than 200 kcal, and the net effect is calorie gain and ultimately weight gain. It is in no way as effective as just reducing calorie intake.

However, this is only half of the story, and in many ways it gives the wrong impression of physical activity, especially when considered as part of a weight management programme. In my opinion, weight management programmes that include a physical activity component will achieve better outcomes than those that do not. Furthermore, why do we run weight management programmes? Is it to have our patients achieve a lower number when standing on the scales, or is it to make them more healthy?

It is clearly the latter, and the evidence for physical activity improving markers of cardiometabolic health is overwhelming (Academy of Medical Royal Colleges, 2015).

There is a dose–response curve for the relationship between physical activity and risk of chronic disease. The more you exercise, the less likely you are to develop a chronic disease, and the unfit get proportionally greater benefit from a small increase in physical activity. The paper by Ekelund et al (summarised alongside) supports this evidence, showing that the greatest reductions in mortality risk were observed in the two groups with the lowest activity. A morbidly obese person who does a moderate to high amount of physical activity has a lower risk of cardiovascular mortality than someone with a healthy BMI who does little or no physical activity (Church et al, 2005). The article by Nicklas et al reviewed on the next page demonstrates that resistance training improves body composition, muscle strength and physical function, and supports the use of it regardless of whether calorie restriction is part of the intended treatment or not.

Anyone can exercise. Even wheelchair-bound patients and the severely disabled can be found appropriate exercises if supported by an appropriate therapist, and a tailored approach can significantly impact long-term engagement with physical activity (Walker et al, 2012). Yes, we should accept the limitations of physical activity as an isolated intervention for weight loss, but let’s not lose sight of the overall picture; we should still include it in our weight management programmes. ■

## Am J Clin Nutr

### The associations between physical activity, BMI, waist circumference and mortality

Readability	★★★★
Applicability to practice	★★★★
Originality	★★★

1. In this article, the authors evaluated the associations between physical activity and all-cause mortality, as well as whether BMI and waist circumference (WC) affected these associations, in a large population-based cohort from the EPIC (European Prospective Investigation into Cancer and Nutrition) study.
2. A total of 334 161 men and women from 10 European countries were followed for a mean of 12.4 years. Physical activity levels were categorised as inactive, moderately inactive, moderately active or active according to the Cambridge Index.
3. Across all three BMI strata (normal-weight, overweight or obese), mortality risk decreased by 20–30% when moderately inactive people were compared with fully inactive people. Higher levels of activity further reduced the risk by around 5–10% in normal-weight and overweight, but not obese, participants.
4. Similar patterns emerged when participants were grouped according to WC.
5. Modelling suggested that if all inactive people increased their physical activity levels, the number of deaths would have reduced by 7.35%, while lowering BMI below 30 kg/m<sup>2</sup> would only reduce the number by 3.66%. Avoiding a high WC would have reduced the number by 6.53%.
6. Thus, the authors conclude that physical inactivity is responsible for twice as many deaths as excessive BMI. Increasing physical activity by the equivalent of 20 minutes of brisk walking per day can significantly reduce the risk of death in inactive people.

Ekelund U, Ward HA, Norat T et al (2015) Physical activity and all-cause mortality across levels of overall and abdominal adiposity in European men and women: the European Prospective Investigation into Cancer and Nutrition Study (EPIC). *Am J Clin Nutr* 101: 613–21

References on next page

## Am J Clin Nutr

## Resistance training and diet in older obese people

Readability	////
Applicability to practice	////
Originality	////

- Resistance training (RT) has been shown to improve muscle mass, muscle strength and overall physical function in older people of normal weight; however, to date, few studies of RT have been performed in obese older people.
- In this trial, 126 obese people aged 65–79 years were randomised to a 5-month regimen of 3 days of progressive RT per week, with or without a concurrent calorie-restricted diet. It was hypothesised that the diet would cause further improvements in muscle strength by reducing intermuscular adipose tissue (IMAT) levels.
- RT comprised three sets of 10 repetitions of eight machine-based exercises for legs, triceps and biceps, with weight adjusted every month to compensate for increasing strength. Calorie restriction comprised a 600-kcal deficit from estimated daily energy requirements.
- Overall, RT alone resulted in improved body composition, including reduced IMAT levels, knee extensor strength and power, muscle quality and chair rise times; however, participants with greater adiposity (and thus IMAT levels) at baseline showed less improvement in these parameters.
- Addition of the diet regimen resulted in a 5.5% reduction in total body mass, as well as improvements in grip strength, 400-m walk time and self-reported disability (by 17.9%, 3.1% and 3.4%, respectively).
- The authors thus conclude that moderately high-intensity RT for 3 days per week is safe and effective in obese older people, and should be incorporated into obesity treatments. The addition of calorie restriction does not compromise these effects and may also increase mobility.

Nicklas BJ, Chmelo E, Delbono O et al (2015) Effects of resistance training with and without caloric restriction on physical function and mobility in overweight and obese older adults: a randomized controlled trial. *Am J Clin Nutr* **101**: 991–9

## J Clin Endocrinol Metab

## Endocrine-disrupting chemicals and obesity: Economic costs

Readability	////
Applicability to practice	////
Originality	////

- Endocrine-disrupting chemicals (EDCs), such as the phthalates found in plastics, organophosphate pesticides, environmental phenols and heavy metals, are associated with obesity and diabetes through their effects on a number of endocrine mechanisms.
- In this study, the authors used current epidemiological data to estimate the disease burden and economic costs associated with exposure to the three EDCs with the best-documented evidence of obesogenicity.
- Dichlorodiphenyldichloroethylene (DDE) was estimated to cause 1555 cases of overweight per year at the age of 10 (40–69% probability) and 28 200 cases of adult diabetes (20–39% probability) per year.
- Phthalate exposure was estimated to result in an extra 53 900 cases of obesity and 20 500 incident cases of diabetes in older women (40–69% probability). Prenatal exposure to bisphenol A (BPA) was estimated to cause 42 400 cases of childhood obesity (20–69% probability).
- The total estimated attributable costs (both direct and indirect) were €859.6 million for DDE, €16.2 billion for phthalate and €1.54 billion for prenatal BPA exposure.
- The authors point out that these costs are likely to be underestimations, as the majority of EDCs were not analysed owing to a poor evidence base.
- While the effects of EDCs are small compared with the effects of diet and lifestyle, policies and regulation to limit human exposure to these agents could be executed more quickly and would be easier to implement and maintain.

Legler J, Fletcher T, Govarts E et al (2015) Obesity, diabetes, and associated costs of exposure to endocrine-disrupting chemicals in the European Union. *J Clin Endocrinol Metab* **100**: 1278–88

## Obes Rev

## Sleep duration and risk of overweight and obesity in children and adolescents

Readability	////
Applicability to practice	////
Originality	////

- The Australian Sleep Health Foundation recommends 10–13 hours of sleep per day in preschool children, 9–11 hours in school-aged children and 8–10 hours in adolescents.
- In this meta-analysis of 24 821 children and adolescents, those who achieved a shorter sleep duration than recommended had a doubled risk of overweight or obesity (odds ratio [OR], 2.15; 95% confidence interval, 1.64–2.81).
- The association was stronger in adolescents than in children (OR, 2.06 vs 1.76), and in younger children compared with older children (OR, 1.88 vs 1.55).

Fatima Y, Doi SA, Mamun AA (2015) Longitudinal impact of sleep on overweight and obesity in children and adolescents: a systematic review and bias-adjusted meta-analysis. *Obes Rev* **16**: 137–49

## N Engl J Med

## Pregnancy outcomes after bariatric surgery

Readability	////
Applicability to practice	////
Originality	////

- In this case-control study of pregnancy outcomes in Sweden, women who had previously undergone bariatric surgery ( $n=554$ ) had lower risks of gestational diabetes (odds ratio [OR], 0.25) and large-for-gestational-age infants (OR, 0.33) compared with women matched for BMI and other risk factors ( $n=2278$ ).
- However, increased surveillance in this patient population is warranted, as there was a higher risk of small-for-gestational-age infants (OR, 2.20), shorter gestation (mean difference, 4.5 days) and, possibly, neonatal death (OR, 2.39;  $P=0.06$ ).

Johansson K, Cnattingius S, Näslund I et al (2015) Outcomes of pregnancy after bariatric surgery. *N Engl J Med* **372**: 814–24

*“The authors conclude that physical inactivity is responsible for twice as many deaths as excessive BMI. Increasing physical activity by the equivalent of 20 minutes of brisk walking per day can significantly reduce risk of death in inactive people.”*

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