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## INTERMITTENT FASTING DIETS

**'Intermittent fasting' involves alternating cycles of eating and fasting without specifying which types of foods can be eaten on non-fasting days. On a fasting day, a person's intake is often limited to non-calorific fluids such as water, tea, coffee and diet drinks, or it may allow a very restricted amount of daily calories.**

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These diets have a strong media presence and have been linked with many celebrities such as Beyoncé, Chris Martin, Ben Affleck and Jennifer Lopez.

There are different types of fasting diets such as:

- the 5:2 diet - limits calorie intake on two days per week to 500kcal per day for women and 600kcal per day for men, and advises the usual recommended daily calorie intake on the five non-fasting days (i.e. roughly 2000kcal for women and 2400kcal for men);
- the 6:1 diet - usual dietary intake for six days per week and a 24-hour fast on one day per week;
- the Eat-Stop-Eat diet - a variation of the 6:1 diet which can include two 24-hour fasts per week;
- the 16:8 diet - fasting for 16 hours per day by consuming all meals within an eight-hour window.

### COMMON ARGUMENTS FOR FASTING DIETS

- Our ancestors would have had periods of fasting depending on food availability.
- Some people prefer an 'all or nothing' approach when trying to restrict calories for weight loss compared to a 'moderation' approach.
- Promoters of intermittent fasting report a host of long-term health benefits, such as increased longevity, improved metabolic health, improved weight loss and a reduction in diseases, e.g. heart disease and Type 2 diabetes.

### COMMON ARGUMENTS AGAINST FASTING DIETS

- May lead to tiredness, headaches, lack of concentration and poor mood.
- May be dangerous if unsupervised by a medical professional depending on the person's age, medical history and lifestyle.
- Not a very balanced approach, potential to interfere with metabolic rate.
- An overall lack of evidence and no significant differences in outcomes found between more moderate daily restriction and this extreme fasting approach.

But what does the evidence say?

### INTERMITTENT FASTING AND WEIGHT MANAGEMENT

Data from randomised control trials up to one year in length have found that there is no difference in weight management outcomes from either eating regularly or intermittent fasting.<sup>1</sup> For example, a recent systematic review reported that although intermittent fasting resulted in significant weight loss (0.2-0.8kg per week), there was no difference in the results when this method was compared to continuous energy restriction when the weekly calorie restriction was similar between groups. Therefore, this study concluded that intermittent fasting 'may be an effective alternative strategy for health practitioners to promote weight loss for selected overweight and obese

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people'.<sup>2</sup> This is supported by a systematic review by Clifton et al. (2016)<sup>3</sup> which found that intermittent fasting and continuous energy restriction produce similar results in terms of weight loss and improvements in cholesterol, blood glucose and insulin levels.

In terms of specific outcomes, Hankey et al (2015)<sup>4</sup> identified a mean weight loss of 2.6%-8.9% (after one to six months respectively), as well as improvements in blood pressure and insulin levels as a result of intermittent fasting interventions. Interestingly, this systematic review also found that these trials had an average 20% drop-out level; which is relatively low compared to other weight loss interventions which can range from 10%-80%.<sup>4,5</sup>

However, all of the above studies highlighted that further research is needed and that the longer-term effects of this method remain unclear.<sup>2-4</sup> There is also some evidence which has reported that rather than true weight loss including a loss of fat, fasting can result in a higher loss of intracellular fluid.<sup>6</sup>

#### INTERMITTENT FASTING AND AGING

A recent systematic review of human studies found that intermittent fasting may improve inflammatory cytokines profile, such as adiponectin:leptin ratio and changes in insulin-like growth factors, which may have a positive effect on aging.<sup>7</sup> Mattson et al (2016)<sup>8</sup> also reported that intermittent fasting is involved in the 'activation of adaptive cellular stress response signalling pathways that enhance mitochondrial health, DNA repair and autophagy'. However, overall large scale research in this area appears limited.<sup>9</sup>

#### THE EFFECT OF MEAL PATTERNS

An important issue when weighing up the pros and cons of intermittent fasting is whether our meal patterns affect our health; does it make a difference if we eat regularly throughout the day or not?

There is a lack of evidence related to meal frequency and subsequent appetite regulation and calorie intake; however, based on small short-term randomised control trials, no significant difference in appetite regulation has been identified when those who eat frequently were compared to those with a more irregular meal pattern.<sup>10</sup>

There is some limited evidence from randomised control trials that having fewer meals in the day may increase the metabolic cost of digesting food, as the thermic effect of food (i.e. the energy the body uses above the resting metabolic rate to digest and store food) may be lower when meals are eaten more regularly over the course of a day rather than in one go; although there is not enough evidence to make any practical recommendations based on this.<sup>11</sup> Yet, it is interesting to note that there is also a fair level of evidence that skipping breakfast is associated with having a higher BMI and being overweight or obese; although no direct cause and effect relationship can be assumed from this.<sup>12</sup> Skipping breakfast for two weeks has also been found to raise LDL cholesterol and produce insulin resistance in a small study by Farshchi et al (2013).<sup>13</sup>

The body of evidence in relation to cholesterol level and meal pattern has found that eating more regularly can modestly decrease total and LDL cholesterol levels among adults with normal cholesterol levels to begin with; however, the

evidence in those with high cholesterol is more limited and doesn't display this relationship. A limited level of evidence based on data in non-diabetic subjects has also found that a more regular meal pattern improves blood glucose and insulin stability.<sup>14</sup>

### POTENTIAL RISKS OF FASTING

Although some earlier studies conducted in rodents found that fasting can increase the amount of liver enzymes which metabolise toxins, subsequent investigation found that this was due to liver shrinkage rather than an improvement in enzyme levels and concerns with fasting were identified, such as an increased susceptibility to toxin damage from reduced antioxidant levels present in the liver.<sup>14-16</sup> A review of the evidence related to fasting from PEN (2013)<sup>17</sup> concluded that 'close examination of the evidence regarding the health effects of fasting does not support the denial of eating as a health-promoting activity. In fact, fasting may actually be deleterious to health by increasing insulin resistance, while decreasing important liver detoxifying enzyme functions, muscle mass and body nutrients, and one's ability to work and exercise'. This report also highlights further issues related to fasting, such as a reduction in immune function and an increase in non-dehydration-related headaches.

Similarly, a systematic review by Horne et al (2015)<sup>9</sup> of the potential health benefits, or health risks, of intermittent fasting found that although a few randomised controlled trials and observational studies have identified benefits from fasting, 'substantial further research in humans is needed before the use of fasting as a health intervention can be recommended'.

### CONCLUSION

In terms of weight loss and cardiovascular health, current research indicates that intermittent fasting and continuous calorie restriction seem to produce similar outcomes, so there may be an argument for considering intermittent fasting as a weight loss method, as there is no one universal solution when it comes to weight management. However, if this was to be considered as an option, it would be important to highlight the potential risks related to fasting and low calorie intakes, as well as the overall limited evidence base and uncertainty about the longer-term outcomes of intermittent fasting.

It is interesting to see a potential benefit of intermittent fasting in relation to healthy aging; however more research is also needed in this area.

Similarly, there is a scarcity of evidence when it comes to the effect of meal patterns on health; but it is interesting that although eating breakfast is associated with a healthier weight and a regular meal pattern may encourage better cholesterol and glycaemic levels, at present there does not seem to be enough evidence to suggest that a regular meal pattern improves appetite regulation, or the metabolic cost of digesting food.

Overall, there is quite a lot of contrasting findings in relation to intermittent fasting, but the one common message is that more evidence is needed to examine the effects of this method; in particular longer-term human studies. However, current research indicates that intermittent fasting can be an effective method to promote weight loss, so this may be worth considering for some individuals, while weighing up the pros and cons of intermittent fasting as discussed in this article.



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