Is `yo-yo’ dieting bad for you?

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Study 1: Weight cycling and immune function
A US study investigated the effect of weight cycling on immune function.

**Subjects and method:** Observational cross-sectional study of 114 overweight (mean BMI=32) post-menopausal women, who had been weight stable for at least the previous 3 months and were apparently healthy. They filled in a weight history questionnaire.

**Results:** Women who reported intentionally losing weight more frequently over the preceding 20 years had lower natural killer cell immunity - see Graph.


**Studies 2/3: Weight cyclers, weight gain & diabetes**
Two recent analyses from the Nurses Health Study throw light on whether weight cyclers are more likely to continue to gain weight and to develop diabetes.

**Subjects and method:** Observational longitudinal study. 965 women who indicated in 1993 that they were weight cyclers and 967 age- and BMI-matched controls were followed for 7 more years.

**Results:** Compared with weight stable non-weight cyclers, severe weight cyclers (those reporting losing at least 20 lb 3x in the preceding 4 years) subsequently gained 10.3 lb more weight, and mild cyclers (those losing at least 10 lbs 3x) subsequently gained 6.7 lb more (adjusted for age and BMI, p<0.001).

In another analysis of 46,634 women from the Nurses Health Study, 20.3% were found to be mild and 1.6% severe weight cyclers in 1993. They were followed for a further 6 years. Although weight cycling was strongly correlated with initial BMI and initial BMI with the risk of subsequent type 2 diabetes, when controlled for initial BMI, weight cycling was not associated with risk of developing diabetes.


**Study 4: Weight cycling and hypertension**
A combined sample of 12,362 German adults from EPIC and Nutrition-Potsdam studies were asked about their weight status in the preceding 2 years. In the next 2 years, amongst obese subjects (BMI ≥30) weight change of any type predicted the risk of hypertension.

In a nutshell
Some observational evidence links weight cycling (‘yo-yo dieting’) with adverse health effects (e.g. hypertension, bone loss). But the total body of evidence does not thus far provide convincing of effects that are independent of weight status. Clinicians should continue to encourage patients towards healthy weight, even if they have regained the weight lost on prior attempts.

**Graph:** NK cytotoxicity in relation to weight loss history (Study 1) (for 4 different effector:target ratios, with SE bars)
(see Table), but this was not true of those of normal weight.


**Table: Odds ratio for developing hypertension in reln. to 2 year prior weight change (c.f weight stable)**

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<th></th>
<th>OR</th>
<th>95% CI</th>
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<tbody>
<tr>
<td>Weight gainers</td>
<td>2.79</td>
<td>(1.19-6.56)</td>
</tr>
<tr>
<td>Weight losers</td>
<td>6.74</td>
<td>(2.58-17.6)</td>
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<tr>
<td>Weight cyclers</td>
<td>4.29</td>
<td>(1.55-11.9)</td>
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**Comments**

The idea that ‘yo-yo dieting’ - recurring cycles of intentional weight loss followed by unwanted regaining of the weight lost - is somehow bad, and may even ‘make you fat’ has a strong place in both the popular mind and with some health professionals.

In the current obesity epidemic it is very important to know whether this is true or not. If it is, we must be careful how we get our patients to lose weight so as to avoid it. If it is false, we can reassure our patients so they do not become afraid of renewing their efforts to lose weight. What then are the facts?

The first thing to point out is that so far almost all the clinical evidence is observational. (Indeed it is doubtful if a randomised trial of deliberate weight cycling could now ethically be conducted in obese subjects). In trying to collate that evidence, we are limited by a serious lack of standard definitions of weight cycling.

Assuming we are talking about deliberate weight loss (since non-deliberate weight loss is likely to reflect co-existing disease), studies have varied a good deal in the time period over which the cycling has occurred, whether there was more focus on the frequency of the cycles or the amount of weight lost, and whether the amount of weight regained is taken into account. The new Studies are good examples of that variability.

It is also important to separate as far as possible any health impact of weight cycling from that of being overweight in the first place. Also to distinguish between people who diet a lot (or are chronically restrained in their eating) from weight cyclers. Only in this way can we hope to separate any effects of chronic nutrient restriction or the psychological mind set of chronic dieting (including binge eating) from any independent effects of the cycling of weight itself.

Such distinctions are not always easy to make in the published literature, including new Study 1, which also illustrates another problem with observational methodology. That is reliance on self-recalled weight history (in the case of Study 1 memory was asked to stretch back fully 20 years). Other measures of weight variability are available but intercorrelate only weakly.

Allowing for all those limitations, what does the literature show? On the question of whether weight cyclers end up putting on more weight in the longer term, there is little prior evidence to confirm new Study 2’s findings, although a new, open trial of very low calorie diet in severely obese subjects found that prior weight cyclers lowered weight and BP less effectively than non-cyclers. Some studies reported weight cyclers having more upper abdominal fat than non-cycling overweight controls, but others have not. New Study 3’s finding of no extra type 2 diabetes risk is compatible with earlier data showing no independent effect on glucose control or insulin resistance.

One study found weight cycling was associated with significantly lower HDL-C levels, but others have not found any link with lipid abnormalities. Reports have also been divided on whether there is any independent association with blood pressure.

Although a number of studies have found that weight variability in earlier adulthood was linked with higher cardiovascular or total mortality in later life, another prospective analysis found no such association. And, as we pointed out earlier, looking at weight fluctuation (as these studies did) is a different issue to the one we are considering here - weight cycling after intentional weight loss.

The question of weight cycling and bone density remains uncertain. Weight cycling and chronic dieting have both been associated with lower lumbar spine bone density, whereas no effect was seen on total or femoral bone density.

Regaining lost weight is no doubt discouraging, but other than some reports of an association between weight cycling and binge eating there is little evidence of links to other psychopathology.

Overall, bearing in mind the complex interactions weight cycling has with absolute weight, fatness and chronic dieting, we do not consider that the evidence of it having significant adverse effects is convincing. Even if it was, it would remain to be proven that this association was causal. It is entirely possible that some factor(s) already present in the weight cycling patient both makes it hard for them to sustain previously achieved weight loss, and produces higher risk of co-morbidities from obesity. (Insulin resistance could be one plausible such factor).

Further research may firm up some of the tentative risks outlined in this review, but we see no reason on the present evidence to discourage people who have had repeated previous attempts at losing weight - whether successful or not - from trying again. The clinician’s efforts would be far better applied to finding out why those prior attempts were unsuccessful, so as to devise a better weight loss strategy for their patient.
References: