

# Both weight loss and weight gain linked with increased fracture risk

January 27 2015

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This is an image of a weight scale. Credit: CDC/Debora Cartagena

Both weight gain and weight loss in older (postmenopausal) women are associated with increased incidence of fracture, but at different anatomical sites, finds a study published in *The BMJ* this week.

The findings also challenge the traditional view that [weight gain](#) protects against fractures.

The influence of [body weight](#) on the risk of fracture is complex. Low body [weight](#) is a well recognised risk factor for fracture, but obesity also increases the risk of fracture at some sites. How fracture patterns differ after intentional and unintentional weight loss in [postmenopausal women](#) is also unknown.

So a team of US researchers investigated associations between postmenopausal change in body weight and incidence of fracture - and associations between voluntary and involuntary weight loss with risk of fracture.

They analysed data on over 120,000 healthy postmenopausal women who were taking part in the Women's Health Initiative Observational Study and Clinical Trials. Women were aged 50-79 at the start of the study (1993-98) and were followed for an average of 11 years.

Information such as age, ethnicity, [body mass index](#) (BMI), smoking, alcohol intake, [physical activity levels](#), calcium and vitamin D intake was recorded at the start of the study.

Each year, participants were weighed and asked to report fractures of the upper limb (hand, wrist, elbow, upper arm, shoulder), lower limb (foot, knee, upper leg except hip, ankle), and central body (hip, pelvis and spine).

Change in body weight was categorised as stable (a change of less than 5% from initial weight), weight loss (a decrease of 5% or more since initial examination), and weight gain (an increase of 5% or more since initial examination).

Results at the third annual visit show that, during an average of 11 years of follow-up, compared with stable weight, weight loss was associated with a 65% increase in hip fracture, a 9% increase in upper limb

fracture, and a 30% increase in central body fracture.

Also, compared with women who had stable weight, weight gain was associated with a 10% increase in upper limb fractures and an 18% increase in lower limb fractures, but no difference in central body fractures.

Compared with stable weight, unintentional weight loss was associated with an increased risk of hip and spine fractures, whereas intentional weight loss was associated with an increased risk of lower limb fractures, but a decreased risk of hip fractures.

This study is the first to focus specifically on how weight change can differentially influence [upper limb](#), lower limb, and central body fractures among postmenopausal women in the US, say the authors.

The findings "have clinical and research implications and challenge the traditional clinical paradigm of weight gain protecting against fractures," they add. "Clinicians should be aware that even intentional weight loss is associated with increased rates of lower limb [fractures](#)."

An accompanying editorial discusses the implications for clinical practice. Juliet Compston, emeritus professor of bone medicine at Cambridge University, says unintentional weight loss of 5% or more in postmenopausal women "should be regarded as a risk factor for fracture, particularly hip fracture."

The finding of an increased risk of fracture with intentional [weight loss](#) and with weight gain, albeit small, however, "emphasises the need for measures to prevent bone loss during interventions to reduce weight," she adds.

**More information:** Paper: [www.bmj.com/cgi/doi/10.1136/bmj.h25](http://www.bmj.com/cgi/doi/10.1136/bmj.h25)

Editorial: [www.bmj.com/cgi/doi/10.1136/bmj.h60](http://www.bmj.com/cgi/doi/10.1136/bmj.h60)

Provided by British Medical Journal

Citation: Both weight loss and weight gain linked with increased fracture risk (2015, January 27)  
retrieved 27 April 2024 from

<https://medicalxpress.com/news/2015-01-weight-loss-gain-linked-fracture.html>

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