Obesity: a new way forward

Obesity is a chronic disease requiring long-term management[1-5]

Professional associations have recognized obesity as a global health challenge requiring a "chronic disease management model"[1,5]

WHO

"Obesity is a chronic disease, prevalent in both developed and developing countries, and affecting children as well as adults."[1]

AMA

"Recognizing obesity as a disease will help change the way the medical community tackles this complex issue that affects approximately one in three Americans."[2]

AACE

"…obesity is a primary disease, and the full force of our medical knowledge should be brought to bear on the prevention and treatment of obesity as a primary disease entity."[3]

TOS

It is the official position of The Obesity Society that obesity should be declared a disease.

Obesity is a complex disease influenced by multiple factors[6,7]:

- Genetic
- Physiologic
- Environmental
- Psychological

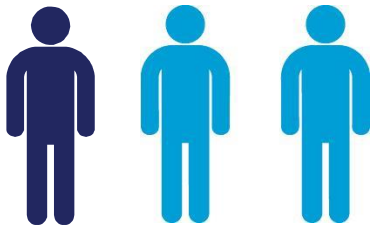
References: 1. WHO. *World Health Organ Tech Rep Ser*. 2000;894:1-253. **2.** AMA. At: http://www.ama-assn.org/ama/pub/news/news/2013/2013-06-18-new-ama-policies-annual-meeting.page. Accessed December 13, 2014. **3.** Mechanick JI et al. *Endocr Pract*. 2012;18(5):642-648. **4.** Allison DB et al. *Obesity*. 2008;16(6):1161-1177. **5.** Jensen MD et al. *J Am Coll Cardiol*. 2014;63(25 pt B):2985-3023. **6.** NHLBI; 1998. NIH publication 98-4083. **7.** Badman MK & Flier JS. *Science*. 2005;307(5717):1909-1914.

Obesity is considered a global pandemic[1]

The global prevalence of obesity has increased significantly over the last 30 years[1]

In 2012, more than one-third of adults in the United States were obese[2]

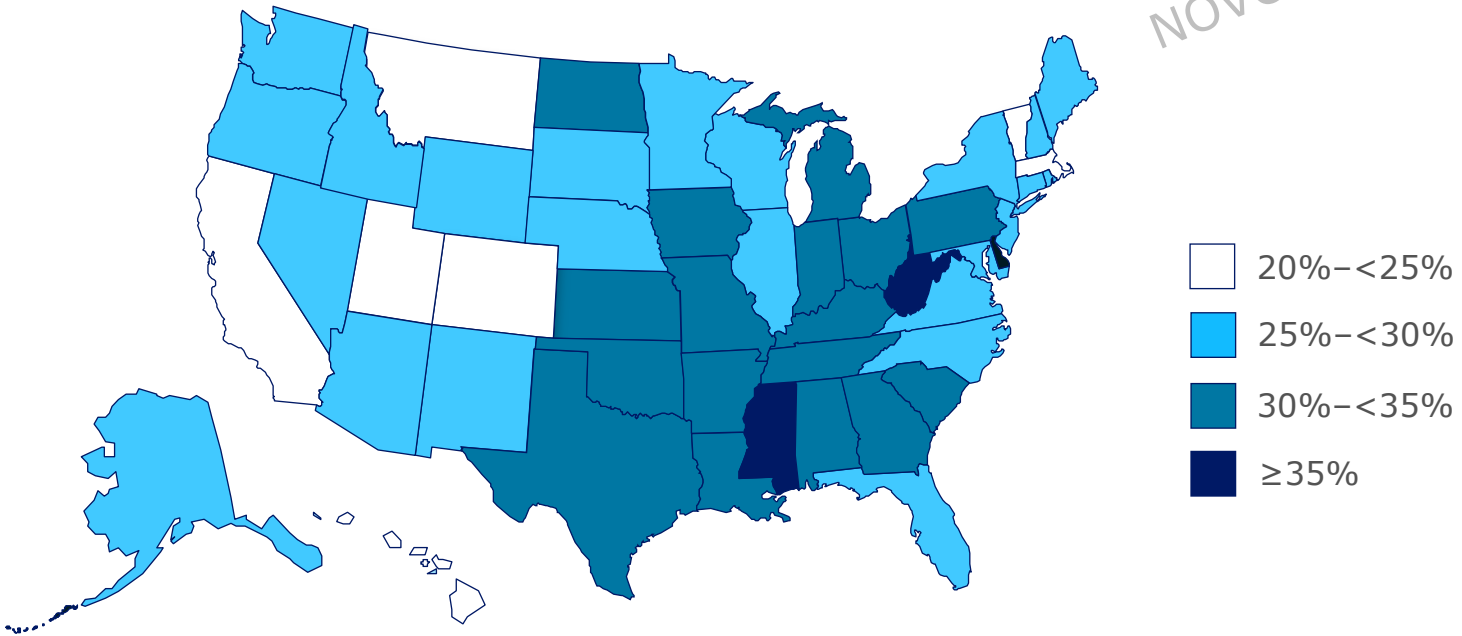
35%



References: 1. Ng M et al. *Lancet.* 2014;384(9945):766-781. **2.** Ogden CL et al. *JAMA*. 2014;311(8):806-814.

Obesity prevalence in the United States

Prevalence varies by state and region and is highest in the South and Midwest[1]



Prevalence reflects Behavioral Risk Factor Surveillance System (BRFSS) methodological changes started in 2011, and these estimates should not be compared to those before 2011.

Reference: 1. Centers for Disease Control and Prevention. Adult Obesity Prevalence Maps. http://www.cdc.gov/obesity/data/prevalence-maps.html. Accessed September 5, 2014.

Definition of obesity

- Obesity is defined by the World Health Organization (WHO) as abnormal or excessive fat accumulation that may impair health[1]
- BMI (body mass index)* provides a convenient population-level measure of obesity[1]

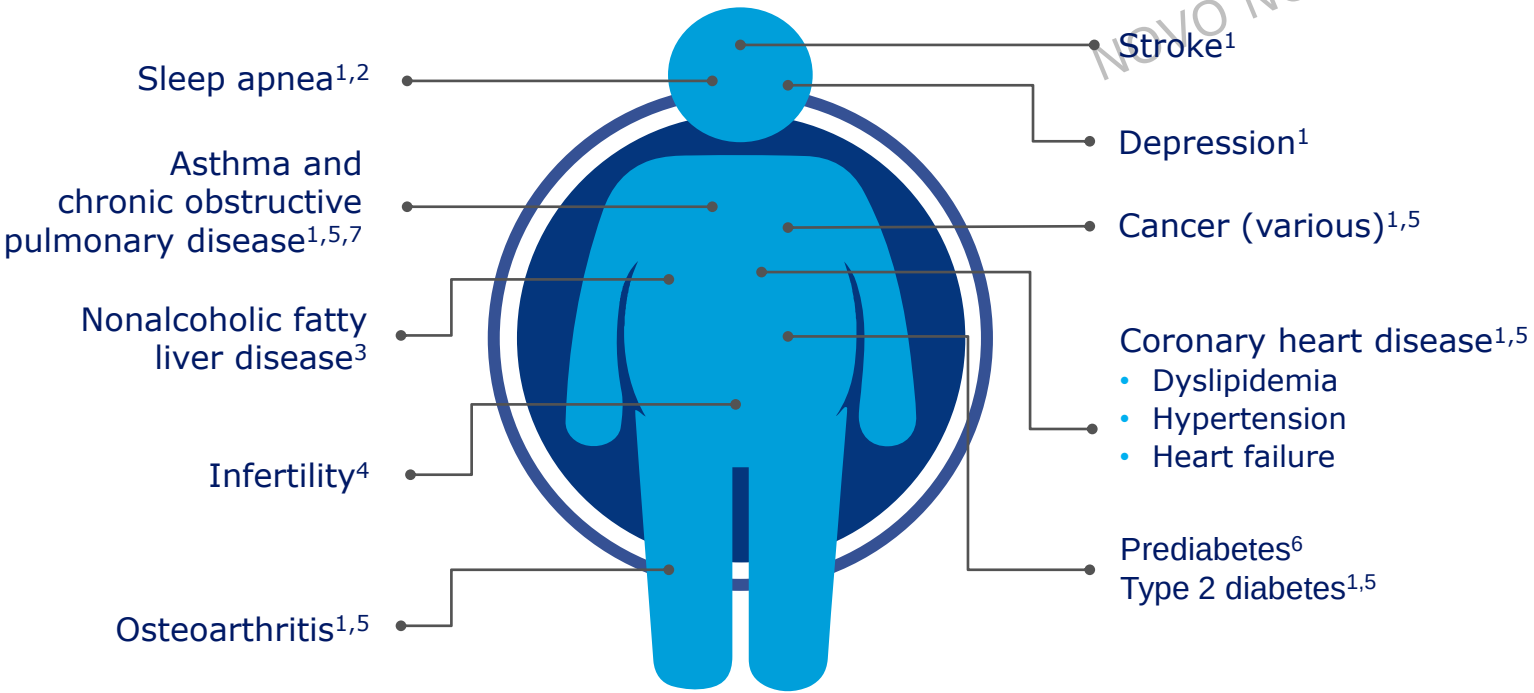
Classification based on BMI[1]

Classification	Underweight	Normal range	Overweight	Obese	Obese, class I	Obese, class II	Obese, class III
BMI	**<18.5**	**≥18.5 and <25**	**≥25 and <30**	**≥30**	**≥30 and <35**	**≥35 and <40**	**≥40**

*BMI is calculated by dividing the weight (kg) by the height (m) squared OR by dividing the weight (lb) by the height (in) squared and multiplying by 703.

Reference: 1. WHO. *World Health Organ Tech Rep Ser.* 2000;894:1-253.

Obesity is associated with multiple complications that pose a public health challenge

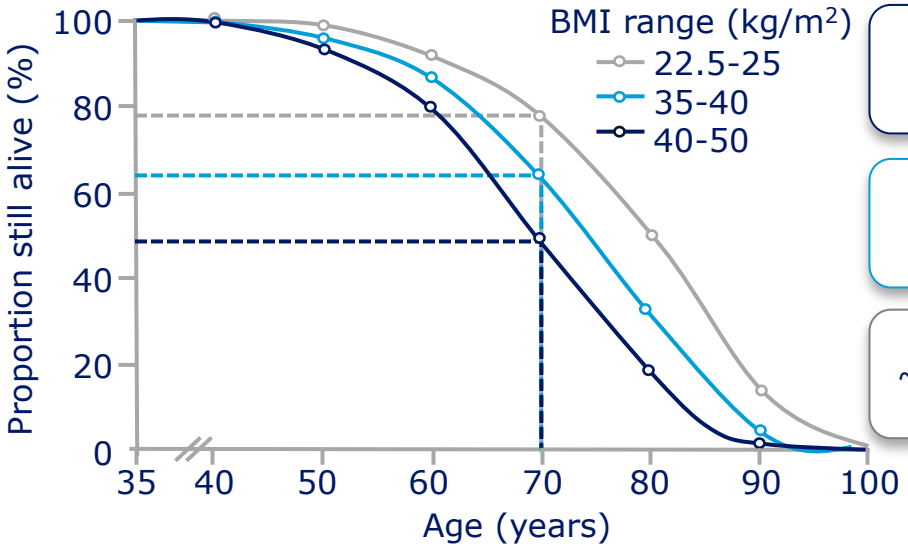


References: 1. National Institutes of Health. *Obes Res.* 1998;6 Suppl 2:51S-209S. **2.** Li C et al. *Prev Med.* 2010;51(1):18-23. **3.** Church TS et al. *Gastroenterology.* 2006;130(7):2023-2030. **4.** Esmaeilzadeh S et al. *Arch Med Sci*. 2013;9(3):499-505. **5.** Guh DP et al. *BMC Public Health*. 2009;9:88. **6.** Shaikh S et al. *Int J Diabetes Dev Ctries*. 2011;31:65-69. **7.** Liu Y et al. *Respir Med.* 2015;109(7):851-859.

Risk of mortality is significantly increased

Research showed a decreased life expectancy of up to 10 years[1,a]

Increased BMI associated with decreased life expectancy



BMI 22.5-25 kg/m²= ~80% chance of reaching age 70 years

BMI 35-40 kg/m²= ~60% chance of reaching age 70 years

BMI 40-50 kg/m²= ~50% chance of reaching age 70 years

For every 5 kg/m² BMI increment above the range of 22.5 kg/m² to 25 kg/m², there is a 30% increase in overall mortality

[a]Data from male subjects.

Reference: 1. Prospective Studies Collaboration et al. *Lancet*. 2009;373(9669):1083-1096.

Patients with obesity can lose years off their life[1,a]

		Years of life lost per age group		
BMI	**Gender**	**20–39 years**	**40–59 years**	**60–79 years**
30 to <35[b]	**Men**	5.9 years	1.7 years	0.8 years
	Women	5.6 years	3.0 years	1.6 years
≥35[b]	**Men**	8.4 years	3.7 years	0.9 years
	Women	6.1 years	5.3 years	0.9 years

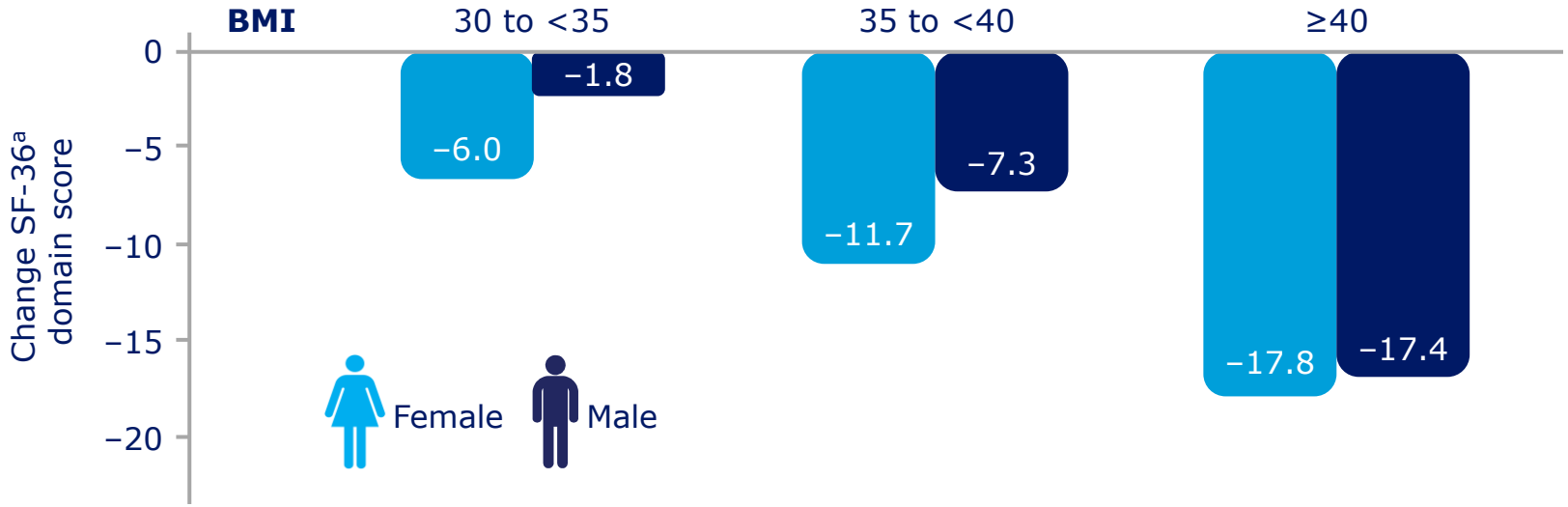
Younger patients with obesity lose the most years off their life

[a]Based on modeling of data from the 2003–2010 National Health and Nutrition Examination Survey.
[b]BMI is in units of kg/m^2.

Reference: 1. Grover SA et al. *Lancet Diabetes Endocrinol*. 2015;3:114-122.

Obesity is associated with impaired physical functioning[1]

The higher the BMI, the greater the risk of impaired physical functioning, which may include limitations in mobility activities such as walking and dressing[2]

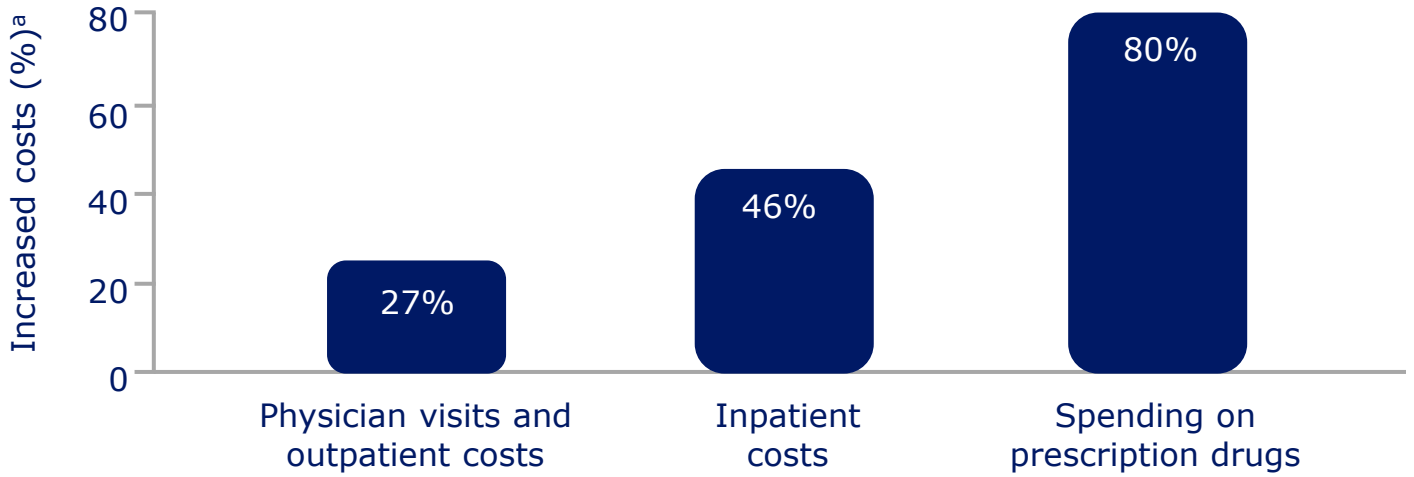


[a]SF-36=international health-related quality of life survey.

References: 1. Hopman WM et al. *Qual Life Res*. 2007;16(10):1595-1603. **2.** Syddall HE et al. *J Nutr Health Aging*. 2009;13(1):57-62.

Health care costs associated with obesity are mostly due to treating obesity-related comorbidities[1]

With increased medical spending, obesity can become an economic burden on both public and private payers

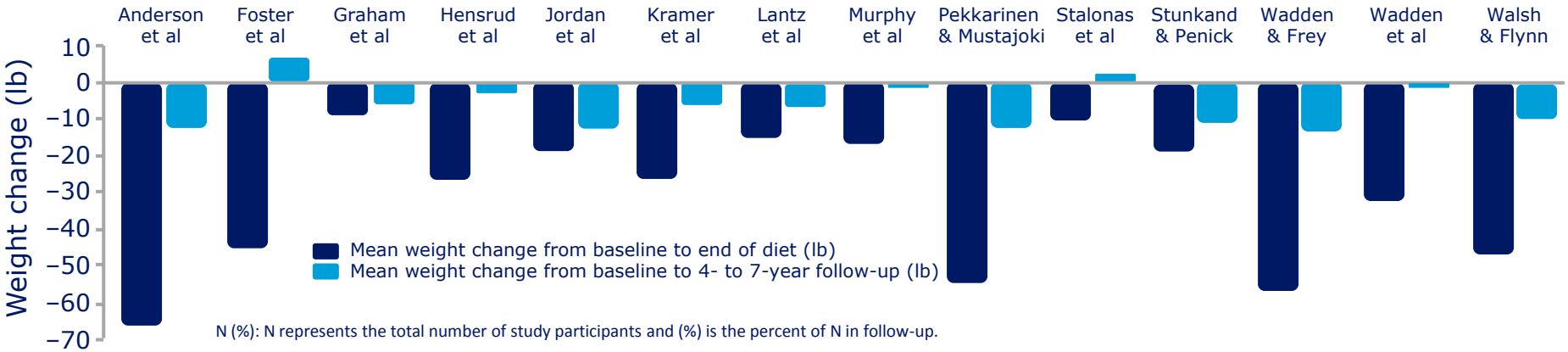


Reference: 1. Finkelstein EA et al. *Health Aff (Millwood)*. 2009;28(5):w822-w831.

Maintaining weight loss is challenging[1,2]

A review of 14 long-term studies showed that participants regained weight after weight loss achieved by diet[1]

Follow-up range from 4 to 7 years



N (%): N represents the total number of study participants and (%) is the percent of N in follow-up.

"… the high rate of relapse among [people with obesity] who have lost weight has a strong physiological basis and is not simply the result of the voluntary resumption of old habits.[3]"

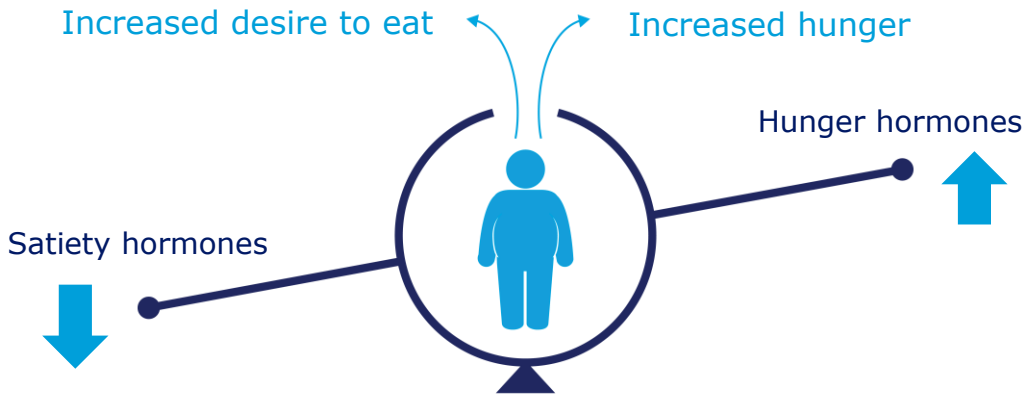
References: **1.** Mann T et al. *Am Psychol*. 2007;62(3):220-233. **2.** MacLean PS et al. *Obesity (Silver Spring)*. 2015;23(1):7-15. **3.** Sumithran P et al. *N Engl J Med*. 2011;365(17):1597-1604.

Science has discovered that physiologic responses to weight loss trigger weight regain[1-5]

Weight loss (for at least one year) in people with obesity results in changes in appetite hormones that increase hunger and the desire to eat[1]

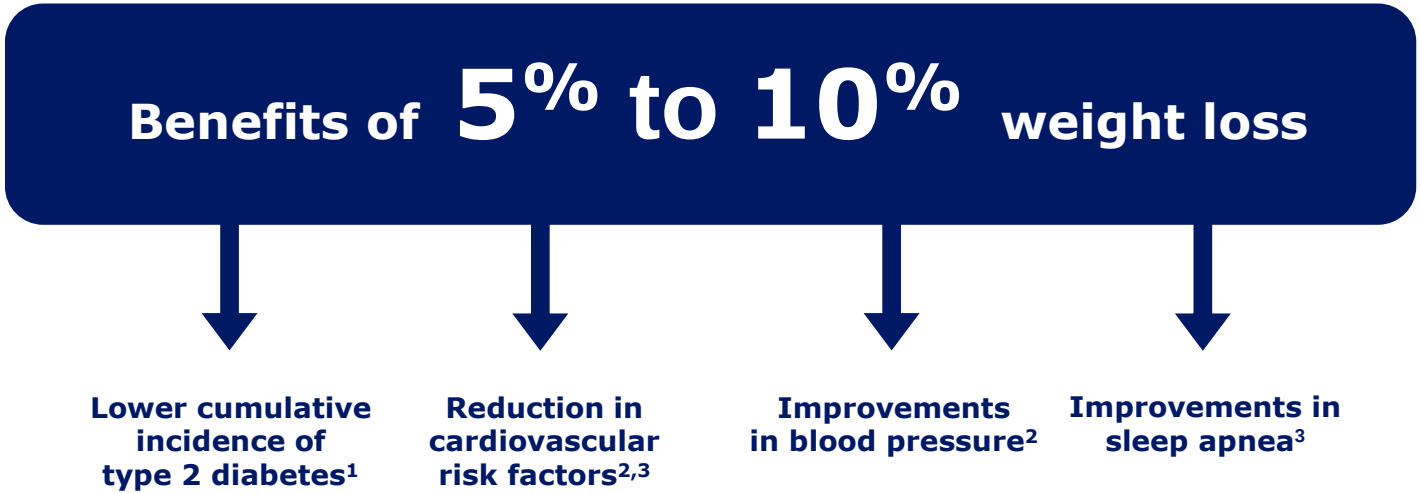
- Reductions in levels of leptin and cholecystokinin, coupled with increases in ghrelin, promote weight regain[1]

The brain has a central role in regulating appetite and energy balance. Metabolic adaptations to weight loss include[1]:



References: 1. Sumithran P et al. *N Engl J Med*. 2011;365(17):1597-1604. **2.** Schwartz A et al. *Obes Rev*. 2010;11(7):531-547. **3.** Sumithran P et al. *Clin Sci (Lond)*. 2013;124(4):231-241. **4.** Rosenbaum M et al. *Int J Obes (Lond)*. 2010;34(suppl 1):S47-S55. **5.** Rosenbaum M et al. *Brain Res*. 2010;1350:95-102.

A 5%-10% weight loss may improve obesity-related comorbidities[1-3]



References: 1. Knowler WC et al. *N Engl J Med*. 2002;346(6):393-403. **2.** Wing RR et al. *Diabetes Care*. 2011;34(7):1481-1486. **3.** Tuomilehto H et al. *Sleep Med*. 2014;15(3):329-335.

Multiple treatment options are needed to help people with obesity lose weight and improve their health[1]

Clinical management of obesity: AHA/ACC/TOS guidelines[2,a]

Treatment	BMI category (kg/m²)				
	25-26.9	27-29.9	30-34.9	35-39.9	≥40
Diet, physical activity, and behavior therapy	Yes, with comorbidities →	Yes →	Yes →	Yes →	Yes →
Pharmacotherapy		Yes, with comorbidities →	Yes →	Yes →	Yes →
Surgery				Yes, with comorbidities →	Yes →

Healthy eating and physical activity must be part of any weight-loss intervention, but they are not always sufficient to maintaining weight loss[2]

[a]Yes alone indicates that the treatment is indicated regardless of the presence or absence of comorbidities. The solid arrow signifies the point at which treatment is initiated.

ACC=American College of Cardiology; AHA=American Heart Association; TOS=The Obesity Society.

References: 1. Ferguson C et al. https://publichealth.gwu.edu/pdf/obesitydrugmeasures.pdf. Accessed January 8, 2015. **2.** Jensen MD et al. *J Am Coll Cardiol*. 2014;63(25 pt B):2985-3023.

Support from health care professionals can help patients achieve clinically significant and maintained weight loss[1]

Physician-initiated discussions motivate patients to lose weight and change behavior[1,2]

- Patients are less likely to start the dialogue for many reasons, including:
  - Potential for hearing hurtful comments about their weight[3]
  - Fear of being blamed for their weight problems[4]
  - Shame and embarrassment about their weight[4]
- To achieve sustainable weight loss, long-term intervention is often required[5]

References: 1. Loureiro ML et al. *Soc Sci Med*. 2006;62(10):2458-2468. **2.** Rueda-Clausen CF et al. *Clin Obes*. 2014;4(1):39-44. **3.** NIH; 2003. Updated 2011. NIH publication 03-5335. **4.** Ruelaz AR et al. *J Gen Intern Med*. 2007;22(4):518-522. **5.** Jensen MD et al. *J Am Coll Cardiol*. 2014;63 (25 pt B):2985-3023.

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