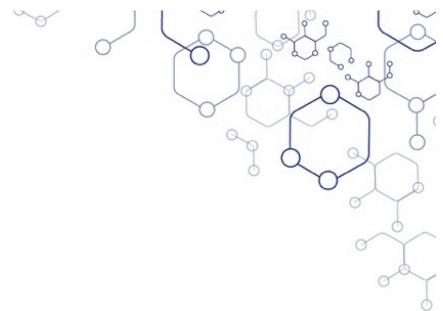


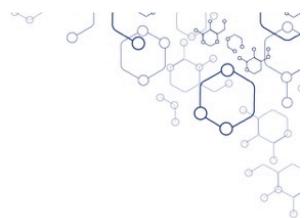


Rethink Obesity®

Discover the Science, Causes, and Effect of Obesity

Rethink Obesity®





**This content was developed for health care professionals
with the purpose of providing educational background
on the disease of obesity**

This content should be used for educational purposes only

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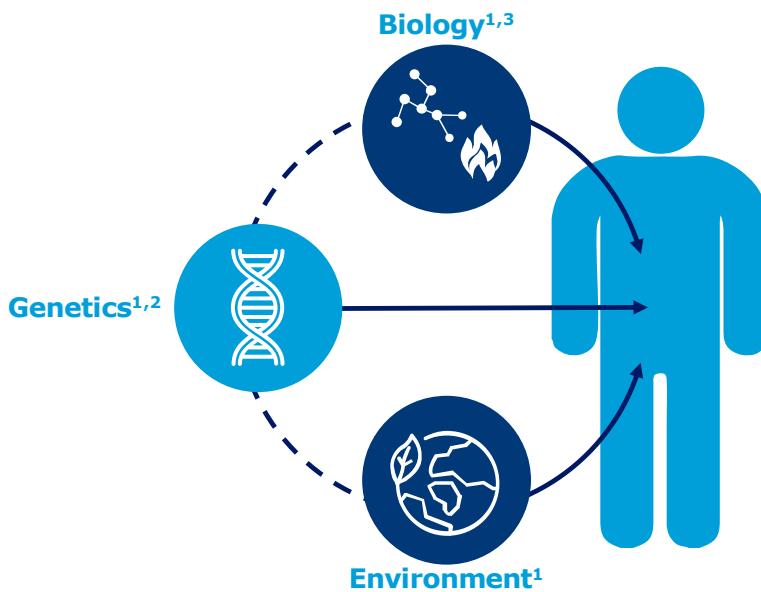
Overview

- Factors that contribute to the heterogeneous, chronic, and progressive disease of obesity
- People affected by obesity
- Risk associated with pre-obesity^a and obesity^b
- Steps for effective management of obesity



Obesity is a chronic disease influenced by a range of factors¹

Obesity is impacted by genetic, environmental, and biological factors¹

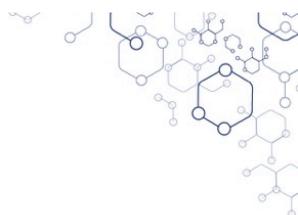


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1. World Health Organ Tech Rep Ser. 2000;894:i-xii,1-253. 2. Lam YY et al. Eur J Clin Nutr. 2017;71:318-22. 3. Sumithran P et al. N Engl J Med. 2011;365(17):1597-604.



Obesity is affected by genetics, environment, and biology



- Genetic factors influence an individual's response to the environmental factors that can contribute to obesity^{1,2}
- Twin and family studies have shown that 40% to 70% of interindividual differences in BMI are explained by genetic factors³
- Following weight loss, metabolic adaptation leads to changes in appetite-regulating hormones and decreases in resting metabolic rate^{2,4-6}

Obesity is considered a global pandemic¹

The global prevalence of obesity has increased significantly over the past 30 years²



Worldwide obesity has nearly
tripled
since 1975²



The chronic disease
of obesity affects over
650 million
adults worldwide²

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1. Ng M et al. *Lancet*. 2014;384(9945):766-81. 2. World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>. Published February 2018. Accessed April 23, 2019.

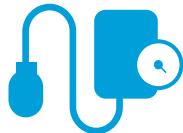


How obesity ranks compared with some other health challenges in the United States

Millions of US adults have health challenges and obesity is one of the most prevalent



About
100 million
adults in the US
have obesity¹



About
75 million
adults in the US have
high blood pressure²



78 million
adults in the US with
high cholesterol who
could benefit
from medicine^{3,a}

^aAdults aged ≥20 years.
1. Milken Institute. <https://assets1c.milkeninstitute.org/assets/Publication/ResearchReport/PDF/Mi-Americas-Obesity-Crisis-WEB.pdf>. Published October 2018.
Accessed April 23, 2019. 2. Centers for Disease Control and Prevention. https://www.cdc.gov/dhsp/data_statistics/fact_sheets/fs_bloodpressure.htm. Last reviewed June 2016. Accessed April 23, 2019. 3. Centers for Disease Control and Prevention. <https://www.cdc.gov/cholesterol/facts.htm>. Last reviewed February 2019.
Accessed April 23, 2019.

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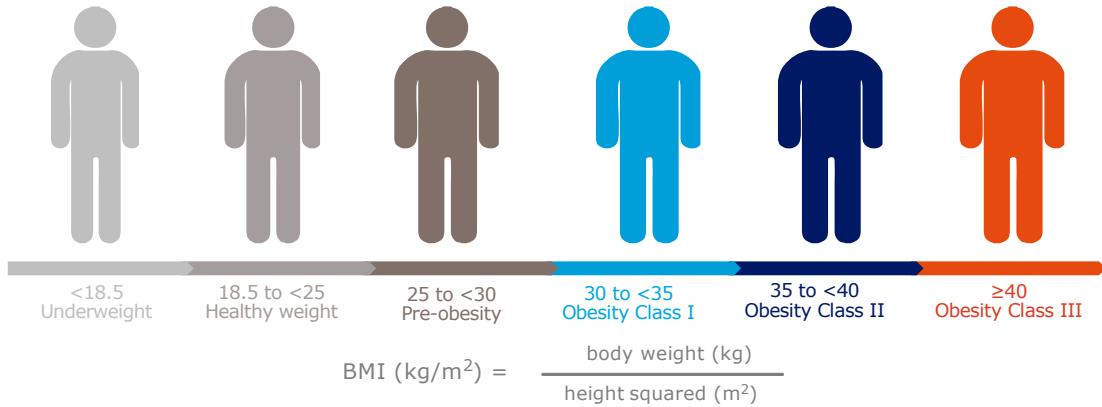




Definition of obesity

Obesity is defined by the World Health Organization (WHO) as abnormal or excessive fat accumulation that may impair health

- BMI (body mass index) provides a convenient, population-level measure of obesity

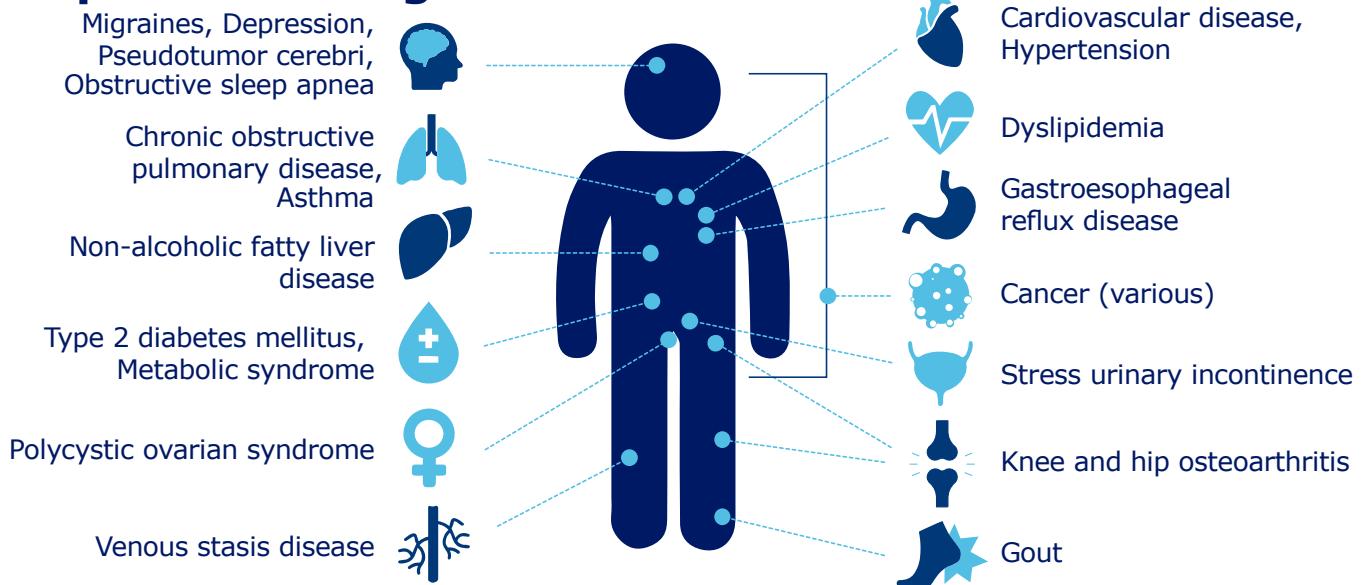


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World Health Organization. *World Health Organ Tech Rep Ser.* 2000;894:1253.



Obesity is a disease that can impact more than your patients' weight

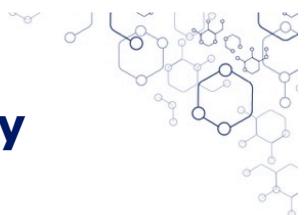


The above list is not exhaustive and is intended to illustrate only a range of key complications.

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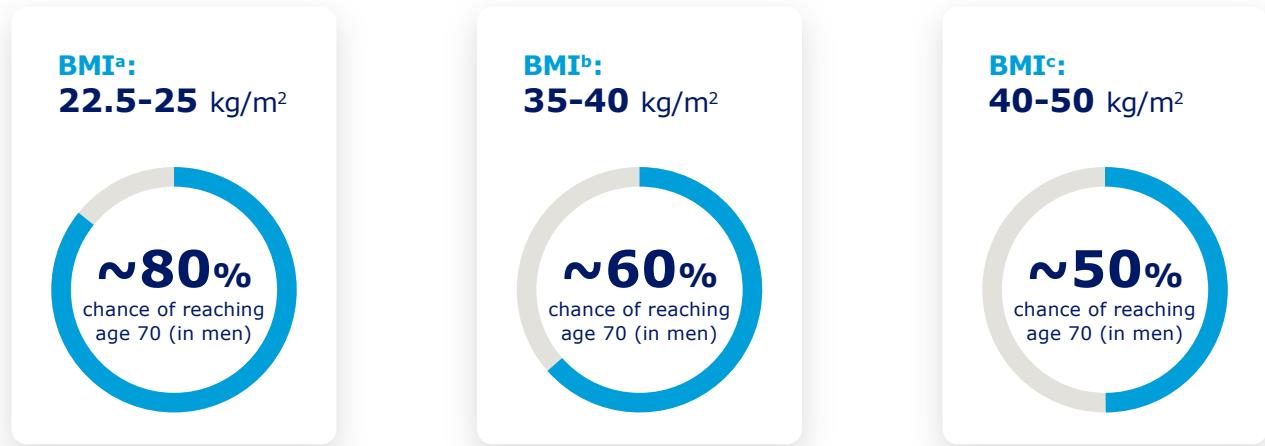
Garvey WT et al. *Endocr Pract.* 2016;22(suppl 3):1-203.





Increased BMI results in higher risk of mortality

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



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^a77% for men and 88% for women. ^b60% for men and 80% for women. ^c49% for men and 72% for women.
Prospective Studies Collaboration, et al. *Lancet*. 2009;373(9669):1083–1096.



Patients with obesity can lose years off their lives^a



		Years of life lost per age group		
		20–39 years	40–59 years	60–79 years
BMI: 30 to <35 kg/m ²	Men	5.9 years	1.7 years	0.8 years
	Women	5.6 years	3.0 years	1.6 years
BMI: ≥35 kg/m ²	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 more years off their life than older patients

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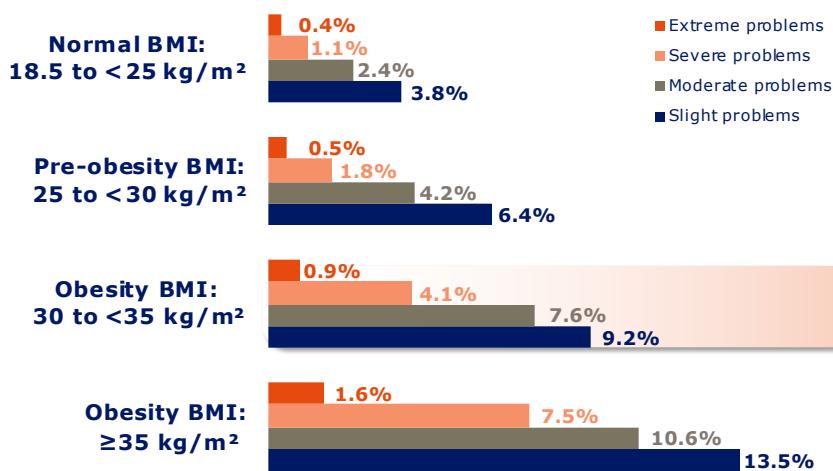
^aData are mean, based on analysis of 3992 responses to the 2003–2010 National Health and Nutrition Examination Survey. Grover SA et al. *Lancet Diabetes Endocrinol.* 2015;3:114–122.



Obesity is associated with impaired physical mobility



Percentage of people with mobility problems



1 in 8 patients
(12.6%)

with BMI 30 to <35 kg/m²
reported
moderate to extreme
mobility problems

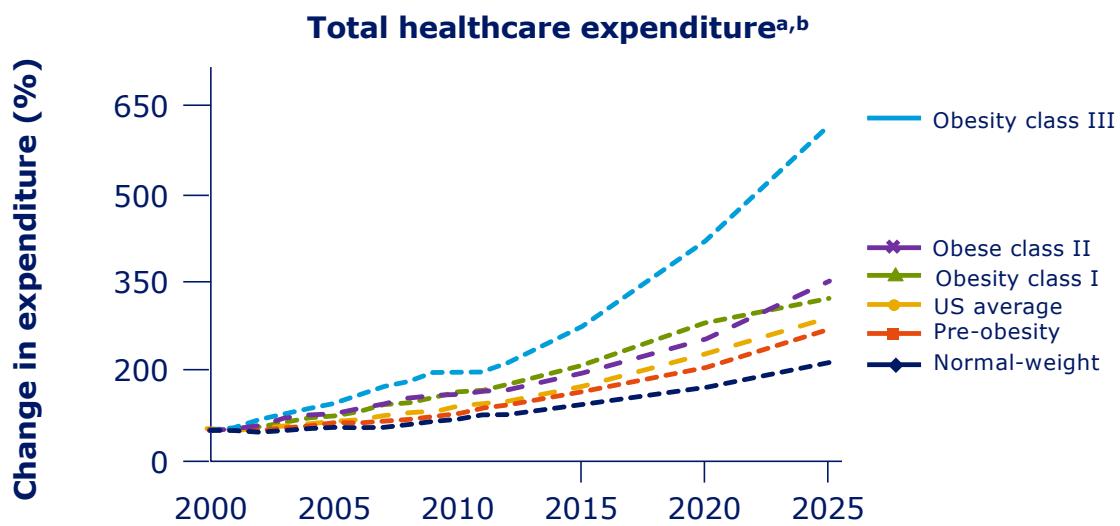
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Busutil R et al. *Health Qual Life Outcomes*. 2017;15(1):197.



People with obesity have higher health care costs than those with normal weight

With increased medical spending, obesity is currently an economic burden that is projected to worsen



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^aBMI (Body Mass Index) categories are defined according to WHO thresholds (WHO 2016) for adults and Cole TJ et al. *BMJ*. 2000;320:1240-3. for children and teenagers. ^b2000 is base year equal to 100.

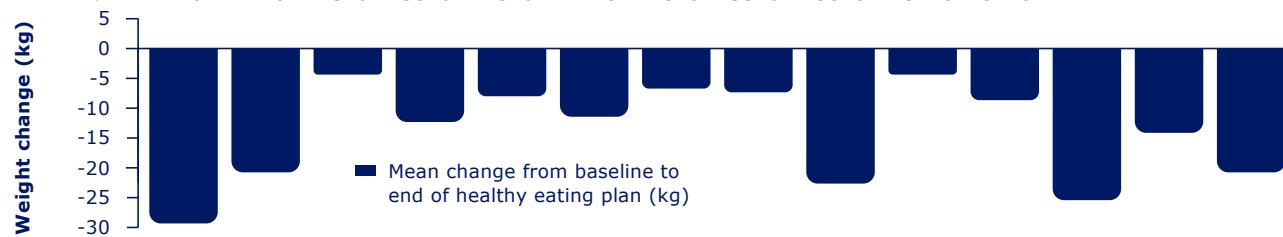
Cecchini M. *PLoS One*. 2018;13(11):e0206703. doi: 10.1371/journal.pone.0206703.



People with obesity regain weight after weight loss achieved by reduced-calorie meal plans^{1,2,a}



Anderson et al. N=52	Foster et al. N=55	Graham et al. N=60	Hensrud et al. N=21	Jordan et al. N=111	Kramer et al. N=152	Lantz et al. N=54	Murphy et al. N=25	Pekkarinen et al. N=24	Stalonas et al. N=36	Stunkard et al. N=26	Wadden et al. N=281	Wadden et al. N=55	Walsh et al. N=143	
Years of follow-up: % of N in follow-up:	5-7 12%	5 47%	4.5 43%	4 88%	5 25%	4 77%	4 48%	4 33%	5.5 88%	5 81%	5 81%	5 22%	5 72%	4.5 47%



People with obesity often find long-term weight loss difficult due to strong physiological responses that encourage weight regain²

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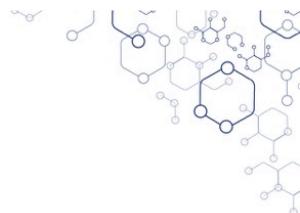
^aA review of 14 long-term studies.

1. Mann T et al. *Am Psychol.* 2007;62(3):220-233. 2. Sumithran P et al. *N Engl J Med.* 2011;365(17):1597-1604.

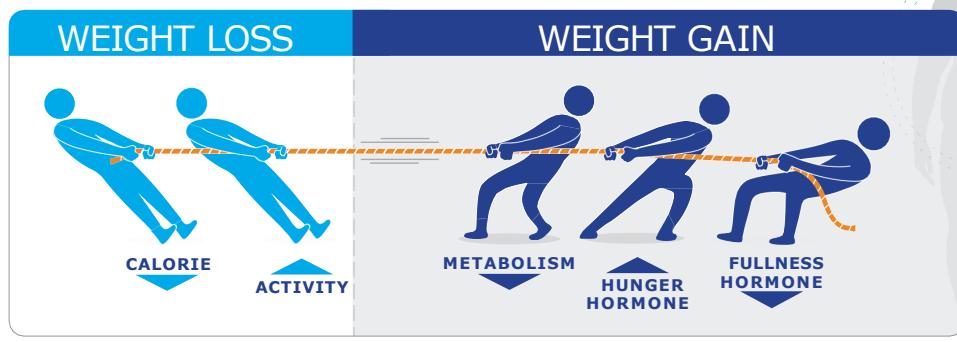


The tug-of-war of weight management

Willpower vs biology: Metabolic and hormonal responses affect the ability to maintain weight loss



After weight loss, metabolic adaptation leads to reductions in resting metabolic rate (~15%),¹ decreasing total energy expenditure,² and changes in appetite-regulating hormones (increase in the hunger hormone [ie, ghrelin] and decrease in satiety hormones [ie, GLP-1, PYY, CCK, amylin]).²



- Learn how you can help patients manage and treat obesity
- Ask your patients about their weight-loss attempts

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Patients were randomized to calorie restriction (CR), calorie restriction with exercise (CREX), or low-calorie diet (LCD) groups. Mean percentage weight change (SEM) at 6 months by group was -10.4 (0.9)% (CR), -10.0 (0.8)% (CREX), and -13.9 (0.7)% (LCD) of initial body weight.

1. Lam YY, Ravussin E. *Mol Metab.* 2016;5(11):1057-1071. 2. Sumithran P et al. *N Engl J Med.* 2011;365(17):1597-1604.



Weight loss improves obesity-related complications



≥5% weight loss can have a clinically meaningful impact on¹

Blood pressure¹⁻³



Cholesterol and lipids^{1,2,4}



Type 2 diabetes^{1,5}



Sleep apnea^{1,6,7}

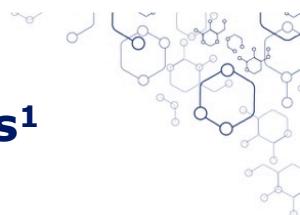


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1. Garvey WT et al. *Endocr Pract.* 2016;22(suppl 3):1-203. 2. Wing RR et al. *Diabetes Care.* 2011;34(7):1481-1486. 3. Dengo AL et al. *Hypertension.* 2010;55:855-861. 4. Dattilo AM et al. *Am J Clin Nutr.* 1992;56(2):320-328. 5. Knowler et al. *NEJM.* 2002;346(6):393-403. 6. Tuomilehto H et al. *Sleep Med.* 2014;15(3):329-335. 7. Foster GD et al. *Arch Intern Med.* 2009;169(17):1619-1626.

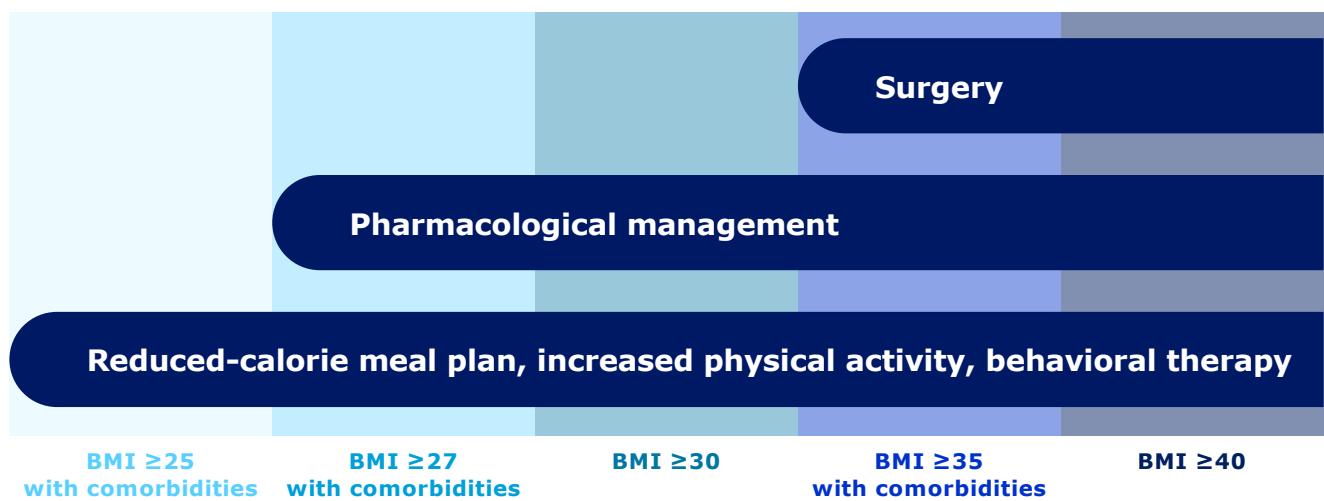
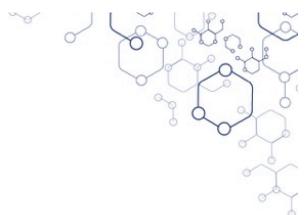


Support from HCPs can help patients achieve clinically significant and maintained weight loss¹



- 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 weight³
 - Fear of being blamed for their weight problems⁴
 - Shame and embarrassment about their weight³
- To achieve sustainable weight loss, long-term intervention is often required⁵

Reduced-calorie meal plan, increased physical activity, and behavioral therapy should be continued throughout the treatment of obesity (AHA/ACC/TOS Guideline)



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Jensen MD et al. *J Am Coll Cardiol.* 2014;63(25):2985-3023.



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Approaches for physical activity

- ≥ 150 minutes moderate-intensity aerobic activity each week can help patients lose and maintain weight^{1,2}
 - Progressively increase physical activity volume and intensity²
 - Split activity time across 3 to 5 days each week²
- Moderate-intensity physical activities include:¹
 - Brisk walking
 - Biking at a casual pace
 - Light yard work (raking leaves or using lawn mower)
 - Actively playing with children

Individualize activities to patient capabilities/preferences, taking into account physical limitations²

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1. Centers for Disease Control and Prevention. http://www.cdc.gov/healthyweight/physical_activity/index.html?s_cid. Last reviewed May 2015. Accessed April 23, 2019. 2. Garvey WT et al. *Endocr Pract.* 2016;22 Suppl 3:1-203.



Approaches for a reduced-calorie meal plan

- Reduced-calorie meal plans should be individualized. There is no “best” plan
 - Approaches should include a ~500–750 kcal daily deficit
- There are a variety of meal plans, such as:
 - Low carbohydrate
 - Low fat
 - High protein
 - Mediterranean
- Meal replacements may be considered

Reduced-calorie meal plans should be selected to reflect personal and cultural preferences

Summary

- Obesity is a chronic disease¹ that is a global pandemic²
- Obesity is associated with a number of weight-related complications such as obstructive sleep apnea, hypertension, and some types of cancers³
- Following weight loss, metabolic adaptation leads to changes in appetite-regulating hormones⁴ and a decrease in resting metabolic rate,^{5,6} which encourage weight regain
- A comprehensive lifestyle approach is recommended to achieve and sustain weight loss in patients with obesity³
 - Treatment for obesity should include individualized reduced-calorie meal plan, increased physical activity, and behavioral therapy³
 - There are pharmacological and surgical options available for the long-term management of obesity in appropriate patients³

Novo Nordisk offers many tools to support conversations with your patients about obesity

Many tools and resources for *HCPs* are available at:

RethinkObesity.com

For US Health Care Professionals Only

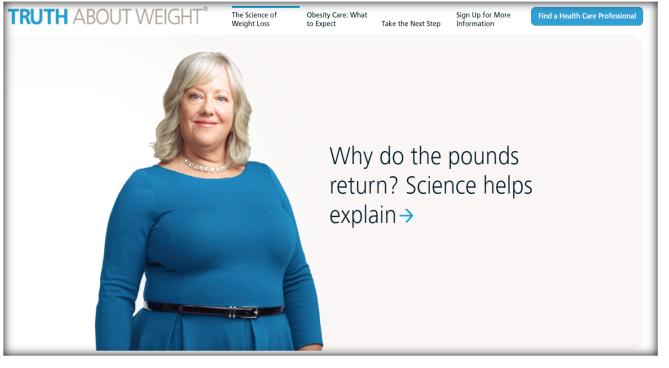
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Resources for *patients* are available at:

TruthAboutWeight.com

TRUTH ABOUT WEIGHT®



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