MATERNAL OBESITY: THE BANE OF OBSTETRICS

A BEACON FOR SEA CHANGE

Eric J. Carlson, DO, MPH, FACOOG (Dist.)

Maternal-Fetal Medicine

Clinical Associate Professor-Department of Obstetrics & Gynecology

Sidney Kimmel Medical College-Thomas Jefferson University

Philadelphia College of Osteopathic Medicine

carlsone@mlhs.org

OBESITY-DEFINITION

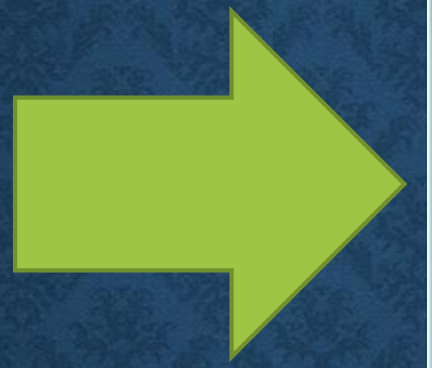
- Pre-Pregnancy Body Mass Index (BMI)
- Underweight: BMI < 18.5 kg/m^2
- Normal Weight: BMI ≥ 18.5 to 24.9 kg/m^2
- Overweight: BMI ≥ 25 to 29.9 kg/m^2
- Obesity: BMI ≥ 30 kg/m^2
- Obesity class I: BMI 30-34.9 kg/m^2
- Obesity class II: BMI 35-39.9 kg/m^2
- Obesity class III: BMI ≥ 40 kg/m^2 (“severe”; “extreme”; “massive” obesity)

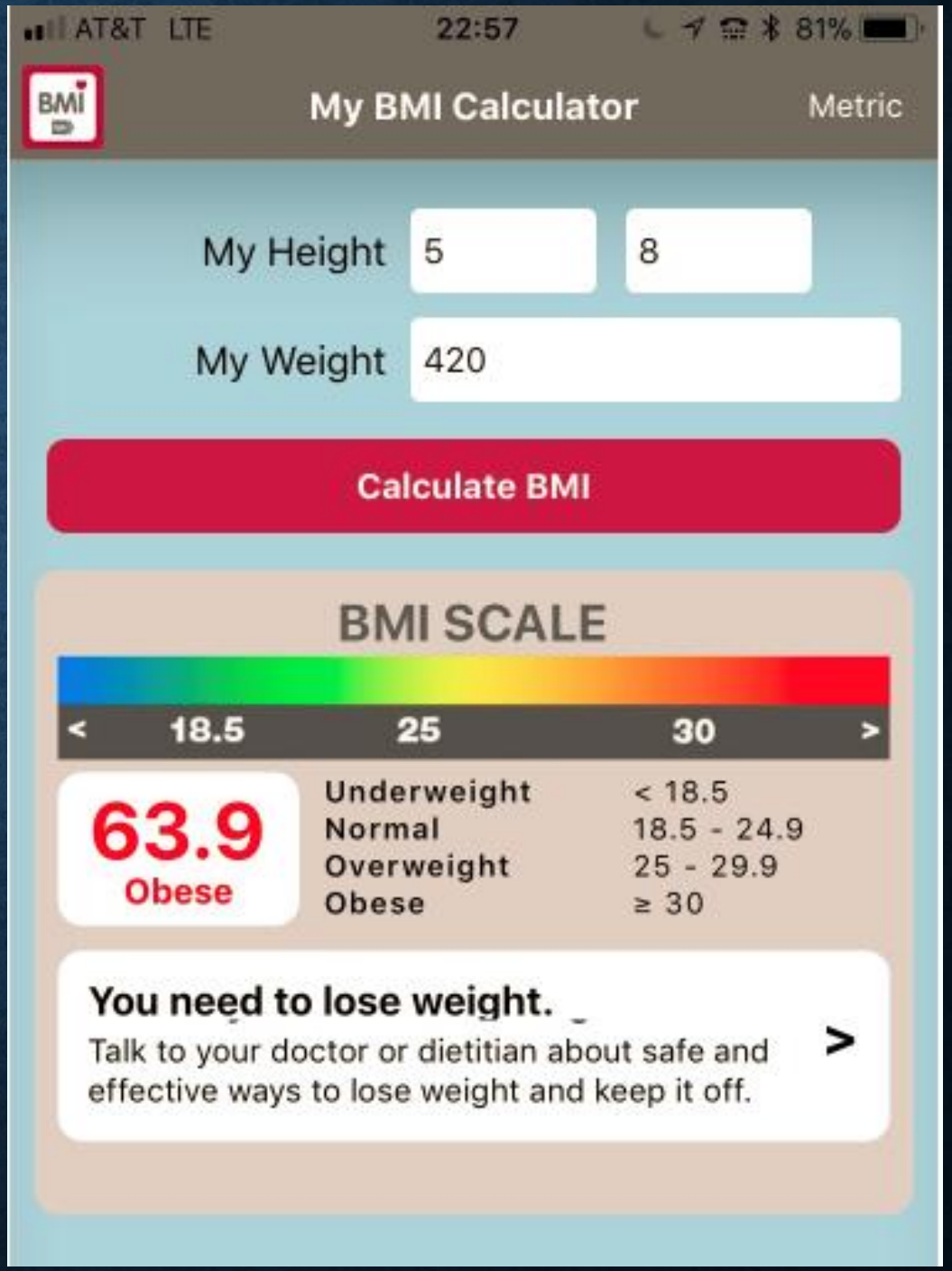
Body Mass Index Table

	Normal						Overweight					Obese										Extreme Obesity															
BMI	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**
Height (inches)	**Body Weight (pounds)**																																			
58	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167	172	177	181	186	191	196	201	205	210	215	220	224	229	234	239	244	248	253	258
59	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173	178	183	188	193	198	203	208	212	217	222	227	232	237	242	247	252	257	262	267
60	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179	184	189	194	199	204	209	215	220	225	230	235	240	245	250	255	261	266	271	276
61	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185	190	195	201	206	211	217	222	227	232	238	243	248	254	259	264	269	275	280	285
62	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191	196	202	207	213	218	224	229	235	240	246	251	256	262	267	273	278	284	289	295
63	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197	203	208	214	220	225	231	237	242	248	254	259	265	270	278	282	287	293	299	304
64	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204	209	215	221	227	232	238	244	250	256	262	267	273	279	285	291	296	302	308	314
65	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324
66	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216	223	229	235	241	247	253	260	266	272	278	284	291	297	303	309	315	322	328	334
67	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223	230	236	242	249	255	261	268	274	280	287	293	299	306	312	319	325	331	338	344
68	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230	236	243	249	256	262	269	276	282	289	295	302	308	315	322	328	335	341	348	354
69	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236	243	250	257	263	270	277	284	291	297	304	311	318	324	331	338	345	351	358	365
70	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243	250	257	264	271	278	285	292	299	306	313	320	327	334	341	348	355	362	369	376
71	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250	257	265	272	279	286	293	301	308	315	322	329	338	343	351	358	365	372	379	386
72	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258	265	272	279	287	294	302	309	316	324	331	338	346	353	361	368	375	383	390	397
73	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265	272	280	288	295	302	310	318	325	333	340	348	355	363	371	378	386	393	401	408
74	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272	280	287	295	303	311	319	326	334	342	350	358	365	373	381	389	396	404	412	420
75	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279	287	295	303	311	319	327	335	343	351	359	367	375	383	391	399	407	415	423	431
76	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287	295	304	312	320	328	336	344	353	361	369	377	385	394	402	410	418	426	435	443

Source: Adapted from *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report.*


Carrier
8:51 PM
My BMI Calculator
Metric
My Height
feet
inches
My Weight
lbs
Calculate BMI
National Heart
Lung and Blood Institute
BMI
SCALE
Underweight
< 18.5
Normal
18.5 - 24.9
Overweight
25 - 29.9
Obese
≥ 30




AT&T LTE
22:57
81%
BMI
My BMI Calculator
Metric
My Height
5
8
My Weight
420
Calculate BMI
BMI SCALE
< 18.5
25
30
>
63.9
Obese
Underweight
< 18.5
Normal
18.5 - 24.9
Overweight
25 - 29.9
Obese
≥ 30
You need to lose weight.
Talk to your doctor or dietitian about safe and effective ways to lose weight and keep it off.
>

OBESITY-PATHOBIOLOGY

Adipose tissue is an active endocrine organ, in excess it can have dysregulatory effects on:

- Metabolic pathways
- Vascular pathways
- Inflammatory pathways

- Abnormalities of these pathways effects placental growth and function (eg. Preeclampsia)

OVERALL RISK OF SEVERE MORBIDITY/MORTALITY

- Antepartum hemorrhage/Transfusion
- VTE (PE/DVT)
- Resp: AFE/Pulmonary Edema
- CNS: hemorrhage (subarachnoid; intracerebral; intracranial)
- Eclampsia
- PPH with transfusion
- Acute Renal Failure
- DIC
- Obstetric Shock

- Normal BMI: 143/10,000
- Overweight: 160/10,000 (AOR 1.1)
- Class 1 Obesity: 168/10,000 (AOR 1.1)
- Class 2 Obesity: 178/10,000 (AOR 1.2)
- Class 3 Obesity: 203/10,000 (AOR 1.4)

Lisonkova S, Muraca GM, Potts J, et al. Assocation between prepregnancy BMI and Severe Maternal Morbidity. JAMA 2017; 318:1777.

EARLY PREGNANCY LOSS

- Retrospective Review: 28,538 women
- of spontaneous euploid conceptions, the likelihood for miscarriage:
- Normal BMI = 10.7%
- Overweight = 11.8%
- Obese = 16.6%
- Obese gravida demonstrated increased rate of recurrent miscarriage (OR 3.51)
- {possible abnormal hormonal or inflammatory mechanism}

Boots C, Stephenson MD. Does obesity increase the risk of miscarriage in spontaneous conception: a systematic Review. Semin Reprod Med 2011; 29:507.

GESTATIONAL DIABETES

- The increased risk of GDM is related to exaggerated insulin resistance during pregnancy with obesity
- Risk for GDM in the obese gravida >>> normal BMI gravida
- In a systematic review of studies on prepregnancy BMI and GDM risk, the prevalence of GDM increased by 0.92% for every 1 kg/m^2 increase in BMI
- Early screening for GDM can detect occult Type II DM
- Obese patients with GDM have a significantly increased risk for macrosomia

Torloni MR, Betran AP, Horta BL, et al. Prepregnancy BMI and the risk of GDM: a systematic review of the literature with meta-analysis. Obes Rev 2009; 10:194.

PREGNANCY-ASSOCIATED HYPERTENSION

- Maternal Weight and BMI are independent risk factors for preeclampsia
- In one systematic review of 13 cohort studies including 1.4 M women, the risk for preeclampsia doubled with each 5-7 kg/m^2 increase in prepregnancy BMI
- Cohort studies of women with hx of preeclampsia demonstrate reduced recurrence with subsequent pregnancies following weight loss
- Obesity is estimated to be responsible for 40% of preeclampsia world-wide
- Possible mechanisms: insulin resistance, hyperlipidemia, subclinical inflammation

O'Brien TE, Ray JG, Chan WS. Maternal BMI and the risk of preeclampsia: a systematic review. Epidemiology 2003; 14:368.

PRETERM BIRTH

- Obesity increases the risk of medically indicated PTB, primarily due to HTN, preeclampsia and diabetes in a dose-response relationship (RR 1.30, 95% CI 1.23-1.37, 5 studies)
- A Swedish population-based cohort study demonstrated that overweight and obese women were at increased risk of spontaneous extremely preterm delivery (22-27 weeks), but not for 28-36 weeks PTD…the authors postulated that inflammation resulted in this increased risk
- PCOS has been associated with spontaneous PTB & cervical insufficiency

McDonald SD, Han Z, Mulla S, et al. Overweight and obesity in mothers and risk of PTB and LBW infants: Systematic review and meta-analyses. BMJ 2010; 341:c3428.

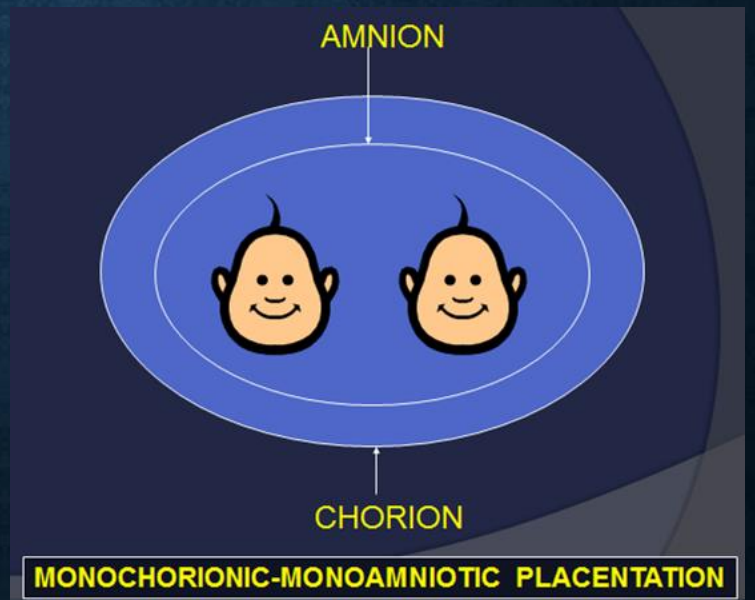
Cnattingius S, Villamor E, Hohansson S, et al. Maternal obesity and risk of PTD. JAMA 2013; 309:2362.

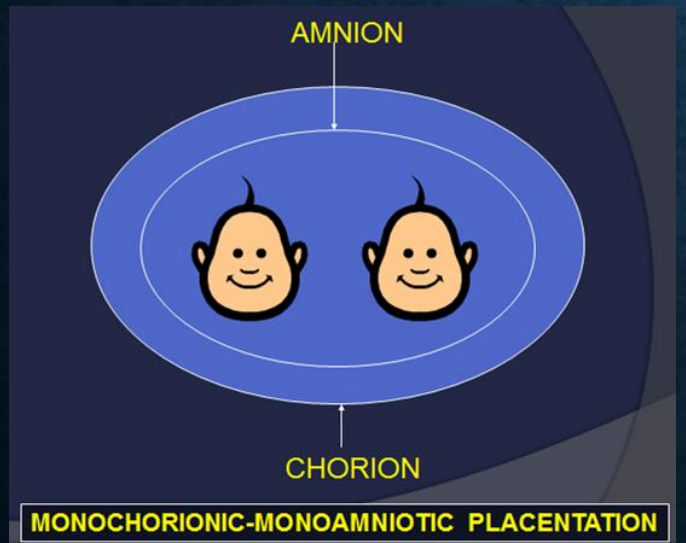
MULTIPLE PREGNANCY

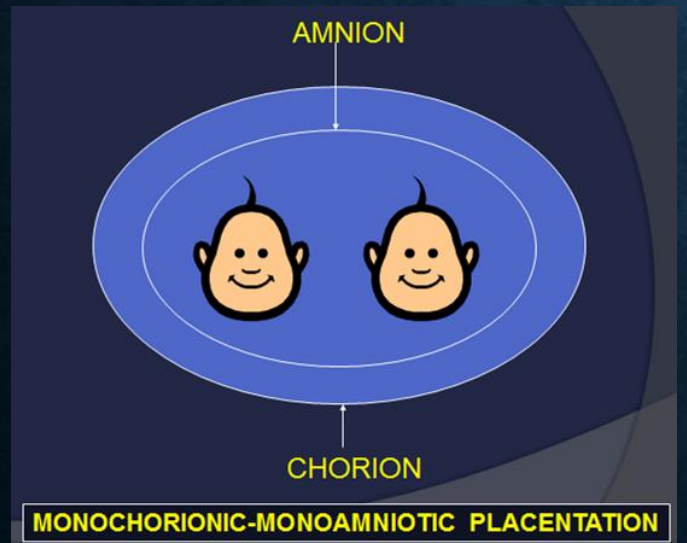
- An increased risk for dizygotic twins has been observed among obese gravidas
- In an analysis of 51,783 pregnancies (561 twins…1/92) in the Collaborative Perinatal Project, the incidence of dizygotic twins in women with BMI $\geq$ 30 kg/m^2 and <25 kg/m^2 was 1.1 and 0.5%, respectively;
- This is believed to be the result of superovulation secondary to elevated FSH levels in obese women

Reddy UM, Branum AM, Klebanoff MA. Relationship of maternal BMI and height to twinning. Obstet Gynecol 2005; 105:593

Nylander PP. The factors that influence twinning rates. Acta Genet Med Gemellol (Roma) 1981; 30:189.


AMNION
CHORION
MONOCHORIONIC-MONOAMNIOTIC PLACENTATION


AMNION
CHORION
MONOCHORIONIC-MONOAMNIOTIC PLACENTATION


AMNION
CHORION
MONOCHORIONIC-MONOAMNIOTIC PLACENTATION

OBSTRUCTIVE SLEEP APNEA

Repetitive episodes of upper airway obstruction during sleep…results in ↓ airflow, hypoxia, sympathetic discharge and recurrent arousals from sleep

Predisposing pregnancy changes leading to OSA:

- Narrowing of oropharyngeal diameter
- Reduced nasal patency secondary to hyperemia and edema of nasal mucosa
- Increase in progesterone levels leads to ↑ TV and ↑ minute ventilation

- OSA is associated with increased rates of eclampsia (OR 5.4), cardiomyopathy (OR 9.0), pulmonary embolism (OR 4.5) and in-hospital mortality (OR 5.3)

Izci B, Vennelle M, Liston WA, et al. Sleep-disordered breathing and upper airway size in pregnancy and postpartum. Eur Respir J 2006; 27:321.

Bourjeily G, Danilack VA, Bublitz MH, et al. Obstructive sleep apnea in pregnancy is associated with adverse maternal outcomes: a national cohort. Sleep Med 2017: 38:50.

CARPAL TUNNEL SYNDROME

Carpal tunnel syndrome (CTS) refers to paresthesias, hypesthesia, pain, or numbness of the thumb, index, and middle fingers, as a result of compression of the median nerve in the carpal tunnel.

The increased prevalence in pregnant women is thought to be caused by pregnancy-related fluid retention leading to compression of the nerve in the carpal tunnel; hormonal changes affecting the musculoskeletal system may also play a role.

Mabie WC. Peripheral neuropathies during pregnancy. Clin Obstet Gynecol 2005; 48:57

Padua L, Aprile I, Caliandro P, et al. Symptoms and neurophysiological picture of carpal tunnel syndrome in pregnancy. Clin Neurophysiol 2001; 112:1946.

OBESITY: COMPLICATES DELIVERY

- Fetal monitoring is technically challenging
- IV Access is more difficult to obtain and maintain
- Cervical exams are difficult to perform
- The stirrups of the labor bed have weight limits (250#)- nurses need to hold pts legs
- Increases the likelihood of cesarean section
- Cesarean section is technically challenging
- Increase likelihood for future cesareans and morbidly adherent placentation

CESAREAN SECTION

- Obesity is an independent risk factor for both elective and emergency C/S
- Obesity results in increased risk for labor induction, prolonged labor and failed induction
- In one study, each unit increase in prepregnancy BMI translated to a 7% increased risk in C/S
- TOLAC is less likely to result in vaginal delivery for obese gravida than for normal BMI gravida
- The Cesarean "conundrum"-(shoulder dystocia versus wound infection)

Nuthalapaty FS, Rouse DJ, Owen J. The association of maternal weight with cesarean risk, labor duration, and cervical induction. Obstet Gynecol 2004; 103:452.

Brost BC, Goldenberg RL, Mercer BM, et al. The Preterm Prediction Study: association of cesarean delivery with increases in maternal weight and BMI. Am J Obstet Gynecol 1997; 177;333.

POSTPARTUM INFECTION

- The obese gravida is at higher risk for postpartum infection (wound, episiotomy, endometritis), regardless of mode of delivery…despite prophylactic antibiotics

- Poor vascularity of subcutaneous adipose tissue and formation of seromas and hematomas account for increased risk of wound infection

Edwards LE, Dickes WF, Alton IR, Hakanson EY. Pregnancy in the massively obese: course, outcome and obesity prognosis of the infant. AM J Obstet Gynecol 1978; 131: 479.

Bianco AT, Smilen SW, Davis Y, et al. Pregnancy outcome and weight gain recommendations for the morbidly obese woman. Obstet Gynecol 1998; 91:97.

Myles TD, Gooch J, Santolaya J. Obesity as an independent risk factor for infectious morbidity in patients who undergo cesarean delivery. Obstet Gynecol 2002; 100:959.

ANESTHESIA DIFFICULTIES

Obese gravidas have higher rates of:

- multiple attempts at placement of a regional anesthetic catheter than normal-BMI gravidas
- inadvertent dural puncture
- failed anesthesia
- hypotension ('-caine reaction')
- technical difficulties establishing an airway

Tonidandel A, Booth J, D'Angelo R, et al. Anesthetic and obstetric outcomes in morbidly obese parturients: A 20-year follow-up retrospective cohort study. Int J Obstet Anesth 2014; 23:357.

Vricella LK, Louis JM, Mercer BM, Bolden N. Impact of morbid obesity on epidural anesthesia complications in labor. Am J Obstet Gynecol 2011; 205:370.e1.

VENOUS THROMBOEMBOLIC EVENT

- Obesity, pregnancy and cesarean delivery are independent risk factors for VTE…which is a major etiology for maternal morbidity/mortality

One review calculated the following risks for postpartum VTE as compared to normal BMI patients:

- Class I obesity: OR 2.5
- Class II obesity: OR 2.9
- Class III obesity: OR 4.6

Kevane B, Donnelly J, D'Alton M, et al. Risk factors for pregnancy-associated venous thromboembolism: a review. J Perinat Med 2014; 42:417.

CONGENITAL ANOMALIES

- Obese women are at increased risk for fetal congenital anomalies:
- Neural Tube Defects (ONTD) OR 1.87
- Cardiovascular anomalies OR 1.30; Septal anomalies OR 1.20
- Cleft palate OR 1.23; Cleft lip and palate OR 1.20
- Anorectal atresia OR 1.48
- Limb reduction anomalies OR 1.34
- [risk for **gastroschisis** OR 0.17]

Stothard KJ, Tennant PW, Bell R, Rankin J. Maternal overweight and obesity and the risk of congenital anomalies: a systematic review and meta-analysis. JAMA 2009; 301:636.

CONGENITAL ANOMALIES

- With increasing BMI there is increasing rates of ONTDs and cardiac anomalies
- Congenital anomalies are more difficult to detect with prenatal ultrasound
- Maternal obesity reduces detection of fetal anomalies by at least 20%, as compared to normal BMI gravidas
- Maternal obesity results in serial ultrasounds to attempt to evaluate fetal anatomy
- Maternal obesity results in increased reimbursement at fetal anatomic survey (76811 code)
- Increased equivocal result from NIPT/cfFDNA
- Maternal obesity results in sonographer/sonologist injury

Hendler I, Blackwell SC, Bujold E, et al. The impact of maternal obesity on midtrimester sonographic Visualization of fetal cardiac and craniospinal structures. Int J Obes Relat Metab Disord 2004; 28:1607.

Dashe JS, McIntire DD, Twickler DM. Effect of maternal obesity on the ultrasound detection of anomalous Fetuses. Obstet Gynecol 2009;113:1001.

SONOGRAPHER INJURY (WRMSD)

- Approximately 85% of sonographers experience work-related pain
- 90% have experienced work-related pain for more than half their careers
- 1:5 sonographers sustains a career-ending work-related injury
- 5 years: the average time in the profession before a sonographer experiences pain

Muir M, Hrynkow P, Chase R, Boyce D, Mclean D. The Nature, Cause, and Extent of Occupational Musculoskeletal Injuries among Sonographers: Recommendations for Treatment and Prevention. Journal of Diagnostic Medical Sonography 2004;20(5):317-325.

SONOGRAPHER INJURY (WRMSD)

- Types of work activities known to cause musculoskeletal injury in sonographers:
- Repetitive motion
- Forceful exertions or strain when pushing into a patient's abdomen
- Awkward postures or unnatural positions
- Uncomfortable positioning of limbs, such as flexion, extension or deviation of hand
- Overuse, generally the result of "downsizing" and increasing number of exams done
- Frequent reaching above shoulder level

Muir M, Hrynkow P, Chase R, Boyce D, Mclean D. The Nature, Cause, and Extent of Occupational Musculoskeletal Injuries among Sonographers: Recommendations for Treatment and Prevention. Journal of Diagnostic Medical Sonography 2004;20(5):317-325.

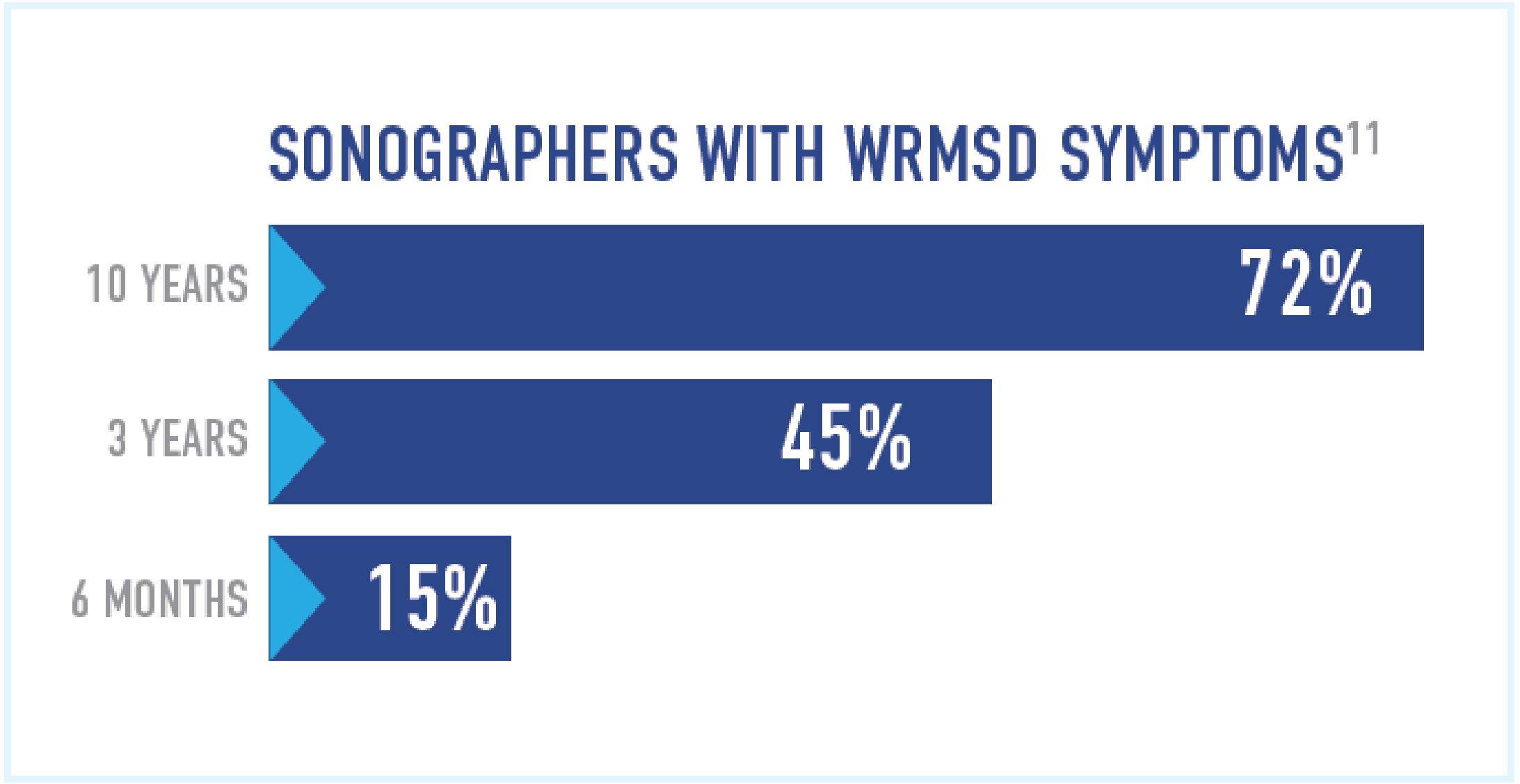


Figure 4. The impact of WRMSDs range from minor discomfort to career-ending injuries.

STILLBIRTH

Risks for birth asphyxia, stillbirth, neonatal death and infant death are all increased in the setting of maternal obesity.

A 2014 systematic review and meta-analysis of cohort studies demonstrated:

RR per 5 unit increase in maternal BMI:

Stillbirth = 1.24

Neonatal Death = 1.15

Infant Death = 1.18

Aune D, Saugstad OD, Henriksen T, Tonstad S. Maternal BMI and the risk of fetal death, stillbirth, and infant Death: a systematic review and meta-analysis. JAMA 2014; 311:1536.

OBESITY: COMPLICATES FETAL TESTING

- Increased risk of Stillbirth leads to antenatal fetal testing
- fetal monitoring is technically challenging (increased maternal abdominal pannus)
- Mechanism of Stillbirth may not be related to hypoxia
- This leads to increased rates of labor induction and ultimately cesarean section

FETAL MACROSOMIA

Prepregnancy BMI has a linear relationship with birth weight…so maternal obesity increases the rate of fetal macrosomia

Macrosomic fetuses are at increased risk for shoulder dystocia and a predisposition to obesity later in life

Johnson JW, Longmate JA, Frentzen B. Excessive maternal weight and pregnancy outcome. Am J Obstet Gynecol 1992; 167:353.

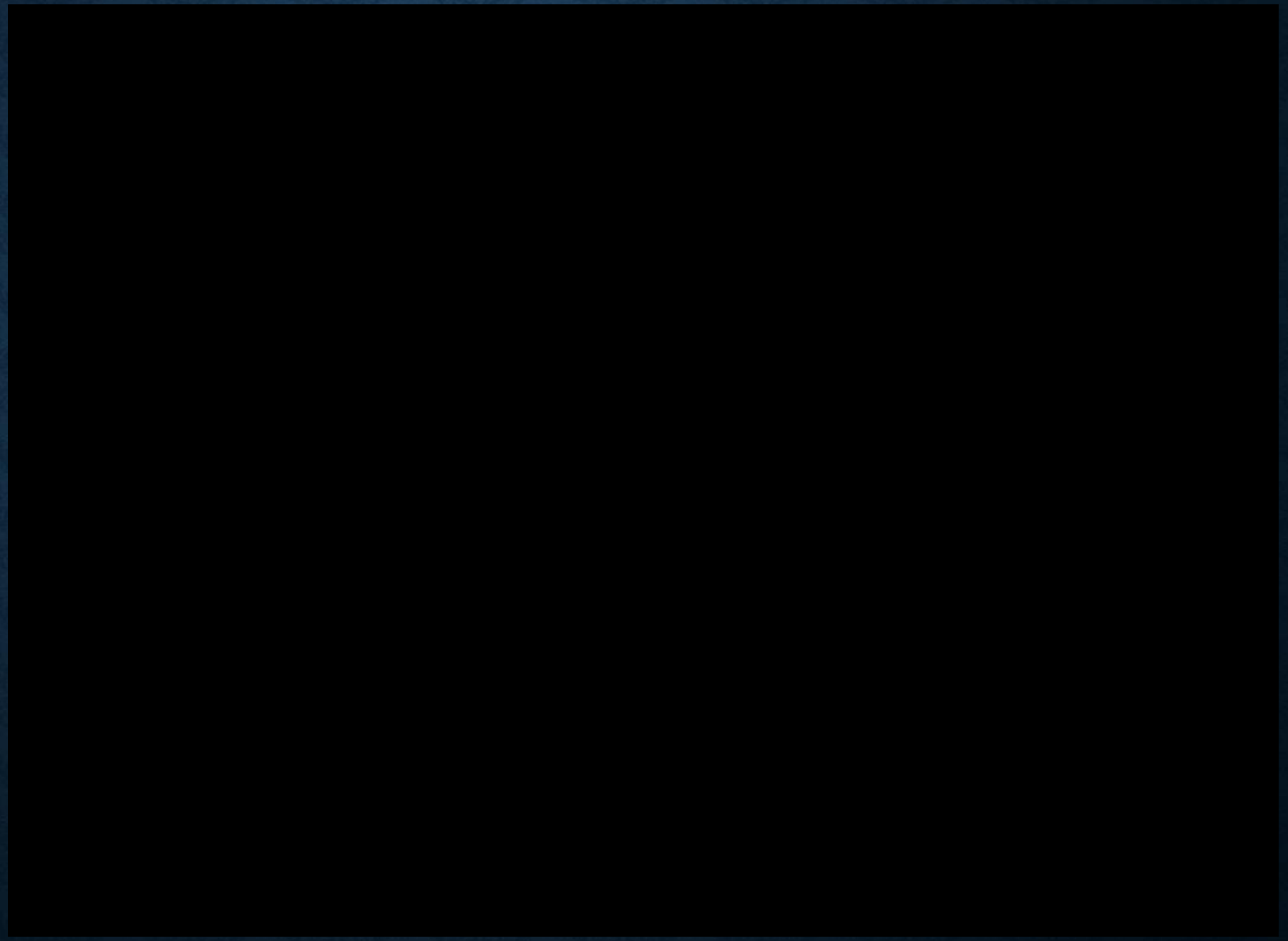
Table 1. Institute of Medicine and Weight Gain in Pregnancy

Prepregnancy Body Mass Index	Total Weight Gain Range (lbs)
Underweight <18.5	28–40
Normal weight 18.5–24.9	25–35
Overweight 25–29.9	15–25
Obese >30	1–20

Modified from Institute of Medicine. Weight gain during pregnancy: reexamining the guidelines. Washington, DC: National Academies Press; 2009.

SHOULDER DYSTOCIA

TURTLE SIGN

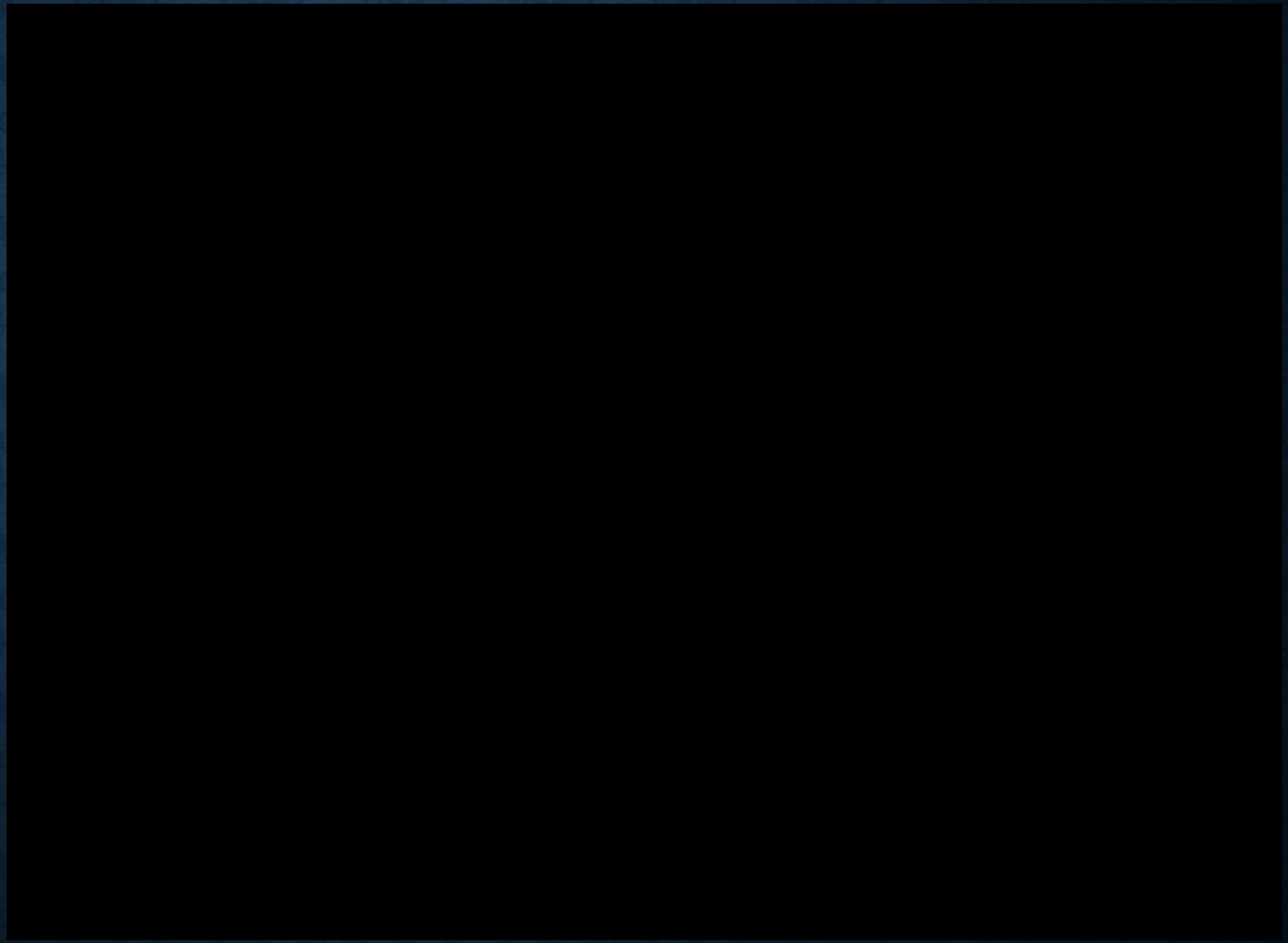


SHOULDER DYSTOCIA

DELIVERY OF POSTERIOR ARM

SHOULDER DYSTOCIA

WOODS SCREW MANEUVER



SHOULDER DYSTOCIA

CORKSCREW MANEUVER

SHOULDER DYSTOCIA

NERVE ROOT AVULSION

HOMO ERECTUS

Arose 1.9 M years ago

Brain volume 50% greater than Australopithecus

Brain volume is 60% that of current-day Homo sapiens

Similar limb and torso proportions to H. sapiens

Required more food and energy to survive

Notable for the ability to store fat for times of famine

OBESITY- FETAL EFFECTS

Maternal obesity results in fetal epigenetic changes due to increased exposure to:

- Insulin
- Lipids
- Inflammatory cytokines

- These exposures are believed to change fetal metabolic programming leading to adverse health outcomes in adults…including obesity

OBESITY-FETAL EFFECTS

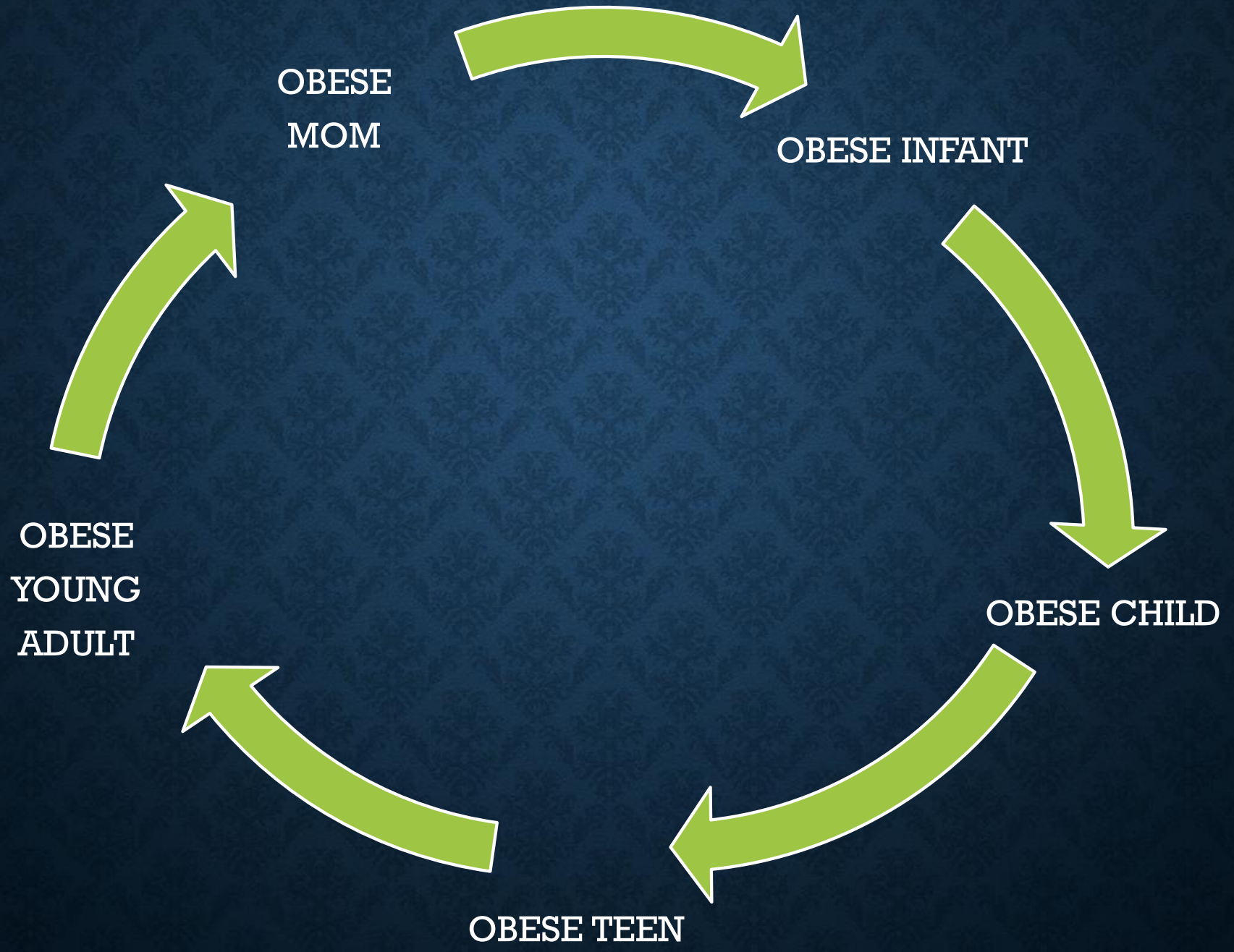
Maternal BMI influences infant body size, shape and composition

High maternal BMI and excessive gestational weight gain are risk factors for childhood obesity

Childhood obesity is a risk factor for adult obesity

Oken E, Taveras EM, Kleinman KP, et al. Gestational weight gain and child adiposity at age 3 years. Am J Obstet Gynecol 2007; 196:322.e1

Loos RJ. Genetic determinants of common obesity and their value in prediction. Best Pract Res Clin Endocrinol Metab 2012; 26:211


OBESE MOM
OBESE INFANT
OBESE CHILD
OBESE TEEN
OBESE YOUNG ADULT

< 10% obese

10-14% obese

15-19% obese

20-24% obese

25-29% obese

30-34% obese

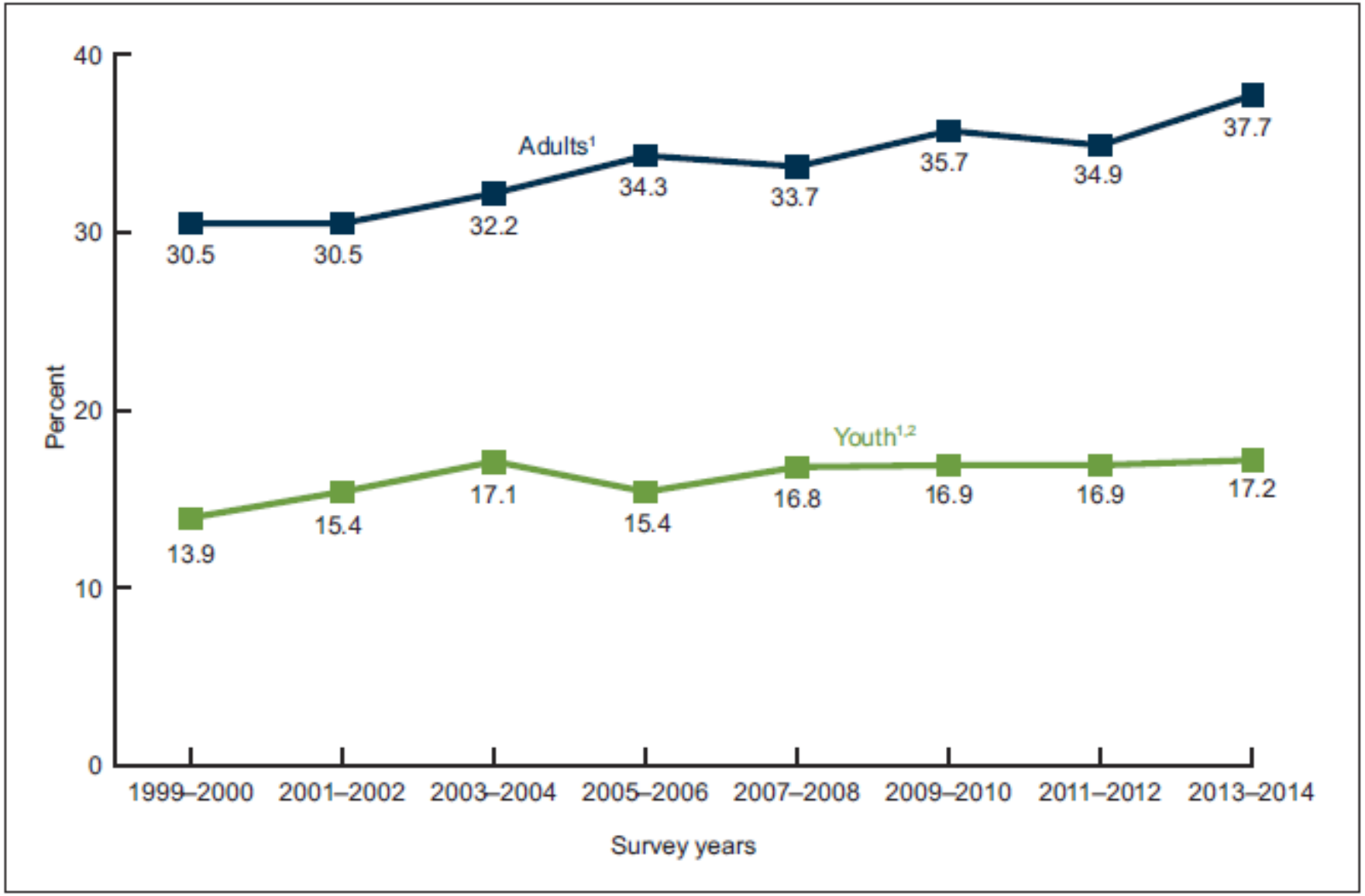
≥35% obese

OBESITY TRENDS 1999-2014:

ADULTS > 19 YEARS
YOUTH 2-19 YEARS

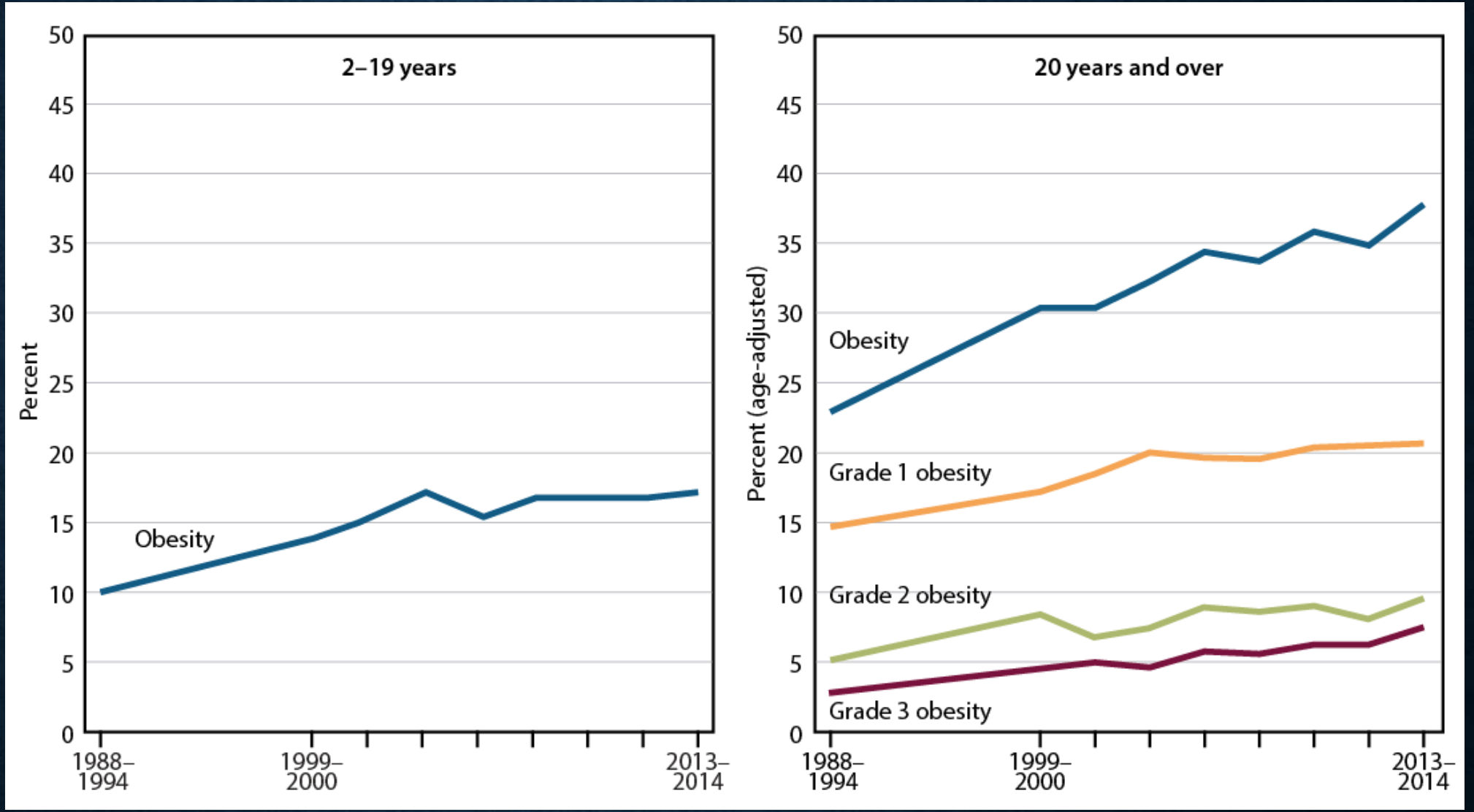
CDC/NCHS

Figure 5. Trends in obesity prevalence among adults aged 20 and over (age-adjusted) and youth aged 2–19 years: United States, 1999–2000 through 2013–2014



[1]Significant increasing linear trend from 1999–2000 through 2013–2014.
[2]Test for linear trend for 2003–2004 through 2013–2014 not significant ($p > 0.05$).
NOTE: All adult estimates are age-adjusted by the direct method to the 2000 U.S. census population using the age groups 20–39, 40–59, and 60 and over.
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey.

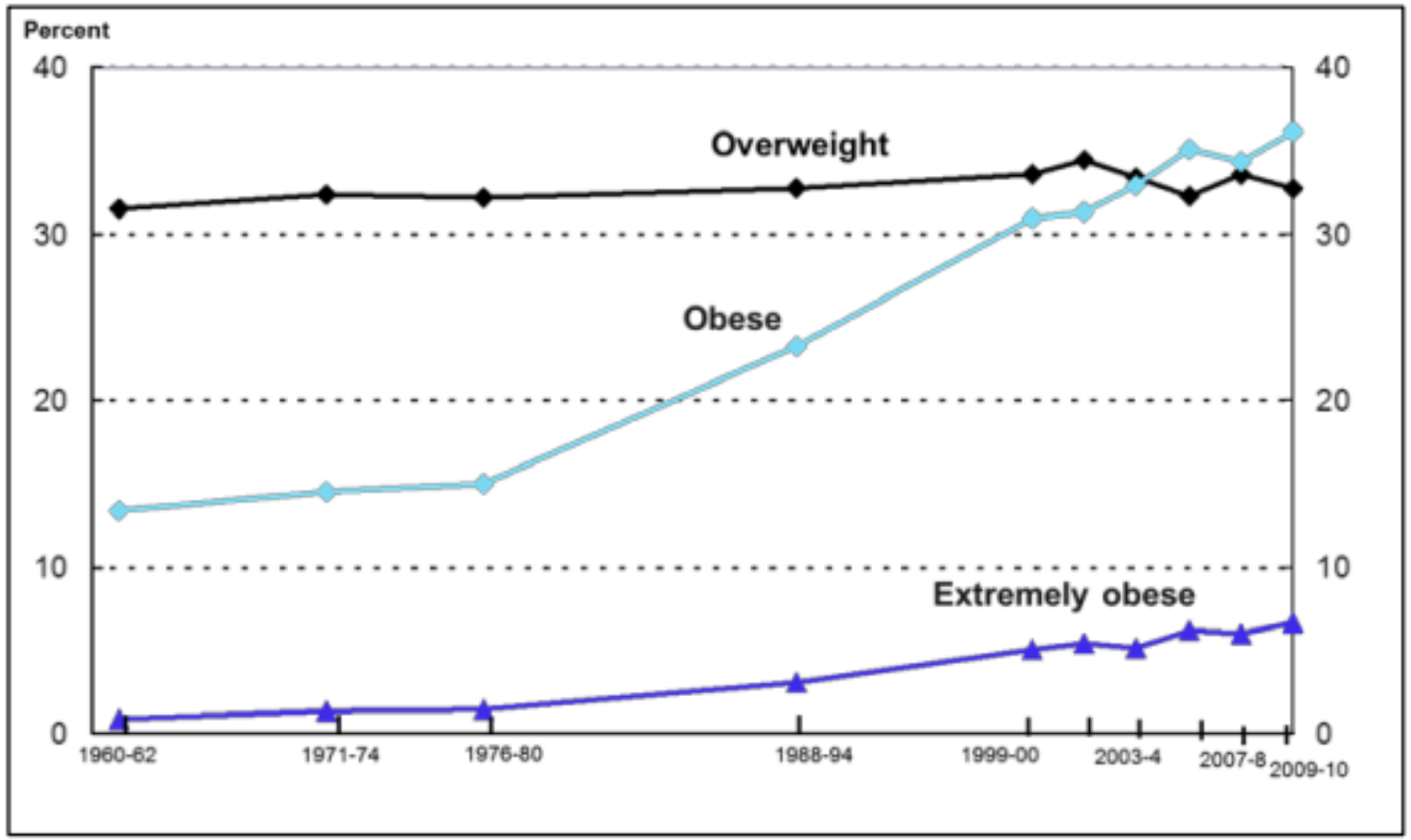
OBESITY



NOTES: For children and adolescents aged 2–19, obesity is defined as a body mass index (BMI) at or above the sex- and age-specific 95th percentile of the CDC growth charts. For adults, obesity is defined as a BMI at or above 30, Grade 1 obesity is a BMI from 30.0 to 34.9, Grade 2 obesity is a BMI from 35.0 to 39.9, and Grade 3 obesity is a BMI greater than or equal to 40.0. Estimates for adults are age-adjusted.

SOURCE: NCHS, *Health, United States, 2016*, Figure 11. Data from the National Health and Nutrition Examination Survey (NHANES).

Figure 1. Trends in Overweight, Obesity, and Extreme Obesity Among Adults Aged 20 to 74 years: United States, 1960–1962 Through 2009–2010



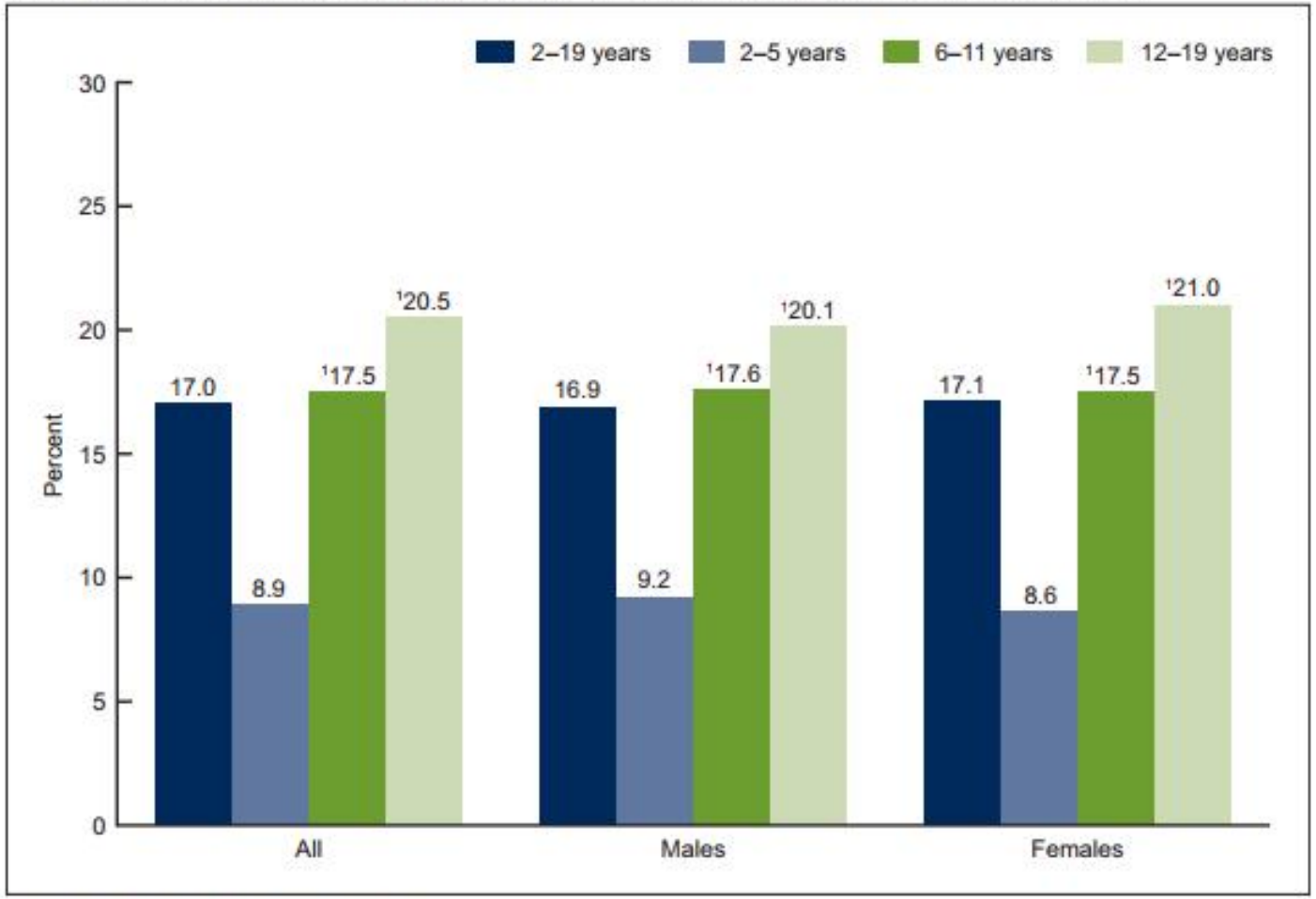
Note: Age-adjusted by the direct method to the year 2000 U.S. Bureau of the Census using age groups 20–39, 40–59 and 60–74 years. Pregnant females were excluded. Overweight defined as a BMI of 25 or greater but less than 30; obesity is a BMI greater than or equal to 30; extreme obesity is a BMI greater than or equal to 40.

Source: CDC/NCHS. National Health and Nutrition Examination Survey 1988–194, 1999–2000, 2001–2002, 2003–2004, 2005–2006, 2007–2008, and 2009–2010.

What was the prevalence of obesity among youth aged 2–19 years in 2011–2014?

The prevalence of obesity among U.S. youth was 17.0% in 2011–2014. Overall, the prevalence of obesity among preschool-aged children (2–5 years) (8.9%) was lower than among school-aged children (6–11 years) (17.5%) and adolescents (12–19 years) (20.5%). The same pattern was seen in both males and females (Figure 3).

Figure 3. Prevalence of obesity among youth aged 2–19 years, by sex and age: United States, 2011–2014



[1]Significantly different from those aged 2–5 years.
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 2011–2014.

WHAT'S HAPPENING IN

NCCOR NEWS

National Collaborative on Child Obesity Research

NJEM

CHOICES research predicts long-term risks of obesity in children

December 21, 2017

How does obesity in childhood affect weight status into adulthood? A recent article in the *New England Journal of Medicine*, "Simulation of Growth Trajectories of Childhood Obesity into Adulthood," explores the long-term risks of obesity later in life given current weight and age.

The study, which is part of the Childhood Obesity Intervention Cost-Effectiveness Study (CHOICES), developed a simulation model to predict growth trajectories. The model pooled five existing U.S. data sets containing 176,720 observations of repeated height and weight information from 41,567 children and adults.

Results show that the majority (57.3%) of current U.S. children aged 2-19 years will be obese at 35 years of age. Furthermore, among obese children, the likelihood of being obese as an adult increases as obese children age. In children that are obese at 2 years, there is a 74.9% probability that they will still be obese at 35; the probability increases to 88.2% if the child is obese at 19 years. The authors suggest the results of this model support the need for increased efforts to develop and implement effective interventions for children who are already obese.

AWARENESS, CARE, AND TREATMENT IN OBESITY MANAGEMENT

Objective: ACTION (Awareness, Care, and Treatment in Obesity maNagement) examined obesity-related perceptions, attitudes, and behaviors among people with obesity (PwO), health care providers (HCPs), and employer representatives (ERs).

Methods: A total of 3,008 adult PwO (BMI ≥ 30 by self-reported height and weight), 606 HCPs, and 153 ERs completed surveys in a cross-sectional design.

Kaplan LM, Golden A, Jinnett K, et al. Perceptions of Barriers to Effective Obesity Care: Results from the National ACTION Study. Obesity. 2017.

ACTION STUDY

ACTION Study identifies five key barriers to obesity care[1]

The ACTION Study explored attitudes, perceptions, and behaviors among all three groups that are preventing effective and comprehensive obesity care.

1. Challenges to maintaining weight loss

People with obesity engage in several serious weight loss attempts, but only a few are able to maintain the achieved weight loss

2. Reluctance to seek help

Despite recognition of obesity as a disease, most people with obesity consider weight loss to be completely their own responsibility, which may prevent them from seeking help from their health care professional

3. Inadequate diagnosis

Many people with obesity have not received a formal diagnosis of obesity

4. Insufficient dialogue and follow-up

The patient-provider dialogue about weight management is insufficient with few follow-up visits

5. Misaligned perceptions of wellness offerings

Employer wellness programs are not meeting the needs of people with obesity

ACTION STUDY

Barrier 1:
Challenges to maintaining weight loss

People with obesity (PwO) engage in several serious weight loss attempts, but only a few are able to maintain the achieved weight loss[1]

People with obesity reported many serious weight loss attempts, but those who achieved weight loss had difficulty maintaining it.

7

Average number of serious weight loss attempts among people with obesity in their adult lifetime

Only 10% of people with obesity were able to maintain the weight loss for more than a year

23% reported a 10% weight loss during the past 3 years. Of which 44% were able to maintain the weight loss for more than one year (10% of total PwO sample)

ACTION STUDY

Weight Loss Goals

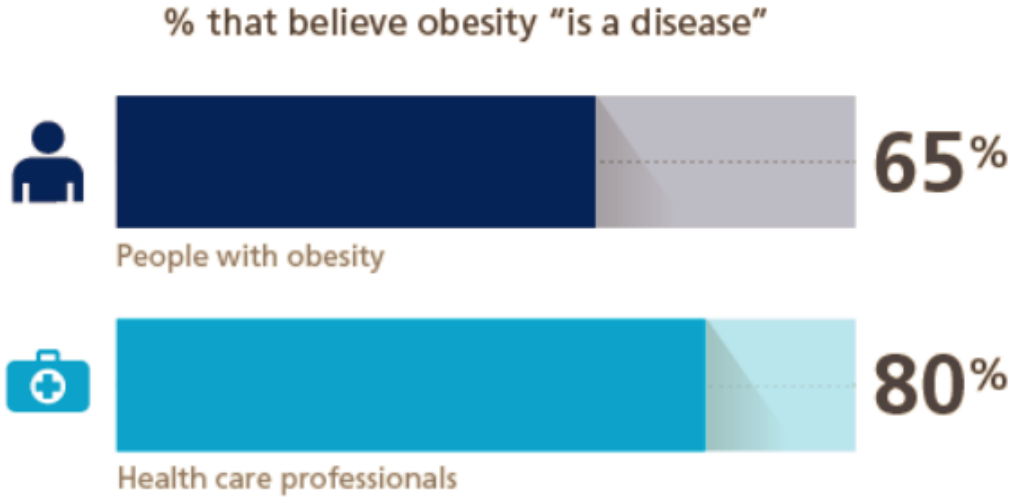
People with obesity (84%) and health care professionals (88%) agree that a 10% weight loss would be beneficial to overall health, a statistic that aligns with scientific literature that states a 5% to 10% weight loss can help improve and reduce the risk of some obesity-related diseases.[1-8]

However, the average weight loss goal set between people with obesity and their health care professional is reported as 20% weight loss.[1]

Barrier 2: Reluctance to seek help

Most people with obesity (PwO) view weight loss as solely their responsibility, which may prevent them from seeking help[1]

Most people with obesity and health care professionals believe obesity is a disease, and many view it as serious, or more serious, than many other health conditions, including high blood pressure, diabetes, and depression.



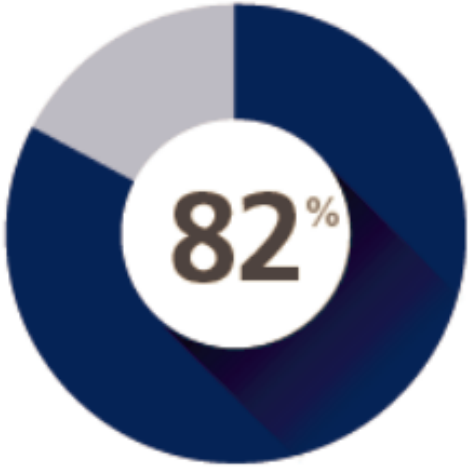
Despite viewing obesity as a disease, most people with obesity don't approach it as they would other chronic diseases.

ACTION STUDY

Views on personal responsibility for weight loss[1]

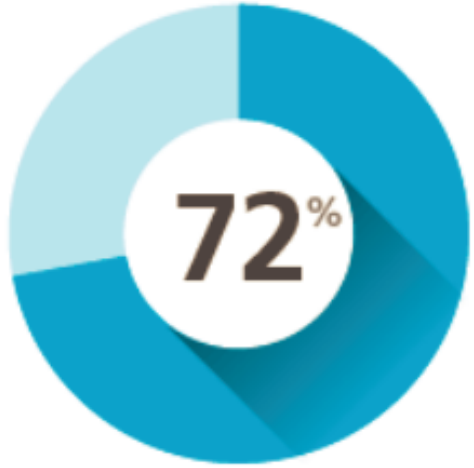
Even though people with obesity consider obesity a disease, most view weight loss to be completely their own responsibility. However, most health care professionals reported that they have a responsibility to actively contribute to their patients' weight loss.

People with obesity



consider weight loss to be completely their own responsibility

Health care professionals



feel responsible to actively contribute to patients' weight loss efforts

ACTION STUDY

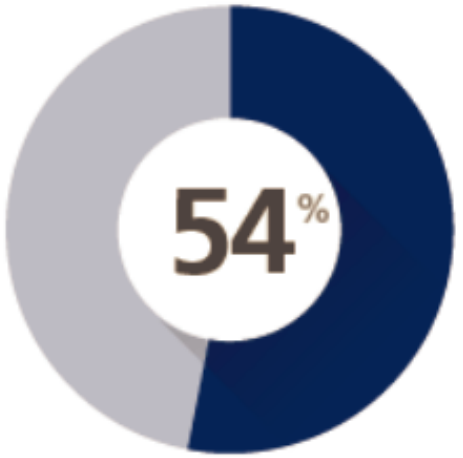
Differing perspectives: Top reasons why people with obesity don't seek weight loss help from their health care professional[1]

ACTION STUDY

The impact of weight on future health[1]

People with obesity and health care professionals have different levels of concern when it comes to how a person's weight affects future health.

People with obesity



worry their weight may affect future health

Health care professionals

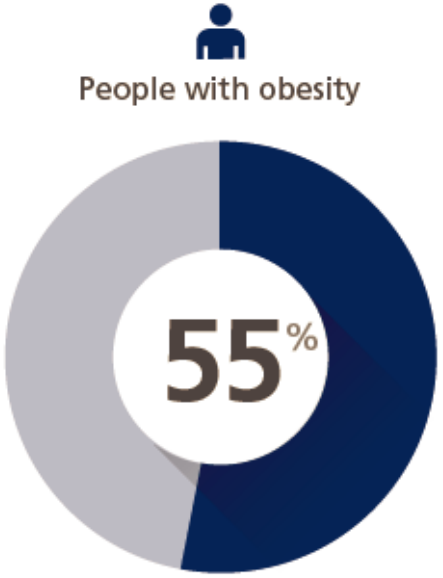
worry their patient's weight may affect future health

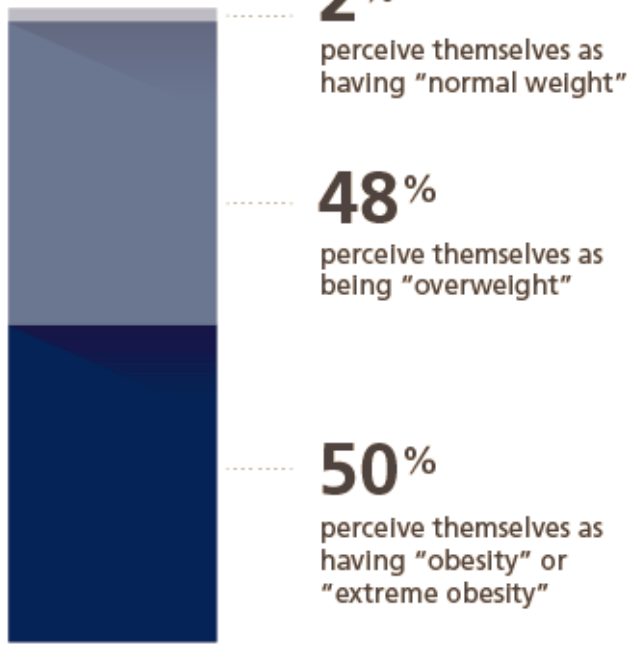
ACTION STUDY

Barrier 3: Inadequate diagnosis

Many people with obesity (PwO) have not received a formal diagnosis of obesity[1]

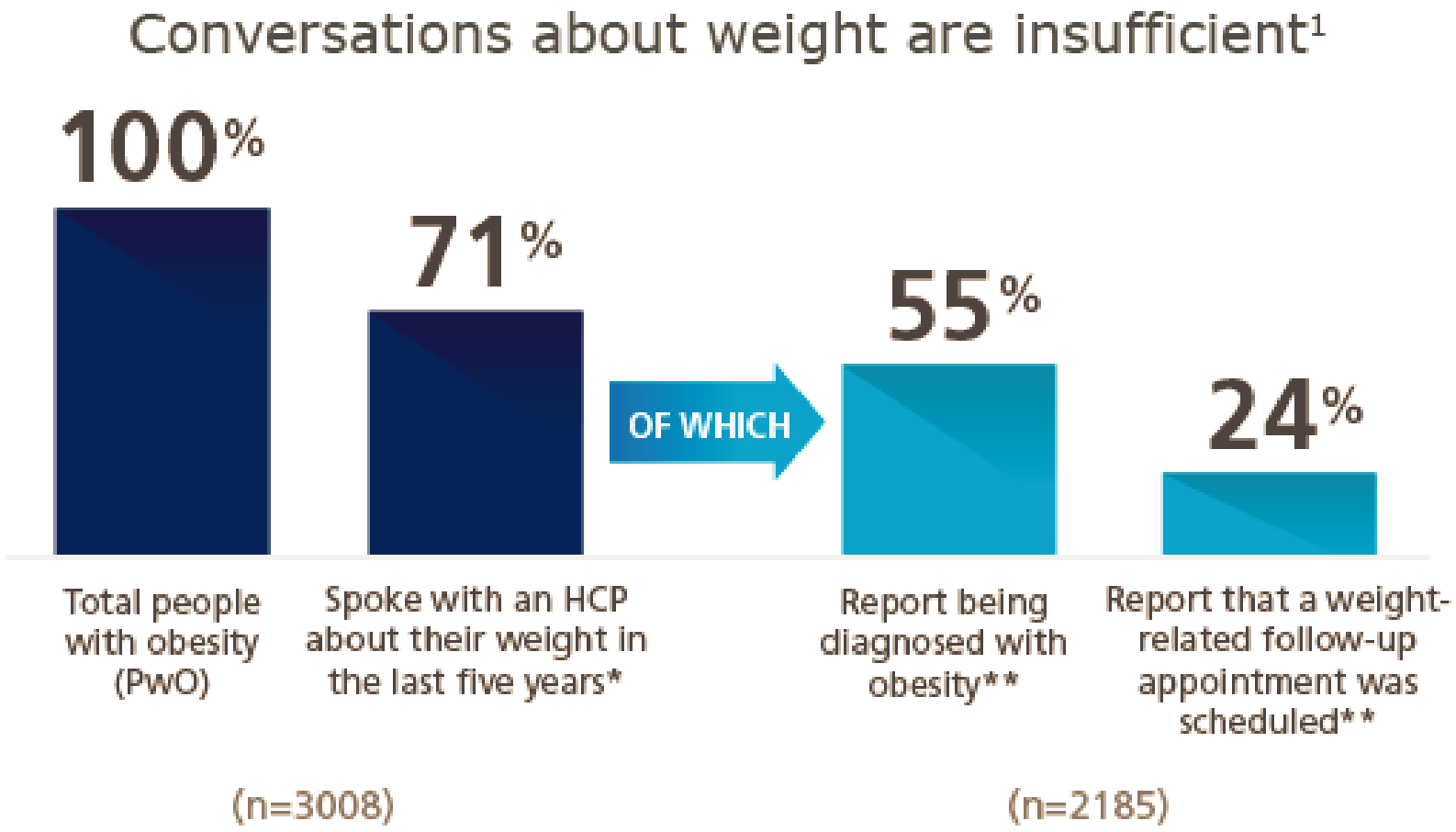
Although all ACTION Study participants actually had obesity based on self-reported height and weight, only slightly more than half report having received a formal diagnosis of the disease. When it comes to self-perception, half consider themselves as being overweight while the other half consider themselves as having obesity.





**Among those 71% who have had a weight loss conversation with their HCP in the past 5 years*

ACTION STUDY



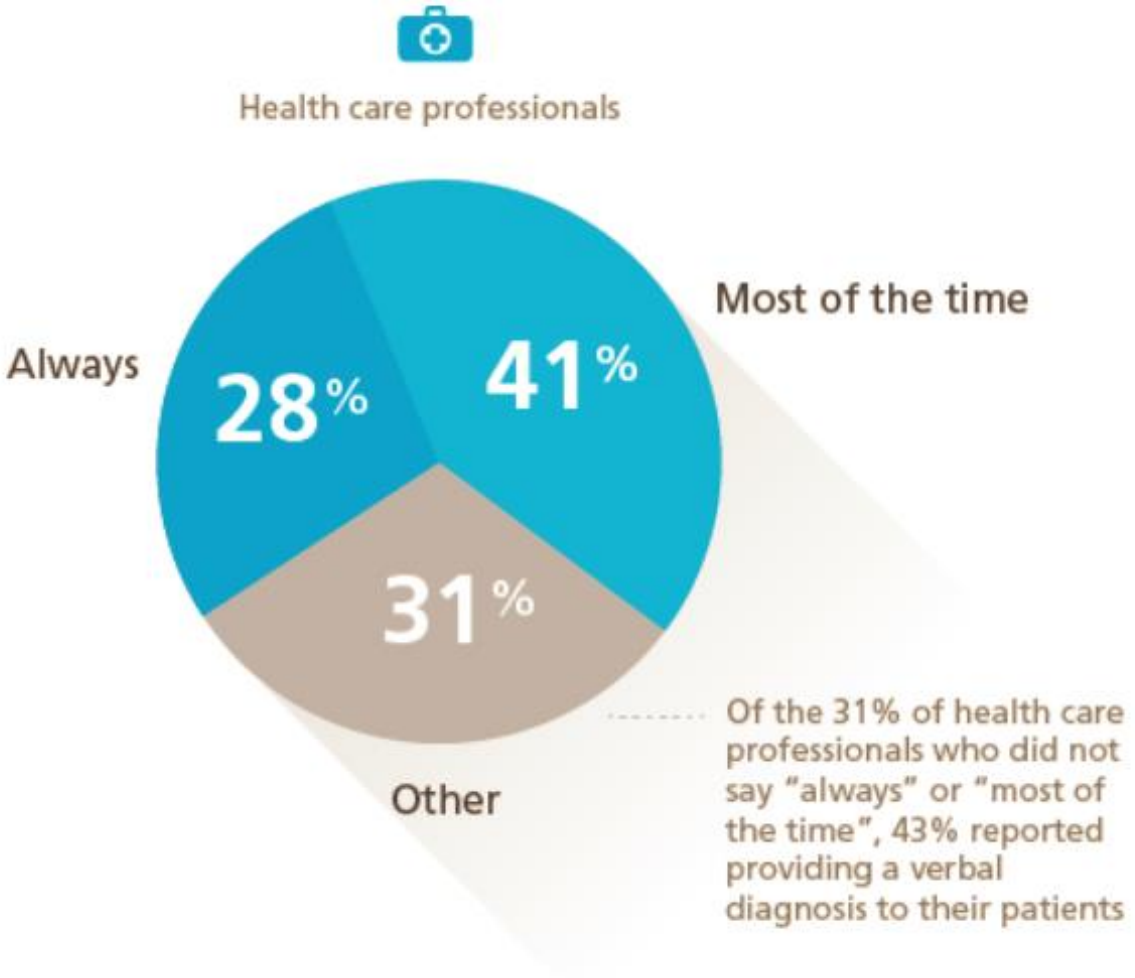
** Either "discussed being overweight" (68%) or "discussed losing weight" (64%) with their HCP*

***Among those 71% who have had a weight loss conversation with their HCP in the past 5 years*

ACTION STUDY

Health care professionals inconsistently record diagnosis of obesity[1]

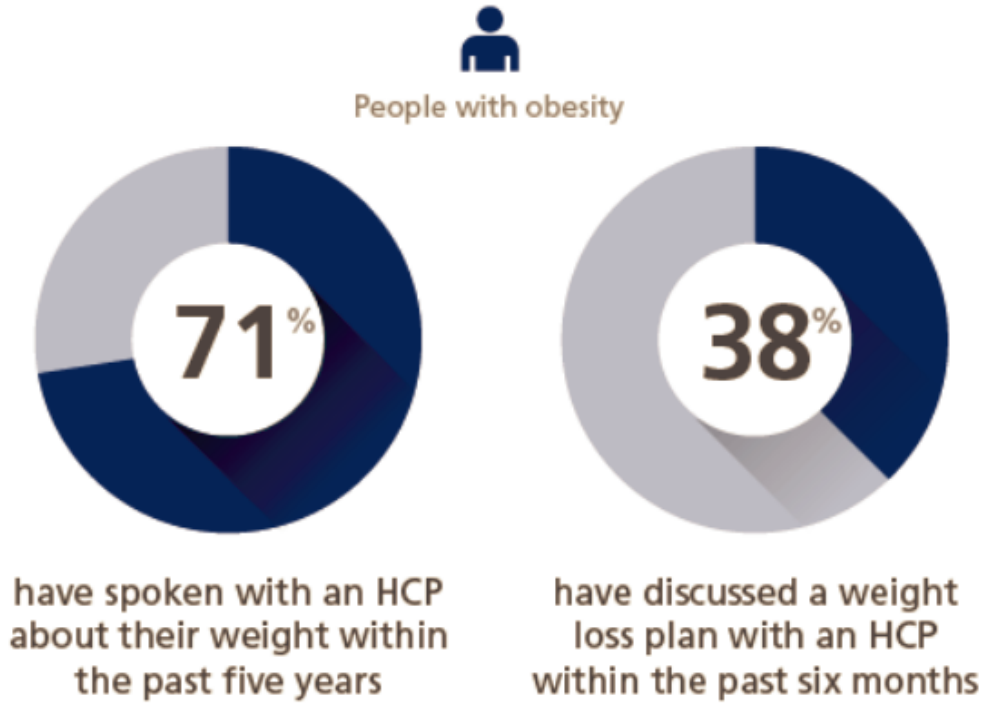
The majority of health care professionals reported that they record "overweight" or "obesity" in the medical record.



Barrier 4: Insufficient dialogue and follow-up

The patient-provider dialogue about weight management is insufficient with few follow-up visits[1]

The majority of people with obesity (PwO) say they have spoken with a health care professional about their weight within the past five years, but only slightly more than a third say they have discussed a weight loss plan with their health care professional within the past six months.



ACTION STUDY

Health care professionals are comfortable discussing weight[1]

Most health care professionals (67%) say they are very or extremely comfortable discussing weight management with their patients, but they cite hurdles to initiating these conversations.

Hurdles to discussing weight with their patients

lack of appointment time

52%

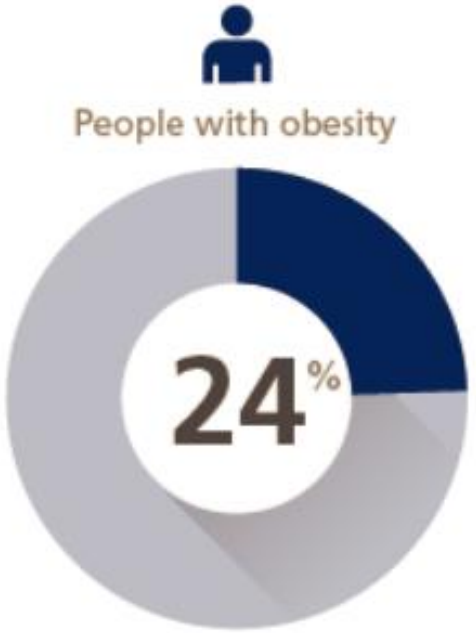
more important issues/concerns

45%

ACTION STUDY

Limited follow-up appointments[1]

Among people with obesity who discussed their weight with a health care professional, only 24% reported that a weight related follow-up appointment was scheduled. More than 95% of people with obesity have kept or intended to keep the follow-up appointment.



say a follow-up appointment was scheduled*

**Out of people with obesity who had a conversation with their health care professional within the past 5 years*

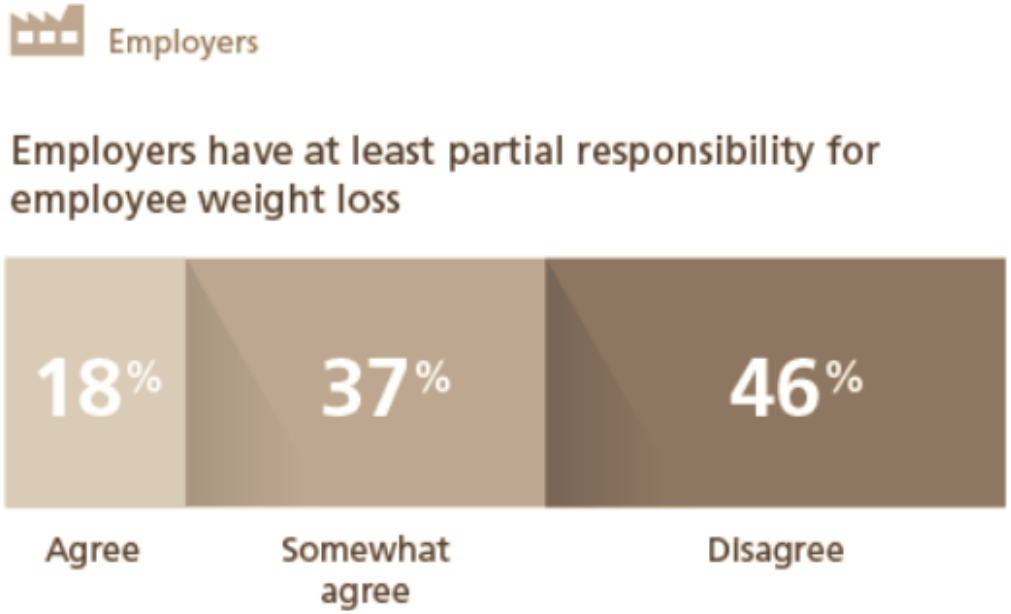
ACTION STUDY

Barrier 5:
Misaligned perceptions of wellness offerings

Employer wellness programs are not meeting the needs of people with obesity[1] (PwO)

Like people with obesity and health care professionals, the majority of employers (64%) agree that obesity is a disease; however, few employers agree they have at least partial responsibility for employees' weight loss.

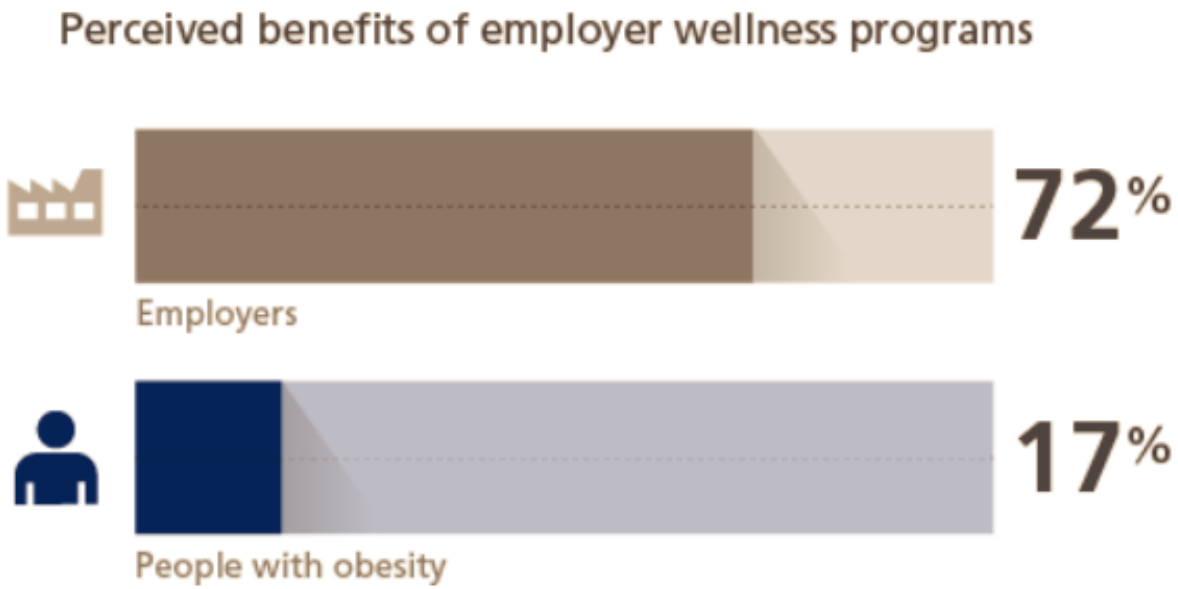
At the same time, employers are motivated to offer wellness programs and more than three quarters (77%) of employers reported providing health and wellness information to employees. Some of these programs include weight management components.



ACTION STUDY

Value in wellness programs perceived differently by employers and people with obesity[1]

The wellness programs offered by employers are not perceived by the majority of people with obesity as helpful.

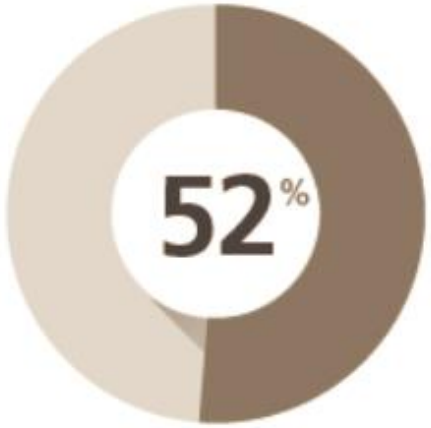


ACTION STUDY

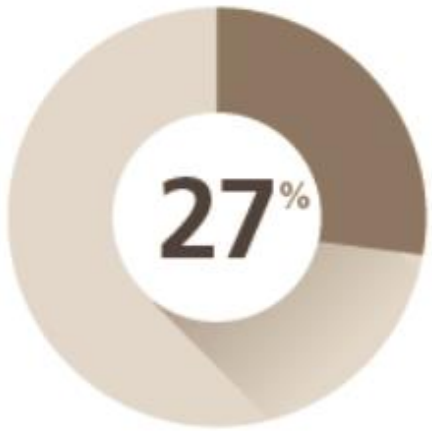
Insurance coverage for medical treatment of obesity is a source of concern for employers[1]

A small number of people with obesity (13%) reported that their employer offers insurance coverage for the medical treatment of obesity. Employers cited multiple reasons for their concern around coverage.

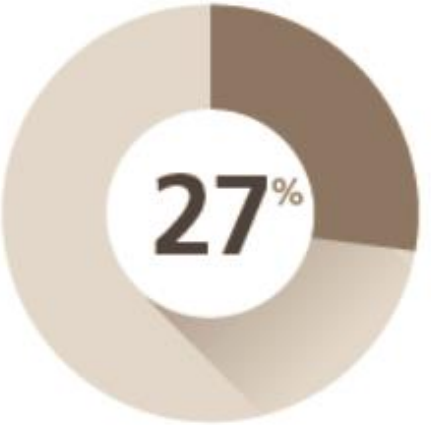
Employers



are concerned about the cost of premiums and/or medical claims when it comes to offering insurance coverage for weight management



highlighted lack of data to demonstrate effectiveness of weight management treatments or programs



highlighted lack of data on costs of providing coverage versus return on investment

Key Practice Recommendations

Recommendations	Comments
Screen all adults for obesity. Offer or refer patients with a body mass index (BMI) of 30 kg/m^2 or greater to intensive, multicomponent behavioral interventions.[1]	This recommendation applies to all adults, not just those with known cardiovascular risk factors.
Screen children 6 years and older for obesity, and offer or refer them to comprehensive, intensive behavioral interventions to promote improvement in weight status.[2]	
A 5% to 10% weight loss can reduce risk of heart disease and diabetes and should be encouraged for all patients who are overweight and obese.[3,4]	
Consider pharmacotherapy in adults who have not been able to lose weight through diet and physical activity alone and who have: BMI of 30 kg/m^2 or greater BMI of 27 kg/m^2 or greater, and obesity-related comorbidity[3,4]	
Consider bariatric surgery in adults who have not been able to lose weight through diet and physical activity alone and who have: BMI of 40 kg/m^2 or greater BMI of 35 kg/m^2 or greater, and obesity-related comorbidity[3]	
Regardless of body weight or weight loss, all patients should be encouraged to be physically active for improved health and weight maintenance.[3]	Regular physical activity is strongly related to maintaining normal weight. Exercise also mitigates health-damaging effects of obesity, even without weight loss.

1. U.S. Preventive Services Task Force. Screening for and management of obesity in adults. Ann Intern Med. *2012;157(5):373-378.*

2. U.S. Preventive Services Task Force. Screening for and management of obesity in children and adolescents. www.uspreventiveservices-taskforce.org/uspstf/uspschobes.htm. Accessed April 18, 2013.

3. National Heart, Lung and Blood Institute. Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults. www.nhlbi.nih.gov/guidelines/obesity/ob_gdlns.pdf. Accessed April 18, 2013.

4. Institute for Clinical Systems Improvement. Obesity, prevention and management of (Mature Adolescents and Adults). www.icsi.org/guidelines__more/catalog_guidelines_and_more/catalog_guidelines/catalog_endocrine_guidelines/obesity/

Evaluate for presence or absence of adiposity-related complications and severity of complications

- Metabolic syndrome
- Prediabetes
- Type 2 diabetes
- Dyslipidemia
- Hypertension
- Cardiovascular disease
- Nonalcoholic fatty liver disease
- Polycystic ovary syndrome
- Female infertility
- Male hypogonadism
- Obstructive sleep apnea
- Asthma/reactive airway disease
- Osteoarthritis
- Urinary stress incontinence
- Gastroesophageal reflux disease
- Depression

Comorbid Conditions in Obesity and Evidence for Amelioration With Weight Reduction

Comorbidity	Improvement After Weight Loss	First Author, Year (Ref)
T2DM	Yes	Cohen, 2012 (132); Mingrone, 2012 (133)[a]; Schauer, 2012 (134); Buchwald, 2009 (135)
Hypertension	Yes	Ilane-Parikka, 2008 (136); Phelan, 2007 (137); Zanella, 2006 (138)
Dyslipidemia and metabolic syndrome	Yes	Ilane-Parikka, 2008 (136); Phelan, 2007 (137); Zanella, 2006 (138)
Cardiovascular disease	Yes	Wannamethee, 2005 (139)
NAFLD	Variable outcomes	Andersen, 1991 (140); Huang, 2005 (141); Palmer, 1990 (142); Ueno, 1997 (143)
Osteoarthritis	Yes	Christensen, 2007 (144); Fransen, 2004 (145); Huang, 2000 (146); Messier, 2004 (147); van Gool, 2005 (148)
Cancer	Yes	Adams, 2009 (149); Sjöström, 2009 (150)
Major depression	Insufficient evidence	
Sleep apnea	Yes	Kuna, 2013 (151)

Abbreviation: NAFLD, nonalcoholic fatty liver disease.

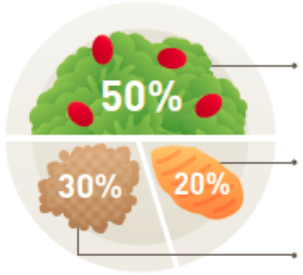
Pharmacological Management of Obesity: An Endocrine Society Clinical Practice Guideline

Caroline M. Apovian Louis J. Aronne Daniel H. Bessesen Marie E. McDonnellM. Hassan Murad Uberto Pagotto Donna H. Ryan Christopher D. Still

The Journal of Clinical Endocrinology & Metabolism, Volume 100, Issue 2, 1 February 2015, Pages 342–362, https://doi.org/10.1210/jc.2014-3415
Published: 01 February 2015

–500 CALORIES / DAY = –1 POUND / WEEK

DECREASE CALORIES CONSUMED.
PAY ATTENTION TO PORTION SIZES.



Fruits / non-starchy vegetables

Lean protein
(the size of a deck of cards)

Whole grains or starchy veggies

Source: choosemyplate.gov

INCREASE CALORIES BURNED.
BE MORE PHYSICALLY ACTIVE.

150 MINUTES
moderate-intensity activity / week

or

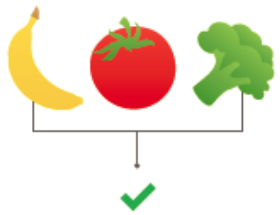
75 MINUTES
vigorous-intensity activity / week

or

a combination of the two throughout the week

LESS JUNK ... MORE FRUITS AND VEGGIES

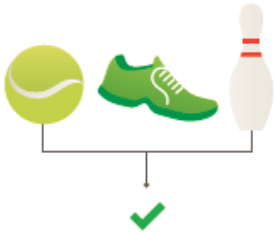
- Added sugars
- Cake, cookies, white bread
- Fried foods



- Fruits
- Vegetables
  (at least 2½ cups daily)

LIMIT SEDENTARY BEHAVIOR.

- On-screen entertainment
- Sitting around
- Lying down



- Playing sports
- Walking or running
- Other physical activities

*** Calculating BMI may not be the most useful method for all body types; consult your physician.

Appendix I: Physical Activity and Exercise: Intensity and Duration

Table I-1: Examples of Moderate* Amounts of Activity [9]

Washing and waxing a car for 45-60 minutes	**Less Vigorous, More Time****
Washing windows or floors for 45-60 minutes	
Playing volleyball for 45 minutes	
Playing touch football for 30-45 minutes	
Gardening for 30-45 minutes	
Wheeling self in wheel-chair for 30-40 minutes	
Walking 1¾ miles in 35 minutes (20 min/mile)	
Basketball (shooting baskets) for 30 minutes	
Bicycling 5 miles in 30 minutes	
Dancing fast (social) for 30 minutes	
Pushing a stroller 1½ miles in 30 minutes	
Raking leaves for 30 minutes	
Walking 2 miles in 30 minutes (15 min/mile)	
Water aerobics for 30 minutes	
Swimming laps for 20 minutes	
Wheelchair basketball for 20 minutes	
Basketball (playing a game) for 15-20 minutes	
Bicycling 4 miles in 15 minutes	
Jumping rope for 15 minutes	
Running 1½ miles in 15 minutes (10 min/mile)	
Shoveling snow for 15 minutes	
Stair walking for 15 minutes	**More vigorous, less time**

*A moderate amount of physical activity is roughly equivalent to physical activity that uses approximately 150 calories of dietary energy per day or 1,000 calories per week.

**Some activities can be performed at various intensities; the suggested durations correspond to expected intensity of effort.

VA/DoD CLINICAL PRACTICE GUIDELINE FOR SCREENING AND MANAGEMENT OF OVERWEIGHT AND OBESITY

Clinical Practice Guideline for Screening and Management of Overweight and Obesity Submitted 04/18/14

…if nothing else, you have to make the diagnosis

"You are overweight/obese"

"your BMI is 32 kg/m^2"