

Behavioral Counseling Interventions for Healthy Weight and Weight Gain in Pregnancy

US Preventive Services Task Force Recommendation Statement

US Preventive Services Task Force

IMPORTANCE The prevalence of overweight and obesity is increasing among persons of childbearing age and pregnant persons. In 2015, almost half of all persons began pregnancy with overweight (24%) or obesity (24%). Reported rates of overweight and obesity are higher among Black, Alaska Native/American Indian, and Hispanic women and lower among White and Asian women. Excess weight at the beginning of pregnancy and excess gestational weight gain have been associated with adverse maternal and infant health outcomes such as a large for gestational age infant, cesarean delivery, or preterm birth.

OBJECTIVE The USPSTF commissioned a systematic review to evaluate the benefits and harms of behavioral counseling interventions to prevent adverse health outcomes associated with obesity during pregnancy and to evaluate intermediate outcomes, including excess gestational weight gain. This is a new recommendation.

POPULATION Pregnant adolescents and adults in primary care settings.

EVIDENCE ASSESSMENT The USPSTF concludes with moderate certainty that behavioral counseling interventions aimed at promoting healthy weight gain and preventing excess gestational weight gain in pregnancy have a moderate net benefit for pregnant persons.

RECOMMENDATION The USPSTF recommends that clinicians offer pregnant persons effective behavioral counseling interventions aimed at promoting healthy weight gain and preventing excess gestational weight gain in pregnancy. (B recommendation)

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Summary of Recommendation

Pregnant persons	The USPSTF recommends that clinicians offer pregnant persons effective behavioral counseling interventions aimed at promoting healthy weight gain and preventing excess gestational weight gain in pregnancy.	B
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See the Figure for a more detailed summary of the recommendations for clinicians. USPSTF indicates US Preventive Services Task Force.

See the Summary of Recommendation figure.

Importance

The prevalence of overweight and obesity is increasing among persons of childbearing age and pregnant persons.¹ Obesity rates during pregnancy increased from 13% in 1993 to 24% in 2015.¹ In 2015, almost half of all persons began pregnancy with overweight (24%) or obesity (24%).^{1,2} Prepregnancy obesity is higher in Alaska Native/American Indian (36.4%), Black (34.7%), and Hispanic (27.3%) women compared with White women (23.7%). Asian women have the lowest rates of obesity (7.5%).^{1,3} Excess weight at the beginning of pregnancy and excess gestational weight gain (GWG) have been associated with adverse maternal and infant

health outcomes such as a large for gestational age (LGA) infant, cesarean delivery, or preterm birth.¹

USPSTF Assessment of Magnitude of Net Benefit

The USPSTF concludes with moderate certainty that behavioral counseling interventions aimed at promoting healthy weight gain and preventing excess GWG in pregnancy have a **moderate net benefit** for pregnant persons (Table 1).

See Table 1 for more information on the USPSTF recommendation rationale and assessment and the eFigure in the Supplement for information on the recommendation grade. See the Figure for

Table 1. Summary of USPSTF Rationale

Rationale	Assessment
Effectiveness of counseling to change behavior	<ul style="list-style-type: none"> The USPSTF found adequate evidence that behavioral counseling interventions that limit excess gestational weight gain improve health outcomes (ie, gestational diabetes, emergency cesarean delivery) among pregnant persons and their infants (ie, macrosomia, large for gestational age). Macrosomia and large for gestational age in infants are intermediate outcomes associated with important health outcomes in infants. The USPSTF found adequate evidence that behavioral counseling interventions demonstrated reductions in intermediate outcomes, including gestational weight gain and postpartum weight retention, at 12 mo. There was also adequate evidence of a lower likelihood of gaining weight in excess of the National Academy of Medicine gestational weight gain recommendations in pregnant persons. The overall magnitude of the benefit of behavioral counseling interventions for healthy weight gain in pregnancy to improve maternal and infant health outcomes is moderate.
Harms of counseling	The USPSTF found adequate evidence to bound the potential harms of effective behavioral counseling interventions as no greater than small, based on the nature of the interventions, the low likelihood of serious harms, and the available information from studies reporting few harms. When direct evidence is limited, absent, or restricted to select populations or clinical scenarios, the USPSTF may place conceptual upper or lower bounds on the magnitude of benefit or harms.
USPSTF assessment	The USPSTF concludes with moderate certainty that effective behavioral counseling interventions aimed at promoting healthy weight gain and preventing excess gestational weight gain in pregnancy have a moderate net benefit for pregnant persons.

Abbreviation: USPSTF, US Preventive Services Task Force.

Figure. Clinician Summary: Behavioral Counseling Interventions for Healthy Weight and Weight Gain in Pregnancy

What does the USPSTF recommend?	For pregnant adolescents and adults: Offer effective behavioral counseling interventions aimed at promoting healthy weight gain and preventing excess gestational weight gain in pregnancy. Grade B
To whom does this recommendation apply?	Pregnant adolescents and adults
What's new?	This is a new recommendation
How to implement this recommendation?	<ol style="list-style-type: none"> Identify patients (adolescents and adults) who are pregnant. Offer effective behavioral counseling or refer patients to behavioral counseling in other settings. <p>Effective behavioral counseling interventions varied in the following:</p> <ul style="list-style-type: none"> Content: <ul style="list-style-type: none"> Individual focus on nutrition, physical activity, or lifestyle and behavioral change Multiple components, most commonly including active/supervised exercise or counseling about diet and physical activity When to start/stop: Generally started at the end of the first trimester or the beginning of the second trimester and ended prior to delivery Duration and intensity: Varied from 15 to 120 minutes and consisted of <2 contacts to ≥12 contacts Who delivered the intervention: Highly diverse and included clinicians, registered dietitians, qualified fitness specialists, physiotherapists, and health coaches across different settings (eg, local community fitness center) How the intervention was delivered: Delivery methods included individual or group counseling that was delivered in person, by computer/Internet, or by telephone calls
What are other relevant USPSTF recommendations?	The USPSTF has made recommendations on screening for obesity in adults, screening for gestational diabetes mellitus, and behavioral counseling interventions to promote a healthy diet and physical activity for cardiovascular disease prevention in adults with and without cardiovascular risk factors. These recommendations are available at https://www.uspreventiveservicestaskforce.org .
Where to read the full recommendation statement?	Visit the USPSTF website to read the full recommendation statement. This includes more details on the rationale of the recommendation, including benefits and harms; supporting evidence; and recommendations of others.

The USPSTF recognizes that clinical decisions involve more considerations than evidence alone. Clinicians should understand the evidence but individualize decision-making to the specific patient or situation.

USPSTF indicates US Preventive Services Task Force.

a summary of the recommendation for clinicians. For more details on the methods the USPSTF uses to determine the net benefit, see the USPSTF Procedure Manual.⁴

Practice Considerations

Patient Population Under Consideration

This recommendation applies to pregnant adolescents and adults in primary care settings.

Definitions

The USPSTF uses the following terms to define healthy weight gain associated with pregnancy. These weight gain guidelines are for singleton pregnancies.

- Gestational weight gain** is defined as the change in weight from before pregnancy (prepregnancy or during the first trimester) to the weight measured prior to delivery.⁵ The National Academy of Medicine (formerly known as the Institute of Medicine) recommendations for healthy GWG are 28 to 40 lb in the prepregnancy underweight category, 25 to 35 lb for the normal prepregnancy weight

category, 15 to 25 lb for the prepregnancy overweight category, and 11 to 20 lb for the prepregnancy obese category.⁵

- Prepregnancy weight categories are based on the World Health Organization categories for nonpregnant persons: underweight (body mass index [BMI] <18.5 [calculated as weight in kilograms divided by height in meters squared]), normal or healthy weight (BMI 18.5-24.9), overweight (BMI 25-29.9), and obese (BMI ≥30).⁵⁻⁷

Behavioral Counseling Interventions

Effective behavioral counseling interventions to promote healthy weight gain in pregnancy are associated with decreased risk of gestational diabetes mellitus, emergency cesarean delivery, infant macrosomia, and LGA infants.¹ Behavioral counseling interventions varied in included components. Some interventions had an individual focus on nutrition, physical activity, or lifestyle and behavioral change. Other interventions had multiple components. The most common types of behavioral counseling interventions included active or supervised exercise or counseling about diet and physical activity.¹ Interventions generally started at the end of the first trimester or the beginning of the second trimester and ended prior to delivery. Intervention sessions lasted from 15 to 120 minutes and ranged from fewer than 2 to 12 or more contacts. Interventionists were highly diverse and included clinicians, registered dietitians, qualified fitness specialists, physiotherapists, and health coaches. Trials used various delivery methods (face-to-face, computer, internet, or telephone).¹

Effective behavioral counseling interventions often referred participants to various interventionists in different settings (eg, local community fitness center). Participants were counseled on healthy diet and exercise through individual or group education sessions. Some interventions provided medically supervised group exercise classes with or without counseling.¹ Behavioral counseling interventions with 12 or more contacts were more effective for some outcomes (mean GWG, excess GWG, and infant macrosomia) than interventions with fewer contacts.¹ There is not enough evidence to determine whether specific components of these interventions were independently related to intervention effectiveness.

Implementation

Primary care clinicians can deliver effective in-person behavioral counseling interventions or refer patients to behavioral counseling interventions in other settings. For more information about behavioral counseling interventions, see Table 2.

Additional Tools and Resources

The following resource may help clinicians implement this recommendation.

- The Community Preventive Services Task Force recommends multicomponent interventions that use technology-supported coaching or counseling to help nonpregnant adults lose weight and maintain weight loss.²⁵
- The Community Preventive Services Task Force recommends exercise programs during pregnancy to reduce the development of gestational hypertension.²⁶

Other Related USPSTF Recommendations

The USPSTF recommends screening for obesity in adults and offering or referring those with a BMI of 30 or greater to intensive, mul-

ticomponent behavioral weight loss interventions.²⁷ The USPSTF also has recommendations on screening for gestational diabetes mellitus²⁸ and behavioral counseling interventions to promote a healthy diet and physical activity for cardiovascular disease prevention in adults with and without cardiovascular risk factors.^{29,30}

Supporting Evidence

Scope of Review

The USPSTF commissioned a systematic review^{1,31} to evaluate the benefits and harms of behavioral counseling interventions to prevent adverse health outcomes associated with obesity during pregnancy and to evaluate intermediate outcomes, including excess GWG. The USPSTF has not previously made a recommendation on this topic.

Benefits of Counseling Interventions to Change Behavior

Sixty-four randomized clinical trials and 4 nonrandomized controlled intervention studies evaluated interventions to promote healthy weight gain and limit excessive GWG during pregnancy.

Study sample sizes ranged from 50 to 2261; the total number of participants in all included studies was 25 789. The mean reported age ranged from 18 to 33 years.^{1,31} None of the studies exclusively enrolled pregnant adolescents or pregnant adults of advanced maternal age. BMI inclusion criteria varied across the trials; there were participants with overweight or obesity (19 trials), those with obesity only (13 trials), those with mixed weight status (34 trials), and those with normal weight only (1 trial). Twenty-eight of the 68 included studies (41%) enrolled more than 20% of patients from diverse backgrounds, including persons who are socioeconomically disadvantaged, racial/ethnic populations, rural populations, or others. Twenty-two studies provided an intervention with an activity component, while 45 studies offered counseling-only interventions. The mean weight loss after the interventions was approximately 1 kg across the trials.^{1,31}

Maternal Health Outcomes

Gestational weight gain interventions were associated with statistically significant reductions in risk of gestational diabetes mellitus (43 trials; relative risk [RR], 0.87 [95% CI, 0.79 to 0.95]; $I^2 = 16.4%$; absolute risk difference [ARD], -1.6% [95% CI, -2.5% to -0.7%]) and emergency (unscheduled) cesarean delivery (134 trials; RR, 0.875 [95% CI, 0.754 to 0.986]; $I^2 = 0%$; ARD, -2.24% [95% CI, -4.20% to 0.03%]). There was no association between GWG interventions and gestational hypertension, total number of cesarean deliveries, preeclampsia, postpartum hemorrhage, perineal trauma, or maternal death.^{1,31} Stratified analyses showed statistically significant interactions between the mixed BMI category and perineal trauma, active interventions and gestational hypertension, high-intensity interventions and gestational hypertension, and intervention intensity and perineal trauma.

Infant Health Outcomes

Gestational weight gain interventions were associated with decreased risk of infant macrosomia (25 trials; RR, 0.77 [95% CI, 0.65 to 0.92]; $I^2 = 38.3%$; ARD, -1.9% [95% CI, -3.3% to -0.7%]) and LGA in infants (26 trials; RR, 0.89 [95% CI, 0.80 to 0.99];

Table 2. Behavioral Counseling Interventions for Healthy Weight and Weight Gain in Pregnancy^a

		Counseling	
	Active/supervised exercise, high intensity ^b	High intensity	Low intensity
Mode of delivery	Structured, supervised exercise classes.	Individual or group counseling in person, online, or over the telephone.	Individual or group counseling in person or over the telephone.
Intensity	One to 3 times per week (average, 45-60 min)	<ul style="list-style-type: none"> • Sessions ranged from once a week to once a month, lasting from 30 min to 2 h. • Interventions may have included telephone call or email follow-up 1 to 2 times per week; eHealth interventions offered online or text message support. 	<ul style="list-style-type: none"> • Sessions ranged from once a month to once a trimester, lasting from 15 to 45 min. • Interventions may have included phone call “booster” sessions and toolkits with educational materials or physical activity accessories for participants.
Intervention content	Classes included aerobic, resistance, and flexibility exercises based on ACOG recommendations for exercise during pregnancy. Intervention participants generally used free weights, resistance equipment, or both.	Counseling focused on nutrition, goal-setting, physical activity, and behavioral and social support strategies. Few interventions followed evidence-based, structured curricula.	Counseling focused on maintaining healthy weight and often included personalized graphs with weight gain guidance based on NAM recommendations.
Example interventions	Bacchi et al, ⁸ 2018 Barakat et al, ⁹ 2019 Phelan et al, ¹⁰ 2018 (Healthy Beginnings) Ruiz et al, ¹¹ 2013 Sagedal et al, ¹² 2017 (Norwegian Fit for Delivery)	Altazan et al, ¹³ 2019 (Expecting Success/SmartMoms) Cahill et al, ¹⁴ 2018 (PreGO) Gallagher et al, ¹⁵ 2018 (LIFT) Renault et al, ¹⁶ 2014 (TOP)	Asaf-Balut et al, ²¹ 2017 Rauh et al, ²² 2013 (FELIPO) Ronnberg et al, ²³ 2014
Materials and practice ^c	Lifestyle Interventions for Expectant Moms https://lifemoms.bsc.gwu.edu/	DASH Eating Plan https://www.nhlbi.nih.gov/health-topics/dash-eating-plan WebCite Healthy Food, Exercise, and Weight for Your Pregnancy https://www.webcitation.org/6QR3k6uaM SmartMoms Intervention Lessons https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6352352/ bin/12884_2019_2196_MOESM1_ESM.docx	Oldways https://oldwayspt.org/traditional-diets/mediterranean-diet Healthy Weight Gain During Pregnancy https://webassets.nationalacademies.org/whattogain/
Population	Pregnant adolescents and adults.		
Practice settings	Primary care or primary care-referable settings and routine prenatal care settings, including obstetrics-gynecology or midwifery clinics and hospitals.		
Interventionists	Midwives, health educators, physical therapists, fitness specialists, or clinical and registered dietitians, or some combination thereof.		
Demonstrated benefit	Gestational weight gain interventions were associated with decreased risk of gestational diabetes mellitus, emergency cesarean delivery, macrosomia, large for gestational age infants, and reduced postpartum weight retention at 12 mo. Gestational weight gain interventions were also associated with modest reductions in mean gestational weight gain and decreased likelihood of exceeding NAM recommendations for gestational weight gain.		

Abbreviations: ACOG, American College of Obstetricians and Gynecologists; NAM, National Academy of Medicine ^b Intervention intensity categorized as low (≤ 2 contacts), moderate (3-11 contacts), or high (≥ 12 contacts). (formerly the Institute of Medicine).

^a Adapted from supplemental eTable 2 in Cantor et al¹ and a modified Template for Intervention Description and Replication (TIDieR) checklist.²⁴

^c Links to resources are available in the article PDF.

$I^2 = 0\%$; ARD, -1.3 [95% CI, -2.3% to -0.3%]).^{1,31} However, the interventions were not associated with changes in growth rates during the first year of life or in risk of preterm birth, neonatal death or stillbirth, shoulder dystocia, admission to the neonatal intensive care unit, or respiratory distress syndrome. Stratified analyses showed statistically significant interactions between intervention intensity and infant macrosomia ($P = .03$ for interaction) but no effect on other infant outcomes by BMI category, intervention type, or intervention intensity.^{1,31} Evidence suggested that some specific pregnancy-related intermediate outcomes are associated with health outcomes. Macrosomia and LGA in infants were associated with an increased risk of maternal and infant complications during birth.

Maternal Weight Outcomes

Gestational weight gain interventions were associated with 1 kg less weight gain across all prepregnancy weight categories (55 trials; pooled mean difference [MD], -1.02 kg [95% CI, -1.30 to -0.75 kg]; $I^2 = 60.3\%$). High-intensity interventions (≥ 12 contacts) were associated with greater effects (28 trials; pooled MD, -1.47 kg [95% CI, -1.78 to -1.22 kg]; $I^2 = 13.0\%$) than were moderate-intensity interventions (3-11 contacts) (18 trials; pooled MD, -0.32 kg [95% CI, -0.71 to -0.04 kg]; $I^2 = 17.6\%$) or low-intensity interventions (≤ 2 contacts) (9 trials; pooled MD, -0.64 kg [95% CI, -1.44 to 0.02 kg]; $I^2 = 48.4\%$; $P < .001$ for interaction). There was no significant interaction between intervention type or baseline BMI category and effects on GWG. Interventions were also associated with a lower likelihood of GWG in excess of the National Academy of Medicine recommendations (39 trials; RR, 0.84 [95% CI, 0.78 to 0.90]; $I^2 = 63.2\%$; ARD, -7.7% [95% CI, -11.0% to -4.6%]), with greater effect size for active interventions ($P < .001$ for interaction) and high-intensity interventions ($P < .001$ for interaction). There was no significant interaction between BMI category and effects on likelihood of excess weight gain. Gestational weight gain interventions were not associated with increased likelihood of adherence to National Academy of Medicine recommendations for GWG (ie, neither gaining excessive weight nor failing to gain sufficient weight) or postpartum weight retention at less than 6 months but were associated with reduced postpartum weight retention at 12 months (10 trials; pooled MD, -0.63 kg [95% CI, -1.44 to -0.01 kg]; $I^2 = 65.5\%$).^{1,31}

Harms of Counseling Interventions to Change Behavior

The USPSTF found limited evidence on harms because most studies were not designed to evaluate harms. Twelve studies evaluated the effects of GWG interventions on maternal anxiety and depres-

sion and showed mixed results.¹ The association between GWG interventions and small for gestational age size in infants was not statistically significant (20 trials; RR, 0.94 [95% CI, 0.80 to 1.10]; $I^2 = 0\%$; ARD, -0.4% [95% CI, -1.7% to 1.0%]).¹ Gestational weight gain interventions were not associated with maternal death (2 trials); however, there were low event rates and few trials.^{1,31}

Response to Public Comments

A draft version of this recommendation statement was posted for public comment on the USPSTF website from December 8, 2020, to January 11, 2021. Comments asked for clarification of the patient population. The USPSTF revised the Practice Considerations section to clarify that the patient population under consideration included pregnant adolescents and adults and to more clearly define "healthy" weight. Comments asked for more clarification about effective interventions. The USPSTF provided examples of effective behavioral counseling interventions that can be used in practice in Table 2.

Research Needs and Gaps

There are several important evidence gaps. Studies are needed that provide more information on the following.

- The effectiveness of interventions on additional short- and long-term maternal and infant health outcomes.
- The specific components of intensive behavioral interventions, including the optimal frequency, length of sessions, and number of sessions needed for an intervention to be effective.
- Whether interventions should be tailored to promote healthy weight gain in populations of pregnant persons of advanced maternal age (eg, older than 34 years); adolescents; diverse populations such as non-Hispanic Black, Alaska Native/American Indian, and Hispanic persons; and populations with increased rates of overweight and obesity.³

Recommendations of Others

The American College of Obstetricians and Gynecologists recommends that clinicians provide counseling on the risks of obesity in pregnancy and provide resources or refer persons of reproductive age to weight-reduction interventions before conception.^{7,32-37} The National Academy of Medicine recommends counseling about healthy weight gain during pregnancy and adherence to its recommendations about GWG.⁵

ARTICLE INFORMATION

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Additional Information: The US Preventive Services Task Force (USPSTF) makes recommendations about the effectiveness of specific preventive care services for patients without obvious related signs or symptoms. It bases its recommendations on the evidence of both the benefits and harms of the service and an assessment of the balance. The USPSTF does not consider the costs of providing a service in this assessment. The USPSTF recognizes that clinical decisions involve more considerations than evidence alone. Clinicians should understand the evidence but individualize decision-making to the specific patient or situation. Similarly, the USPSTF notes that policy and coverage decisions involve considerations in addition to the evidence of clinical benefits and harms.

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