

# A HEALTHY BABY IS WORTH THE WEIGHT



**ACOG Technical Bulletin Number 179. Nutrition during pregnancy. ACOG Technical Bulletin Number 179--April 1993.** Int J Gynaecol Obstet. 1993 Oct; 43(1): 67-74 [No authors listed].

A woman's prepregnant BMI and her total weight gain during pregnancy are important determinants of newborn weight. A woman's prepregnant BMI determines the total weight gain and the rate of weight gain per month recommended during her pregnancy. Both are under maternal control, but can be influenced by the health care provider. Both lend themselves to nutritional assessment, prophylactic recommendations, and therapeutic interventions in the preconceptional and prenatal periods. Nutritional advice during pregnancy includes a balanced daily diet containing approximately 35 kcal for each kilogram of optimal body weight plus 300 kcal. The food plan should be consistent with the women's food preferences if it is to be followed. Within this context, an appropriate diet is selected from protein-rich foods, whole-grain breads and cereals, dairy products, and fruits and vegetables. Vitamin supplementation is not required in this patient. Of the minerals, only iron is recommended as a supplement, to maintain body stores and minimize the occurrence of iron deficiency anemia. Postpartum maintenance of balanced nutrition with the woman consuming at least 1,800 kcal daily will facilitate breast-feeding. Vitamin and mineral supplementation during lactation is not required routinely. A puerperal weight loss of no more than 0.9 kg (2 lb) a month will not affect nursing performance.

**Abrams B, Altman SL, Pickett KE. Pregnancy weight gain: still controversial.** Am J Clin Nutr. 2000 May; 71(5 Suppl): 1233S-41S. Division of Public Health Biology and Epidemiology, University of California, Berkeley 94720, USA. barbara@socrates.berkeley.edu

During the 20th century, recommendations for maternal weight gain in pregnancy were controversial, ranging from rigid restriction to encouragement of ample gain. In 1990, the Institute of Medicine (IOM) recommended weight-gain ranges with the primary goal of improving infant birth weight. These guidelines were widely adopted but not universally accepted. Critics have argued that the IOM's recommendations are unlikely to improve perinatal outcomes and may actually increase the risk of negative consequences to both infants and mothers. We systematically reviewed studies that examined fetal and maternal outcomes according to the IOM's weight-gain recommendations in women with a normal prepregnancy weight. These studies showed that pregnancy weight gain within the IOM's recommended ranges is associated with the best outcome for both mothers and infants. However, weight gain in most pregnant women is not within the IOM's ranges. All of the studies reviewed were observational and there is a compelling need to conduct experimental studies to examine interventional strategies to improve maternal weight gain with the objective of optimizing health outcomes. PMID: 10799396 [PubMed - indexed for MEDLINE]

**Carmichael S, Abrams B, Selvin S. The pattern of maternal weight gain in women with good pregnancy outcomes.** Am J Public Health. 1997 Dec; 87(12): 1984-8. Division of Public Health Biology and Epidemiology, University of California, Berkeley, USA.

**OBJECTIVES:** This study describes the pattern of maternal weight gain in women with good pregnancy outcomes and provides data to fill in the provisional weight-gain charts published by

the Institute of Medicine (IOM) in 1990. **METHODS:** We selected 7002 women with good outcomes (defined by factors related to maternal and infant health) from the University of California, San Francisco, Perinatal Database. For each body mass index category, we compared percentiles of weight gain by trimester in women who achieved the IOM recommendations for total gain and those who did not. **RESULTS:** Trimester rates of gain varied by body mass index category and exceeded IOM guidelines in all groups. Forty percent of these women with good outcomes had total gains within the guidelines and provided data to complete the IOM weight-gain charts. **CONCLUSIONS:** Most women in this good-outcome sample would have been suspected of being at increased risk for poor outcome on the basis of their weight gain. This confirms the IOM recommendation that evaluation of the underlying causes of excessively high or low weight gain during pregnancy is necessary before appropriate interventions can be applied. PMID: 9431288 [PubMed - indexed for MEDLINE]

**Caulfield LE, Witter FR, Stoltzfus RJ. Determinants of gestational weight gain outside the recommended ranges among black and white women.** *Obstet Gynecol.* 1996 May; 87(5 Pt 1): 760-6. Center for Human Nutrition, Johns Hopkins University School of Hygiene and Public Health, Baltimore, Maryland, USA.

**OBJECTIVES:** To identify factors influencing risk of gaining outside the Institute of Medicine recommendations for pregnancy weight gain, and to determine whether these factors differ by race. **METHODS:** Multivariate methods were used to identify risk factors for under- and over-gain among 2617 black and 1253 white women delivering at the Johns Hopkins Hospital during 1987-1989. **Results:** Only 28.2% of black women and 32.5% of white women gained the recommended amounts of weight during pregnancy. Maternal pre-pregnancy body mass index (BMI), height, parity, education, smoking, hypertension, duration of pregnancy, and fetal sex influenced risk for under-gain or over-gain. Black women were 1.51 (95% confidence interval [CI] 1.23-1.85) times more likely to under-gain, but 0.89 (95% CI 0.74-1.08) times less likely to over-gain than white women. No interactions were found between any factor examined and BMI or race. **CONCLUSION:** Only about one-third of women are gaining the recommended amounts of weight during pregnancy. Black women are at increased risk for gaining less weight than recommended, and selected maternal characteristics associated with race do not explain this difference. Further, risk factors for under-or over-gain do not differ between black and white women. PMID: 8677082 [PubMed - indexed for MEDLINE]

**Caulfield LE, Stoltzfus RJ, Witter FR. Implications of the Institute of Medicine weight gain recommendations for preventing adverse pregnancy outcomes in black and white women.** *Am J Public Health.* 1998 Aug; 88(8): 1168-74. Center for Human Nutrition, Johns Hopkins University School of Hygiene and Public Health, Baltimore, MD 21205, USA. lcaulfie@jhsph.edu

**OBJECTIVES:** This study examined the relation between gestational weight gain and risk of delivering a small-for-gestational-age or large-for-gestational-age infant by race, along with the implications of gaining weight according to the Institute of Medicine guidelines. **METHODS:** Logistic regression methods were used to identify risk factors for small- and large-for-gestational-age births among 2617 Black and 1253 White women delivering at the Johns Hopkins Hospital between 1987 and 1989. **RESULTS:** Rate of total weight gain was related to

risk of small- and large-for-gestational-age births; the relationship differed according to maternal body mass index but not race. No differences in outcome by race were evident for women with low body mass indexes; among those with average or high indexes, however, Black women were at higher risk of small-for-gestational-age births and at lower risk of large-for-gestational-age births. **CONCLUSIONS:** Having Black women gain at the upper end of the recommended range is unlikely to produce measurable reductions in small-for-gestational-age births. Some beneficial reductions in the risk of large-for-gestational-age births may occur if weight gain recommendations are lowered for average-weight and overweight White women. PMID: 9702142 [PubMed - indexed for MEDLINE]

**Cogswell ME, Scanlon KS, Fein SB, Schieve LA. Medically advised, mother's personal target, and actual weight gain during pregnancy.** *Obstet Gynecol.* 1999 Oct; 94(4): 616-22. Division of Nutrition and Physical Activity, National Center for Chronic Disease Prevention and Health Promotion, the Epidemic Intelligence Service, Epidemiology Program Office, Centers for Disease Control and Prevention, Atlanta,.

**OBJECTIVE:** To evaluate whether advice on pregnancy weight gain from health care professionals, women's target weight gain (how much weight women thought they should gain), and actual weight gain corresponded with the 1990 Institute of Medicine recommendations. **METHODS:** Predominantly white, middle-class women participating in a mail panel reported their prepregnancy weights, heights, and advised and target weight gains on a prenatal questionnaire (n = 2237), and their actual weight gains on a neonatal questionnaire (n = 1661). Recommended weight gains were categorized for women with low body mass index (BMI) (less than 19.8 kg/m<sup>2</sup>) as 25-39 lb; for women with average BMI (19.8-26.0 kg/m<sup>2</sup>) as 25-34 lb; and for women with high BMI (more than 26.0-29.0 kg/m<sup>2</sup>) and very high BMI (more than 29.0 kg/m<sup>2</sup>) as 15-24 lb. **RESULTS:** Twenty-seven percent of the women reported that they had received no medical advice about pregnancy weight gain. Among those who received advice, 14% (95% confidence interval [CI] 12%, 16%) had been advised to gain less than the recommended range and 22% (95% CI 20%, 24%) had been advised to gain more than recommended. The odds of being advised to gain more than recommended were higher among women with high BMIs and with very high BMIs compared with women with average BMIs. Black women were more likely than white women to report advice to gain less than recommended. Advised and target weight gains were associated strongly with actual weight gain. Receiving no advice was associated with weight gain outside the recommendations. **CONCLUSION:** Greater efforts are required to improve medical advice about weight gain during pregnancy. PMID: 10511369 [PubMed - indexed for MEDLINE]

**Hickey CA. Sociocultural and behavioral influences on weight gain during pregnancy.** *Am J Clin Nutr.* 2000 May; 71(5 Suppl): 1364S-70S. Department of Maternal and Child Health, School of Public Health, University of Alabama at Birmingham, USA. hickeyc@uab.edu

Studies have consistently identified a positive association between prenatal weight gain and birth weight. Much less, however, is known about factors that may influence women to gain weight within currently recommended ranges. The importance of this issue is suggested by recent reports indicating that only 30-40% of women actually gain weight within these ranges. This paper examines demographic, sociocultural, and behavioral factors that are associated with, and may influence risk of, low prenatal weight gain among adult women with low and

normal body mass indexes. Available data suggest that these factors include ethnicity, socioeconomic status, age, education, pregnancy intendedness or wantedness, prenatal advice, and psychosocial characteristics such as attitude toward weight gain, social support, depression, stress, anxiety, and self-efficacy. Potential theoretical models for these associations include biological, behavioral, and mixed pathways. The design of targeted intervention studies will depend on further identification and characterization of sociocultural and behavioral risk factors that, along with reproductive and nutritional characteristics, may predict which women are most likely to have inadequate prenatal weight gain. PMID: 10799414 [PubMed - indexed for MEDLINE] Full text at: <http://www.aicn.org/cgi/content/full/71/5/1364S>

**Hickey CA, Cliver SP, Goldenberg RL, McNeal SF, Hoffman HJ. Low prenatal weight gain among low-income women: what are the risk factors?** Birth. 1997 Jun; 24(2): 102-8. Department of Maternal and Child Health, School of Public Health, University of Alabama at Birmingham 35294-2010, USA.

**BACKGROUND:** Although a large body of evidence suggests that prenatal weight gain is an important determinant of fetal growth, 23 to 38 percent of nonobese women have low prenatal weight gain. Determination of potential risk factors for low gain is essential to develop targeted intervention programs. This study examined the association of maternal sociodemographic, lifestyle, and reproductive characteristics with the actual occurrence of low gain among 536 black and 270 white low-income, nonobese women. **METHODS:** Sociodemographic, pregnancy wantedness, reproductive, and anthropometric data were obtained by interview during the first prenatal visit. A 72-item questionnaire, administered at 24 to 26 weeks' gestation, assessed residential and household characteristics, housing characteristics, income, transportation, physical activity, employment, and institutional support. Variables associated with low gain in bivariate analyses were included in logistic regression analysis to determine the adjusted odds ratios for low gain. **RESULTS:** Three characteristics were associated with increased adjusted odds ratios for low prenatal weight gain among black women: having a mistimed or unwanted pregnancy, caring for more than one preschool child at home, and not using own car for errands. One characteristic, working more than 40 hours per week when employed, was associated with low gain among white women. **CONCLUSION:** Although these preliminary findings require additional confirmation, they suggest that a variety of sociodemographic and lifestyle features deserve investigations that target the identification and characterization of risk factors for low prenatal weight gain. PMID: 9271976 [PubMed - indexed for MEDLINE]

**Hickey CA, Cliver SP, McNeal SF, Hoffman HJ, Goldenberg RL. Prenatal weight gain patterns and birth weight among nonobese black and white women.** Obstet Gynecol. 1996 Oct; 88(4 Pt 1): 490-6. Department of Maternal and Child Health, School of Public Health, University of Alabama at Birmingham, USA.

**OBJECTIVE:** To examine the association between prenatal weight gain patterns and birth weight, using Institute of Medicine (IOM) guidelines. **METHODS:** Data from a prospective follow-up study of risk factors for fetal growth restriction were used to examine the impact of low weight gain on mean birth weight. A total of 415 nonobese (body mass index [BMI] less than 26) black (n = 275) and white (n = 140) women who delivered at term were included in this analysis. Linear regression analysis was used to examine the impact of low first-trimester gain (less than

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2.3 kg with low BMI [less than 19.8]; less than 1.6 kg with normal BMI [19.8-26.0]) and low second- and third-trimester rates of gain (less than 0.38 kg/week with low BMI; less than 0.37 kg/week with normal BMI) on mean birth weight while controlling for selected sociodemographic and reproductive variables. RESULTS: Patterns with low gain in the first and second or in the second and third trimesters were associated with significant decreases in mean birth weight, ranging from 206 to 265 g; low gain in only the first or third trimester was not associated with a significant decrease in mean in birth weight. The impact of low gain on mean birth weight varied by ethnic group. CONCLUSION: These observations suggest that inadequate patterns of prenatal weight gain, defined by IOM guidelines, are associated with decreased birth weight, particularly when the patterns involve low second-trimester gain. PMID: 8841205 [PubMed - indexed for MEDLINE]

**Hickey CA, Cliver SP, McNeal SF, Hoffman HJ, Goldenberg RL. Prenatal weight gain patterns and spontaneous preterm birth among nonobese black and white women.** *Obstet Gynecol.* 1995 Jun; 85(6): 909-14. Department of Maternal and Child Health, School of Public Health, University of Alabama at Birmingham, USA.

OBJECTIVE: To examine the relationship between prenatal weight gain and spontaneous preterm delivery, using the Institute of Medicine (IOM) guidelines. METHODS: Nonobese low-income black (677 subjects) and white (338) women were grouped by ethnicity and prepregnancy body mass index (BMI) as low (less than 19.8) or normal (19.8-26.0). The relationship of total gain (first trimester) and weekly rate of gain (second and third trimester) to spontaneous preterm delivery was determined while controlling for sociodemographic and reproductive variables as well as for time between last weight observation and delivery. RESULTS: For all women combined, the mean (+/- standard deviation) weight gain during the first trimester was 2.48 +/- 3.36 kg, and the mean rate of gain during the second and third trimesters was 0.49 +/- 0.21 and 0.45 +/- 0.28 kg/week, respectively. Low first- or second-trimester weight gain was not associated with increased adjusted odds ratios (OR) for spontaneous preterm delivery. Third-trimester rates of gain below the lower limit of the IOM-recommended range (less than 0.38 kg/week with low BMI, less than 0.37 kg/week with normal BMI) were associated with increased preterm delivery among all women (OR 2.46, 95% confidence interval [CI] 1.53-3.92), all black women (OR 1.98, 95% CI 1.16-3.41), and all white women (OR 4.05, 95% CI 1.41-11.66). CONCLUSION: These observations suggest that a low third-trimester rate of weight gain, defined using IOM guidelines, is associated with an increased risk of spontaneous preterm delivery among nonobese black and white women. PMID: 7770259 [PubMed - indexed for MEDLINE]

**Kogan MD, Alexander GR, Kotelchuck M, Nagey DA, Jack BW. Comparing mothers' reports on the content of prenatal care received with recommended national guidelines for care.** *Public Health Rep.* 1994 Sep-Oct; 109(5): 637-46. Centers for Disease Control and Prevention, National Center for Health Statistics, Followback Survey Branch, Hyattsville, MD 20782.

The Public Health Service's Expert Panel on the Content of Prenatal Care Report in 1989 provided detailed guidelines for the components of each prenatal visit. However, the extent to which women were receiving the recommended care when the guidelines were being formulated has yet to be determined. The 1988 National Maternal and Infant Health Survey

results permit an examination of the proportion of women who reported receiving some of the recommended procedures. Women were asked if they received six of the recommended procedures (blood pressure measurement, urine test, blood test, weight and height taken, pelvic examination, and pregnancy history) in the first two visits, and whether they received seven types of advice or counseling (nutrition; vitamin use; smoking, alcohol, and drug use cessation; breastfeeding; and maternal weight gain) any time during their pregnancy. Only 56 percent of the respondents said they received all of the recommended procedures in the first two visits, and only 32 percent of the respondents said they received advice in all of the areas. Logistic regression analysis indicated that women receiving their care from private offices were significantly less likely to receive all the procedures and advice than women at publicly funded sites of care. This study suggests that recommendations of the Public Health Service's expert panel were not being met. PMID: 7938384 [PubMed - indexed for MEDLINE] Article online at <http://www.ajcn.org/cgi/content/full/71/5/1233S>

**Parker JD, Abrams B. Prenatal weight gain advice: an examination of the recent prenatal weight gain recommendations of the Institute of Medicine.** *Obstet Gynecol.* 1992 May; 79(5 ( Pt 1)): 664-9 School of Public Health, University of California, Berkeley.

The Institute of Medicine (IOM) recently published new guidelines for maternal weight gain during pregnancy. Using data collected at Moffitt Hospital, University of California at San Francisco, we examined the associations between maternal weight gain outside the recommendations of the IOM and three pregnancy outcomes (small for gestational age [SGA] infants, large for gestational age [LGA] infants, and cesarean delivery). These analyses were repeated using population-specific weight gain ranges derived from a subgroup of women in this cohort with healthy pregnancy outcomes. The purpose of the study was to compare the national guidelines of the IOM with hospital standards. Both the recommendations of the IOM and the hospital ranges were associated with fewer SGA infants, LGA infants, and cesarean deliveries. The overall associations were similar for the population-derived and national ranges. Although the IOM ranges should be examined in other populations and with other birth outcomes, our results validated their recommendations. Maternal weight gain within the IOM recommendations reduced the risk of the outcomes studied; furthermore, these ranges performed as well as those derived from the target population. PMID: 1565346 [PubMed - indexed for MEDLINE]

**Schieve LA, Cogswell ME, Scanlon KS. Maternal weight gain and preterm delivery: differential effects by body mass index.** *Epidemiology.* 1999 Mar; 10(2): 141-7. Epidemic Intelligence Service, Epidemiology Program Office, and Division of Nutrition and Physical Activity, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA 30341, USA.

We examined associations between weight gain (kg) per week of pregnancy and net weight gain per week of pregnancy (weight gain - birth weight/weeks of gestation at delivery) and preterm delivery in a population of 266,172 low-income women. Risk of preterm delivery was lowest among women with intermediate weight gain (0.35 to <0.46 kg/week) and net weight gain (0.27 to <0.37 kg/week). Both lower and higher weight gains and net weight gains per week were associated with an increased risk for preterm delivery. Associations, however, were not uniform across body mass index categories. Compared with women gaining 0.35 to <0.46

kg/week, preterm risk differences (95% confidence limits) for women gaining <0.10 kg/week were +9.5% (+6.5, +12.4) for underweight women, +6.7% (+5.6, +7.9) for average-weight women, +3.5% (+2.0, +4.9) for overweight women, and +0.4% (-0.4, +1.2) for obese women. The opposite pattern was observed with high weight gain. Preterm risk differences for weight gains >0.65 kg/week ranged from +0.8% (-0.7, +2.1) for underweight women, to +2.5% (+1.3, +3.9) for obese women. We also evaluated weight gain per week in the latter part of pregnancy (from week 14 to delivery). The same basic patterns were observed; however, variation in the associations across body mass index groups was not as marked. PMID: 10069249 [PubMed - indexed for MEDLINE]

**Schieve LA, Cogswell ME, Scanlon KS. An empiric evaluation of the Institute of Medicine's pregnancy weight gain guidelines by race.** *Obstet Gynecol.* 1998 Jun; 91(6): 878-84. Epidemiology Program Office, and the Division of Nutrition and Physical Activity, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, Georgia 30341, USA. ljs9@cdc.gov

**OBJECTIVE:** To examine associations between pregnancy weight gain outside and within ranges recommended by the Institute of Medicine and birth weight by both prepregnant body mass index (BMI) and race-ethnicity. **METHODS:** Mean birth weight and incidence of term low birth weight (LBW, less than 2500 g) and high birth weight (more than 4500 g) were compared across BMI-pregnancy weight gain-race-ethnicity strata. Subjects were 173,066 white, black, and Hispanic low-income pregnant women attending prenatal nutrition programs between 1990 and 1993. **RESULTS:** Among low and average BMI women (all race-ethnicity groups), weight gain within Institute of Medicine ranges resulted in significant LBW reductions; further LBW reductions at gains beyond Institute of Medicine ranges were offset by increasing high birth weight risk. Among women of high and obese BMI, LBW trends were less pronounced; thus, the benefit of gaining within the Institute of Medicine range was less apparent. Although blacks in every BMI-weight gain category had lower mean birth weights than white women, gaining in the upper end of the Institute of Medicine ranges did not provide a consistent LBW reduction for black women; adjusted LBW odds ratios and 95% confidence intervals for gains in the upper relative to the lower half of the Institute of Medicine range were 1.3 (0.8, 2.1), 0.7 (0.5, 1.03), 0.3 (0.2, 0.8), and 1.3 (0.7, 2.5) for black women of low, average, high, and obese BMI, respectively. **CONCLUSION:** Institute of Medicine pregnancy weight gain ranges recommended for low and average BMI women appear reasonable, but recommendations for high and obese BMI women require further evaluation. The recommendation that black women in all BMI groups strive for gains toward the upper ends of the ranges is not supported clearly by these data. PMID: 9610990 [PubMed - indexed for MEDLINE]

**Siega-Riz AM, Adair LS, Hobel CJ. Institute of Medicine maternal weight gain recommendations and pregnancy outcome in a predominantly Hispanic population.** *Obstet Gynecol.* 1994 Oct; 84(4): 565-73. Department of Nutrition, University of North Carolina School of Public Health, Chapel Hill.

**OBJECTIVES:** To describe gestational weight gain patterns by pre-pregnancy weight and trimester of pregnancy, and to examine the risk of preterm birth associated with pre-pregnancy weight and gestational weight gain using various definitions of adequacy based on the Institute of Medicine (IOM) standard. **METHODS:** We used data collected prospectively from 8736 pregnant women receiving care in public health clinics in the West Los Angeles area. Pre-

pregnancy weight was based on self-report obtained at the initial visit. Maternal weight was measured at each prenatal visit, allowing for the calculation of total weight gain and the rate of weight gain during each trimester. RESULTS: Women underweight before pregnancy (body mass index less than 19.8) had the greatest risk of delivering preterm (crude relative risk 1.7,  $P < .05$ ). Similarities in patterns of weight gain were seen between women of low weight and normal pre-pregnancy weight status, as well as between overweight and obese women. Compared to the IOM recommendations for total weight gain, 47.8% of underweight women and 36.6% of normal-weight women gained the recommended amount. In contrast, 52% and more than 75% of overweight and obese women, respectively, had excessive gains. Inadequate weight gain during the third trimester as opposed to excessive gain, defined specifically for each pre-pregnancy weight status, was predictive of preterm birth. CONCLUSIONS: Weight monitoring during pregnancy continues to have clinical applications for the prediction of poor birth outcomes. Weight gain less than 90% the IOM recommendation in the third trimester may serve as an indicator for identifying women at risk of delivering preterm. PMID: 8090394 [PubMed - indexed for MEDLINE]

**Siega-Riz AM, Adair LS, Hobel CJ. Maternal underweight status and inadequate rate of weight gain during the third trimester of pregnancy increases the risk of preterm delivery.** J Nutr. 1996 Jan; 126(1): 146-53. Department of Nutrition, University of North Carolina School of Public Health, Chapel Hill 27516, USA.

This study examines the differences in the pattern of weight gain according to trimesters of pregnancy for women who delivered term vs. preterm and analyzes the independent effect of prepregnancy weight status and rate of weight gain on delivering preterm. The differential effects of these variables on the etiological pathways of prematurity (preterm labor and preterm rupture of the amniotic membranes) were also examined. Data were collected prospectively from 7589 pregnant women receiving care in public health clinics in the West Los Angeles area. Eighty percent of women identified themselves as being of Hispanic origin. Multivariate logistic regression techniques were used to isolate the role of each nutritional variable from other factors that may influence birth outcome. Women who delivered preterm had patterns of weight gain similar to women delivering term infants. Underweight status (body mass index  $< 19.8$  kg/m<sup>2</sup>) before pregnancy nearly doubled the likelihood of delivering preterm [adjusted odds ratio (AOR) 1.98, 95% confidence interval (CI) = 1.33, 2.98]. Inadequate weight gain in the third trimester defined as  $< 0.34$ ,  $0.35$ ,  $0.30$  and  $0.30$  kg/wk for underweight, normal weight, overweight and obese women, respectively, increased the risk by a similar magnitude (AOR 1.91, 95% CI = 1.40, 2.61). Slight differentiation of these risk factors occurred when analyzing the etiological pathways of preterm birth. Preconceptional nutrition counseling and promotion of adequate weight gain during the third trimester of pregnancy should be components of public health programs designed to decrease the prevalence of preterm birth. PMID: 8558295 [PubMed - indexed for MEDLINE]

**Siega-Riz AM, Hobel CJ. Predictors of poor maternal weight gain from baseline anthropometric, psychosocial, and demographic information in a Hispanic population.** J Am Diet Assoc. 1997 Nov; 97(11): 1264-8. Department of Nutrition, University of North Carolina, Chapel Hill, USA.

OBJECTIVE: To identify which baseline factors best predict poor maternal weight gain among Hispanics. SAMPLE: Pregnancy and outcome data collected prospectively from 4,791 Hispanic  
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women attending public prenatal clinics in West Los Angeles, Calif, from 1983 through 1986. METHODS: Prepregnancy weight was categorized into weight status groups using body mass index (BMI). Poor total weight gain (based on a mean gestational age at last measurement, which was at 35 weeks) was defined as less than 21 lb for women with BMI less than 26 and less than 10 lb for women with BMI of 26 or greater. Analyses used Student's t test, chi 2, and multivariate regression techniques (linear and logistic). RESULTS: Poor total weight gain was identified in 29% of the women. For women who were underweight or normal weight before pregnancy, the only factor associated with increasing the risk of poor total weight gain was short stature (adjusted odds ratio [AOR] = 1.5, 95% confidence interval [CI] = 1.24, 1.84). The following factors decreased the risk: being US born (AOR = 0.61, 95% CI = 0.37, 1.00); being primiparous and under 29 years old (for < 20 years AOR = 0.69, 95% CI = 0.51, 0.92 and for 20 to 29 years AOR = 0.63, 95% CI = 0.49, 0.81); planning the pregnancy (AOR = 0.82, 95% CI = 0.67, 1.00); and having a close relative die during the pregnancy (AOR = 0.65, 95% CI = 0.44, 0.95). For obese and overweight women, physical abuse by the baby's father increased the risk (AOR = 3.19, 95% CI = 1.27, 8.01) of poor total weight gain, whereas receiving financial support from the baby's father decreased the risk (AOR = 0.59, 95% CI = 0.37, 0.95). APPLICATIONS/CONCLUSIONS: These baseline factors could aid in targeting nutrition and other social services earlier to pregnant Hispanic women. By strategically targeting pregnant women in greatest need of services, improvements in birth outcomes may be enhanced. PMID: 9366864 [PubMed - indexed for MEDLINE]

**Strauss RS, Dietz WH. Low maternal weight gain in the second or third trimester increases the risk for intrauterine growth retardation.** J Nutr. 1999 May; 129(5): 988-93. Division of Pediatric Gastroenterology and Nutrition, UMDNJ-Robert Wood Johnson School of Medicine, New Brunswick, NJ, USA.

Low maternal weight gain during pregnancy has been suggested as a cause of intrauterine growth retardation (IUGR). However, pregnancy weight gain and fetal growth vary greatly throughout pregnancy. We examined the relationship between maternal weight gain in individual trimesters to the risk of IUGR in 10,696 women enrolled in the National Collaborative Perinatal Project (NCPP) and the Child Health and Development Study (CHDS). Low weight gain was defined as <-0.1 kg/wk for the first trimester and <0.3 kg/wk for the second and third trimester. IUGR was defined as a birth weight <2500 g in full-term infants. Low weight gain in the first trimester was not associated with an increased risk of IUGR. After controlling for confounding factors (maternal height, body mass index, parity, race, toxemia, diabetes), low weight gain in the second trimester was associated with a relative risk of IUGR of 1.8 (1.3-2.6) in the NCPP cohort and 2.6 (1.6-4.1) in the CHDS cohort. Similarly, low weight gain in the third trimester was associated with a relative risk of IUGR of 1.7 (1.3-2.3) in the NCPP cohort and 2.5 (1.7-3.8) in the CHDS cohort. After correcting for weight gain in other trimesters, this increased risk remained. Increased risk of IUGR was observed with low second and third trimester weight gain across the spectrum of maternal body mass index. The risk of low weight gain in the second or third trimester was significantly lower in teenagers and significantly greater in overweight women and women aged 35 y or older. Low weight gain in either the second or third trimester was associated with a significantly greater risk of intrauterine growth retardation in two distinct cohorts. We conclude that increased awareness of maternal weight gain in mid and late pregnancy is critical to identifying infants at risk for IUGR. PMID: 10222390 [PubMed - indexed for MEDLINE] Article can be found at <http://www.nutrition.org/cgi/content/full/129/5/988>.