women were more likely than obese or overweight women to gain under IOM guidelines (55% v 19% v 28%) (all p<.001). Exceeding IOM guidelines was associated with macrosomia in obese women (aOR 2.51 95%CI 1.01, 6.26). In overweight women, adjusted odds of macrosomia (aOR 2.82 95%CI 2.82, 8.75) were of similar magnitude to those for obese women, but findings were not significant. Individual OGTT values were not associated macrosomia.

CONCLUSION: Exceeding IOM weight gain guidelines is associated with infant macrosomia among obese GDM women, independent of OGTT results. Gestational weight gain is a modifiable risk factor that influences macrosomia risk. Interventions that optimize gestational weight gain may improve pregnancy outcomes among obese GDM women and could have significant public health impact.

Odds of macrosomia by IOM recommendations and BMI category

		Gained less than IOM guidelines (n=142)		Gained more than IOM guidelines (n=202)	
	macrosomia n /sample n	OR (95% CI)	aOR (95% CI)	OR (95% CI)	aOR (95% CI)
Normal	10/110	.24 (.03, 1.87)	.34 (.04, 2.76)	1.50 (.27, 8.41)	1.71 (.29, 9.97)
Overweight	27/167	1.35 (.38,4.74)	1.24 (.34, 4.55)	2.77 (.94, 8.17)	2.82 (.91, 8.75)
Obese	52/189	.60 (.18, 2.06)	.70 (.20, 2.44)	2.07 (.86, 5.01)	2.51 (1.01, 6.26)

Reference group, IOM weight gain guidelines met (n=104); normal (BMI 18.5-24.9), overweight (BMI 25.0-29.9), obese (>30.0).

255 Can a threshold third trimester hemoglobin A1C be used to predict maternal and neonatal pathology?

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OBJECTIVE: To determine a threshold, third trimester hemoglobin A1C (HbA1C) that predicts adverse maternal and neonatal outcomes.

STUDY DESIGN: This was a retrospective cohort study of 157 women who delivered 169 singleton infants at Vidant Medical Center between 2007 and 2012 who had either gestational (48%) or pre-existing diabetes (52%). The primary outcome was whether or not the infant was discharged home with mother. Secondary outcomes included macrosomia/ large for gestational age infants, intrauterine fetal demise, neonatal intensive care admission, intravenous treatment of hypoglycemia (<40 mg%), hyperbilirubinemia (>12mg%), and shoulder dystocia. Maternal primary outcomes included preeclampsia and unintended cesarean section. A ROC analysis was performed to determine the threshold HbA1C that would predict a composite adverse neonatal outcome including any one of the latter outcomes.

RESULTS: Our population was typically obese (Table), African-American or hispanic (68%), and indigent. 74% of the term patients went home with their neonates and 22% of term neonates were admitted to the NICU. Our ROC analysis identified a threshold of HbA1C of 5.3 %. There were no significant differences in age, parity, or DM class among the low and high HbA1C classes. The Table depicts the differences in outcomes above and below a third trimester HbA1C of 5.3%. We found a significant difference in the HbA1C between those that had any secondary outcome present compared to those where all adverse outcomes were absent.

CONCLUSION: A HbA1C >5.3 % appears to predict poor pregnancy outcomes for mother and neonate and might be used as a management goal.

Outcomes by high and low HbA1C

Parameter	HbA1C < 5.3	HbA1C >5.3
BMI (STD)	35.1(4.4)	39.7(8.8)
Initial HbA1C (STD)	6.27(1.4)	7.43(1.8)
Max.Units Insulin	94	107
Third Trimester HbA1C (STD	5.07(0.2)	6.35(0.85)
C/S*	20%	38%
Preeclampsia	0	12%
IUFD	0	3.4%

*All patients with intended vaginal birth.

256 Sleep apnea in early pregnancy: an independent risk factor for the development of gestational diabetes

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OBJECTIVE: Objective assessments of the association between sleep apnea (SA) and glucose metabolism in pregnancy are limited. The objective of this study was to evaluate the relationship between objectively assessed SA in early pregnancy and the subsequent development of gestational diabetes mellitus (GDM) in a cohort of high risk pregnant women.

STUDY DESIGN: This was a planned subgroup analysis of data from a SA and preeclampsia study. Women with chronic hypertension, obesity, twin gestation and/or a history of preeclampsia (i.e., those at high risk of preeclampsia) who were between 6 and 20 weeks were recruited to participate in an overnight SA evaluation with a validated portable monitor. Women with pregestational diabetes were excluded. SA was defined as an apnea-hypopnea index (AHI) of ≥ 5. The diagnosis of GDM was abstracted from the medical record and confirmed by a review of oral glucose tolerance testing (OGTT) by study personnel blinded to the sleep study results. The relationship between SA and GDM was explored using univariable and multivariable analysis.

RESULTS: AHI and OGTT results were available for 75 of the 80 women recruited. The mean gestational age at the sleep study was 17.1 ± 4.2 weeks. Twenty-six (35%) women had SA and 20 (25%) developed GDM. Women with SA differed from those without SA according to various demographic characteristics (Table). Women with SA were more likely to develop GDM (46.2% vs. 14.3% p=.003). After controlling for possible confounding factors including BMI, maternal age, and a history of chronic hypertension, SA remained independently and positively associated with the development of GDM (OR 3.7, 95% CI=1.1, 13.3).

CONCLUSION: Among high-risk women, SA during the first half of pregnancy is an independent risk factor for the development of GDM. Further research is needed to determine whether screening for and treatment of SA during pregnancy can lessen the frequency of GDM.

Demographic and clinical characteristics

	Women with SA N = 26	Women without SA N = 49	P value
Maternal age	35.8 ± 4.0	33.9 ± 6.8	0.2
White Black Hispanic Other	42% 35% 19% 4%	33% 37% 18% 12%	0.8
Pre-pregnancy BMI	39.3 ± 7.5	32.4 ± 9.6	0.002
Multiparous	73%	82%	0.4
Chronic hypertension	61%	24%	0.002
Prior preeclampsia	31%	27%	0.7
Twins	4%	10%	0.7

257 Comparison of insulin requirements in women with type 1 diabetes managed with continuous subcutaneous insulin infusion versus multiple daily insulin injections

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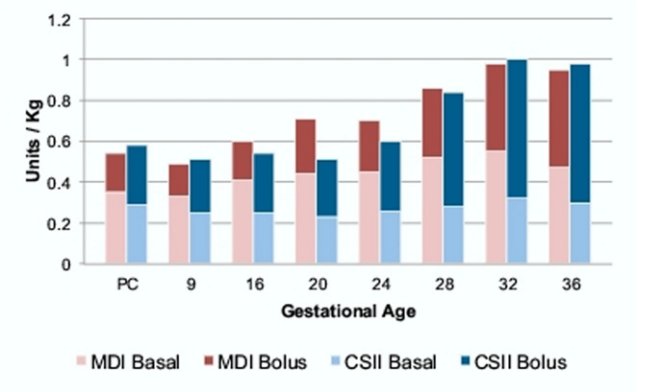
OBJECTIVE: Type 1 diabetes mellitus (T1DM) may be managed with continuous subcutaneous insulin infusion (CSII) or multiple daily injections (MDI), however comparisons of insulin profiles between these two modalities have not been well described. Our objective was to characterize and compare the changes in insulin basal and bolus dosing across gestation in patients managed with CSII and MDI.

STUDY DESIGN: This retrospective cohort examined women with T1DM with first trimester HbA1c < 7.4. The primary outcome was a comparison of changes in basal and bolus insulin between CSII and MDI from preconception (PC) to delivery.
RESULTS: Five patients managed with CSII and five patients with MDI were compared. There were no differences in maternal age (30±1.3 vs. 28±6.2 years, p=0.38), PC BMI (23.9±3.3 vs. 24.7±1.8 kg/m^2, p=0.67), PC hemoglobin A1C (6.2±0.40 vs. 6.7±0.7%, p=0.38) or third trimester A1C (5.7±3.6 vs. 6.1±0.6, p=0.25). Increases in basal and bolus insulin across gestation were noted for both CSII and MDI patients with a peak at 32 weeks (Figure). There were no statistical differences at any gestational age in total and bolus insulin doses among those managed with CSII versus MDI. A higher basal insulin rate was required across gestation in the MDI group when compared with the CSII group but this difference only reached statistical significance at 20 weeks (Figure). Among the CSII group, the percent change in basal insulin from PC to peak insulin requirement was 10%, while the percent change in bolus insulin was 134%. In the MDI cohort, the corresponding percent change in basal insulin was 57% and in bolus insulin was 152%.
CONCLUSION: In patients with well-controlled T1DM, there are differences in insulin dosing among those managed with CSII and MDI. There was a higher increase in basal insulin requirements in those managed by MDI when compared to those on CSII. These data may improve insulin management in T1DM pregnancies.

Comparison of basal and bolus insulin doses between MDI and CSII



258 Evaluation of the impact of an intensive follow-up program on postpartum glucose tolerance testing

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OBJECTIVE: Gestational diabetes mellitus (GDM) is a strong risk factor for developing overt diabetes later in life, and studies have demonstrated that identification of prediabetes can enable interventions preventing subsequent diabetes. Various professional societies have stressed the importance of postpartum glucose tolerance testing (GTT) for patients with GDM, although few strategies have been evaluated. We assessed the impact of a one-year program sponsored by the Rhode Island Department of Health aimed at increasing postpartum GTT using direct nurse and patient navigator supervision.
STUDY DESIGN: During the year of implementation, all GDMs were followed after their delivery. A nurse or bilingual patient navigator contacted patients as often as necessary to encourage attendance at their scheduled 2-hour 75-gram oral GTT and to overcome obstacles to testing including knowledge deficit, language barriers, directions and transportation. Patients with abnormal testing were referred to the appropriate provider. To assess the impact of this strategy, data from all patients with GDM seen in our specialty clinic the previous year served as a control for comparison with data from our intervention group.
RESULTS: One hundred seventy five patients treated during the year prior to implementation were compared to 193 in the program. Baseline characteristics were smiliar between in groups (Table). Postpartum GTT increased from 76 (43.4%) to 112 (58%), p=0.01. In the course of the project, compared to the previous year, 7 more cases of impaired fasting glucose were discovered (23 vs 16), along with 6 additional cases of impaired glucose tolerance (18 vs 12) and 4 more cases of overt diabetes (8 vs 4). $1670 dollars were spent per additional postpartum test and $3530 per abnormal test.
CONCLUSION: Given that the number needed to treat of prediabetic former GDMs is 5 to prevent or delay one case of diabetes, implementation of direct nurse and outreach worker supervision should be effective with significant long-term benefits.

Comparison between participants with prior to and during grant implementation

	Year prior to project (n=175)	Year of project (n=194)	p value
Maternal Age (years) - Mean (SD)	29.9 (6.38)	30.0 (6.0)	0.63
Maternal BMI at first visit - Mean (SD)	25.8 (5.1)	26.5 (6.5)	0.37
Patients with past h/o GDM	27 (15.4%)	21 (10.8%)	0.22
Patients with past h/o Macrosomia	22 (12.6%)	17 (8.7%)	0.26
Number of Smokers	28 (16%)	30 (15.4%)	0.91
Gravidity Primiparous Multiparous	36 (20.6%) 139 (79.4%)	38 (19.5%) 156 (80.5%)	0.67
50g Glucose challenge (mg/dl) - Mean (SD)	171.8 (44.6)	167.3 (33.5)	0.28
Patients on insulin treatment	76 (43.4%)	69 (35.6%)	0.12
Patients w/ family history of Diabetes	53 (30.3%)	59 (30.4%)	0.87
Pregnancy GTT Fasting (mg/dl) - Mean (SD)	95.3 (15.3)	94.7 (14.5)	0.74
Pregnancy GTT - 1-hr (mg/dl) - Mean (SD)	194.6 (25.3)	193.3 (34.9)	0.69
Pregnancy GTT - 2-hr (mg/dl) - Mean (SD)	168.5 (30.0)	175.5 (32.0)	0.06
Pregnancy GTT - 3-hr (mg/dl) - Mean (SD)	129.1 (31.2)	139.9 (32.7)	0.003
Hemoglobin A1c (%) - Mean (SD)	6.01 (0.88)	5.71 (0.63)	0.11
GA at delivery (weeks)- Mean (SD)	38.3 (1.8)	38.2 (1.7)	0.55
Birth-weight (grams) - Mean (SD)	3282.4 (532.8)	3281.6 (564.4)	0.98

A p value less than 0.05 is considered statistically significant.

BMI, body mass index; *GA*, gestational age; *hr*, hour; *OGTT*, oral glucose tolerance test; *SD*, standard deviation.

259 Outcomes after implementation of first trimester screening for gestational diabetes

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OBJECTIVE: Acknowledging recommendations from the IADPSG, our institution recently transitioned from traditional third-trimester (T3) to first-trimester (T1) screening for gestational diabetes (GDM). This new protocol has doubled the rate of diagnosis of GDM. Our objective was to describe and compare perinatal outcomes based on the mode and timing of diagnosis.
STUDY DESIGN: This retrospective cohort study evaluated patients from our institution diagnosed with GDM from July-December 2011. Beginning in July, new early screening guidelines were initiated which included a diagnosis of GDM if T1 HbA1c ≥ 5.7% or fasting plasma glucose (FPG) was ≥ 92 mg/dL. If both HbA1c and FPG were normal, an abnormal 2-hour glucose tolerance test (GTT) at 24-28 weeks was diagnostic of GDM. However, during this 6-month transition period, many providers continued traditional T3 two-step screening for GDM with a 1-hour glucose challenge test (GCT) followed by a 3-hour GTT. We compared differences in outcomes between T1 and T3 screening groups and within the 4 different subgroups of those diagnosed by T1 screening (HbA1c, FPG, both HbA1c and FPG, or