

MFM Division
ECU Brody School of Medicine
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Pregestational diabetes

Baseline evaluation:

HbA1c, ECG, 24 hr urine for total protein and CrCl, examination for retinopathy

Evaluation each trimester:

Urine culture, HbA1c

Pregnancy Guidelines

1. **Maintain euglycemia:** Fasting BS < 85mg/dl, one hour PP < 140mg/dl, 2 hour PP < 120mg/dl, mean BS < 105 mg/dl
 - a. Fingerstick glucose
 - i. NPH/Reg regimen:
 1. Fasting and 2 hours PP (4 X day)
 - ii. Lantus/rapid- acting insulin regimen
 1. Fasting and 1 hour PP
 - b. Use memory glucometer and logbook
 - c. Validate logbooks and glucometer: HbA1C q trimester
2. **Methods of maintaining euglycemia**
 - a. Nutrition guidelines: BMI determined Kcal/day, 1.5 g/kg ideal weight of protein, > 1800 mg Ca+/day, and < 20% of Kcal from saturated fats
 - i. BMI < 20: 35 Kcal per kg actual weight
 - ii. BMI 20-26: 30 Kcal per kg actual weight
 - iii. BMI >26: 25 Kcal per kg actual weight
 - iv. No less than 2000 Kcal per day or more than 3000 Kcal/day
 - v. Distribution:
 1. 1/9 of Kcal per snack x 3
 2. 2/9/Kcal per meal X3
 - vi. CHO =45-55% of calories from carbs
 - b. Limit CHO to 30 grams at breakfast meal, with other meals containing 30-60 grams of CHO and snacks containing 15-30 grams of CHO (depending on daily, overall carb intake recommendation). Avoid fruit intake at breakfast meal. Advise no juice intake, except for use in tx of hypoglycemia
 - c. Protein: 1.1 g/kg (pregravid weight or AIBW for obese), with minimum of 60 grams of protein
 - i. AIBW= [(pregravid weight-ideal body weight) X 0.25] + IBW
 - d. **Exercise:** 40 minutes per day for 4 days per week at a level that one can talk but not sing (70% VO₂)
 - e. **Medication:** Patients may be on oral agents, insulin or both
 - i. Oral agents:
 1. Glyburide
 2. Metformin

ii. **Insulin:**

1. Total dose:

a. Initial

i. First trimester 0.5 units per kg ideal weight

ii. Second trimester: 0.8 units per kg ideal weight

iii. Third trimester: 1.0 units per kg ideal weight

b. Changing to a shorter acting regimen from 70/30: calculate sensitivity based on current dosage, type of insulin being used and control.

2. **Insulin dosing regimen:**

a. **Lantus and rapid insulin regimen**

i. Lantus: 50% of total daily insulin dose given in the evening

ii. Rapid acting: split evenly at time of meals for a total of 50% of daily total insulin dose

a. Split evenly for meals of similar CHO counts

b. Adjusted dose based on number of CHO consumed (i.e. 1 units per 10 CHO)

b. **NPH/Regular insulin regimen**

i. Total Insulin Dose

1. 2/3 given in am

a. NPH 2/3 of am dose

b. Regular Human Insulin 1/3 am dose

2. 1/3 total dose given in pm

a. Regular human insulin 1/2 pm dose given with evening meal

b. NPH 1/2 pm dose given qhs

c. **Alternate regimens including insulin pumps as needed**

3. **Euglycemia**

a. **Baseline goals** is to maintain euglycemia defined as: Fasting < 80mg/dl, 1 hr PP< 140mg/dl, 2hr <120 mg/dl and median BS< 95mg/dl.

b. **Adjust insulin** to achieve euglycemia when

i. Fasting BS> 90 mg/dl on >50% of values

ii. 2hr PP>125mg/dl on >50% of values

c. **Insulin sensitivity used to calculate changes**

***Regular insulin regimen:** “1500 rule”: Divide 1500 by the total daily dose of daily insulin, in units. Ex: if total daily dose is 30 units of insulin, insulin sensitivity factor would be 50 (1500 ÷ 30).

So 1 unit of insulin would lower glucose by 50 mg/dl.

3. Follow fetal growth:

- a. Fundal height each visit
- b. Ultrasounds:

Dating US next available initial appt:

Fetal growth with detailed anatomic survey at 18-20 weeks

Fetal growth at 24-28 weeks and 36-37 weeks

4. Fetal testing:

a. Fetal kick counts starting at 26 weeks

b. NST / BPP (see document on fetal surveillance)

a. For class A2, B,C,D fetal testing is initiated at 32 weeks

b. Earlier exceptions

i. IUGR - time of diagnosis (defined as <5%)

ii. Start at 28 weeks:

Maternal end-organ involvement

Fetal hyperalimentation

EFW or AC > 95%

Polyhydramnios

Co-morbidity (ie. CHTN)

d. Testing Modalities: many tests of fetal well being are available and none is universally superior to the others.

i. Gestational age < 32.0 wks – Biophysical profile

ii. Gestational age > 32.0 wks – NST with weekly AFV

a. *Non-stress tests above or at 32w0d* - Two or more accelerations (15 bpm zenith above baseline FHR with a total acceleration duration of >15 seconds regardless of fetal movement)

b. *Non-stress tests below 32w0d* - Two or more accelerations (10 bpm zenith above baseline FHR with a total acceleration duration of >10 seconds regardless of fetal movement).

c. Modified BPP – reactive NST and at least 2 x 2 cm pocket of amniotic fluid

5. Timing of Delivery: Gestational age > 39 weeks should be avoided.

a. Amniocentesis at 36-38 weeks to evaluate fetal lung maturity:

- i. Non-compliance
- ii. Hyperglycemia: FBS consistently >95mg/dl or 2 hour PP consistently BS > 125 mg/dl
- iii. Fetal hyperalimentation
- iv. Presence of endorgan involvement or co-morbidity

b. Mature fetal lung studies: L:S ratio > 2.5 or PG present

c. Lamellar body counts may not be reliable in diabetic pregnancies

6. Intrapartum management

a. Cesarean section if EFW>4250gm in Class A2-H

- b. Intrapartum insulin drip for those on antenatal insulin
 - i. Use Endotool protocol
- c. Intrapartum sliding scale for those not requiring antenatal insulin.
 - i. Use FSBS q 2 hours and rapid acting insulin

7. Postpartum

- a. Postpartum day #1 begin insulin at $\frac{1}{2}$ predelivery dose or at dose prepregnancy dose
- b. Agents in those breastfeeding (in order of preference):
 - i. Insulin
 - ii. Metformin
 - iii. Glyburide
- c. Diet: 45 grams of carbohydrates at each meal with snacks limited to 15 grams of carbohydrates. Review hypoglycemic s/sx, especially if breastfeeding due to hypoglycemia potentially more prevalent when breastfeeding.