



# Gestational Diabetes

PUTTING GUIDELINES  
INTO PRACTICE

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## Presenters



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## Objectives

- ☆ Recognize risk factors for GDM and discuss methods for preventing the development of GDM
- ☆ Relate the Colorado Clinical Guidelines for GDM to practice
- ☆ Recognize client challenges and barriers to adequately care for GDM
- ☆ Identify educational tools and resources for available use with clients
- ☆ Discuss the long-term risk of GDM in the development of type 2 diabetes for both mother and child

## Definition of GDM

- ☆ Gestational Diabetes Mellitus (GDM) is glucose intolerance recognized for the first time during pregnancy.
- ☆ This does not currently recognize the difference between pre-existing diabetes identified for the first time during pregnancy and diabetes that develops due to the pregnancy



## Why Does It Develop?

- ☆ Insulin transports glucose from blood into cells
- ☆ Placental hormones and inflammatory cytokines (TNF-a) cause worsening insulin resistance in the late 2<sup>nd</sup> trimester – intended to shunt nutrients to the fetus
- ☆ Women are unable to produce enough insulin to overcome the overwhelming resistance and maintain euglycemia
- ☆ If body cannot keep up with ↑ demand → ↑ glucose in the blood → Gestational Diabetes

## Why Be Concerned?

- ☆ Maternal Concerns
  - ◆ Increased intensity of medical care
  - ◆ Higher risk of infections, C-section
  - ◆ **~50% Maternal risk of developing type 2 Diabetes in 5-10 years!!**
- ☆ Infant Concerns
  - ◆ Increased central obesity
  - ◆ Risk of stillbirth
  - ◆ Problems regulating glucose & may need NICU
  - ◆ Enlargement of pancreas, heart and liver
  - ◆ **↑ risk for developing childhood obesity and type 2 "adult onset" diabetes**



\* Slide adapted from Dr. Linda Barbour, 12.6.06

## Risk Factors



- ☆ High-Risk if any of the following:
  - ◆ Advanced maternal age ( $\geq 35$  y.o.)
  - ◆ Obese (BMI  $> 29$  kg/m<sup>2</sup> based on PPW)
  - ◆ High-risk ethnic population
    - Asian/Pacific Islander, American Indian, Hispanic, Black
  - ◆ Prior history of GDM
  - ◆ Previous macrosomic infant
    - Birth weight is  $> 4000$ g (8# 13oz.)
  - ◆ History of GDM related obstetric complications
  - ◆ First degree relative with diabetes
    - Parent, sibling, child
  - ◆ Polycystic Ovary Syndrome (PCOS)
  - ◆ Glycosuria

## GDM Prevention

- ☆ Client is "High-Risk", what can you do?
  - ◆ Early glucose screening
  - ◆ Educate on healthy eating & exercise
  - ◆ Track weight gain
  - ◆ Tell her about the risk of GDM



## Colorado Clinical Guidelines on Gestational Diabetes

Developed by the Colorado Clinical Guidelines Collaborative  
and the Diabetes Prevention and Control Program  
at the Colorado Department of Public Health and Environment  
November 2006

## Early Screening Protocol for High Risk Women

- ☆ 50-g, 1-hour Oral Glucose Challenge Test (OGCT) when risk factors are identified
- ☆ If OGCT  $\geq 135$  mg/dl, follow with 3-hour Oral Glucose Tolerance Test (OGTT)
- ☆ If positive OGTT, there is suspicion of pre-existing diabetes
- ☆ If 1-hour OGCT  $< 135$  mg/dl or values on 3-hour OGTT are normal, then re-screen between 24-28 weeks

## Universal Screening at 24-28 weeks

- ☆ Screen **all** women for GDM between 24-28 weeks with a 50-gram, 1-hour OGCT
- ☆ If OGCT is  $< 135$  mg/dl, no further testing required
- ☆ During the last trimester insulin needs are 2-3x higher
- ☆ Follow diagnostic criteria



## Diagnosis of GDM<sup>1</sup>

- ☆ 3-hour OGTT is the diagnostic test
- ☆ If 2 or more values meet or exceed these values, then diagnose GDM:
  - ◆ Fasting Blood Glucose  $\geq$  95 mg/dl
  - ◆ 1-hour  $\geq$  180 mg/dl
  - ◆ 2-hour  $\geq$  155 mg/dl
  - ◆ 3-hour  $\geq$  140 mg/dl

<sup>1</sup> American Diabetes Association, Carpenter and Coustan

## For OGCT $\geq$ 200 mg/dl

- ☆ You may test serum fasting blood glucose (FBG) prior to conducting the 3-hour test
  - ◆ If serum FBG is  $<$  95 mg/dl, continue with OGTT
  - ◆ If serum FBG is  $\geq$  95 mg/dl, woman has GDM and no OGTT is necessary.

## Only 1 Elevated Value?

- ☆ Recommend physical activity and provide nutrition counseling
- ☆ If OGTT was prior to 24 wks, wait to rescreen between 24-28 wks
- ☆ If OGTT was between 24-28 wks, repeat 3-hour OGTT in another 3-4 wks
  - ◆ Glucose intolerance increases as pregnancy progresses, 30% of women subsequently develop GDM

## Blood Glucose Management Tools

- ☆ Medical Nutrition Therapy
- ☆ Exercise
- ☆ Blood Glucose Monitoring
- ☆ Medication Management
- ☆ Prenatal Surveillance



## Medical Nutrition Therapy

- ☆ Assess
  - ◆ Individualize plan based on client's caloric needs and weight gain to date
- ☆ Instruct
  - ◆ Teach carbohydrate counting, healthy food choices, appropriate weight gain
- ☆ Evaluate
  - ◆ Review food and blood glucose records to assess compliance

## Exercise

- ☆ Recommend physical activity, if no contraindications
- ☆ Aim for 30 minutes/day, 5 days/week
- ☆ Benefits include  $\downarrow$  insulin resistance,  $\downarrow$  postprandial hyperglycemia and prevention of excessive weight gain



## Self-Monitoring of Blood Glucose (SMBG)

- ☆ 4x/day; fasting and 1 or 2-hours pp
- ☆ Collect reliable values for a minimum of 1-2 weeks before considering medication
- ☆ Rotate SMBG if frequency is decreased
- ☆ Never discontinue SMBG during pregnancy, glucose intolerance increases as pregnancy progresses

## SMBG Goals

- ☆ Fasting <95 mg/dl
- ☆ 1 hour postprandial <130-140 mg/dl
- ☆ 2 hour postprandial <120 mg/dl

## Medication Management with Insulin

- ☆ NPH plus the rapid-acting insulins Lispro (Humalog) OR Aspart (Novolog) have been shown to be most effective
- ☆ NPH plus Regular have been used safely in pregnancy as well
- ☆ Glargine (Lantus) is not yet recommended because further study is needed
- ☆ SMBG should guide dosage and timing

## Medication Management with Oral Agents

- ☆ Glyburide
  - ◆ Not FDA approved, but off label use has increased in last decade
  - ◆ Likely to fail in women diagnosed < 24 weeks, fasting BG > 110mg/dl, morbidly obese and advanced maternal age ( $\geq 35$  y.o.)
- ☆ Metformin
  - ◆ Inconclusive evidence to recommend use after 1<sup>st</sup> trimester
  - ◆ Contraindicated with IUGR, placental insufficiency and preeclampsia

## Prenatal Surveillance

- ☆ Daily "kick counts" at 28 weeks
- ☆ Prenatal testing (type of test left to discretion of practitioner)
  - ◆ Euglycemic: may delay until 40 weeks
  - ◆ Not euglycemic, no meds: initiate at 36 wks
  - ◆ Medication-controlled: initiate at 32-34 wks
  - ◆ Other complications: may initiate sooner



## Fetal-Based Strategy

- ☆  $\uparrow$  fetal abdominal circumference (AC) on an ultrasound conducted between 28-34 weeks
  - ◆ Correlates with  $\uparrow$  amniotic fluid insulin levels, a marker of poor maternal glycemic control
  - ◆ Indicates development of excess subcutaneous fat and visceral fat in the fetus
- ☆ Tighten glycemic control if the fetal AC is >75th percentile
- ☆ Relax slightly if the fetal AC is completely normal



# Client Challenges & Barriers



*Imagine...*



## Emotions

- ★ Afraid
- ★ Anxious
- ★ In denial
- ★ Concerned
- ★ Confused
- ★ Angry
- ★ Scared
- ★ Alone
- ★ Overwhelmed
- ★ Frustrated
- ★ Guilty
- ★ No Control
- ★ Intimidated
- ★ Helpless
- ★ Sad
- ★ Worried



## Barriers

- ★ Transportation
- ★ Health insurance
- ★ Financial concerns
- ★ Learning level
- ★ Physical discomforts
- ★ Food insecurity
- ★ Family support
- ★ Cultural differences
- ★ Medical jargon
- ★ Language
- ★ Ability to cook
- ★ Change is difficult
- ★ Other support systems
- ★ SMBG 4x/day
- ★ Depression
- ★ More appointments
- ★ Time off of work
- ★ Mixed messages



## Solutions

- ★ Be patient's advocate
- ★ Tell them it's not their fault
- ★ Take time to explain
- ★ Good listening skills
- ★ Engage family
- ★ Offer follow-up
- ★ Provide education appropriately
- ★ Acknowledge emotions
- ★ Be culturally aware
- ★ Provide referrals for support
- ★ Financial assistance



## Educational Tools & Resources



## GDM Toolkit



- ☆ Colorado Clinical Guidelines
- ☆ 1-hour and 3-hour Instruction Sheet
- ☆ My Diabetes Record
- ☆ GDM Flowsheet
- ☆ Weight Gain Grid
- ☆ Postpartum Flyer & Reminder Card
- ☆ Educational Materials
  - ◆ Diabetes Education Society – Making Everything Right™ patient booklet & curriculum
  - ◆ International Diabetes Center – Gestational Diabetes patient book & curriculum

## Web Resources

- ☆ American Diabetes Association
  - ◆ <http://diabetes.org/home.jsp>
- ☆ Calorie King
  - ◆ <http://www.calorieking.com/>
- ☆ Colorado Clinical Guidelines Collaborative – GDM Guidelines
  - ◆ <http://www.coloradoguidelines.org/guidelines/gestationaldiabetes.asp>
- ☆ Determining BMI and Appropriate Weight Gain
  - ◆ [www.healthy-baby.org](http://www.healthy-baby.org)
- ☆ Diabetes Education Society
  - ◆ [www.diabetesedu.org](http://www.diabetesedu.org)
- ☆ International Diabetes Center Materials
  - ◆ [www.parknicollet.com/healthinnovations/](http://www.parknicollet.com/healthinnovations/)
- ☆ Joslin Diabetes Center
  - ◆ <http://www.joslin.org/>
- ☆ National Diabetes Education Program
  - ◆ <http://ndep.nih.gov/index.htm>
- ☆ National Institute of Child Health & Development
  - ◆ [www.nichd.nih.gov/publications/pubs/gest\\_diabetes/](http://www.nichd.nih.gov/publications/pubs/gest_diabetes/)

## Long Term Risk



## Postpartum Risk

- ☆ **Crucial** that women return to their provider for follow-up
- ☆ All women following GDM pregnancies have **50% risk of developing type 2 diabetes** within 5-10 years
- ☆ Those with Impaired Glucose Tolerance or Impaired Fasting Glucose have an **80% risk of developing type 2 diabetes**

## Risk to Child



- ☆ Infants born to mothers with GDM, regardless of their actual weight, have increased body fat and decreased lean body mass<sup>1</sup>
- ☆ Siblings born to Pima Indian women prior to developing diabetes vs. siblings born to same women with GDM<sup>2</sup>
  - ◆ By age 25-29, 20% risk of developing type 2 diabetes for 1<sup>st</sup> child (no GDM in pregnancy)
  - ◆ By age 25-29, 70% risk of developing type 2 diabetes for 2<sup>nd</sup> child (GDM during pregnancy)

<sup>1</sup> Catalano, AJOG 2003

<sup>2</sup> Dabelea, Knowler, Pettitt J MFM 2000:9:93

## Steps to Take

- ☆ Inform client about risk of type 2 diabetes for self and child
- ☆ Encourage breastfeeding
- ☆ Encourage weight loss within 6 to 12 months
  - ◆ If overweight/obese, work to lose 5-7% of body weight slowly, over time
- ☆ Schedule a 75-g 2-hour OGTT 6-12 weeks postpartum
- ☆ Educate on effective contraception

## Postpartum Reclassification Criteria

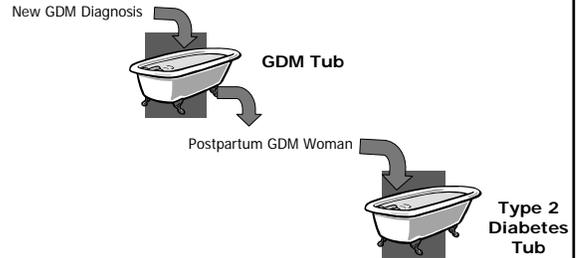
Time	Normoglycemia	Pre-diabetes	Type 2 Diabetes Mellitus
Fasting	< 100 mg/dl	≥ 100 mg/dl and < 126 mg/dl Impaired Fasting Glucose	≥ 126 mg/dl
2-hour	< 140 mg/dl	≥ 140 mg/dl and < 200 mg/dl Impaired Glucose Tolerance	≥ 200 mg/dl

\*American Diabetes Association criteria

**Diagnose Type 2 Diabetes Mellitus**  
with either a fasting  $\geq 126$  mg/dl  
**OR** a 2-hour  $\geq 200$  mg/dl

## Overflowing the System

☆ What can we do to change this?



## Thank You!

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