


# Hyperglycemia in Pregnancy




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Stay tuned for a Fun Food Fact at the end of this presentation!



# The Incidence of Diabetes is on the Rise!

- Type 1, Type 2, Gestational Diabetes (GDM)
- Women with GDM 7 x more likely to develop Type 2 Diabetes
- Children of pregnancies affected by GDM at greater risk for obesity and Type 2 Diabetes

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- 5-10% of women with GDM are found to actually have Type 2 DM
  - Women with hx of GDM have a 35-60% chance of developing DM in the next 10-20 years

# 2011 ADA Guidelines Diagnosing Hyperglycemia in Pregnancy

- Refer to algorithm
- Able to now diagnose type 2 diabetes in pregnancy; and GDM earlier
- 50 gm screen and 100 gm, 3 hr OGTT no longer standard protocol

# Diagnosing

- <13 weeks with 1 risk factor present – use 1 of 3 diagnostic tests
- 13-23 6/7 weeks and risk factors present – 75 gm, 2 hr OGTT
- 24-28 weeks – universal testing with 75 gm, 2 hr OGTT

# What Does This Mean?

- Will likely see **more** women being diagnosed with type 2 and GDM **earlier** in their pregnancies

# Medical Nutrition Therapy (MNT)

## Outcome Goals

- Adequate nutrient intake
  - Calories
  - Vitamins and minerals
- Appropriate weight gain
- Blood glucose in target range
- Limit episodes of hypoglycemia in women requiring medication



# Individualized Meal Plan

- Registered Dietitian (RD) should complete nutrition assessment and develop MNT plan for women with:
  - Pre-existing diabetes (type 1, type 2)
  - GDM, especially if on medication
  - Diabetes related complications (hypertension, nephropathy, retinopathy, gastroparesis)

# MNT Assessment

- Pre-pregnancy weight
- Food intolerances and cravings
- Appetite
- Intake of raw or undercooked meats, eggs, milk
- Prenatal supplementation
- Food program participation/assistance
- Substance/medication use
- Physical activity
- Labs and medical history
- Planned method of infant feeding

# MNT Intervention Steps

- 1st – Determine weight gain goals
- 2nd – Calculate energy/calorie needs
- 3rd – Develop meal plan

# Weight Gain Goals

- Determine pre-pregnancy weight category
  - Underweight
  - Normal Weight
  - Overweight
  - Obese

# Institute of Medicine

## Weight Gain During Pregnancy

### Recommendations

#### ■ Guidelines

- Based on the World Health Organization BMI categories rather than the categories from the Metropolitan Life Insurance tables
- Include a specific and relatively narrow range of recommended gain for obese women

# Weight Gain Recommendations

<b>Prepregnancy BMI</b>	<b>BMI (kg/m<sup>2</sup>) (WHO)</b>	<b>Total Weight Gain Range (lbs)</b>	<b>Rates of Weight Gain 2<sup>nd</sup> and 3<sup>rd</sup> Trimesters</b> (Mean range in lbs/wk)
Underweight	<18.5	28-40	1 (1-1.3)
Normal Weight	18.5-24.9	25-35	1 (0.8-1)
Overweight	25.0-29.9	15-25	0.6 (0.5-0.7)
Obese	≥30.0	11-20	0.5 (0.4-0.6)

# Calculate Calorie Needs

## ■ Estimated Energy Requirement (EER)

$$\text{EER} = 354 - (6.91) \times A = \text{PA} \times (9.36 \times \text{Wt} + 726 \times \text{Ht})$$

A = age (years)

PA = physical activity coefficient

(sedentary 1.0; moderately sedentary 1.12, active 1.27)

Wt = weight (kg)

Ht = height (meters)

\*Note – all multiplication steps are completed before addition and subtraction, regardless if outside or within parenthesis

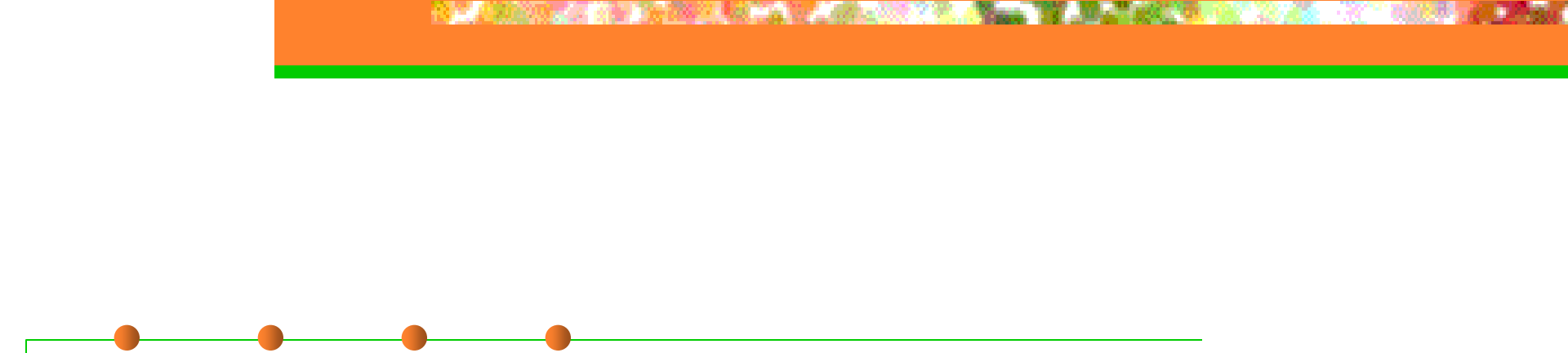
# EER

- Can be used to calculate preconception calorie needs or initial pregnancy calorie needs
- For pregnancy, add 300 calories per day for the 2<sup>nd</sup> and 3<sup>rd</sup> trimesters



# Calculate Calorie Needs

- Based on gestational age (for normal weight women)
  - **1<sup>st</sup> trimester:** Adult EER + 0
  - **2<sup>nd</sup> trimester:** Adult EER + 160 kcal (8 kcal/wk x 20 wk) + 180 kcal
  - **3<sup>rd</sup> trimester:** Adult EER + 272 kcal (8 kcal/wk x 34 wk) + 180 kcal

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- No consensus on determining calorie needs for overweight and obese pregnant women – a dietetics professional should evaluate
  - Some women, especially those who are sedentary and/or live in developing countries, may not need the additional calories (*ADA Position Statement 2002*)

# Develop Meal Plan

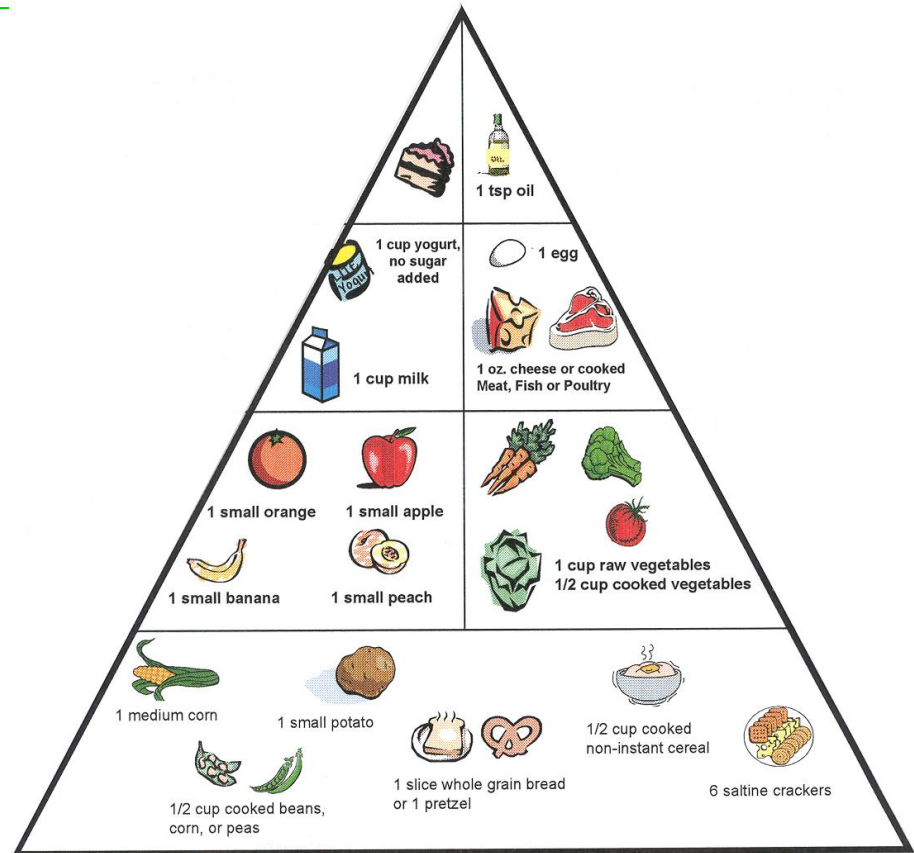
- Individualized and culturally sensitive
- Meal and snack timing/schedule
- Easy to use and follow

# Meal Plan Basics

- Three small meals and 3-4 snacks, evenly spaced (help prevent hypoglycemia and control post prandial glucose)
- CHOs (especially simple) at first meal limited (greatest insulin resistance at this time)
- Evening snack (to prevent starvation ketosis overnight)
- Minimum 1800 calories

# Recommended Intake From Food Groups

- Starch -  $\geq 7$
- Fruit -  $\geq 2$
- Milk -  $\geq 3$
- Vegetables -  $\geq 4$
- Protein -  $\geq 7$
- Fat -  $\geq 3$



# Meal Plan Macronutrients

- Carbohydrates (CHO)
  - 40-45% of calories (about 200-250 grams/day)
  - Minimum 175 g/day (provision of glucose for fetal brain and prevention of ketones)
  - Individualized for obese women, restriction of 35-40% of calories from CHO recommended

# CHO Sources and Tips

- CHO food groups
  - Starches
  - Fruits
  - Milk and Yogurt
- Encourage whole food intake – avoid highly processed, refined, fruit juice
- Hidden sources of sugar
- Recommend skim or 1% milk, 4-8 ounces/meal or snack – may need to avoid at first meal

# Possible Meal Plan CHO Distributions

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- 210 g CHO

- 30 – 30 – 45 – 30 – 45 – 30

- 195 g CHO

- 15 – 30 – 45 – 30 – 45 – 30

- 180 g CHO

- 15 – 30 – 45 – 15 – 45 – 30



# Meal Plan Macronutrients

## ■ Protein

- 0.8 g/kg/day preconception and 1<sup>st</sup> half of pregnancy
- 1.1 g/kg/day 2<sup>nd</sup> half of pregnancy (+ 25 g/day)
- RDA is 71 g/day

# Protein Sources and Tips

- Protein food group
  - Meats, eggs, cheese, peanut butter
- Recommend protein at first meal of day
- Meat analogs usually contain some CHO
- Encourage low fat choices, natural peanut butter

# Meal Plan Macronutrients


- ● ● ●
- Fat

- Encourage monounsaturated fats
- Less than 7% total calories from saturated fats
- Less than 1% total calories from trans fats

# Fat Sources and Tips

- Fat food group
  - Unsaturated
  - Saturated
- Encourage monounsaturated fats- canola oil, olive oil, olives, avocados
- Limit saturated fats – animal fat, palm and coconut oil
- Limit trans fats – baked products, cookies, chips

# MNT Evaluation

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- Problem solving
  - Follow up

# RD Should Evaluate:

- Inadequate weight gain or dietary intake
- Continuous weight loss
- Excessive weight gain
- Elevated fast or postprandial glucose values
- Other conditions
  - Type 1 or type 2
  - Eating disorder
  - Vegetarian
  - Obese or underweight

# Follow Up

- Review food records and blood glucose values
- Weight
- Adjust meal plan as needed
- Review prevention and treatment of hypoglycemia

# WIC-Approved Foods to Emphasize

- Frozen vegetables
- Brown basmati rice
- Original or plain soy milk
- Mozzarella cheese
- Grind your own peanut butter
- Plain oatmeal, Cheerios, All-Bran
- Tomato, other vegetable juice



# Self Monitoring of Blood Glucose (SMBG)

- GDM, Type 1, Type 2 DM – recommend test blood glucose fasting, and 1 or 2 hours after meals
- 1 hour post prandial values most closely correlated with birth outcomes
- 1 hour often easier to remember and does not interfere with impact of snacks on blood glucose

# Blood Glucose Goals

- Fasting and Pre-Meal: 60 – 110 mg/dl
  - 60 – 89 mg/dl
- 1 hour PP: 110 to < 155 mg/dl
  - 100 – 129 mg/dl
- 2 hour PP: <120 to <130 mg/dl
  - < 120 mg/dl

# Medications Used



- Insulin – Regular, NPH most common; basal insulin (i.e. Lantus) and insulin analogs ( i.e. Humalog) sometimes used
- Glyburide – Sulfonylurea that helps the pancreas release more insulin
- Glucophage/Metformin – helps liver make correct amount of glucose and cells use insulin more efficiently

# Medication Precautions

- Insulin and Glyburide can cause hypoglycemia – instruct on s/s and treatment
  - Rule of 15
- Glucophage's main side effect is GI disturbance; usually taken with meal(s) to reduced side effects

# Post Partum Topics

- Insulin/Medication Needs
- Meal Plan for Breastfeeding, Weight Loss, etc.
- Contraception
- Testing for Type 2 DM
- Post Partum Depression Screen
- Pre Conception Counseling/Blood Glucose Control

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- Let's continue to work collaboratively in making healthy moms and healthy babies our business!

# Fun Food Fact

Americans eat enough peanut butter each year to cover the floor of the Grand Canyon!





# Questions?

