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Diabetes and Pregnancy Promoting a Health Legacy 2022

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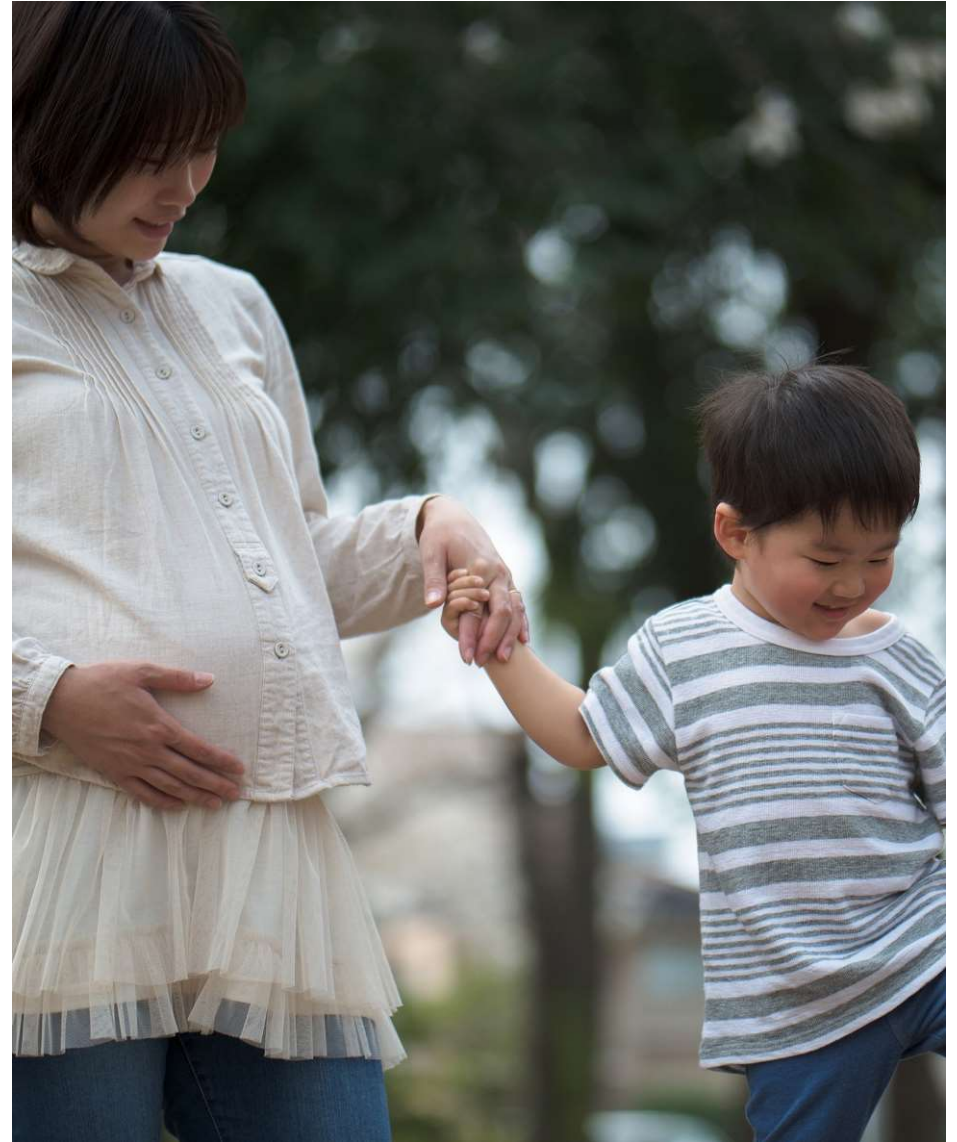
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Coach Bev has no conflict of interest

- ▶ Not on any speaker's bureau
- ▶ Does not invest in pharmaceutical or device companies
- ▶ Gathers information from reading package inserts, research and standards

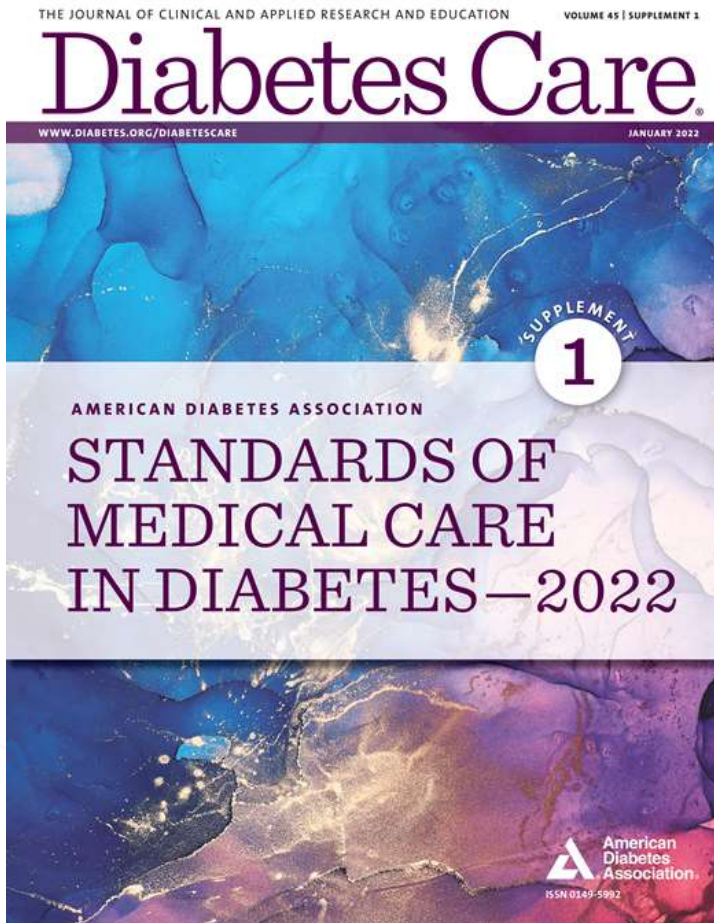


Objectives – Diabetes & Pregnancy

- ▶ 1. Describe 5 issues that affect women with diabetes.
- ▶ 2. Discuss the unique attributes of pre-existing diabetes in pregnancy and gestational diabetes.
- ▶ 3. State the diagnostic criteria and management goals for gestational diabetes.
- ▶ 4. List potential short term and long term complications of fetal exposure to hyperglycemia.



References



STANDARDS OF CARE | DECEMBER 16 2021

15. Management of Diabetes in Pregnancy: *Standards of Medical Care in Diabetes—2022* **FREE**

American Diabetes Association Professional Practice Committee

For more detailed management information, please check out to Sweet Success Program

Plus other articles as sited on slides

Perinatal care makes a difference

- ▶ Reaching out before pregnancy has the potential for slowing the diabetes epidemic
- ▶ Focus:
 - ▶ prenatal,
 - ▶ perinatal and
 - ▶ postnatal health



Engaging and supporting Kids to Adults



**Environment
LifeStyle
Access**



Engaging and supporting during pregnancy to help slow the epidemic

▶ Phases of Life

▶ Before, during and after Pregnancy



▶ LifeStyle

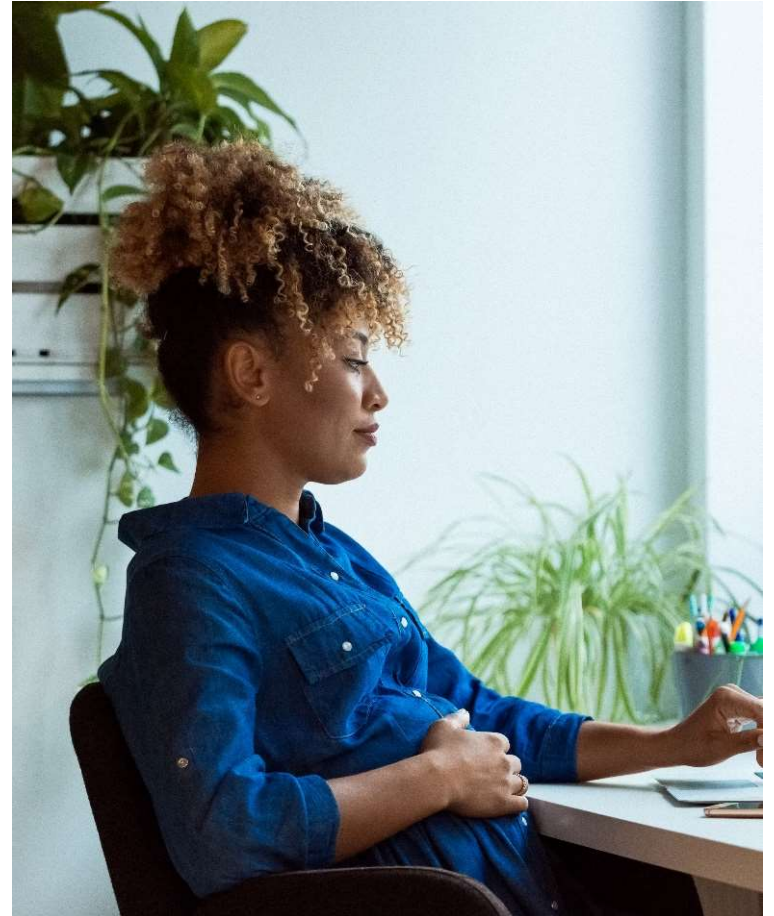
- ▶ Healthy Weight
- ▶ Keeping Active
- ▶ Eating healthy

▶ Social determinants of health

- ▶ Access to safe places to exercise
- ▶ Access to healthy foods
- ▶ Adequate paying job/finances
- ▶ Access to health care resources
- ▶ Finances
- ▶ Feel safe at home
- ▶ History of trauma

Screening in early Pregnancy

- ▶ Checking glucose levels before 15 weeks of gestation:
 - ▶ Can find undetected diabetes or hyperglycemia
 - ▶ Prevent fetal exposure to hyperglycemia
 - ▶ Allows providers and pregnant people to take action to prevent complications
- ▶ Use standard diabetes diagnostic criteria.
 - ▶ If positive, diagnosis “Diabetes complicating pregnancy”
- ▶ If fasting BG 110+ or A1C 5.9%+
 - ▶ At higher risk of adverse outcomes and more likely to experience GDM and need insulin.



2. Pre Diabetes & Type 2- Screening Guidelines (ADA 2022 Clinical Practice Guidelines)

1. Start screening at age **35** for ALL
2. Screen adults if BMI ≥ 25 (Asians BMI ≥ 23) plus one or > additional **risk factor**:

- ▶ First-degree relative w/ diabetes
- ▶ Member of a high-risk ethnic population
- ▶ Habitual physical inactivity
- ▶ PreDiabetes*
- ▶ HIV on antiretroviral meds
- ▶ History of heart disease

Screen using A1c, Fasting Blood Glucose or OGTT.

Repeat screening at least every 3 years if negative.

If prediabetes or high risk, recheck yearly

STANDARDS OF CARE | DECEMBER 16 2021

2. Classification and Diagnosis of Diabetes: *Standards of Medical Care in Diabetes—2022* **FREE**

American Diabetes Association Professional Practice Committee



Diabetes Care 2022;45(Supplement_1):S17–S38

<https://doi.org/10.2337/dc22-S002>

Diabetes 2 - Who is at Risk?

(ADA Clinical Practice Guidelines)



Screening in dental practices can help detect diabetes. ~30% of dental patients over age of 30, have some degree of dysglycemia.

Risk factors cont'd

- ▶ HTN - BP > 140/90
- ▶ HDL < 35 or triglycerides > 250
- ▶ History of Gestational Diabetes Mellitus
- ▶ Polycystic ovary syndrome (PCOS)
- ▶ Other conditions assoc w/ insulin resistance:
 - ▶ Elevated BMI, acanthosis nigricans (AN)

Screen Pregnant Women for Diabetes Before 13 weeks

- ▶ Screen for undiagnosed Type 2 at the first prenatal visit using *standard* risk factors.
- ▶ Women found to have diabetes at their initial prenatal visit treated as “Diabetes in Pregnancy”
- ▶ If BG below target, recheck at 24-28 weeks for Gestational Diabetes



PrePregnancy BMI and risk of GDM

BMI Odds Ratio of GDM

▶ <20	0.75
▶ 25-29	1.97
▶ 30-35	3.01
▶ >35	5.55

▶ The risk of GDM is positively associated with prepregnancy BMI.

▶ Obesity Review, 2009, March 10(2)- A systematic review of the literature with meta analysis

Preconception weight continues to increase



- ▶ 55% enter pregnancy at BMI >25 (CDC)
- ▶ < 30% of gain recommended gestational weight
- ▶ Excess weight increases risk for GDM
- ▶ Take home message – Assess BMI, assist with resources to healthy eating, appt w/ Registered Dietitian

CDC Report 2011-2015, published Jan 2018
https://www.cdc.gov/mmwr/volumes/66/wr/mm665152a3.htm?s_cid=mm665152a3_w

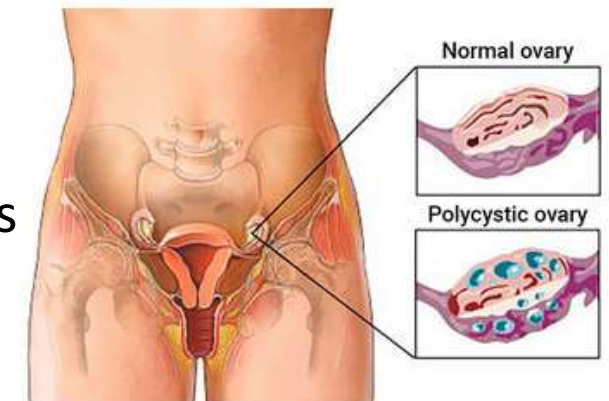
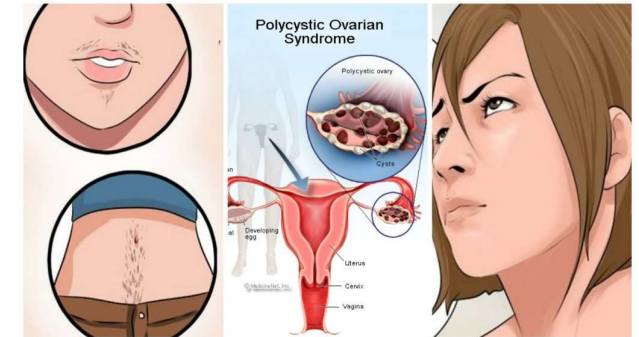
Life Study

- ▶ KR has a history of polycystic ovary syndrome (PCOS) treated with metformin 850mg BID.
- ▶ Monthly bleeding is two weeks late.
- ▶ At provider visit, discovers that 4 wks pregnant
- ▶ Fasting glucose is 103 mg/dl
- ▶ What is PCOS?



Polycystic Ovarian Syndrome

- ▶ Reproductive disorder of hyperandrogenism, ovulatory dysfunction, polycystic ovaries
- ▶ About 40% have prediabetes (10% DM)
- ▶ Clinical findings
 - ▶ Infertility, amenorrhea, irregular menses, hirsutism, acne, obesity, dyslipidemia, acanthosis nigricans.
 - ▶ “PCOS is the 5 o’clock shadow of Metabolic Syndrome”
- ▶ Treatment
 - ▶ Lifestyle changes (lose wt, exercise, healthy eating)
 - ▶ Meds (Metformin and others)
 - ▶ Monitor BG for prediabetes/ diabetes



Polycystic Ovarian Syndrome and Related Issues

- ▶ **Diabetes** 50% with PCOS will have diabetes or pre-diabetes by age 40.
- ▶ **High blood pressure** Greater risk of HTN
- ▶ **Cholesterol.** Elevated LDL cholesterol and low HDL cholesterol.
- ▶ **Sleep apnea.** If BMI 25+, increased sleep apnea risk.
- ▶ **Depression and anxiety** more common
- ▶ **Endometrial cancer.** PCOS, excess wt, insulin resistance, diabetes, increase risk of developing endometrium cancer



Life Study

- ▶ KR has a history of polycystic ovary disease treated with metformin 850mg BID.
- ▶ Monthly bleeding is 2 weeks late.
- ▶ At provider visit, discovers 4 wks pregnant
- ▶ Fasting glucose is 103 mg/dl
- ▶ What are next actions?



Quick Question 1

► KR is 4 weeks pregnant. Fasting glucose is 103 mg/dl. What best describes KR's current situation?

- A. KR has gestational diabetes
- B. KR needs a 75 gm OGTT
- C. KR has type 1 diabetes
- D. KR might have prediabetes



Quick Question 2

▶ If prediabetes diagnosis is confirmed, what is the next step?

- A. Continue metformin
- B. Start basal insulin
- C. Add human basal bolus insulin
- D. Stop metformin, start sulfonylurea



Metformin for Polycystic Ovary Syndrome

- ▶ If metformin used to treat polycystic ovary syndrome and induce ovulation
- ▶ Stop at end of first trimester.



How does Pregnancy Affect BG?



BG levels during pregnancy



Pregnancy normally associated with lower fasting glucose and higher post meal glucose



Early pregnancy, more insulin sensitive

Insulin needs may drop



2nd, 3rd trimester increased insulin resistance

Insulin needs may increase by 2-3x's pre-pregnancy needs



After delivery – insulin needs drop dramatically

Blood Glucose and Pregnancy

- ▶ Non-diabetes usual glucose ranges
 - ▶ Mean fasting BG
 - ▶ 61-75 mg/dl
 - ▶ Peak post prandial
 - ▶ Rarely exceeds 126 mg/dl
 - ▶ Maximal post prandial excursions 60 – 90 mins after start of meal.



Inturrisi, Lintner – Diagnosis and Treatment of Hyperglycemia in Pregnancy - 2011

Hyperglycemia and Fetal Risk

During 2-3rd trimester insulin resistance increases =hyperglycemia

Maternal glucose can cross the placenta

Maternal insulin can NOT cross placenta

Fetus exposed to maternal glucose, but not maternal insulin. Fetus makes insulin.

Insulin stimulates fetal growth, increase in adipose tissue

Poll question 3

- ▶ What best describes gestational diabetes?
 - a. Diabetes discovered within the first 12 weeks of pregnancy.
 - b. Diabetes discovered in the 24-28 week of pregnancy.
 - c. Risk of getting diabetes before pregnancy.
 - d. Diabetes discovered at any point during pregnancy.



Gestational DM ~ 9% of all Pregnancies

- ▶ Detected at 24-28 weeks of pregnancy (most insulin resistant phase)
- ▶ GDM prevalence increased by
 - ▶ ~10–100% during the past 20 yrs
- ▶ Women getting pregnant later



Rates of Gestational Diabetes (GDM) and Diabetes in Pregnancy increasing

- ▶ 1% to 2% have type 1 or type 2 during pregnancy
- ▶ 6% to 9% develop GDM.
- ▶ From 2000 to 2010
 - ▶ GDM rates increased 56%
 - ▶ Type 1 or type 2 before pregnancy increased 37%.
- ▶ Asian and Hispanic women have higher rates of GDM
- ▶ Black and Hispanic women have higher rates of type 1 or type 2 diabetes during pregnancy.

CDC

<https://www.cdc.gov/reproductivehealth/maternalinfanthealth/diabetes-during-pregnancy.htm>



KR Life Study – Question 4

- ▶ KR meets with a dietitian and is able to adjust their meal plan and activity and lowers BG to non-diabetes range. At 25 weeks KR goes to the lab for one step 75gm OGTT.
 - ▶ Blood glucose results
 - ▶ FBG 91
 - ▶ 1 hour 183
 - ▶ 2 hr 156
- ▶ What best describes KR's status?
 - A. Normal blood glucose with pregnancy
 - B. Pre diabetes associated pregnancy
 - C. Gestational diabetes
 - D. Diabetes in pregnancy



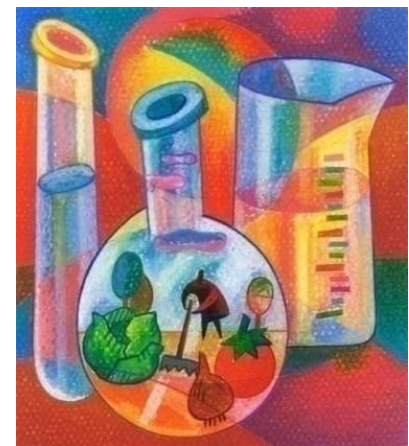
GDM Criteria - 2 Options

“1 Step” – 75 gm OGTT

- ▶ 24-28 weeks
- ▶ OGTT in am after overnight fast of 8 or > hrs
- ▶ **GDM Diagnosis if ANY** of the following values met or exceeded:

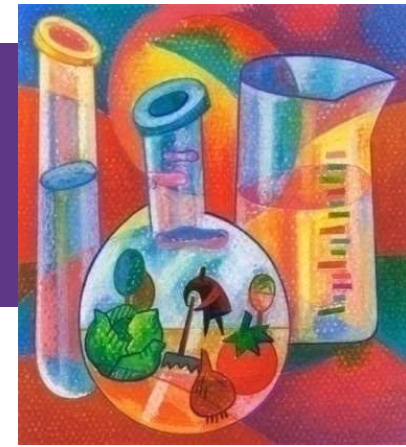
▶ FBG	1 HR	2HR
▶ ≥ 92	or ≥ 180	or ≥ 153

Based on Hyperglycemia and Adverse Pregnancy Outcomes Study - IADPSG



GDM Criteria – Option 2

“NIH 2 step”



▶ Step 1

- ▶ 50 gm Oral Glucose Tolerance Test (non-fasting)
- ▶ If BG 140* at 1 hour proceed to Step 2

▶ Step 2 – 100 gm Oral Glucose Tolerance (fasting)

GDM - If at least two of the following four plasma glucose levels (measured fasting and at 1, 2, and 3 h during OGTT) are met or exceeded (Carpenter-Coustan criteria)

Fasting: 95 mg/dL (5.3 mmol/L)

1 h: 180 mg/dL (10.0 mmol/L)

2 h: 155 mg/dL (8.6 mmol/L)

3 h: 140 mg/dL (7.8 mmol/L)

Risks associated w/ elevated BG -GDM Second and Third Trimester

- ▶ **Macrosomia: fetal wt > 4000g (~ 9lbs)**
 - ▶ Birth trauma, shoulder dystocia, clavicular fracture
 - ▶ Increased risk of C-section
 - ▶ Still birth
 - ▶ Polyhydramnios (excess amniotic fluid)
 - ▶ Pre-eclampsia: edema, HTN, proteinuria
 - ▶ Neonatal hypoglycemia (should be >40)



A1C in Gestational Diabetes

- ▶ Due to physiological increases in red blood cell turnover, A1C levels fall during normal pregnancy
- ▶ A1C represents an integrated measure of glucose
- ▶ May not fully capture postprandial hyperglycemia, which drives macrosomia.
- ▶ A1C may be used as a secondary measure of glycemic control in pregnancy, after blood glucose monitoring.



A1c Target in Pregnancy

- ▶ In early gestation, lowest rates of adverse fetal outcomes with A1C <6–6.5%
- ▶ In 2-3rd trimester, A1c <6%, has lowest rates of macrosomia, preterm deliver and preeclampsia.
- ▶ An A1c < 6% is optimal during pregnancy, if it can be achieved with out significant hypo.
- ▶ Evaluate for and avoid hypoglycemia
 - ▶ increases risk of low birth wt



Glycemic Targets in Pregnancy

- ▶ A1c < 6-6.5%
 - ▶ (closer to 6 in 2nd/3rd tri)
- Fasting glucose 70–95 mg/dL and either
- One-hour postprandial glucose 110–140 mg/dL or
- Two-hour postprandial glucose 100–120 mg/dL



Lower limits do not apply if managed with diet only

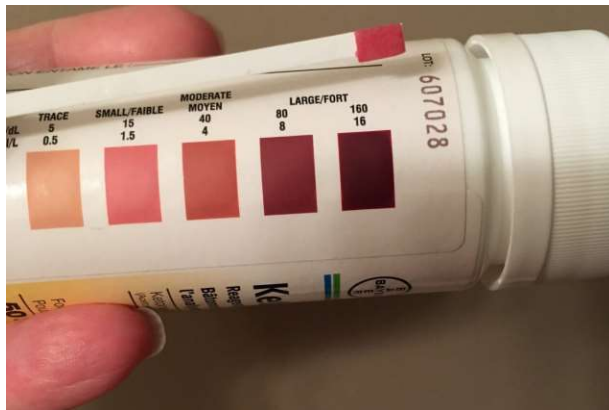
Nutrition Intervention: Pregnancy and Diabetes

▶ Dietitian

- ▶ Referral within 48 hours of diagnosis
- ▶ MNT initiated within 1 week of diagnosis

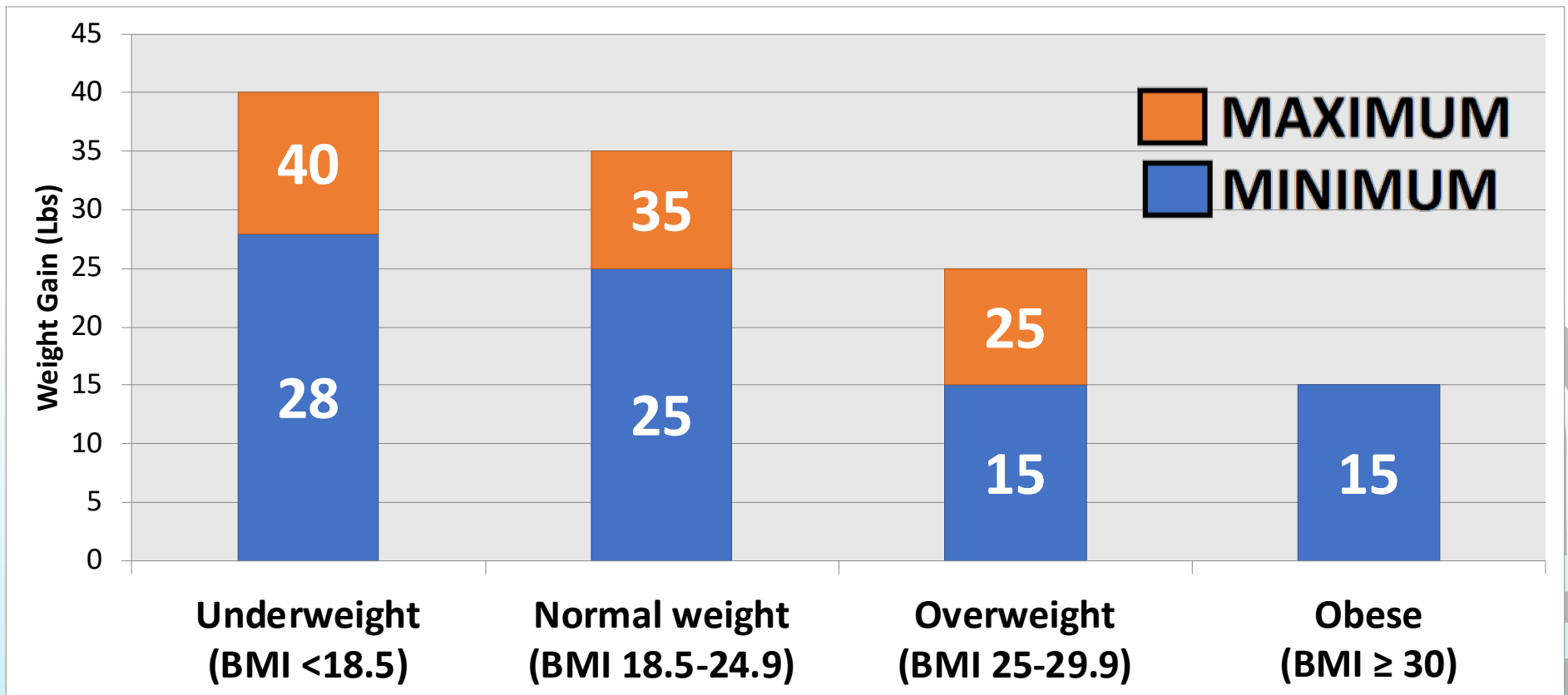
▶ Avoid ketonemia from ketoacidosis or starvation ketosis

- ▶ Make sure consuming sufficient carbs
- ▶ Monitor urine ketones
- ▶ DKA associated with risk of stillbirth



Pre-pregnancy BMI and Weight Gain

Pre-pregnancy BMI and Weight Gain



70-85% of GDM Manage with Lifestyle

- ▶ Food plan based on Dietary Reference Intakes (DRI).
- ▶ DRI during pregnancy recommends a minimum of
 - ▶ 175 g of carbohydrate (individualize)
 - ▶ a minimum of 71 g of protein
 - ▶ and 28 g of fiber.
- ▶ Emphasis on monounsaturated and polyunsaturated fats while limiting saturated fats and avoiding *trans* fats.
- ▶ Coaching on amount, type of carbohydrate and impact on BG



Sample Meal Plan for Women with Gestational Diabetes

This sample meal plan will guide you until you meet with a registered dietitian to create an individualized plan.

Breakfast (2 carbs=30g)	1 slice whole wheat toast (1 carb) 1 egg 1 cup fat-free milk (1 carb)
Snack (1 carb=15g)	4-6 whole wheat crackers (1 carb) 1 ounce cheddar cheese
Lunch (3 carbs=45g)	2 slices whole wheat bread (2 carbs) 3 ounces turkey Lettuce and tomato 1 cup raw veggies 1 cup berries (1 carb) 1 cup fat-free milk (1 carb)
Snack (2 carbs=15-30g)	2 tablespoons peanut butter 1 small apple (1 carb) 3 cups popcorn (1 carb)
Dinner (3 carbs=45g)	4 ounces skinless chicken breast 1 medium baked potato (2 carbs) 2 tablespoons reduced-fat sour cream 1 cup broccoli salad 1-2 tablespoons salad dressing 1 cup fat-free milk (1 carb)
Snack (1-2 carbs=15-30g)	1/2 banana (1 carb) 2 tablespoons nuts 1/2 cup plain nonfat Greek yogurt (1/2 carb)

<https://yalehealth.yale.edu/sample-meal-plan-women-gestational-diabetes>

Eat a healthy diet or follow a meal plan for your entire pregnancy to improve your health and to help ensure a healthy pregnancy. If you need to make changes to your diet or meal plan to keep your glucose level in the healthy range, your health care provider will help.

Management of Hyperglycemia in Type 2 or GDM

- ▶ For type 2s or GDM, oral meds may not be sufficient to get BG to target.
- ▶ Glyburide, Metformin not recommended.
- ▶ Both cross the placenta to the fetus
- ▶ If lifestyle alone doesn't help achieve glucose goals, insulin is recommended.



Management of Pregnancy and Diabetes

- ▶ Insulin is preferred for GDM, type 1 and 2
 - ▶ Does not cross placenta
 - ▶ Can overcome insulin resistance associated w/ type 2
- ▶ Either multiple daily injections or insulin pump technology
- ▶ Refer to specialized center
- ▶ Get eye exam before pregnancy and every 3 months



Sample Insulin Management Plan

PMC full text:

[Saudi Med J. 2015; 36\(4\): 399–406.](#)

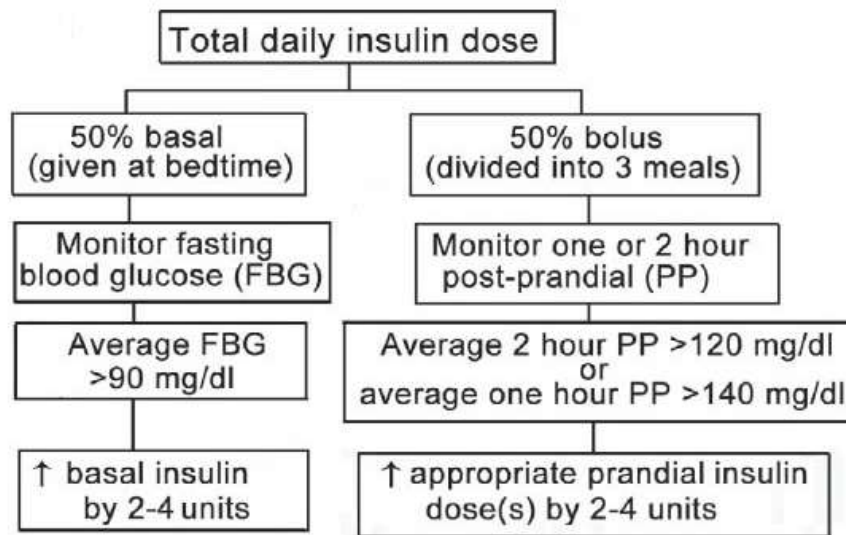
doi: [10.15537/smj.2015.4.10307](#)

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Not on Exam

Figure 1



Initiation and optimization of insulin therapy in hyperglycemia during pregnancy.

TABLE 2.

Insulin Regimens for GDM and Pregnancy in Patients With Type 2 Diabetes

Regimen	Dose
Weight-based dosing (10)	0.7–1 units/kg daily in divided doses (no additional recommendations are provided)
Trimester + weight-based dosing	1st trimester TDD: 0.7 units/kg 2nd trimester TDD: 0.8 units/kg 3rd trimester TDD: 0.9–1 units/kg

<https://spectrum.diabetesjournals.org/content/29/2/92.figures-only>

How to Deliver Insulin During Preg

- ▶ Human insulin preparations don't cross the placenta
- ▶ Insulins studied in RCTs are preferred
 - ▶ Regular insulin (U-100 and U-500), insulin aspart, insulin lispro (U-100 and U-200), NPH, and insulin detemir all carry a pregnancy category (2017)
- ▶ Many prefer insulin pumps in pregnancy
 - ▶ not clear that they are superior to multiple daily injections.
 - ▶ Insulin pumps can contribute to:
 - ▶ fasting and postprandial glycemic targets
 - ▶ reduced hypoglycemia and
 - ▶ more aggressive prandial dosing to achieve targets.



 American Diabetes Association. **DiabetesSpectrum.**

[Diabetes Spectr.](#) 2016 May; 29(2): 92–97.
doi: [10.2337/diaspect.29.2.92](#)

Insulin Use in Pregnancy: An Update

[Alyson K. Blum](#)^{MD}

After delivery - Gestational Diabetes

- ▶ Test for undiagnosed diabetes at first prenatal visit in those with risk factors
- ▶ Test for GDM at 24-28 weeks
- ▶ Test GDM women for post partum diabetes at 4-12 weeks, using OGTT
- ▶ Women with GDM need lifelong screening for prediabetes/diabetes at least every 3 yrs
- ▶ Women with hx of GDM, found to have prediabetes need intensive lifestyle interventions or metformin to prevent diabetes.



Postpartum after GDM

- ▶ History of GDM equals a 10-fold increased risk of developing type 2 diabetes
- ▶ 60% risk of getting diabetes in 5 years
 - ▶ Encourage Breast Feeding (reduces future type 2 risk by 50%)
 - ▶ Encourage weight control
 - ▶ Encourage exercise
 - ▶ Make sure connected with health care
 - ▶ Lipid profile/ follow BP
 - ▶ Preconception counseling



Risk of Future Diabetes after Gestational Diabetes

Immediately after birth

- 5 – 10% have diabetes

6 – 12 weeks later

- 10% diagnosed w/ DM
- 20% have pre diabetes

36 months later

- 30% have metabolic syndrome

5 years later

- 50% have Type 2

Improving Health / Preventing GDM



- ▶ Reaching out to women and providing them with the necessary tools and resources is critical
- ▶ Improve screening and health equity
- ▶ Promote prevention of GDM
- ▶ Provide the woman and family with ongoing education, screening and resources
- ▶ Consider social determinants of health from youth through adulthood
- ▶ Increase access to healthy foods, health care and provide opportunities
- ▶ Discuss family planning



Poll Question #5

- ▶ ML is 7 weeks pregnant. The midwife checks fasting BG and it is 134. What does ML have?
 - A. Gestational diabetes
 - B. Latent Autoimmune Diabetes
 - C. Pregnancy induced hyperglycemia
 - D. Diabetes in pregnancy



Diabetes in Pregnancy



31 year old with Type 1 Diabetes

- ▶ Tells you I am ready to get pregnant.
- ▶ Uses an insulin pump and CGM.



Diabetes in Pregnancy or (Pre-existing DM)

- ▶ Someone with pre-existing type 1 or 2 becomes pregnant
- ▶ Elevated BG discovered in first 13 weeks of pregnancy
- ▶ **Preconception A1c goal < 6.5%.**
 - ▶ 2/3 of all pregnancies w/ diabetes not planned
- ▶ Involve and empower to help prevent complications



Diabetes in Pregnancy – Why do glucose levels matter so much?

- ▶ Risk of malformation associated w/ degree of hyperglycemia during first trimester
 - ▶ 1st Trimester potential complications directly proportional to A1c levels
- ▶ 5-8 weeks is organogenesis.
- ▶ Diabetes in pregnancy may increase risk of obesity, hypertension, and type 2 diabetes in offspring later in life



Pregnancy, Youth and Diabetes

- ▶ The TODAY study documented that despite disease- and age-specific counseling
 - ▶ 10.2% of the females in the cohort became pregnant over an average of 3.8 years of study participation.
 - ▶ 26.4% of pregnancies ended in a miscarriage, stillbirth, or intrauterine death
 - ▶ 20.5% of the liveborn infants had a major congenital anomaly.



Poll Question 6

▶ AR has type 1 diabetes and is in shock because they just discovered they are 6 weeks pregnant. AR uses a CGM and insulin pump to manage their diabetes and their most recent A1C is 8.3%. Which of the following is a potential complication associate with hyperglycemia during the first 10 weeks of pregnancy?

- A. Macrosomia and post-natal jaundice
- B. Intrauterine hypoglycemia
- C. Neonatal respiratory distress
- D. Diabetic embryopathy

First 10 Weeks of Pregnancy Risks

Complications directly proportional to A1C elevations during the first 10 weeks of pregnancy.

- ▶ Diabetic embryopathy, especially anencephaly, microcephaly
- ▶ Congenital heart disease
- ▶ Renal anomalies
- ▶ Caudal regression



Elevated Blood Sugars in Pregnancy – Potential Complications

- ▶ spontaneous abortion
- ▶ fetal anomalies
- ▶ Preeclampsia
- ▶ fetal demise
- ▶ macrosomia,
- ▶ neonatal hypoglycemia,
- ▶ Hyperbilirubinemia
- ▶ neonatal respiratory distress syndrome, among others.



Preconception Counseling

- ▶ Start at puberty and continue for anyone with diabetes and reproductive potential
- ▶ Incorporate preconception counseling into routine diabetes care.
- Discuss family planning and effective contraception (with consideration of long-acting, reversible contraception) until treatment regimen and A1C are optimized for pregnancy.
- Reinforce importance of working toward A1C <6.5% to reduce the risk of complications



Preconception Planning

- ▶ For girls of childbearing potential provide:
 - ▶ Info on effective contraception or abstinence to prevent unplanned pregnancy.
 - ▶ Use developmentally appropriate educational tools
 - ▶ Enable adolescent girls to make well-informed decisions
 - ▶ Free preconception counseling resources tailored for adolescents are available at ADA
 - ▶ Include education about the risks of malformations associated with elevated glucose levels



31 year old with Type 1 Diabetes

- ▶ Tells you I am ready to get pregnant.
- ▶ Uses an insulin pump and CGM.
- ▶ Also takes an ACE Inhibitor and statin.
- ▶ What is A1c target pre-pregnancy and any other recommendations?



A1c Target in Pregnancy

- ▶ A1c target at <6- 6.5%
- ▶ In early gestation, lowest rates of adverse fetal outcomes with A1C <6–6.5%
- ▶ In 2-3rd trimester, A1c <6%, has lowest rates of macrosomia, preterm deliver and preeclampsia.
- ▶ An A1c < 6% is optimal during pregnancy, if it can be achieved with out significant hypo.
- ▶ Evaluate for and avoid hypoglycemia
 - ▶ increases risk of low birth wt



Blood Glucose Goals during Pregnancy

- ▶ Fasting 70 - 95 mg/dl
- ▶ One hour post meal 110 - 140 mg/dl
- ▶ Two hour post meal 100 - 120 mg/dl
- ▶ *A1c < 6 - 6.5%

*may need to be relaxed to < 7% if excessive hypoglycemia –
A1c lower during pregnancy due to increased RBC turnover rate
Lower limits do not apply if managed with diet only

Glucose Monitoring in Pregnancy

- ▶ GDM – check fasting blood glucose and post prandial BG
- ▶ Pre-existing type 1 or type 2, need to also check premeal BG
- ▶ Continuous glucose monitoring (CGM) can help to achieve A1C targets when used in addition to pre- and postprandial glucose monitoring
 - ▶ can reduce macrosomia and neonatal hypoglycemia in pregnancy complicated by type 1 diabetes.



CGM in Pregnancy

- ▶ Continuous glucose monitoring (CGM) can be used in addition to pre- and postprandial BG monitoring, to achieve A1C targets
- ▶ CGM metrics may be used in addition to but not be used as a substitute for BG monitoring
 - ▶ to achieve optimal pre- and postprandial targets.
- ▶ Estimated A1C and glucose management indicator calculations **not** be used in pregnancy as estimates of A1C



Type 1 and Hypoglycemia

- ▶ Increased risk of hypoglycemia in first trimester
 - ▶ Due to altered counterregulatory response in pregnancy that may decrease hypoglycemia awareness.
- ▶ Education about prevention, recognition, and treatment of hypoglycemia is important before, during, and after pregnancy to help to decrease and manage the risk of hypoglycemia.
- ▶ Insulin resistance drops rapidly with delivery of the placenta (leads to hypo post delivery)



Time in Range | Pregnancy

- ▶ For those with type 1 diabetes and pregnant:
 - > 70% of BG readings within 63-140 mg/d
 - < 4% of readings < 63 mg/dL
 - < 1% of readings < 54 mg/dL
 - < 25% of readings > 140 mg/dL



Clinical Targets for Continuous Glucose Monitoring Data Interpretation: Recommendations From the International Consensus on Time in Range

Tadej Battelino et al. Diabetes Care Aug 2019, 42 (8) 1593-1603; DOI: 10.2337/dci19-0028

Poll Question 7

- ▶ MR has type 1 diabetes and is trying to get pregnant. According to ADA Standards, which of the following medications need to be stopped before pregnancy?
 - A. Levothyroxine, labetalol
 - B. Lipitor, Lisinopril
 - C. Metformin, nifedipine
 - D. Flonase, folic acid



Meds and Blood Pressure Target During Pregnancy

- ▶ Target B/P < 110-135/85
- ▶ **Meds contraindicated during pregnancy**
 - ▶ ACE inhibitors and Angiotensin Renin Blockers (ARB)
 - ▶ Statins
- ▶ **B/P Meds approved**
 - ▶ Methyldopa, nifedipine, labetalol, diltiazem, clonidine, prazosin.
 - ▶ Other beta blockers except atenolol can be used



Type 1 or 2 – Aspirin Therapy for Preeclampsia 100-150 mg daily

- ▶ People with type 1 or 2 have 2-4x's increased risk of preeclampsia during pregnancy.
 - ▶ Signs: HTN, Proteinuria, edema
 - ▶ Associated with decrease blood flow to fetus.
- ▶ Start aspirin therapy at 12-16 weeks until birth
 - ▶ US Preventive Task Force 2018 recommendations
 - ▶ Taking ASA reduces morbidity, saves lives and lowers health care costs



31 year old with Type 1 Diabetes

- ▶ Uses an insulin pump and CGM, Time in Range
- ▶ Stop ACE Inhibitor and statin
- ▶ Other recommendations?
 - ▶ Find knowledgeable team
 - ▶ Monitor Blood Pressure and glucose with meter
 - ▶ Eye exam before and during each trimester
 - ▶ Prepare for glucose changes over each trimester and post delivery
 - ▶ Help with problem solving



Postpartum with *PreExisting DM*



- ▶ Meal plan adjustment for goals/needs
- ▶ Breastfeeding and BG balance
- ▶ Family planning
- ▶ Preconception counseling starts here
- ▶ Connect with long term follow up care
- ▶ Monitor for postpartum depression and provide support

Postnatal Health: Maternal Behavior

- ▶ For children:
Breastfeeding decreases risk type 1 and type 2 and excess weight
- ▶ For parent:
 - ▶ Breastfeeding decreases diabetes risk by 50%.
 - ▶ Plus breastfeeding decreases blood pressure, risk of breast cancer and helps with weight management



Engaging and supporting

▶ Phases of Life

▶ After Delivery



▶ Environment

- ▶ Access to safe places to exercise
- ▶ Access to healthy foods
- ▶ Adequate paying job/finances
- ▶ Access to health care / Postnatal care
- ▶ Access to child care

▶ LifeStyle

- ▶ Breast feeding
- ▶ Weight management
- ▶ Keeping Active
- ▶ Choose healthy foods
- ▶ Role model for children

Diabetes and Pregnancy and Beyond

- ▶ Sexuality
- ▶ Heart and Vessel disease
- ▶ Alcohol Consumption



Improving Sex Life

- ▶ People with diabetes get more vaginal and bladder infections
- ▶ Difficulty achieving orgasm due to neuropathy
- ▶ Painful intercourse due to lack of genital lubrication

Treatment

- ▶ Lower blood glucose / blood pressure
- ▶ Treat genital infections and UTI's
- ▶ Water based lubricants for vaginal dryness
- ▶ Hormone replacement therapy
- ▶ Eat to prevent lows during intimacy
- ▶ Allow time, touching and romance



Poll question #8

- ▶ Which of the following is true about heart disease and women?
 - A. Women with diabetes are more likely to die of heart disease than men with diabetes.
 - B. Women with diabetes have heart disease up to 10 years later than women without diabetes.
 - C. Women with diabetes have unusually low LDL levels.
 - D. Women with diabetes usually experience crushing chest pain with heart attack



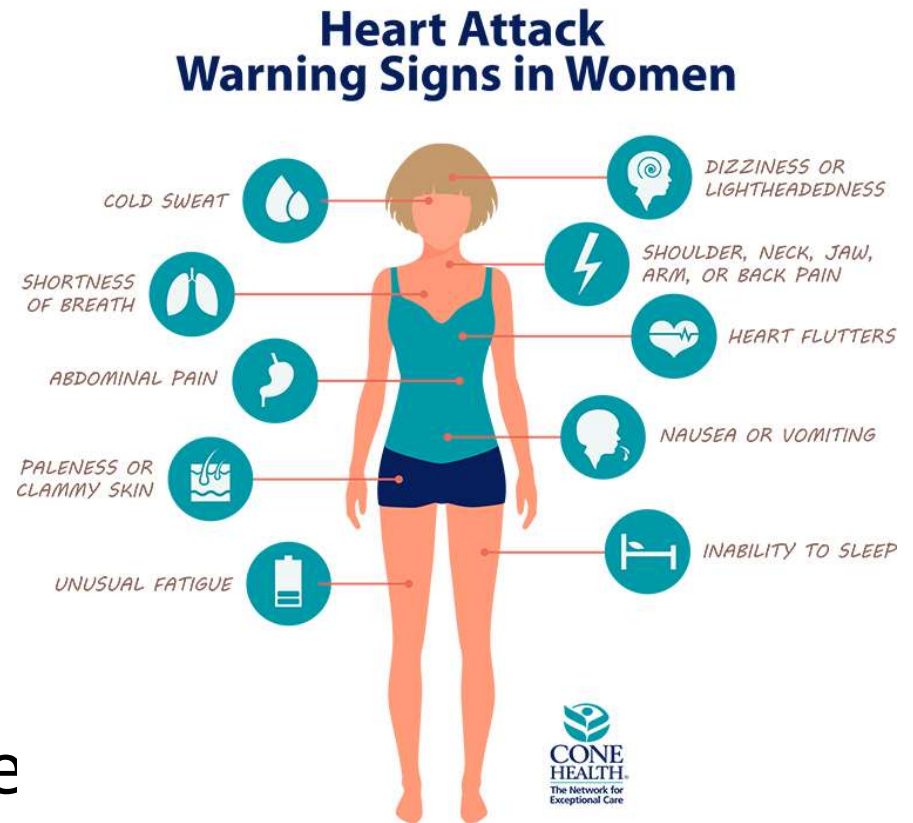
Women, DM, CVD



- ▶ 6x's rate of CVD than non-DM women
- ▶ 4xs risk of CVD & mortality compared to men w/ diabetes who have 2xs the risk
- ▶ Women with diabetes present 10 years earlier with CVD than women without diabetes (same as men). Lose female protection.
- ▶ Why?
 - ▶ Elevated BG, HTN, dyslipidemia, excess wt, PCOS, depression, lower income, later detection

Heart Disease | Leading Cause of Death in US Women

- ▶ 1 in every 5 female deaths.
- ▶ 299,578 deaths in 2017
- ▶ Leading cause of death for African American & white women.
- ▶ Women more commonly describe nausea, tiredness and jaw pain, although some women may have the same symptoms as men.



Stroke Awareness

Hennepin
Healthcare

BE

BALANCE

Sudden
loss of
balance/
dizziness



EYES

Vision loss
of one or
both eyes



Stroke is an emergency.

Recognize the signs

FAST

FACE

Facial
weakness
or
drooping



ARMS

Weakness
of
arms



SPEECH

Difficult
or slurred
speech



TIME

Call
911
now!

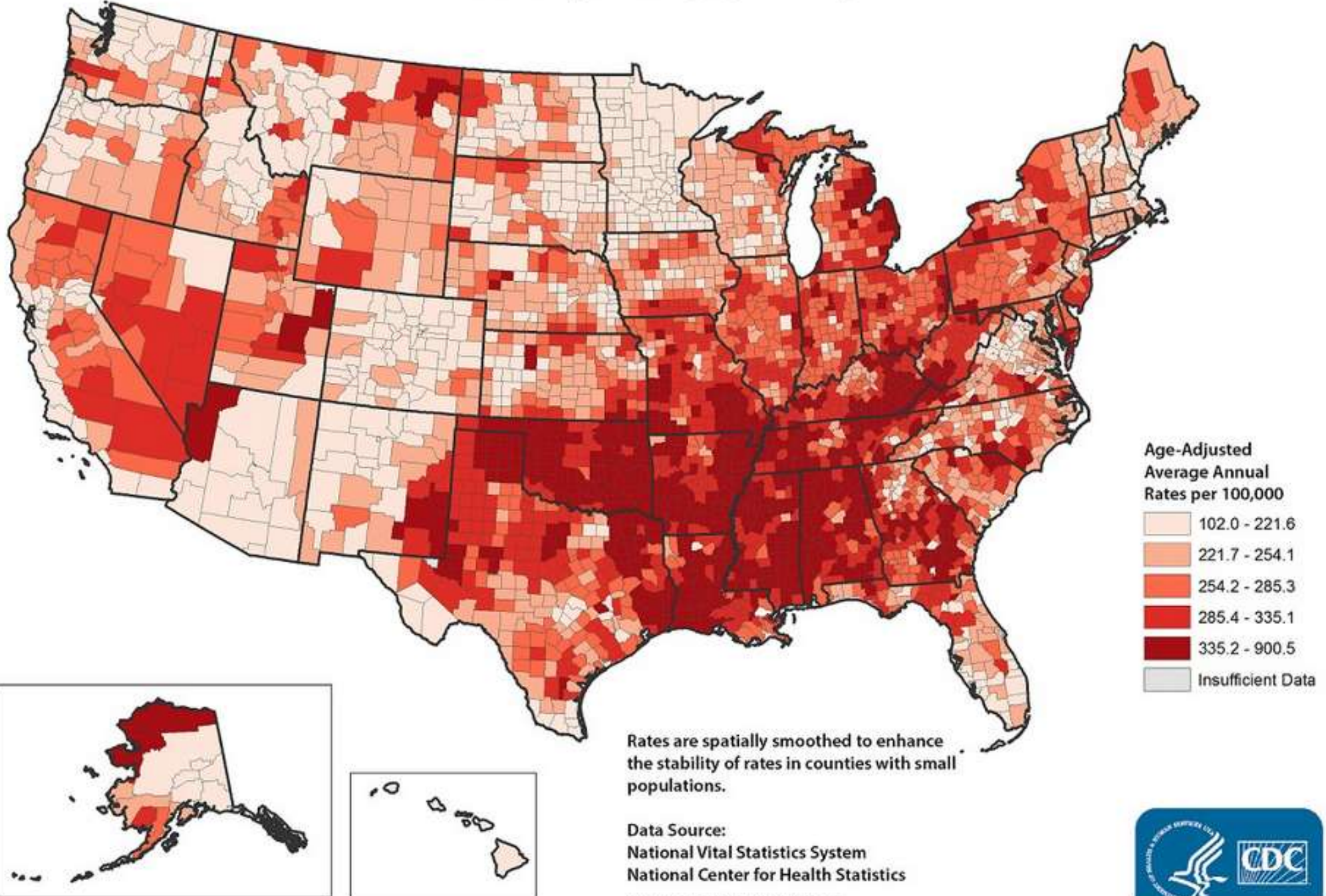


<https://www.cdc.gov/stroke/women.htm>

Stroke kills twice as many women as breast cancer does, making stroke the third leading cause of death for women.²

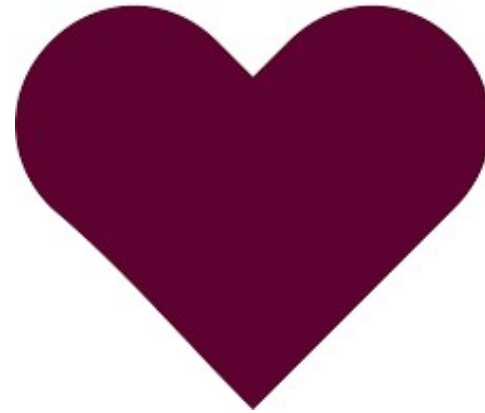
Heart Disease Death Rates, 2015-2017

Women Ages 35 +, by County



INTERHEART Study

- ▶ Identified 9 Risk Factors for CV Disease in Women
 - ▶ Diabetes
 - ▶ Dyslipidemia
 - ▶ Hypertension
 - ▶ Smoking
 - ▶ Psychosocial stress
 - ▶ Obesity—especially abdominal fat
 - ▶ Physical inactivity
 - ▶ Poor eating habits with too little fruit
 - ▶ High alcohol intake
- ▶ Diabetes increases the risk of CVD and mortality 2-4 xs
- ▶ However, diabetes has a different impact in women and men; it increases the risk by about four times in women and about twofold in men



Type 2 diabetes and cardiovascular disease in women

Jan 2013, vol 56 <https://link.springer.com/article/10.1007%2Fs00125-012-2694-y>

Alcohol Intake on Rise

- ▶ Women, older adults, racial/ethnic minorities, and socioeconomically disadvantaged
- ▶ Associated with increased alcohol use, high-risk drinking, and *DSM-IV* Alcohol Use Disorder
- ▶ These findings portend increases in many chronic comorbidities in which alcohol use has a substantial role.

JAMA Psychiatry Sept 2017
<https://jamanetwork.com/journals/jamapsychiatry/article-abstract/2647079?redirect=true>

Women are drinking more during the pandemic, and it's probably got a lot to do with their mental health

by Shalini Arunogiri, Caroline Gurvich and Jayashri Kulkarni, The Conversation



Credit: Shutterstock

COVID-19 has significantly affected our collective mental health.

<https://medicalxpress.com/news/2020-06-women-pandemic-lot-mental-health.html>

YOUR HEALTH

Women Now Drink As Much As Men — Not So Much For Pleasure, But To Cope

June 9, 2021 - 5:18 AM ET
Heard on All Things Considered

ANERI PATTANI

FROM **KHN**

Washington Post – Heavy Drinking has been normalized for women. That’s dangerous. 2016

- ▶ Excessive drinking for women in US is defined as anything more than one drink a day.
- ▶ Women have smaller bodies than men, blood-alcohol levels climb faster and stay elevated longer.
- ▶ Women make less alcohol dehydrogenase enzymes than men to break down alcohol.
- ▶ According to CDC, women are more prone to suffer brain atrophy, heart disease and liver damage from heavy drinking.
- ▶ Women who drink have an increased risk of breast cancer.
- ▶ Females more susceptible to the unwanted biological effects of alcohol than men, even when adjusted for weight.



Health Legacy – Great opportunity to pass on your best for generations to come

- ▶ Healthy eating before and during pregnancy matters
- ▶ Keep Active
- ▶ Family planning
- ▶ Encourage active participation in care; before, during and after.



Thank You

- ▶ Questions?
- ▶ Email info@diabetesed.net
- ▶ www.DiabetesEd.net
- ▶ Phone 530-893-8635



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