Prevention of Diabetes After Gestational Diabetes: What We Know

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CDC's National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP)

CHRONIC DISEASES IN AMERICA

1 in 2 US Adults Have Diabetes or Prediabetes

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cdc.gov/chronic diseases/resources

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Classification of Gestational Diabetes (GDM) (1)

- GDM is diabetes diagnosed in the second or third trimester of pregnancy that was not clearly overt diabetes prior to gestation
- Global prevalence ~ 14% to 17%

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Figure 1. Rate of gestational diabetes: United States, 2016–2020

NOTE: Significant increasing trend for 2016–2020 ($p < 0.05$).
SOURCE: National Center for Health Statistics, National Vital Statistics System, Natality.

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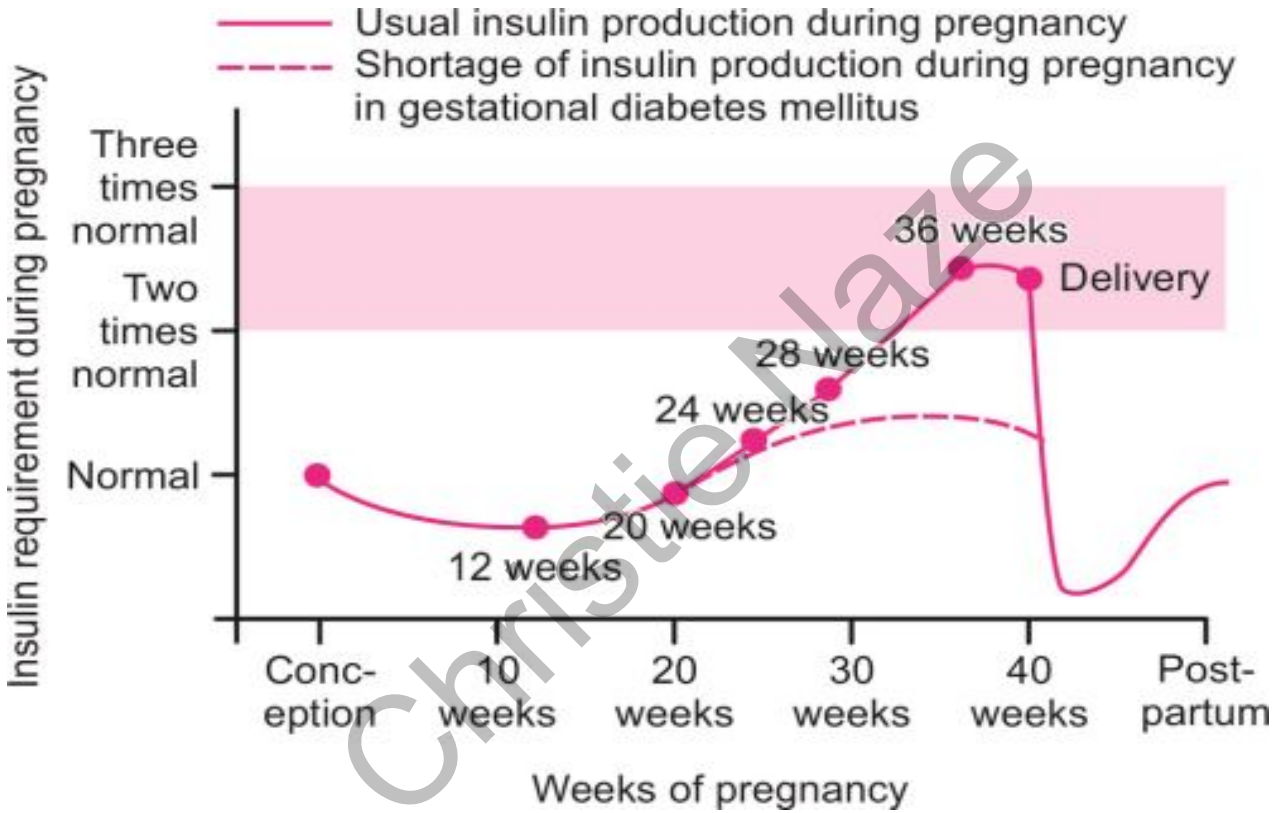
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for Health Statistics
National Vital Statistics System

NCHS reports can be downloaded from: https://www.cdc.gov/nchs/products/index.htm.



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RSSDI Diabetes Update 2016

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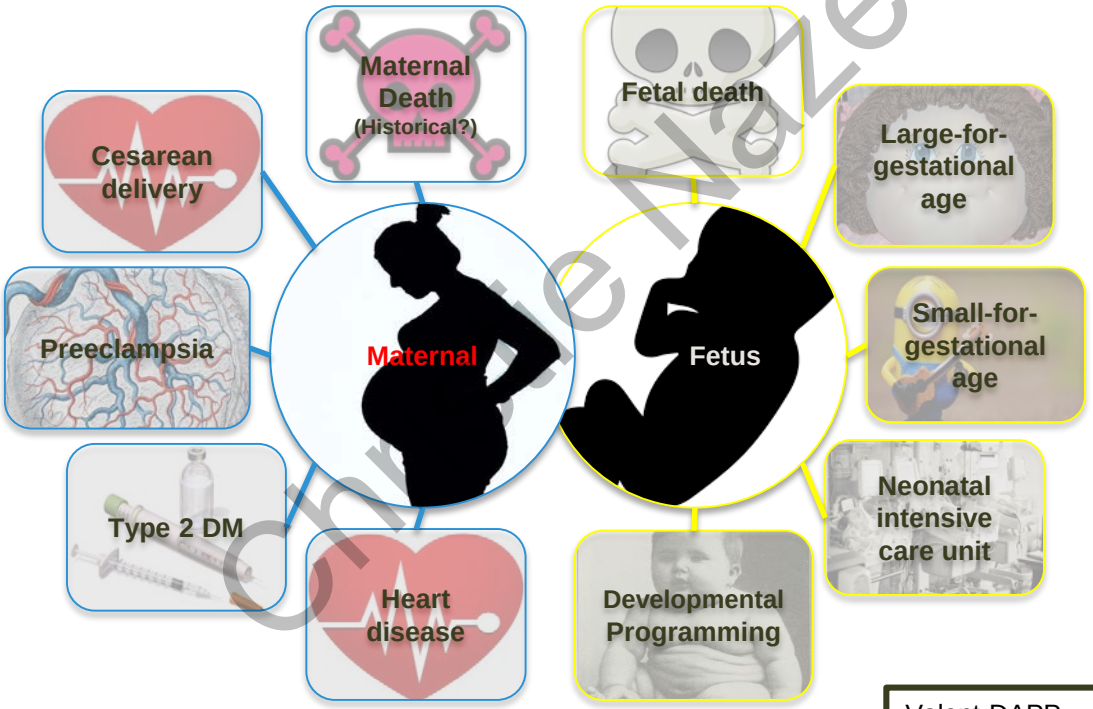
Why Do We Care About GDM?



Valent-DAPP

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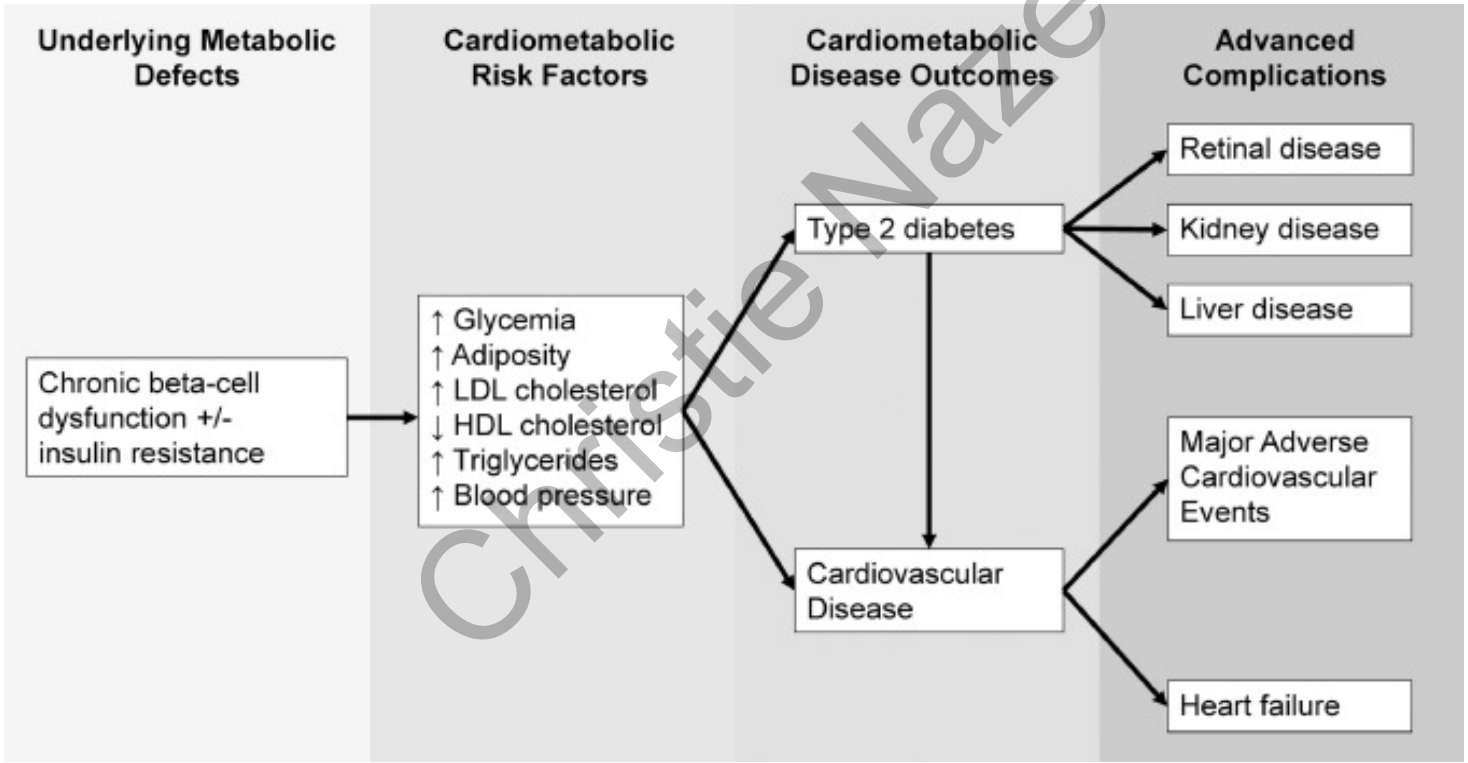
Life Course Perspective of GDM (3)



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Pregnancy provides a glimpse into long-term health outlook and presents opportunities for prevention

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Preventing T2DM- What Is Known

- T2DM arises from a combination of lifestyle and genetic factors
- Modifiable risk factors :
  - Healthy BMI
  - Following a healthy dietary pattern
  - Engaging in regular physical activity
  - Consuming alcohol in moderation
  - Avoiding smoking

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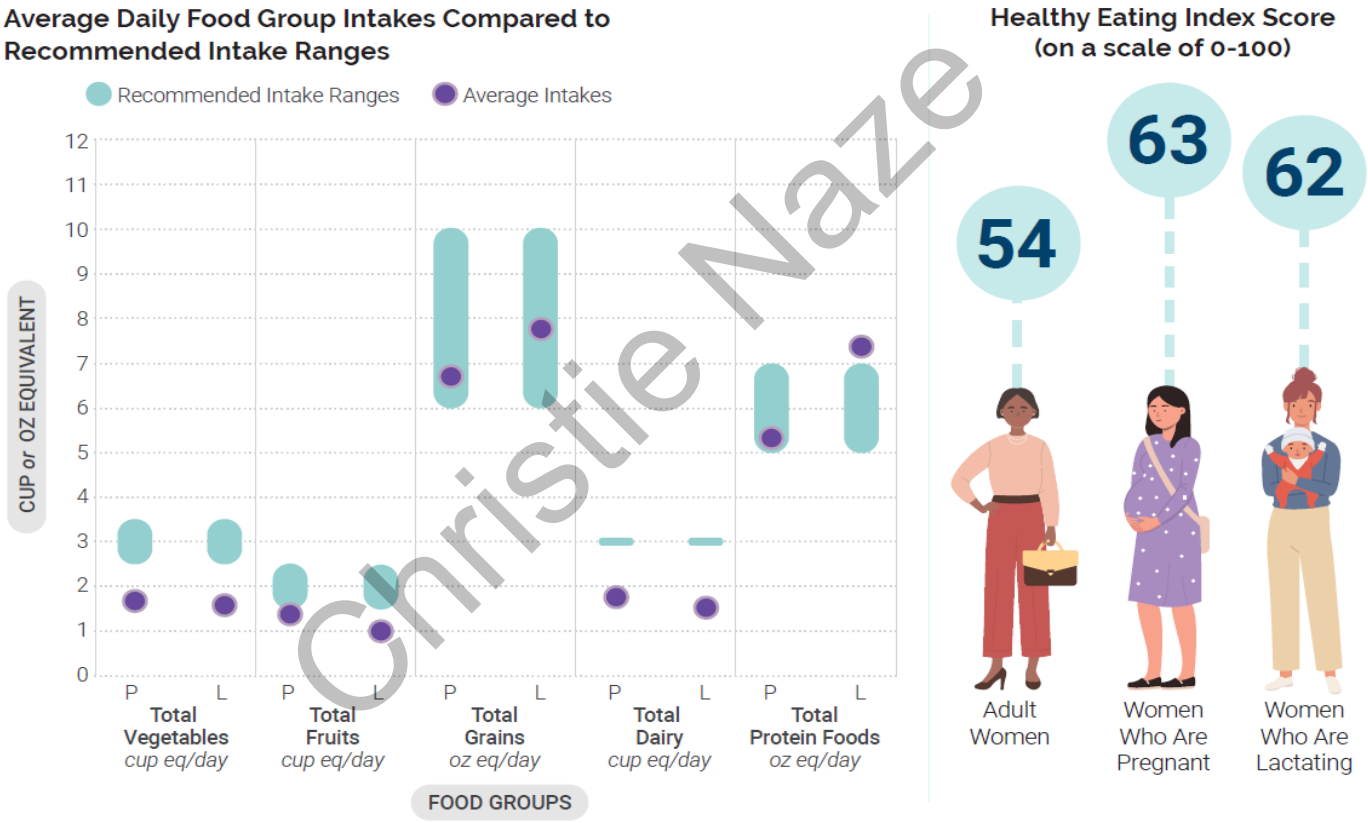
Figure 5-1

Current Intakes: Women Who Are Pregnant or Lactating



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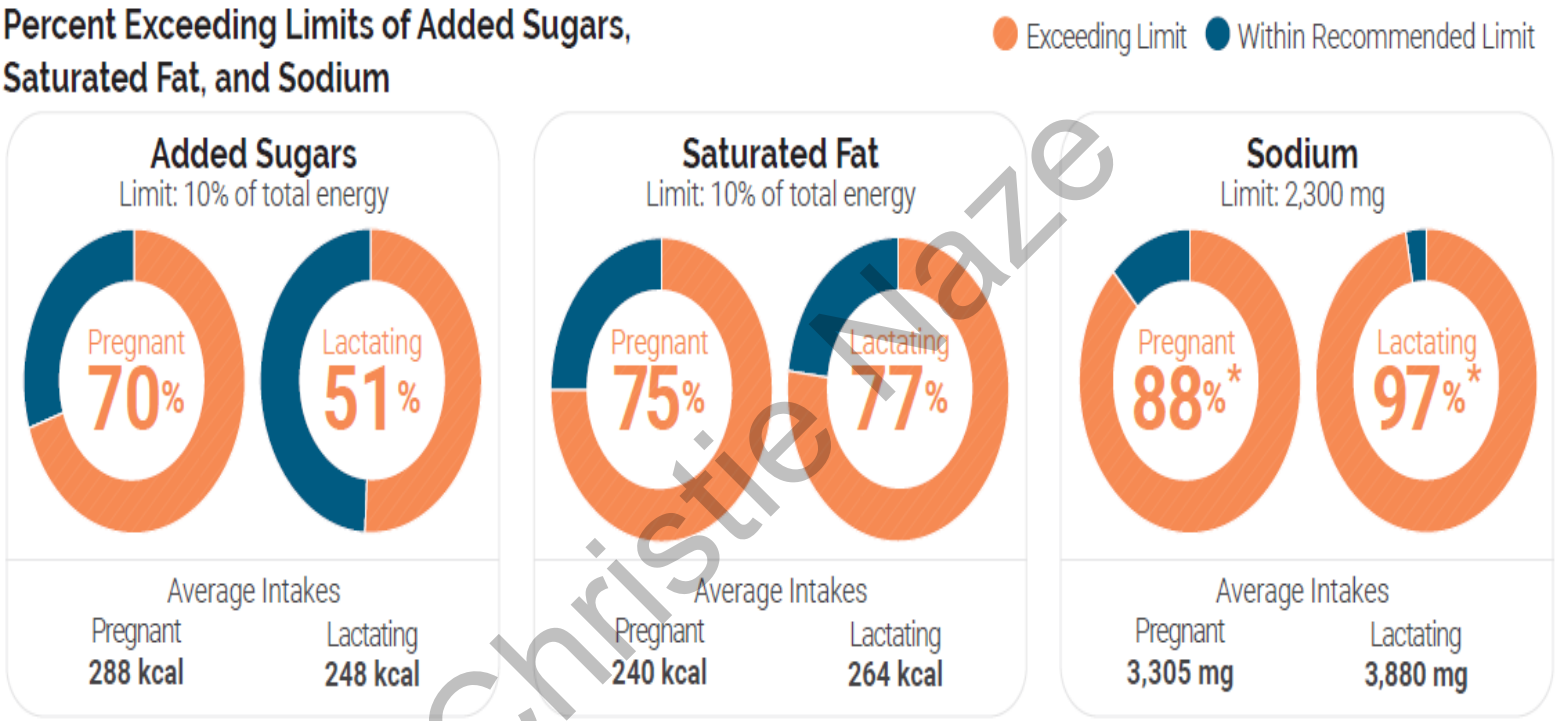
Percent Exceeding Limits of Added Sugars, Saturated Fat, and Sodium



***NOTE:** Estimates may be less precise than others due to small sample size and/or large relative standard error.

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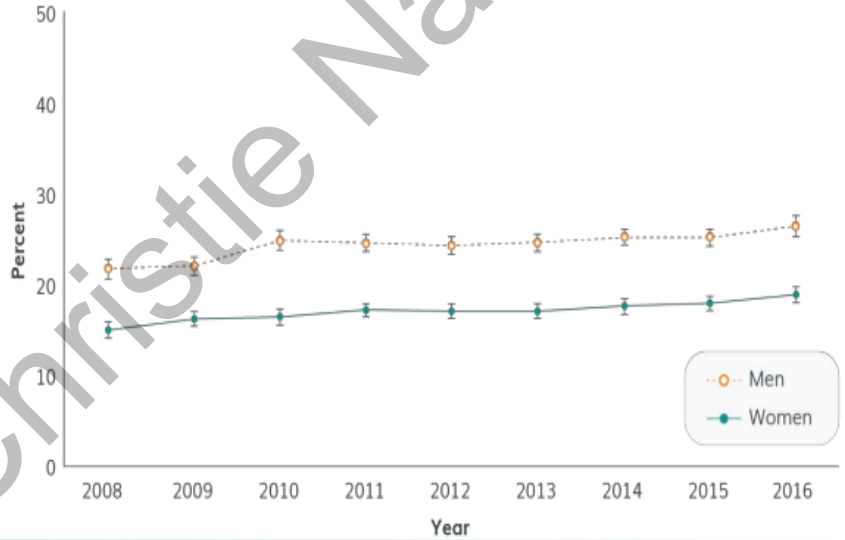
Why We Need to Promote Physical Activity

Costs of Inadequate Physical Activity*

- $117 billion dollars in annual health care costs
- 10 percent of premature mortality

*Defined as not meeting the key guidelines for adults

Percentage of U.S. Adults Ages 18 Years or Older Who Met the Aerobic and Muscle-Strengthening Guidelines, 2008–2016



Information adapted from the Physical Activity Guidelines for Americans, 2nd edition. Available at health.gov/PAGuidelines.

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Study	Population analyzed	Intervention	Follow-up duration	Key findings
Diabetes Prevention Program (DPP)[67]	Subset of DPP participants with pre-diabetes and previous GDM ($n = 350$)	Randomized to intensive lifestyle, metformin or placebo	3 years	Both lifestyle and metformin reduced incident diabetes by ~50% compared to placebo
Perez-Ferre et al.[78]	Women with previous GDM, excluding those with impaired fasting glucose at first postpartum evaluation ($n = 260$)	Randomized to intervention group (Mediterranean diet and monitored physical activity) or control (usual care)	36 months	Lifestyle intervention reduced incidence of glucose disorders compared to control (42.8% vs. 56.75%).
She		at follow-up visits) or control (usual care)		19%), did not reach statistical significance.
Hu et al.[80]	Women with previous GDM ($n = 1180$)	Randomized to lifestyle intervention (dietician visits, physical activity counselling) or usual care	12 months	Lifestyle intervention led to weight loss, improved cardiometabolic risk factors and reduced insulin resistance compared to usual care.
Wein et al.[81]	Women with previous GDM and impaired glucose tolerance ($n = 200$)	Randomized to intensive or routine dietary advice	Median follow-up 51 months	No significant difference in prevalence of diabetes and impaired glucose tolerance was found.

***Table 1*: Selected studies of lifestyle interventions for reducing the risk of progression to type 2 diabetes in women with a history of GDM.**

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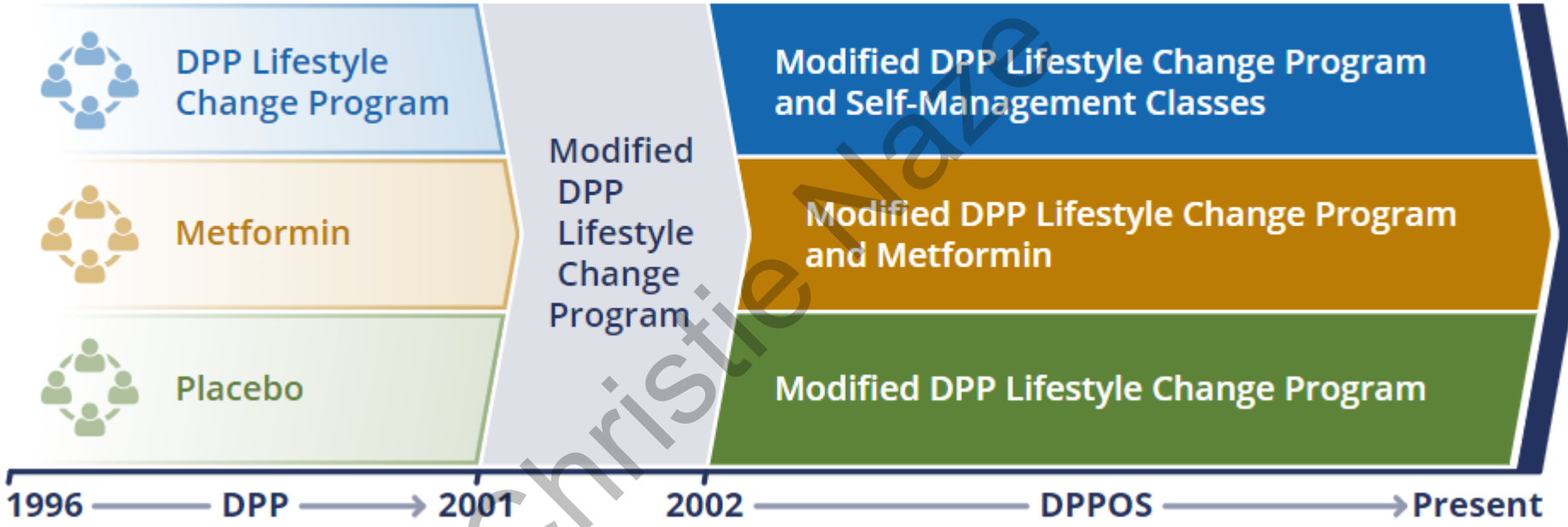
DPP & DPPOS Timeline



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Diabetes Prevention Program (DPP) (6)

General results

- ILS reduced risk of T2DM by 58%
- MET reduced risk of T2DM by 31%
- Enrolled women 350 women with history of GDM, 1416 with previous live birth with no hx of GDM
- If hx of GDM, 71% higher risk of T2 compared to no hx of GDM
- Hx GDM + ILS reduced risk of T2DM by 53%
- Hx GDM + MET reduced risk of T2DM by 50%

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DPPOS Follow-Up Study- What This Study Adds (6)

- DPP intervention continues to prevent or delay T2DM for mean follow-up of 15 years; ILS (27%), Met (18%)
- Hx GDM + placebo = 48% increased risk
- Hx GDM + ILS = 35% reduced risk
- Hx GDM + metformin = 40% reduced risk
- No GDM + ILS = 30% reduced risk, + metformin, no reduced risk
- DPP Lifestyle Change Program is cost effective

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2022 BMJ study- What This Study Adds (7)

- Looked at associations of adherence to optimal levels of 5 modifiable risk factors with risk of progression to T2DM among women with history of GDM from the longitudinal NHS, with 28 years follow-up
  - Healthy BMI, high quality diet, regular physical activity, moderate alcohol consumption and not smoking
- **Conclusion**:
  - Having optimal levels of five modifiable risk factors was associated with a more than 90% relative reduction in the risk of incident T2DM compared to those who didn't have any
  - **An incremental increase** in the # of optimal modifiable risk factors was associated with a dose-dependent

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2023 ADA Practice Guidelines- GDM diet

MNT for GDM:

- provide adequate energy and nutrient intake to promote fetal and maternal health, achieve glycemic goals and promote weight gain according to 2009 IOM recs

New for 2023:

- A diet that severely restricts any macronutrient should be avoided
  - Called out the keto diet, Paleo diet and any diet high in saturated fat
- Nutrient dense whole foods are recommended
  - Highlighted fruits, vegetables, legumes, whole grains, nuts, seeds and fish
- Processed foods, fatty red meat and sweetened foods and beverages should be limited

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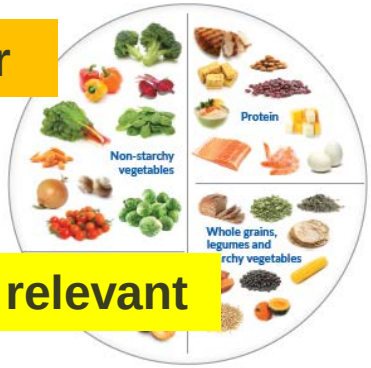
Anti-inflammatory

CENTER FOR WOMEN'S HEALTH

My Pregnancy Plate Food Choice Guide

Tasty

High fiber



Culturally relevant

Nutrient dense

nd Program

High-quality eating for before, during and after pregnancy

High quality

CARBOHYDRATES

STARCH

Choose mostly whole grain items.

1 small serving is a carb portion:

⅓ cup is a carb portion:

½ cup is a carb portion:

1 cup is a carb portion:

FRUIT

1 small serving is a carb po

¾ cup = 1 carb

1 cup = 1 carb

1 ¼ cup = 1

MILK AND MILK PRODUCTS

Choose lowfat or

1 cup = ½ carb

For non-dairy alternatives like soy, almond, and oat milks, or flavored yogurts, choose brands

NON-STARCHY VEGETABLES

Think of these as free and eat them often!

PROTEIN

Include a protein source at each meal and snack.

Some plant-based proteins include high-quality carbs — see starch.

Limit these choices:

Fatty meats like beef, por

FATS

Choose mostly unsaturated fats.

Limit saturated fats:

Low in saturated fat/
Limit red and processed meat

Whole foods over processed

Affordable

Lower in added sugars

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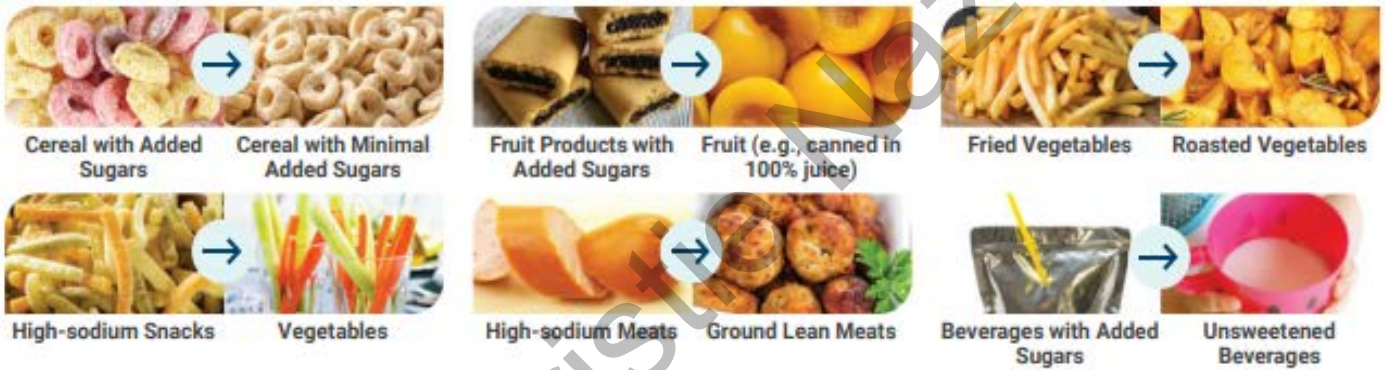
Figure 2-1

Make Healthy Shifts To Empower Toddlers To Eat Nutrient-Dense Foods in Dietary Patterns

Science shows that early food preferences influence later food choices. Make the first choice the healthiest choices that set the toddlers on a path of making nutrient-dense choices in the years to come. Examples of shifts in common choices to healthier, more nutrient-dense food choices include:



[2]**If consuming up to 2 ounces of seafood per week**, children should only be fed cooked varieties from the "Best Choices" list in the FDA/EPA joint "Advice About Eating Fish," available at **FDA.gov/fishadvice** and **EPA.gov/fishadvice**. **If consuming up to 3 ounces of seafood per week**, children should only be fed cooked varieties from the "Best Choices" list that contain even lower methylmercury: flatfish (e.g., flounder), salmon, tilapia, shrimp, catfish, crab, trout, haddock, oysters, sardines, squid, pollock, anchovies, crawfish, mullet, scallops, whiting, clams, shad, and Atlantic mackerel. If consuming up to 3 ounces of seafood per week, many commonly consumed varieties of seafood should be avoided because they cannot be consumed at 3 ounces per week by children without the potential of exceeding safe methylmercury limits; examples that should not be consumed include: canned light tuna or white (albacore) tuna, cod, perch, black sea bass. For a complete list please see: **FDA.gov/fishadvice** and **EPA.gov/fishadvice**.

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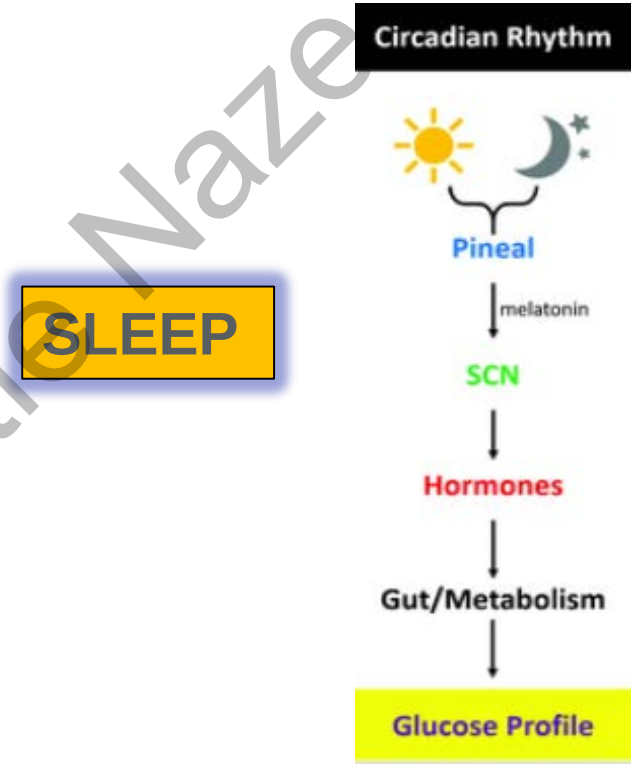
When You Eat Is Very Important

Chrononutrition: refers to coordinating food intake with the body's daily rhythms



SLEEP

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Diabetes Spectrum 2018 Jul; ds180014. https://doi.org/10.2337/ds18-0014

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MOVE YOUR WAY®

Everyone needs a mix of physical activity during and after pregnancy.

Moderate-intensity aerobic activity

Anything that gets your heart beating faster counts.

at least **150** minutes a week

AND

Muscle-strengthening activity

Do activities that make your muscles work harder than usual.

at least **2** days a week

Is that more than you can do right now? Start with just **5 minutes**. It all adds up!

Walk. Run. Dance. Play. **What's your move?**

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Prevention of T2DM Starts Before Delivery (5)

- Start conversation about the importance of postpartum care and glucose screening way before delivery and continue through post-partum period
- Screen for diabetes 4-12 weeks postpartum
- Screen every 1 to 3 years thereafter
- Encourage breast feeding for T2 reduction
- Subsequent pregnancy planning?
- Refer to DPP

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Preventing T2DM- What Is Known (5)

Post-partum Screening:

- **Facilitators:** Education, access to transportation, availability of child care, connection with clinical staff and social support, integrating family members in activities of lifestyle change, remote access to lifestyle change support, teaching healthy eating at lower financial cost
- **Barriers:** Fragmented care, insufficient information, **inaccurate perception of future risk of T2DM**, challenges of new maternal role, time constraints, lack of support, financial pressures, guilt for

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CDC's National DPP- How Does It Work?

- Year-long intensive lifestyle change program- weekly visits first 16, every other week rest of year; goals:
  - A weight loss of 7%
  - 150 minutes a week of physical activity
- Participants work with lifestyle coach and group to overcome barriers to healthy living
  - Track food intake and physical activity
- Cost: $499
  - Both Medicare and Medicaid cover 100% of the cost
  - Some commercial and employer-based health plans also cover
- Who is eligible?
  - Must be 18 years or older, have BMI of 25 or higher (or 23 or higher if of Asian descent)
  - Have been diagnosed with prediabetes
  - Have history of GDM

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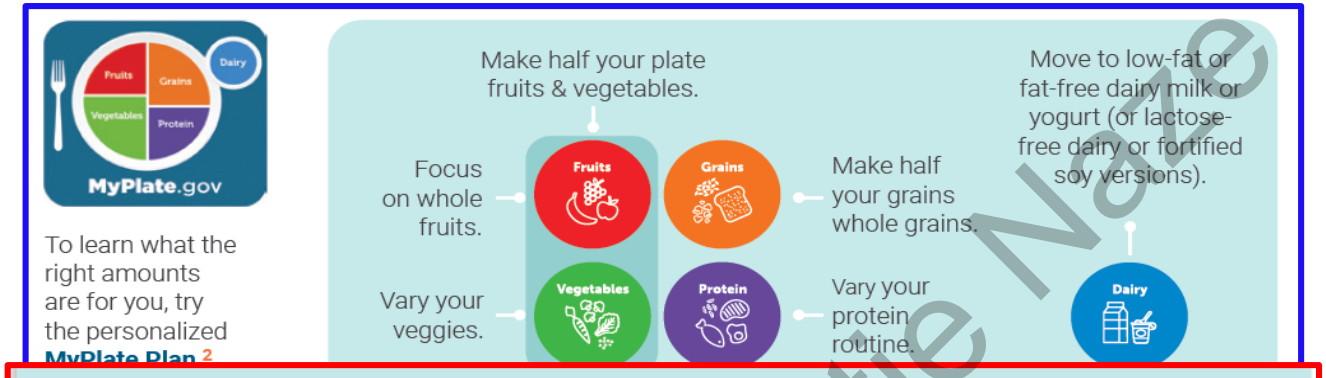
Tools/Resources- You Can Dodge T2DM after GDM



- DPP Lifestyle change program
- It's Never Too Early to Prevent Diabetes Brochure
- ADA

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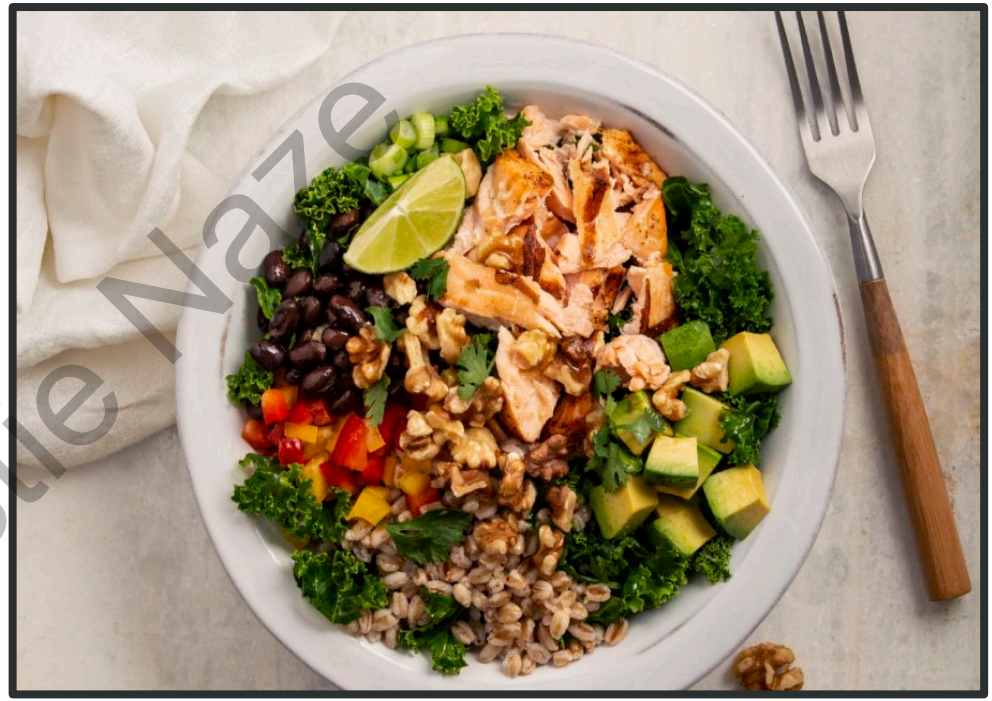
A Plate Full Of Prevention- Family Style



Recipes: California Walnuts, California Almonds, California Avocado
Oldwayspt.org

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3. Fu, Jennifer, and Ravi Retnakaran. “The Life Course Perspective of Gestational Diabetes: An Opportunity for the Prevention of Diabetes and Heart Disease in Women.” EClinicalMedicine, vol. 45, 11 Feb. 2022
4. Diabetes Prevention Program Research Group. Long-term effects of lifestyle intervention or metformin on diabetes development and microvascular complications over 15-year follow-up: the Diabetes Prevention Program Outcomes Study. Lancet Diabetes Endocrinol. 2015 Nov;3(11):866-75

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7. Yang J, et al. Modifiable risk factors and long term risk of type 2 diabetes among individuals with a history of gestational diabetes mellitus: prospective cohort study BMJ 2022; 378 :e070312 doi:10.1136/bmj-2022-070312

Other References:

- Dietary Guidelines for Americans 2020-2025, 8th Edition
- https://health.gov/moveyourway

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Thank You

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