

NUTRITION NURTURES

Empowering Maternal Wellness

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OBJECTIVES

- I. Discuss role of a Registered Dietitian in supporting maternal health.
- II. Summarize the relationship between diet, pregnancy outcomes, maternal health and fetal development.
- III. Identify the function and food sources of essential macronutrients and micronutrients critical for maternal and fetal health.
- IV. Contrast maternal nutrient needs across trimesters, including postpartum recovery.
- V. Examine unique medical nutrition therapy considerations for gestational diabetes through the lens of a patient case study.



Nutrition is a key modifiable factor that may affect birth outcomes and has long-term effects on the health of both the offspring and the birthing individual.

UpToDate, 2024



Nutrition is one chapter in a big book.

*But it is an
important one!*

Perry, S. E. (2022). Maternal Child Nursing Care (7th ed.).
Mosby. <https://nursekey.com/maternal-and-fetal-nutrition/>

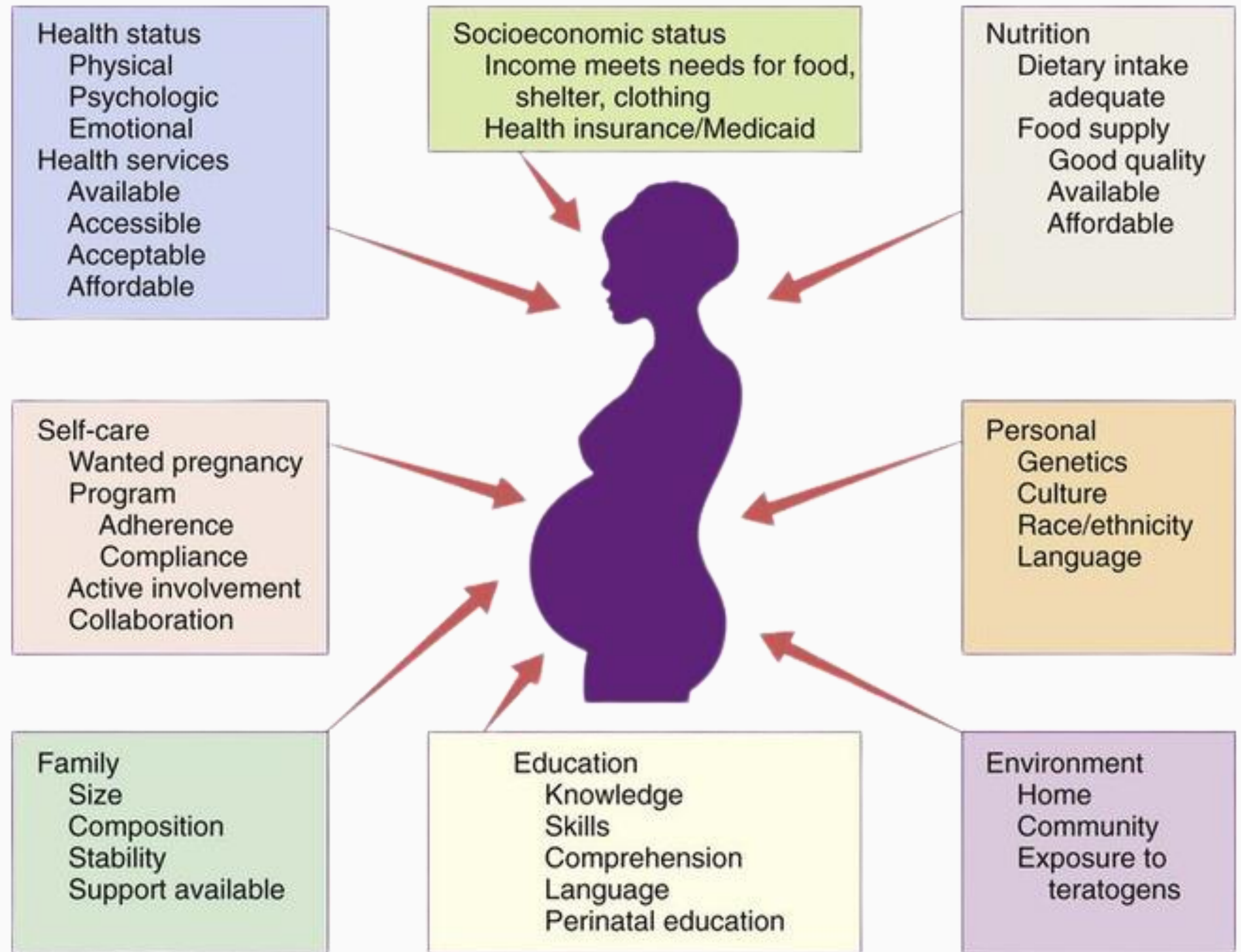


FIG 9-1 Factors that influence the outcome of pregnancy

THE ROLE OF THE REGISTERED DIETITIAN

CORE RESPONSIBILITIES

During Pregnancy

- Personalized nutrition assessment
- Customized nutrition plan, emphasizing key nutritional focus areas
- Education and counseling
- Support for special diets
- Continuous monitoring and assistance

ADVANTAGES OF THE RD

During Pregnancy

- Optimal fetal development
- Reduced risk of complications
- Improved maternal health
- Empowerment
- Touch point to screen for additional support needs (e.g., social work, mental health)

DIET AND PREGNANCY-RELATED OUTCOMES

Abdollahi, S., Soltani, S., de Souza, R.J., et al. (2021). Associations between Maternal Dietary Patterns and Perinatal Outcomes: A Systematic Review and Meta-Analysis of Cohort Studies. *Advances in Nutrition*. <https://doi.org/10.1093/advances/nmaal56>

- Higher maternal adherence to a healthy diet was associated with a reduced risk of gestational hypertension (14%), maternal depression (40%), low birth weight (28%) and preterm birth (56%).
- Maternal adherence to a healthy diet was also show to have a positive effect on gestational weight gain and higher birth weight between the two studied groups.
- Contrastingly, higher maternal adherence to an unhealthy or mixed diet was associated with higher odds of gestational hypertension (23%).
- In stratified analyses, a higher healthy eating index was associated with reduced odds of large for gestational age and a higher head circumference.

DIET AND PREGNANCY-RELATED OUTCOMES

Teede, H. J., Bailey, C., & Moran, L. J. et al. (2021). Association of Antenatal Diet and Physical Activity–Based Interventions With Gestational Weight Gain and Pregnancy Outcomes: A Systematic Review and Meta-analysis. JAMA Internal Medicine. <https://doi.org/10.1001/jamainternmed.2021.6373>

- Compared to routine care, nutrition interventions were associated with reduced gestational weight gain, risk of gestational diabetes and total adverse maternal and neonatal outcomes.
- Compared to routine care, physical activity interventions were associated with reduced risk of cesarean section, hypertensive disorders and total adverse maternal outcomes.
- Overall lifestyle intervention (combined types) was associated with reduced gestational weight gain, risk of gestational diabetes, and total adverse maternal outcomes (vs routine care).

BOTTOM LINE: These findings support the implementation of lifestyle intervention, with a Registered Dietitian as part of the healthcare team, into prenatal care and public policy around the world.

THE FOUNDATIONS OF MATERNAL NUTRITION



ADEQUACY

Energy needs vary by trimester. Food intake impacts energy levels and fetal growth.



VARIETY

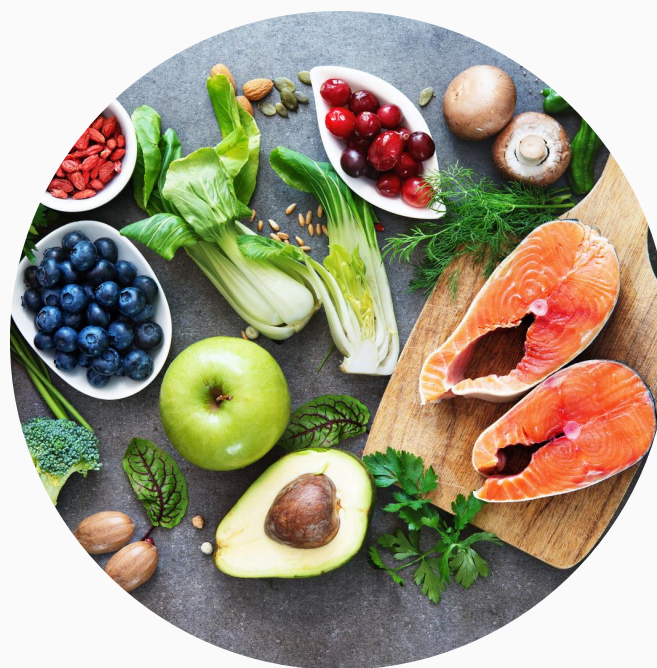
Eating a wide variety of foods encourages intake of critical vitamins and minerals.



BALANCE

Macronutrient balance throughout pregnancy influences energy, cell growth and hormone regulation.

PREPARING FOR PREGNANCY



ADEQUATE ENERGY INTAKE

To optimize menstrual cycle and ovulation.



IRON-RICH FOODS

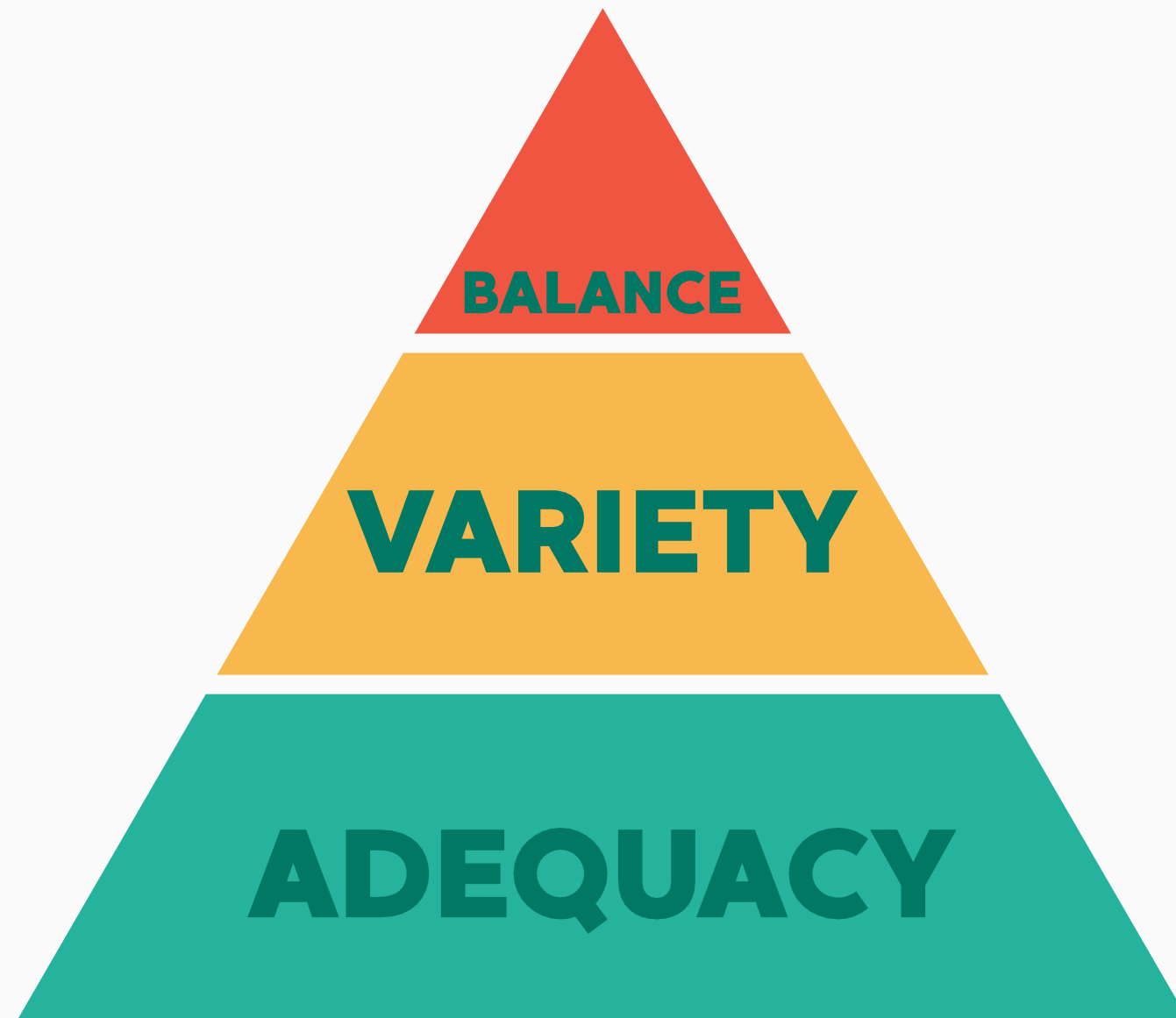
Essential for making blood cells and delivering oxygen. Pair with vitamin C-rich foods to enhance absorption.



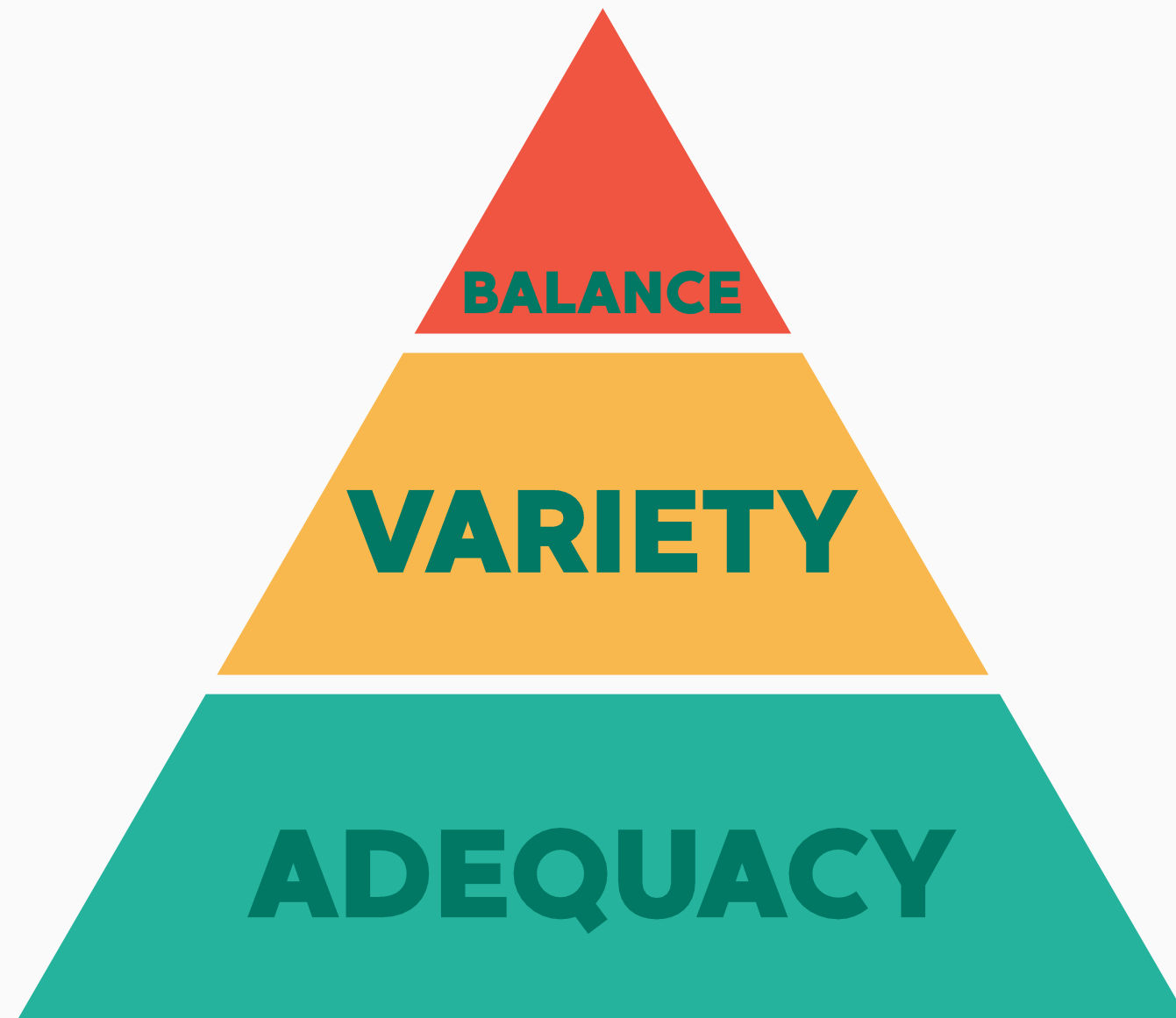
KEY NUTRIENTS: FOLATE AND IODINE

Folate is essential for DNA synthesis and iodine supports healthy hormone balance. Our needs increase significantly in early pregnancy. Take a prenatal to supplement.

What do pregnant people and endurance athletes have in common?

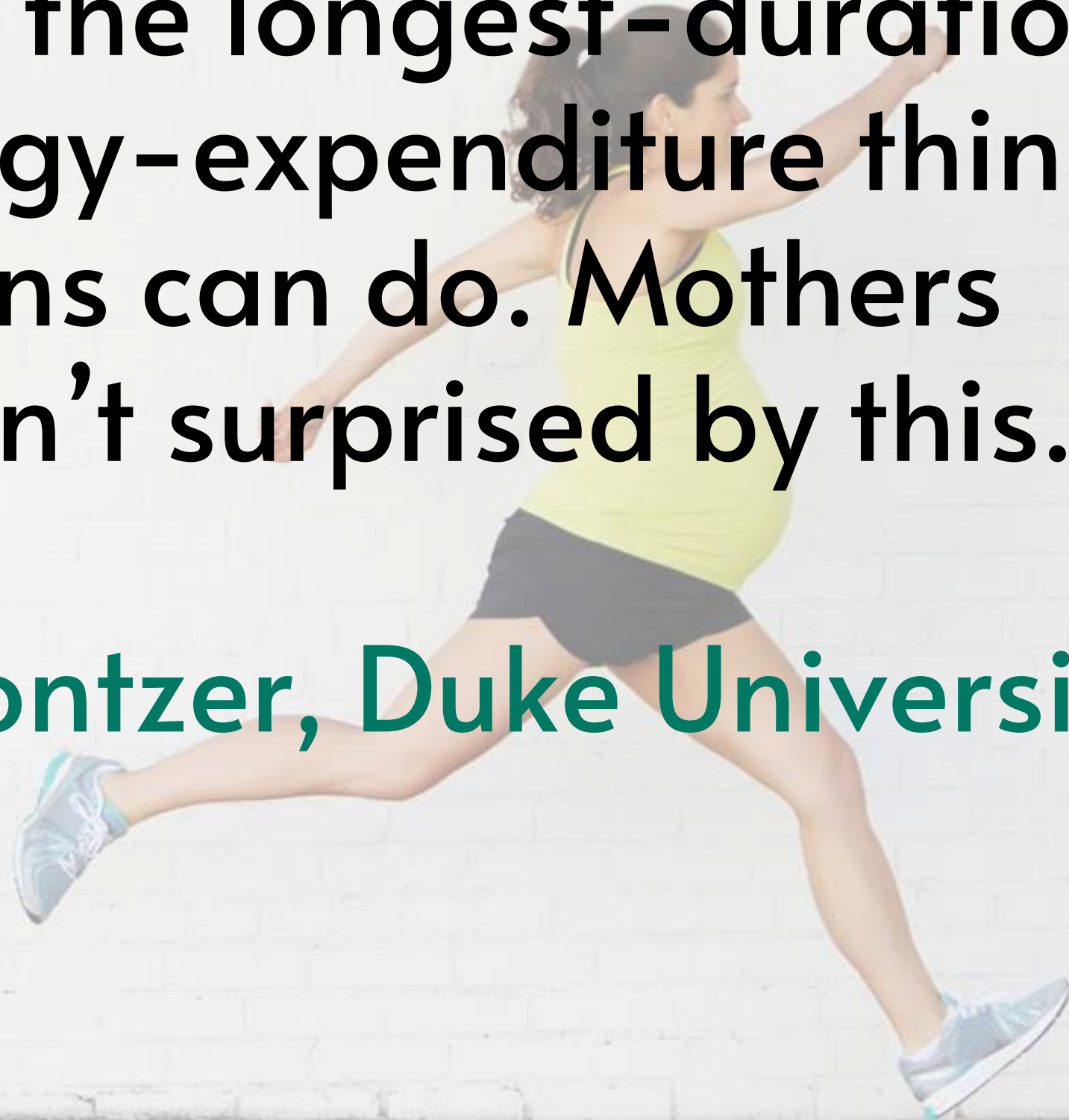


What do pregnant people and endurance athletes have in common?



**“Pregnancy is the longest-duration,
highest-energy-expenditure thing
that humans can do. Mothers
probably aren’t surprised by this.”**

Dr. Herman Pontzer, Duke University



ENERGY NEEDS



FIRST TRIMESTER

- Daily estimated energy requirements during the first trimester are the same as for nonpregnant individuals.
- This applies to the general obstetric population.



SECOND AND THIRD TRIMESTERS

- Highly individualized.
- Most recommendations are based on pre-pregnancy body weight
 - 150 - 300 extra kCals per day may be required to meet weight gain goals.
 - Controversial: Some studies support a small caloric deficit (-50kCals/day) during the second and third trimesters for those in larger bodies.*

*This should be monitored closely to ensure there are no micronutrient deficiencies.

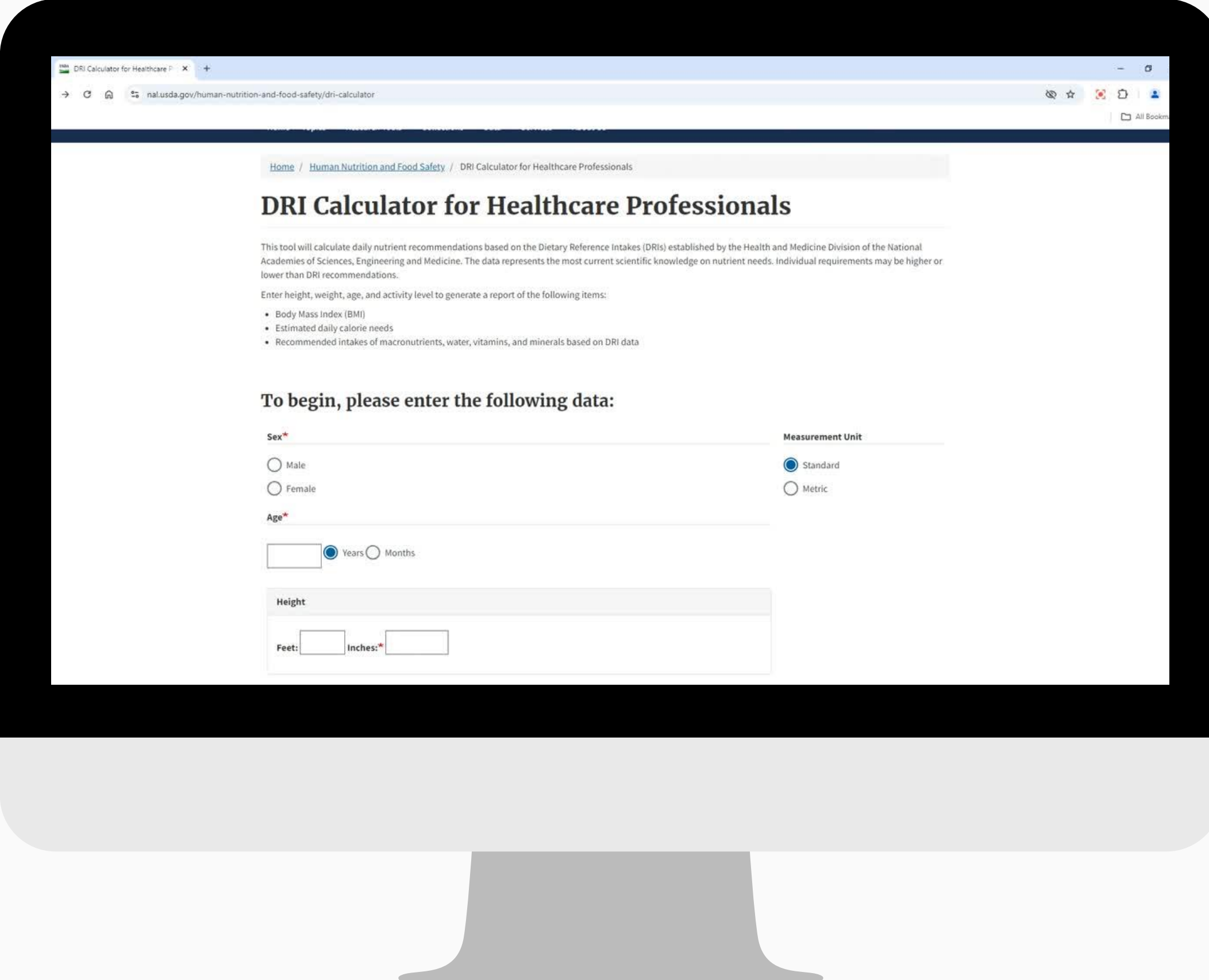


"FOURTH TRIMESTER"

- Those who gave birth via C-Section may need up to 35kCals/kg body weight to encourage proper wound healing.
- Those who choose to chest feed will need approximately 400 extra kCals per day.

CALCULATE YOUR NEEDS

with the DRI Calculator



The screenshot shows a web browser window displaying the "DRI Calculator for Healthcare Professionals" page. The browser's address bar shows the URL: `nal.usda.gov/human-nutrition-and-food-safety/dri-calculator`. The page has a dark blue header with a breadcrumb trail: [Home](#) / [Human Nutrition and Food Safety](#) / [DRI Calculator for Healthcare Professionals](#).

DRI Calculator for Healthcare Professionals

This tool will calculate daily nutrient recommendations based on the Dietary Reference Intakes (DRIs) established by the Health and Medicine Division of the National Academies of Sciences, Engineering and Medicine. The data represents the most current scientific knowledge on nutrient needs. Individual requirements may be higher or lower than DRI recommendations.

Enter height, weight, age, and activity level to generate a report of the following items:

- Body Mass Index (BMI)
- Estimated daily calorie needs
- Recommended intakes of macronutrients, water, vitamins, and minerals based on DRI data

To begin, please enter the following data:

Sex*

☐ Male

☐ Female

Measurement Unit

☒ Standard

☐ Metric

Age*

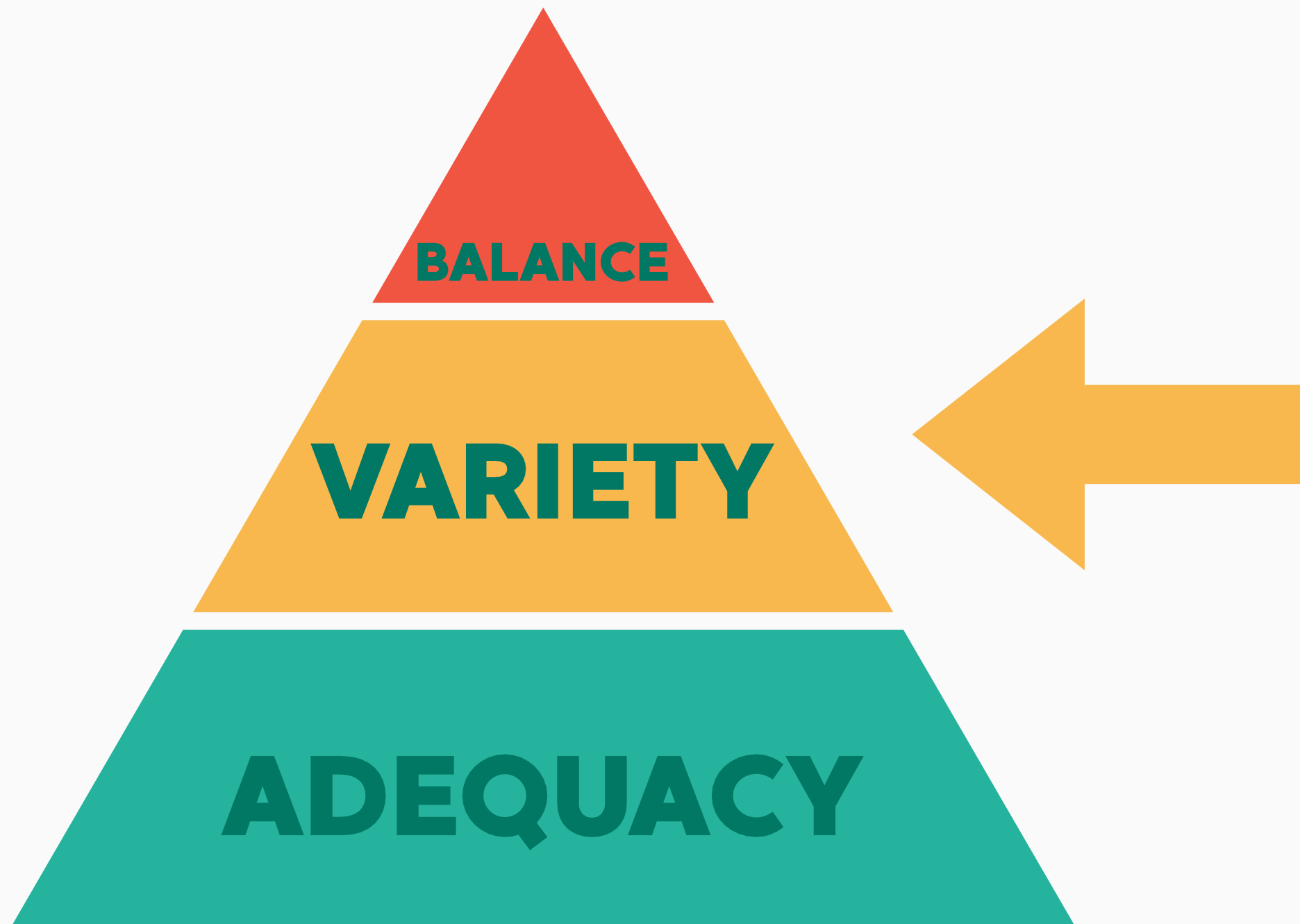
☒ Years ☐ Months

Height

Feet: Inches:

VARIETY

More variety = More exposure to vitamins and minerals



Key Micronutrients

- Folate/Folic Acid
- Iron
- Calcium
- Vitamin D
- Omega-3 Fatty Acids (DHA)
- Vitamin A
- Vitamin B12
- Vitamin B6
- Zinc
- Iodine
- Choline

WHAT TO EXPECT

Nutritional Impact

First Trimester

- Increased levels of estrogen, progesterone and HCG may increase nausea/vomiting.
- Progesterone slows digestive track which can lead to heartburn, constipation and gas.
- Cardiac volume increases.
- Extreme tiredness can occur due to the physical and emotional demands.

STRATEGIES:

Survival, food flexibility and forgiveness, small frequent meals, basic, low fat foods as tolerated, quality prenatal, hydration,

Second Trimester

- A decrease in HCG hormone along with changes in levels of estrogen and progesterone means less nausea and tiredness.
- Appetite and energy may increase.
- Weight gain may lead to back pain.
- Increase in insulin resistance.

STRATEGIES:

Reintroduce food variety, veggies and whole grains for fiber and vitamins/minerals, seek support if severe nausea continues, iron rich foods, enjoy more physical activity.

WHAT TO EXPECT

Nutritional Impact

Third Trimester

- Pregnancy hormones relax the valve between your stomach and esophagus and cause heartburn.
- Connective tissues that hold bones in place also relax which can cause pelvic and back pain.
- An important trimester for lung, kidney and fat development, increasing importance of consuming protein-rich foods and additional energy intake.

STRATEGIES:

Small and frequent meals and snacks, manage reflux and heartburn symptoms, trust increased appetite, continue with food variety, focus on color for vitamins and minerals. (Edge, 2020)

“Fourth Trimester”

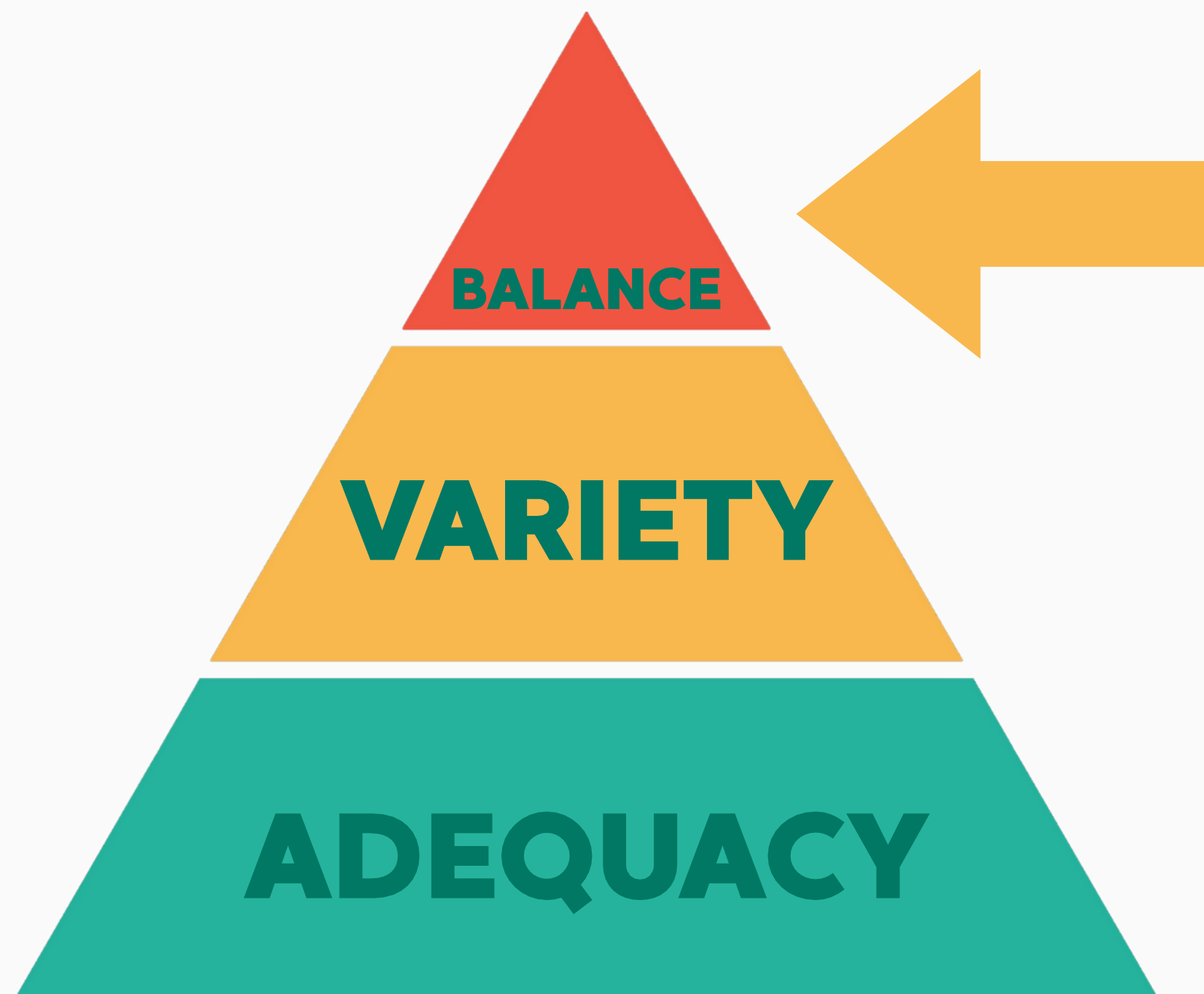
- Postnatal depletion is the state your body is in after birth when you’ve devoted so many nutrients to growing a baby.
- Blood loss during delivery can impact iron status. Iron repletion is essential.
- Labor and delivery impacts the GI tract making a bowel movement challenge (e.g., anesthesia slowing GI tract, hemorrhoids or stitches after a vaginal delivery causing you to avoid pushing.)

STRATEGIES:

Iron-rich foods, foods rich in omega-3 fats, well cooked grains/starches alongside plenty of fat and protein. Hydration needs increase with chest feeding. Stool softeners are often advised.

BALANCE

How you eat will depend upon your pregnancy, symptoms and other life responsibilities you are balancing.



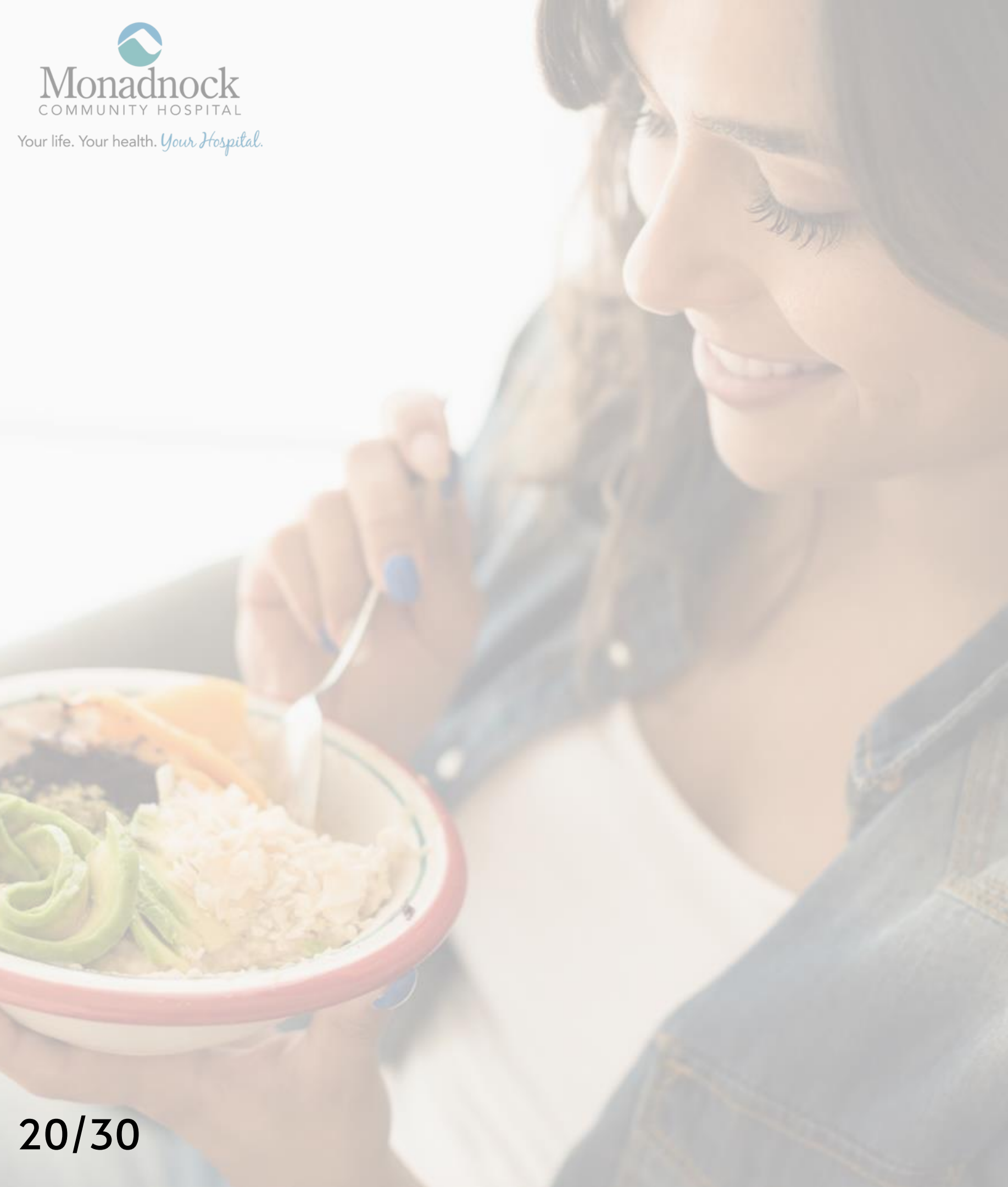


PROTEIN NEEDS

- Increase in protein should be proportion to total calories (10 - 35% total intake).
- Some experts have recommended keeping protein consumption below 25% of intake.
- Special protein powders and high-protein supplements are not recommended for those who have access to protein rich foods. These supplements have no measurable benefits and may have harmful effects.
- Vary protein sources for greatest benefit (e.g., lean meats, poultry, eggs, seafood, beans, peas, lentils, nuts, seeds and soy products.)

CARBOHYDRATE & FIBER NEEDS

- Increase in carbohydrates should be proportion to total calories (45 - 65% of intake).
- Fiber intake of 28 - 36g/day is recommended, along with adequate fluid intake.
- Pair carbohydrate-rich foods with protein and fat for lasting energy and stabilize blood sugar.
- Focus on fruits, vegetables and whole grains, as tolerated. Limit intake of sugar-sweetened beverages to avoid high postprandial blood glucose levels.

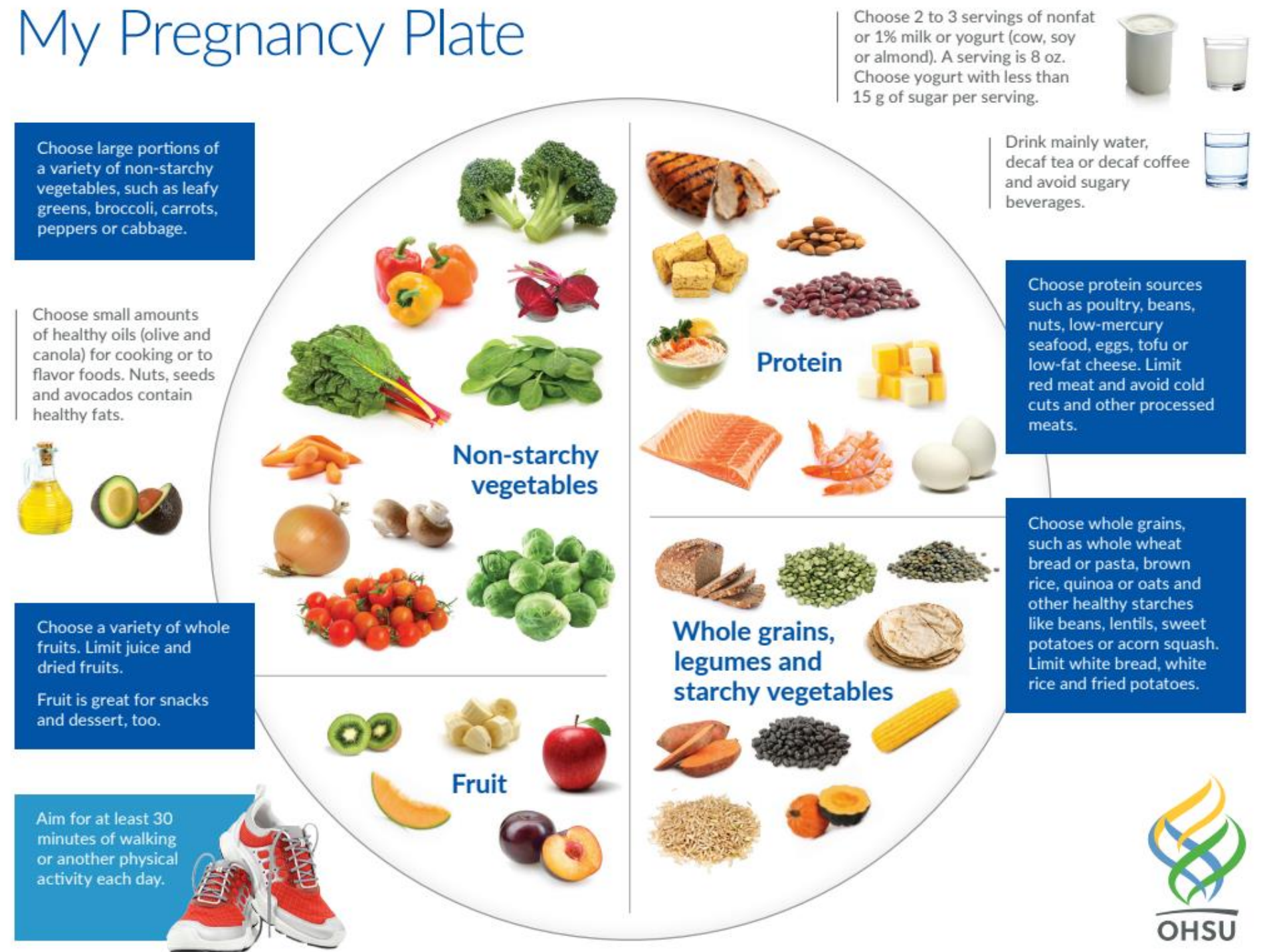


DIETARY FAT NEEDS

- Increase in fat should be proportion to total calories (20 - 35% of intake).
- Approximately 75% of pregnant people exceed the recommended limit for saturated fat (e.g., heavily marbled meat and dairy, coconut, palm and palm kernel oil).
- Focus on unsaturated fats with minimal saturated fat intake (<10% of intake).
- 8-10oz of seafood per week (choose types low in mercury).
- Nutrient-Dense Sources: Avocados, nuts, seeds, olive oil, canola oil, fatty fish.
- Some foods are fortified with DHA: yogurt, milk and eggs.

APPLYING RECOMMENDATIONS

My Pregnancy Plate



- **Breakfasts:** Spinach and Avocado Scramble with Berries, Plain Greek Yogurt Parfait with chia seed jam, walnuts and honey, oatmeal cooked with FairLife Milk, ground flaxseed, almond butter and a banana.
- **Lunches:** Quinoa Salad with Roasted Vegetables, Chickpeas and Tahini Dressing, Grilled Chicken Salad with Mixed Greens, Avocado, Pecans, and Goat Cheese, Lentil and beef chili over a sweet potato and broccoli.
- **Dinners:** Salmon with roasted brussels sprouts and a farro salad, Turkey meatballs with marinara sauce and barilla protein pasta, Stir-fry with tofu, mushrooms, bell peppers and brown rice, kimchi on side.

CASE STUDY

Rebecca, 31yo F, 67", 135#, BMI 21.1

- ✓ Medical Hx: PCOS, ADHD, family history of T2DM.
- ✓ Pregnancy Hx: Two miscarriages, one prior live birth (vaginal delivery), conceived via IVF.
- ✓ Current: 24wk pregnant, just failed 1-hr 50g OGTT with reading of 187mg/dL. No history of GDM in first pregnancy.

22/30



A Week Later. . .

Rebecca was asked to come back for a 100g 3-hr OGTT follow up. The results were 160mg/dL. Rebecca was diagnosed with Gestational Diabetes Mellitus. She received a script for a glucometer and a referral to nutrition services. She plans to test her BG four times per day for the next 2 weeks.

Initial MNT Session

- | | |
|-----------------------------|-------------------------|
| ✓ Diet History | ✓ Sleep |
| ✓ Meal Patterns/Diet Recall | ✓ Physical Activity |
| ✓ BG Data | ✓ Literacy/Numeracy |
| ✓ Financial means | ✓ Stress/Social Support |



Initial MNT Session

Nutrition Diagnosis: Altered nutrition-related lab values R/T gestational diabetes diagnosis AEB failed OGTT and elevated capillary glucose readings.

Nutrition Intervention:

- Discussed blood glucose targets.
- Reviewed the relationship between pregnancy and insulin resistance.
- Listed strategies that can help improve insulin resistance for those with GDM.
- Highlighted change talk when pt mentioned reasons why change is important to her.
- Reviewed BG log and discussed contributing factors to highs in relationship to current habits.
- Discussed non-diet related factors that can impact BG.



Initial MNT Session

Nutrition Goals:

Goal #1: Keep a food and BG log for the next two weeks;

Goal #2: Pair carbohydrate foods with non-carbohydrate foods (mixed meals);

Goal #3: Go for a 10 minute walk after main meals;

Goal #4: Increase intake of non-starchy vegetables at dinner, as tolerated;

Goal #5: Incorporate an additional protein source with pasta dinners (e.g., protein pasta, chicken)

25/30 Will follow up in two weeks.



Follow Up MNT Session

- ✓ Reviewed pt's calculated nutrition needs;
- ✓ Results of food and BG log;
- ✓ Changes made since last visit;
- ✓ Discussed role of insulin as an intervention for GDM when further dietary restraint isn't appropriate;
- ✓ Carbohydrate targets for BG management and meal planning strategies for family- and GDM-friendly meals and snacks.



Follow Up MNT Session

Nutrition Recommendations

- Increase protein at breakfast (e.g., crustless spinach quiche with pork breakfast sausage and a banana)
- Pair fresh fruit with nut butter for snack
- Incorporate additional plant-based protein and fat at lunch (e.g., lentil soup, arugula salad with parmesan cheese)
- Increase protein and fat at snacks (e.g., full-fat Greek yogurt with chia seeds and vanilla extract)
- Include a variety of vegetables at dinner, as tolerated (e.g., beef meatloaf with roasted Brussels sprouts, roasted red potatoes)



One-Month Follow Up

- 32-weeks pregnant with avg. fasting BG of 85mg/dL, avg. 2-hr posprandial BG of 110mg/dL.
- No more complaints of fatigue, iron-deficiency anemia has resolved.
- Regular bowel movements and less nausea.
- Enough energy to restart yoga practice and play with son after preschool.
- OBGYN satisfied with numbers, no need for insulin at this time.

THANK YOU!



30/30

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counseling? Ask your primary
healthcare provider for a referral.
Visit Us At: MCHNutrition.org

For more information or to
schedule an appointment, call
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