# Paying It Forward

# The Effects of Perinatal Nutrition on Future Generations

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# Fetal Origins of Adult Disease

- Theory introduced in 1980s by David Barker, MD
- Prenatal nutrition is linked to heart disease via metabolic disorders
- Fetal programming
  - Fetus adapts to the environment in the womb • Problems arise when there is a mismatch
  - between the womb and the outside world

"Early" Prenatal Care Can Be Too Late

**Preconception Health Matters** 



## CDC's Preconception Health and Health Care Initiative

- Encourages women and men to get healthy and stay that way to reduce risk of:

  - Preterm birth
    Low birth weight infants
    Birth defects and other health problems
- The 2017 Women's Preventive Services Initiative (WPSI):
  - at least one preventive care visit yearly starting in adolescence, with the goal of ensuring women get the necessary prenatal and inter-conception care

index.html; www.wom

# Future Moms' To-Do List

✓Get a physical exam that includes blood work

✓ Achieve and maintain body weight within the healthy range

- ✓ Evaluate safety of OTC and prescription meds
- ✓ Update vaccinations

✓ Quit smoking (linked to LBW, preterm birth, birth defects, infant death)

✓ Quit recreational drugs, even if legal

✓Talk about depression, if necessary

# Future Dads' To-Do List

- ✓ Practice "girth control" with balanced diet
- ✓ Mind your biological clock
- ✓ Take a daily multi
- ✓ Limit alcohol intake
- Check safety of OTC and prescription meds
- ✓ Stop smoking and using recreational drugs, even the legal kind

# **Prepregnancy Body Weight Stats**

- 20+ year-olds on average: 37% are obese
- Prepregnancy BMI among women giving birth in 2014:
- 3.8% were underweight (BMI less than 18.5)
- 45.9% were of normal weight (BMI 18.5–24.9)
- 25.6% were overweight (BMI 25.0-29.9)
- 24.8% were obese (BMI greater than 29.9)
- More women were overweight or obese than in the healthier weight range.

r65\_06.pdf; https://www.cdc.gov/n http://www.iom.edu/Reports/2009/weight-Gain-during-pregnancy-Reexamining-the-Guidelines.aspx

# Potential Risks of Overweight and Obesity

- Reduced fertility and chances for conception, even with ART
- Pregnancy hypertension
- Birth defects (the more overweight, the greater the risk)
- Gestational diabetes
- Induction of labor
- Cesarean delivery

- Stillbirth
  - Infant death
  - Post-partum weight retention
  - Lower breastfeeding initiation and duration
  - Higher risk for obesity, diabetes, HTN in offspring

# **Preterm Birth**

- Leading cause of infant death
- Leading cause of long-term disability in children
  - Cerebral palsy, developmental delays, vision and hearing problems
- The more preterm (before 37 weeks), the greater the potential for problems.



# About 380,000 babies are born prematurely every year.

That's about 10% of all births, which is among the WORST of all developed countries.

# **Risk Factors for Preterm Birth**

- Pregnancy with twins, triplets or more
- Problems with the uterus, cervix or placenta
- Some infections, particularly of the amniotic fluid and lower genital tract
- Smoking cigarettes, using illicit drugs
- Being underweight or obese before pregnand
- HIN (uncontrolled)
- Diabetes (uncontrolled)

# **Preterm Birth Outcomes**

- Immature GI tract can lead necrotizing enterocolitis (NEC)
- Preterm infants account for 60%-80% of NEC cases
- Problems start with feeding, as bacteria are introduced to the gut
- NEC causes inflammation that can lead to perforation and a cascade of negative health events

# Hyperglycemia and Pregnancy Outcomes

- 84 million Americans have prediabetes; many are women of childbearing age.
- Hyperglycemia in first trimester increases risk for birth defects and miscarriage.
- Prediabetes often predicts GDM and post-pregnancy type 2 diabetes.
- CDC estimates that GDM affects 9% of pregnancies. Risk factors include:
   BMI of 30 or higher
  - African American, Hispanic, American Indian, Asian descent
- Screen women before pregnancy, and if GDM, afterwards, too.
   http://www.dabetes.org/dabetes-basics/statistics/;
   http://www.dc.gor/mmwrthtm/rrs5061.htm
   http://www.dc.gor/manu/fabetes/perancy/

# Weight Gain During Pregnancy

Guidelines to Help Improve Maternal Health and Pregnancy Outcomes

Body Mass Index (kg/m2)			
Underweight	<18.5		
Normal	18.5-24.9		
Overweight	25.0-29.9		
Obese			
IDM goal: Conceive accordingly, which v			

BMI (kg/m2)	Recommended Weight Gain (singleton)	Recommended Weight Gain (twins)
<18.5		
18.5-24.9		
		2E to 42

# Gestational Weight Gain (GWG)

- Maternal weight status throughout the reproductive cycle influences the health
  of mother and child.
- In a 2017 meta-analysis of more than 1.3 M women, 47% had GWG greater than IOM guidelines
- In this group, there was a greater risk of macrosomia (birth weight of 8.8 pound or more) and cesarean delivery.
- GDM occurrence and post-delivery weight loss not measured.
- Gaining outside the guidelines also raises risk of childhood obesity
   and type 2 diabetes in child later in life

# Calorie Needs in Pregnancy

- T1: 0 extra calories
- •T2: + 340 calories/day
- T3: + 452 calories/day
- Nearly all food choices should be nutrient-rich.

National Academy of Sciences. Dietary Reference Intakes Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids. Washington, DC: National Academies Press, 2002.

# Healthy Eating During the Childbearing Years

**Bridging Nutrient Gaps** 

# Nutrients of Public Health Concern for Adults and Children

- Calcium: No change during pregnancy and lactation. (1,000 mg/day)
- Vitamin D: No change during pregnancy and lactation. (600 IU/day)
- Potassium: No change during pregnancy (4,700 mg/day); Lactation: 5,100 mg/day
- Fiber: Increases slightly as it's related to calorie intake. (14 grams/1,000 calories)



## Nutrients of Concern In U.S. Women of Childbearing Age

#### • Iron:

- Non pregnant: 18 mg
- Pregnancy: 27 mg
- Lactation: 9 mg • Folic acid:

  - Non pregnant: 400 IU
  - Pregnancy: 600 IU
  - Lactation: 500 IU



# **Other Nutrients of Concern**

#### Choline:

- Non pregnant: 425 mg
- Pregnancy: 450 mg
- Lactation: 550 mg

# Docosahexaenoic Acid (DHA):

- Minimum of 200 mg/day during pregnancy and lactation
- Iodine:
- Non pregnant: 150 mcg
  - Pregnancy: 220 mcg
  - Lactation: 290 mcg

### Iron

- Iron stores at conception are a strong indicator for irondeficiency anemia in pregnancy
- Iron is necessary for:
- Hgb production
- oxygen transport
  fetal immunity
- energy production
  CNS development
- 30 mg elemental iron/day to prevent anemia during pregnancy
  60 to 120 mg/day to treat

00051880.htm; http://www.cdc.gov/n

# **Folic Acid**

- Helps prevent neural tube defects (NTD) during first 30 days after conception
- · Linked to lower risk for preterm birth, fetal growth restriction and LBW
- Women capable of becoming pregnant: 400 mcg/day from supplements, fortified foods or mixture

### Choline

#### Essential nutrient

- 90 95% of pregnant women consume less than the suggested amount. Associated with a lower risk for NTD in some population studies
- Necessary for CNS development and support, and for acetylcholine production
- Animal studies suggest adequate choline during pregnancy improves cognitive functioning and may affect brain health later in life
- All cells need choline to preserve their structural integrity
- Choline can now be included on Nutrition Facts Label. • DV is 550 mg; labeling is voluntary

# Selected Sources of Choline (mg)

- Egg yolk, large: 125
- Ground beef, 3 oz. cooked: 85
- Pork tenderloin, 3 oz. cooked: 83
- Chicken breast, boneless, skinless, 3 oz. cooked: 78
- Salmon, sockeye, 3 oz. cooked : 65

# Docosahexaenoic Acid (DHA)

- Dominant fatty acid (FA) in brain cells
- Comprises up to 50% of the total FA in phospholipids of the retina
- DHA demands highest during the last trimester when fetal brain and CNS rapidly accumulate DHA
- Maternal plasma DHA highly dependent on intake

https://www.ncbi.nlm.nih.gov/pubmed/17419889; https://www.ncbi.nlm.nih.gov/pubmed/18184094

# Selected Sources of DHA (mg)

- Salmon, Atlantic, farmed, 3 oz. cooked: 1,238
- Tuna, white, canned, drained, 3 oz. : 535
- Prenatal vitamins with DHA: 200
- Chicken, roasted, dark meat, 1 cup: 70
- Fortified eggs, 1 large: 57-150
- Fortified soy beverages, milk, yogurt, 8 oz. : 32
- Manufacturer data; www.nal.usda.gov/fnic/foodcomp/search/

# How Much Fish for Women?

• 2015-2020 Dietary Guidelines for Americans:

- Adults: at least two fish meals (8 ounces) weekly
- Pregnant and breastfeeding women: two to three fish meals (8 to 12 ounces) weekly

Un average, pregnant women consume less than 2 ounce of fish weekly.

http://bit.ly/2bQ2ogT; DGA: http://bit.ly/2bY4Agi

# Seafood Guidance

- Lead with the good news: You can eat fish, and you should eat more.
- Shrimp, canned light tuna, salmon, pollock, and catfish are among the lowest in mercury, and are among Americans' top favorites.
- Limit white albacore tuna to 6 oz/week.
- Avoid tilefish, shark, swordfish, king mackerel, big eye tuna (sushi), marlin, orange roughy.

http://www.cnpp.usda.gov/sites/default/files/nutrition\_insights\_uploads/insight46.pdf; https://www.fda.gov/Food/ResourcesForYou/Consumers/ucm393070.htm

# Vitamin D

- Ages 1- 70 years: 600 IU vitamin D/day
- Upper limit: 4,000 IU/day
- Women in their childbearing years often get insufficient vitamin D
- Obesity decreases circulating vitamin D
- Difficult to get all the vitamin D you need from food

# Maternal Vitamin D Insufficiency

- Meta-analysis: serum 25-Hydroxyvitamin D [25(OH)D levels below 50 nmol/L (20 ng/mL) associated with:
  - Intrauterine growth restriction
  - Preeclampsia
  - Preterm birth
- 50 nmol/L or more is generally considered adequate for bone and overall health in healthy people.

s://www.ncbi.nlm.nih.gov/pubmed/23311886; https://www.ncbi.nlm.nih.gov/pubmed/23311886

# Selected Food Sources of Vitamin D (IU)

- Salmon (sockeye), 3 oz. cooked: 570
- Tuna, light, canned, drained, 3 oz.: 216
- Orange juice, vitamin D-fortified, 1 cup: 100
- Milk, any fat level, vitamin D-fortified, 1 cup: 98
- Yogurt, fortified, 5 oz. : 74
- Egg, 1 large: 41

www.nal.usda.gov/fnic/foodcomp/search/

# Vitamin D: Infants

- Vitamin D requirements cannot ordinarily be met by breast milk
   alone; infant formula is sufficiently fortified
- Breastfed infants should start receiving 400 IU of vitamin D in the early days of life to prevent rickets.

https://www.ncbi.nlm.nih.gov/pubmed/18977996?dopt=Abstract

# Iodine

- Major component of thyroid hormones that support CNS development during pregnancy
- Women of childbearing age in U.S. are among those likely to consume inadequate amounts of iodine
- Mild to moderate maternal iodine deficiency linked to increased risk for ADHD and other problems
- Infants who are exclusively breastfed depend on maternal iodine sufficiency for optimal development; breast milk iodine levels vary
- · Processed foods provide most of our salt intake, but salt is not iodized.

# **Including Adequate Iodine**

- Dairy milk, yogurt, seaweed, and seafood are iodine sources
- ¼ tsp iodized salt: about 70 mcg
- American Thyroid Association recommends pregnant and breastfeeding women and women planning to become pregnant consume at least 250 mcg iodine daily (higher than the IOM)
- iounic duily (ingrici than the low)
- 150 mcg of that from dietary supplement
- Potassium iodide is preferred form
- Can be found in OTC and prescription multivitamin/multimineral supplements
- https://www.thyroid.org/wp-content/uploads/2012/05/ATAIodineRec.pdf

### Multivitamin/Multimineral Supplements

- Low-risk, relatively low-cost, with potential rewards for mom and baby
- Fill in nutrient gaps that may affect mom and baby
  Poor diet before and during pregnancy and lactation
  - Gluten-free diets
  - Low or minimal intake of one or more food groups
- Meta-analysis of 41 studies suggests a link between MV and reduced NTD, heart and limb defects, and cleft palate

https://academic.oup.com/ajc/article/160/9/886/86599/Multivitamin-Use-and-the-Risk-of-Preterm-Birth; https://www.ncbi.nlm.nih.gov/pubmed/17022907

# Alcohol, Caffeine, Herbals

# Alcohol

Preconception: 2 or more drinks daily may lengthen time to pregnancy

- Pregnancy: No amount of alcohol is considered safe.
  - About 10% of pregnant women drink some alcohol during pregnancy.

ttp://www.marchofdimes.com/pregnancy/alcohol-during-pregnancy.asps; http:health.nih.gov/topic/FetalAlcoholSyndrome; https://www.cdc.gov/mmwr/prevew/mmwrhtml/mmb437a3.htm/s\_cd=mm6437a3\_w.

# Why Alcohol and Pregnancy Don't Mix

- Fetal Alcohol Spectrum Disorders, which include:
- Mental retardation
- Birth defects
- Behavioral problems
- Emotional problems
- Learning disabilities
- https://www.cdc.gov/ncbddd/fasd/facts.html

# Caffeine

- Observational studies link caffeine to miscarriage, growth restriction, LBW, pre-term birth, and stillbirth
- Insufficient evidence from RCTs to support benefits of completely avoiding caffeine during pregnancy
- Consensus is moderation: limit caffeine to 200 mg/day during pregnancy and when trying to conceive.

iatrics/108/3/776.full.pdf

• OK to consume small amounts when breastfeeding.

# Common Caffeine Sources (mg)

- Starbucks coffee, 16 oz. : 330
- Starbucks Caffe Mocha, 16 oz. : 175
- Tea, brewed, 16 oz.: 110
- Stay Alert gum, 1 piece: 100
- Red Bull, 8.3 oz. : 76
- Snapple, Lemon Iced Tea, 16 oz.: 62
- Coffee-flavored ice cream, 8 oz. : 58
- Diet Coke, 12 oz. : 47

# **Herbal Supplements**

Insufficient evidence regarding the safety of all herbs during pregnancy and lactation.

- Research suggests the following should be avoided:
  - Feverfew
  - Mugwort
  - Blue cohoshGoldenseal
  - Juniper berry
  - Chasteberry
  - Rue
  - Pennyroyal oilEphedra

https://nccih.nih.gov/health/herbsataglance.htm



# **Physical Activity Guidelines for Americans**

 Healthy women: At least 150 minutes of moderate-intensity aerobic activity, such as brisk walking, during and after their pregnancy, spread throughout the week.

 Healthy women who already do vigorous-intensity aerobic activity, such as running, or large amounts of activity can continue doing so during and after their pregnancy provided they stay healthy and discuss with their health care provider how and when activity should be adjusted over time.

Avoid any activity with pressure changes or risk of falling



# **Exercise During Pregnancy**

- Improves chances of gaining within the IOM's guidelines
- Helps prevent and manage GDM
- Improves mood and energy level
- Lessens constipation
- Improves sleep

# The Fourth Trimester:

Recovery, Breastfeeding, and Preparing for the Next Pregnancy?

# **Nutrient Needs of Breastfeeding Moms**

- Calorie increase (above needs in nonpregnant state): 330/day for first 6 months; 400/day for 6-12 months
- Fluid: minimum of 13, 8-ounce glasses/day
- DHA: minimum of 200 mg/day
- Daily multivitamin to cover nutrient needs + balanced diet with adequate choline and DHA; may need supplemental vitamin D and DHA

# Post-partum Weight Loss

- No drastic calorie restriction for at least 6 weeks post-delivery (nursing moms: no less than 1,800 calories/day)
- OK to exercise, if exercise is OK with health provider
- Give your body time to recover; can take up to a year to return to "normal"

# The Maternal Gut Microbiome

Paying It Forward for Healthier Generations

# Bugs Are Us



Microbiota: Microorganisms sharing human space
 Microbiome: Refers to microbes' genomes

- We co-exist with at least 10X as many microbial cells as human cells; mostly bacteria
- 99% of the microbiota is beneficial bacteria
- Most of the microbiome is in the gut, and most of the microbiome is bacteria
- The gut microbiome is a separate metabolic "organ" because it has so much influence over the rest of the body.

# Why We Need Beneficial Gut Bacteria

- Foster development of the immune system and for gut integrity
- Compete with pathogens and help prevent illness
- Break down toxins and potential carcinogens
- Make vitamins K, B2, B12, and folate
- · Promote the absorption of nutrients from food
- · Ferment resistant starch to create SCFA

## What Influences the Gut Microbiome?

- Mode of delivery at birth
- Antibiotic use
- Diet
  - Breastfeeding/infant formula/diet in early life
  - Food provides substrates for gut bacteria and can be source of live beneficial organisms (probiotics).
  - Short-term and long-term eating habits alter gut microbiota; bacterial community adapts and changes with diet

# The Gut Microbiome and Body Weight

- Healthy adult humans typically harbor more than 1,000 species of bacteria found predominantly in the Bacteroidetes and Firmicutes phyla.
- Higher levels of Bacteroidetes have been found in the guts of obese people, and may be better at extracting energy from food than Firmicutes.
  - Weight loss reduced Bacteroidetes and increased Firmicutes.
- http://www.ncbi.nlm.nih.gov/pubmed/24855004 http://www.ncbi.nlm.nih.gov/pubmed/23159341

# The Gut Microbiome, Prediabetes, and Type 2 Diabetes

- Disruptions in the balance of gut microbial populations may contribute to weight gain, and to insulin resistance (IR).
- IR resistance can lead to prediabetes and type 2 diabetes.

# The Gut-Brain Axis

- Gut dysbiosis linked to variety of stress-related conditions, such as anxiety and depression.
- The brain and the gut are in constant communication.
- Interactions between the ENS and gut microbes may result in communication between our brain and gut.
- Stress can change microbiota composition and vice versa.
- Levels of serotonin (a feel-good neurotransmitter) are influenced by gut bacteria; most serotonin is produced in the gut.

http://www.caltech.edu/news/microbes-help-produce-serotonin-gut-46495

### Colonizing the Infant Gut In Utero

 Infant gut is not sterile; meconium (infant's first stool) is thought to reflect intrauterine environment
 Microbes are found in the placenta, umbilical cord, mammary glands

 It's unclear how the gut becomes colonized in utero, but may be due to mom's increased gut permeability that allows translocation

• The first few years of life provide the opportunity to program the gut, given that it remains remarkably stable from age three on.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3426293/

# Mode of Delivery

- As babies pass through the birth canal, they are colonized by beneficial "pioneer microbes."
  - Educate the developing immune system
  - Provide favorable conditions for the arrival of other beneficial microbes
- During vaginal birth, the infant is also inoculated with mom's skin and intestinal microbiota.

# **Cesarean Delivery**

- With cesarean delivery:
  Initial gut environment is less diverse
  Colonization is delayed
- Babies born by cesarean delivery initially reflect more skin and environmental microbes in their gut
- U.S. cesarean delivery rate is 32%

https://www.cdc.gov/nchs/data/nvsr/nvsr63/nvsr63\_06.pdf

# Does CD Influence Health?

CD may increase risk of:

- asthma
- systemic connective tissue disorders
- rheumatoid arthritis
- IBD
- immune deficiencies
- leukemia
  - 2 M term infants delivered by CD studied for 35 years
  - No associations were found between cesarean delivery and type 1 diabetes, psoriasis, or celiac disease

# **Preterm Infants**

- Cesarean delivery may be a factor
- Gut microbiome is less diversity and harbors more pathogenic bacteria than term infants
- Associated with NEC, which is associated with antibiotic use

# Prebiotics Feed the Infant Gut

- Waxy skin coating of fetus vernix is shed into the amniotic fluid as fetus approaches term
- The fetus swallows the amniotic fluid which contains pieces of the vernix, which provides short chain fatty acids (SCFA)
- Gut bacteria ferment SCFA and extract energy
- In term babies, SCFAs are present in the gut and serve as the initial prebiotics for infants

# Breast Milk and Infant Microbiome

- Contains beneficial bacteria, so it's a probiotic (has live organisms) and a prebiotic (food)
- Breastfed infants have a greater diversity of microbes.
- Colostrum is rich in Human Milk Oligosaccharides (HMOs), which aren't fully digestible but are broken down by gut microbes.
- HMOs selectively promote the growth of beneficial bacteria (Bifidobacteria) while suppressing certain pathogens, including E. Coli, and C. perfringens.
- Also promotes immunity and suppresses inflammation and may help protect against ear infections, asthma, allergy, etc.
- Breastfeeding is associated with a decreased risk of overweight in offspring.





# What's the Best Gut Microbioata?

- There doesn't appear to be a "perfect microbiota."
- The gut microbiome specializes itself, largely due to eating patterns, and there's lots of variation among healthy people.
- Differences in the numbers of different kinds of microbes have been found between people with high-fat "Western" diets, plant-rich diets, and animal protein-rich diets.

tp://www.ncbi.nlm.nih.gov/pubmed/24848531

# Fermented Foods (Probiotics)

- Yogurt (milk + live active cultures)
- Kefir (milk + yeast and bacteria)
- Kimchi (cabbage and bok choy + lactic acid)
- Sauerkraut (cabbage + lactic acid; purchase unpasteurized kind)
- Tempeh (fermented cooked soybeans formed into a "cake")
- Kombucha (fermented drink made with tea, sugar, bacteria and yeast); not recommended during pregnancy

# **Probiotic Supplements**

- Probiotic = live organisms that, when consumed in adequate amounts, confer a health benefit.
- Used to (IBS), Irritable Bowel Disease (IBD), C. difficile infection conditions.
- But what, if anything, do they do for healthy people?
  No long-term studies of safety or efficacy.
  - Difficult to know which strains are best.

# **Probiotic Supplementation: Pregnancy**

- Probiotics during and after pregnancy may alter the infant's microbiome, but evidence is mixed
- Probiotics during pregnancy have shown some promise in
  - regulating plasma glucose levels and insulin sensitivity
  - neonatal colonization of bifidobacterial
  - reductions in the fetal growth associated with GDM
- Need more RCTs that are consistent for:
  - Strains
  - Dosing
  - Timing

# Prebiotics

- Prebiotics are components of food that promote the growth of beneficial microorganisms in the intestine.
- While probiotics introduce good bacteria into the gut, prebiotics act as a *food source* for the colonies of bacteria that live there.
- Prebiotics, unlike probiotics, are not heat-labile.

# **Resistant Starch (Prebiotic)**

- Indigestible fermentable fiber.
- Colonic bacteria feed on resistant starch; produce short chain fatty acids (SCFA), including butyrate.

# **Butyrate's Health Effects**

- Energy source for gut microbes and for cells in the lining of colon.
- Helps body dodge colon cancer and inflammatory bowel disease (IBD)
  Inadequate fiber leads to degradation of the intestinal lining.
- Travels to the liver and signals it to release less glucose.
- Plays a role in stabilizing blood glucose levels.



# Adequate Fiber Intake

- Fiber can produce changes in the gut microbiota. The phyla don't change, but the species do.
- Adults need 14 grams fiber daily for every 1,000 calories consumed
  - Minimum of 28 grams per daily on a 2,000-calorie diet • We consume, on average, about 12 grams fiber daily per 2,000 calories

High-fiber foods include: Whole grains: At least 3 servings daily Fruits, vegetables: At least 5 servings daily Legumes: ½ cup daily

# **Emulsifiers in Food May Harm Microbiome**

- Two dietary emulsifiers carboxymethylcellulose and polysorbate-80 induced gut microbiota alteration and gut barrier dysfunction in mice, resulting in weight gain, low-grade inflammation, and metabolic disorders in rats.
- Eroded the mucous membrane that lines the gut and provides a buffer between the epithelial cells and gut microbes.
- Altered composition of gut microbes, not only boosting strains that promote inflammation but driving down strains that check the process.

# How to Build a Better Gut

- Eat adequate dietary fiber every day, and include foods rich in resistant starch as part of a balanced diet.
- · Eat at least one serving of fermented foods daily.
- Include plant protein, such as soy and legumes, to make it easier to include fermented and fibrous foods into your eating plan.
- Avoid excess intake of foods with carboxymethylcellulose and polysorbate-80 .
- Avoid probiotic supplements for now, unless you have a medical problem and have consulted a health care provider for advice about what kind, and how much, to take.



# Pay It Forward Start Early, Stay Well









