



GrowBaby®

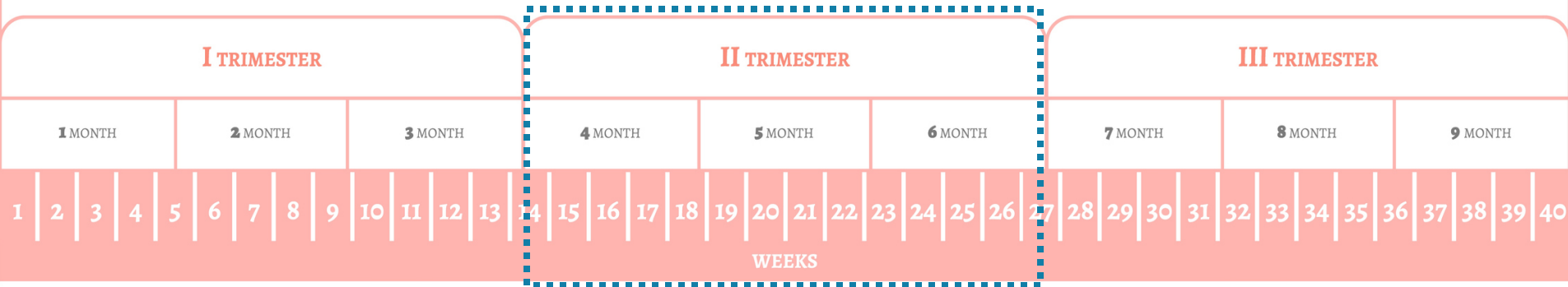
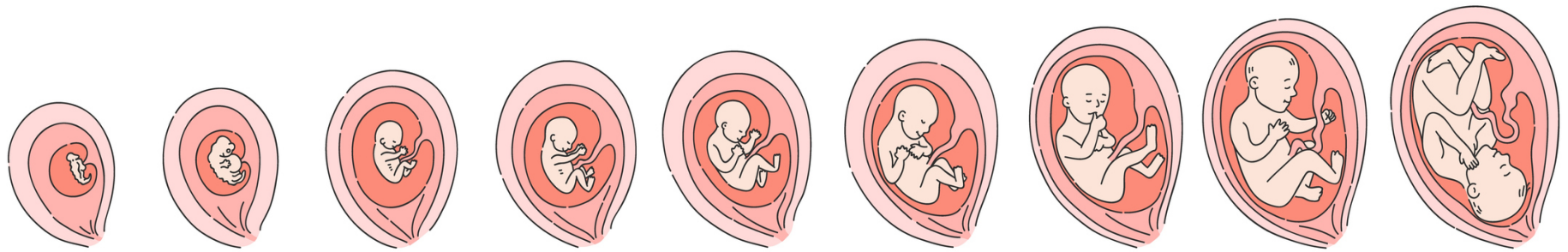
2ND TRIMESTER
WEEKS 14-27



@growbabyhealth



@growbabyhealth



- ❖ **Immune System:** The first **white blood cells** are produced by baby's liver, thymus, and spleen.
- ❖ **Palette development:** Experience their first tastes.
- ❖ **Musculoskeletal:** First **fetal movements** are felt while baby's bones and teeth develop **Coordination:** Baby starts **learning how to grasp, suck their thumb, hiccup, and will soon open their eyes**
- ❖ **Language:** Baby can detect their first sounds

IMPORTANT MACRONUTRIENTS FOR 2ND TRIMESTER

Protein

Quality

Combination
plant/animal
protein

Fats

Omega-3
fatty acids

Variety of
healthy fats

Carbohydrate

Rainbow of
fruits/veggies

Unrefined-
high fiber-
complex

IMPORTANT MICRONUTRIENTS FOR 2ND TRIMESTER

Vitamins

B2, B6, Folate,
B12 & Choline

Vitamin A, C,
D, K

Minerals

Iron, Calcium

Magnesium

Phytonutrients

Rainbow of
fruits/veggies

Prebiotic fibers
for probiotic
support

MACRONUTRIENT FOCUS

LOW GLYCEMIC INDEX

40% CARBOHYDRATE/30% PROTEIN/30% FAT

“Normal pregnancy can be associated with a decline in energy and micronutrient intake from diet. Low dietary GI and GL were the best predictors of a favorable micronutrient profile.”

Goetzke et al, American Journal of Clinical Nutrition, Volume 102, Issue 3, 1 September 2015, Pages 626–632



GrowBaby®

MACRONUTRIENT BALANCE & QUALITY

LOW GI addresses the increased micronutrient needs of pregnancy³

- **Mediterranean (ME) diets** reduced the incidence of GDM-most relevant neonatal outcomes were the improvements in rates of SGA and LGA newborns²

LOW GI reduces

- Risk of macrosomia in women with GDM¹
- Risk of insulin usage in women with GDM¹

LOW GI and added fiber reduced risk of macrosomia even further¹

❖ High-glycemic load and low-cereal fiber diet was linked to a 2.15-fold (1.04–4.29) increased risk of GDM⁴

1: Wei, Jet al, *Medicine*, 95(22), e3792.

2: Assaf-Balut et al, *PLoS One*. 2017;12(10):e0185873.

3: Goletzke et al, *American Journal of Clinical Nutrition*, Volume 102, Issue 3, 1 September 2015, Pages 626–632

4: . Zhang et al, *Diabetes Care*. 2006;29:2223–2230

FATS & OILS

DAILY

Minimally refined, cold-pressed, organic, non-GMO preferred

2 tbsp Avocado 1 tsp Oils, salad: almond, flaxseed, grapeseed, olive (extra virgin), rice bran, 1 tsp Butter (2t whipped) 1/4 oz Chocolate, dark 2 tbsp

1 1/2 tbs

1 tbs
1 tbs

>70%

1 SERV

NUTS

6
2
6
1 tbs
3 tbs

2 tbs
5
1 tbs
6

1 SERV

PROTEIN

Lean, g

ANIMAL

1 oz
1/4 c
2/3 c
1
1 oz
1 oz

1 oz

Shrimp, clams, crab, lobster, mussels, oyster, scallops, shrimp
Meat: beef, buffalo, elk, lamb, pork, venison, other wild game

1 OZ SERVING = 35-75 CALORIES, 7 G PRO

FLUIDS (NO SUGAR/SODIUM ADDED)

DAILY

8 oz Water, Sparkling Water, Coconut Water, Herbal Tea

LEGUMES

DAILY

3/4 c Bean soups 1/2 c Edamame (cooked)
1/2 c Black soy beans (cooked) 1/3 c Hummus or other bean dips
1/2 c Dried beans, lentils, peas (cooked) 1/2 c Green peas (cooked)

1 SERVING = 110 CALORIES, 15 G CARBS, 7 G PRO

VEGETABLES (STARCHY)

DAILY

1/2 c Acorn squash, cubed 1/2 md Potato (purple, red, sweet, yellow)
1 c Beets, cubed 1/2 c Potatoes, mashed
1 c Butternut squash, cubed 1/2 c Root vegetables: parsnip, rutabaga
1 c Celery root, cubed

Let's Calculate Protein

Current Weight in lbs / 2.2 = Kilograms

Kilograms X 1.1 / 1.2 g =

Grams needed daily

For example: 160 lbs / 2.2 = 72 kilograms
X 1.1 = 80 grams daily (11.4 oz)

Basil

Chamomile

Dill

Echinacea

Fennel

Fenugreek

Lavender

Mint

Nettle

Oregano

Red Raspberry Leaf*

Rosemary

Thyme

*Discuss dosing, form & frequency

Cinnamon

Curcumin (cumin)

Ginger

Nutritional Yeast

Paprika

Pepper (black)

Turmeric

Dirty Dozen (Buy Organic): celery, hot peppers, kale, spinach, tomatoes

Clean Fifteen (Ok Conventional): asparagus, broccoli, cabbage, cauliflower, eggplant, mushrooms, onions

1/3 c

Couscous, whole wheat

1/2 c

English muffin

1/2 c

Kasha, cooked^{GF}

1/2 c

Muesli (no added sugar)

1/3 c

Pasta

1/2 c

Pita

1/2 c

Quinoa, cooked^{GF}

1/3 c

Rice^{GF}; basmati, black, brown, purple, red, wild

1

Tortilla, 6" (whole wheat/grain rice, corn)

1/4 c

Wheat germ

1 SERVING = 75-110 CALORIES, 15 G CARBS

Gluten-free grains

Kamut

Millet^{GF}

Oats

Quinoa^{GF}

Rice^{GF} (all types)

Semolina

Sorghum^{GF}

Spelt

Teff^{GF}

Whole Wheat

^{GF}=GLUTEN FREE

When does your
baby first
experience
flavors?

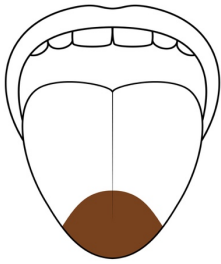


OPENING THEIR WORLD

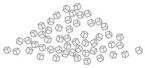
❖ **The flavors that you eat pass through you into the your amniotic fluid.** Starting in the 2nd trimester, your amniotic fluid is not just electrolytes, but carbohydrates, fats, protein, and urea, as well.



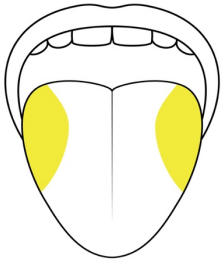
SWEET



SALTY



SOUR



BITTER



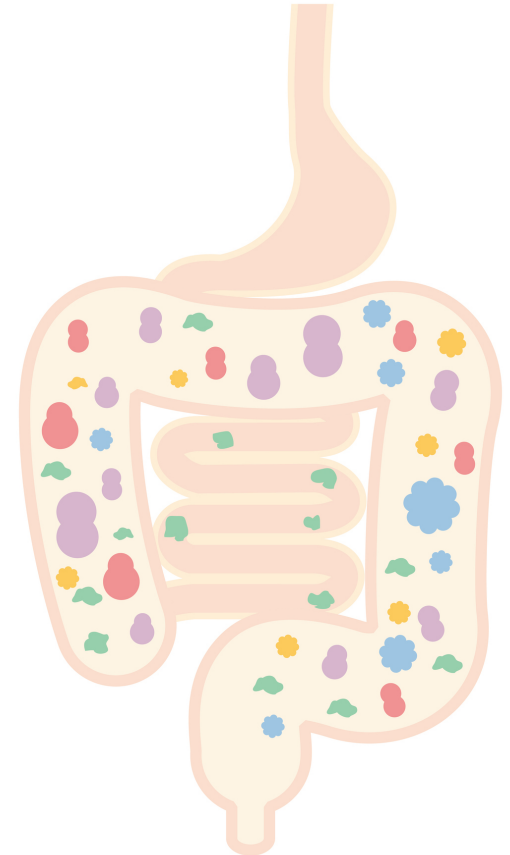
UMAMI



Taste Receptors in mouth is not the only place tasting occurs...

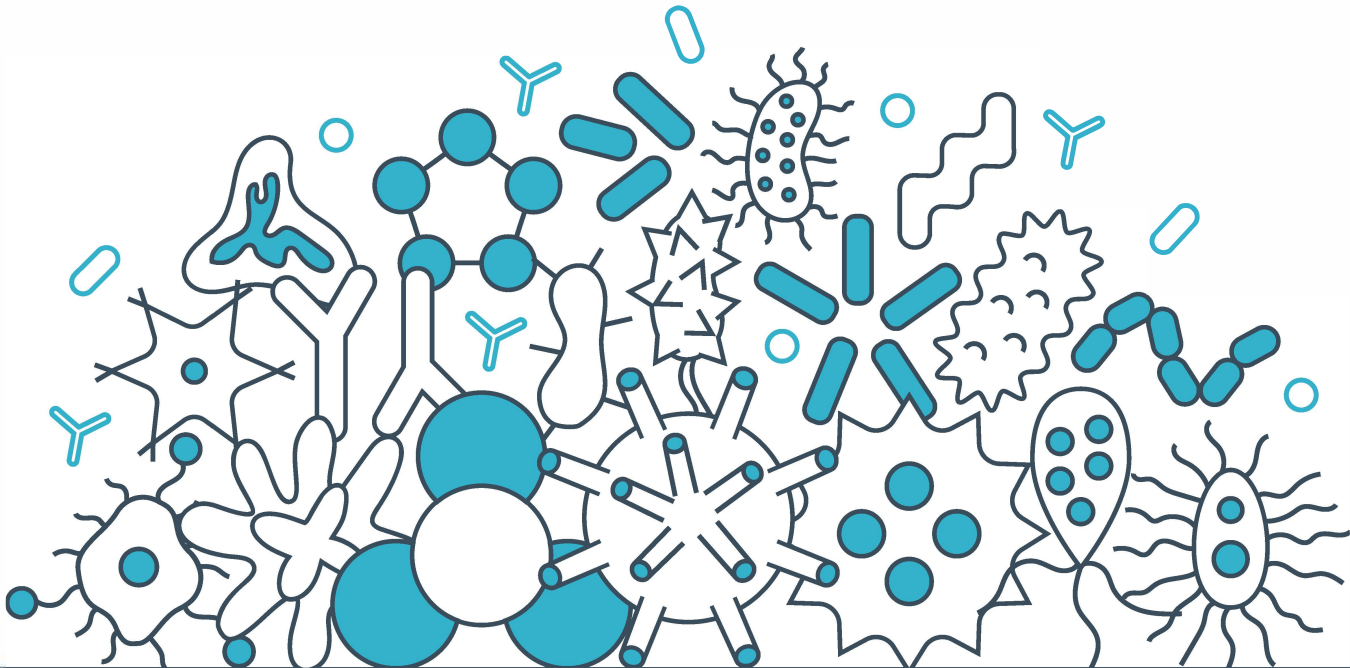
Swallowing amniotic fluid exposes flavors, nutrients & bacteria to the *epithelial* & *enteroendocrine* cells of the gut ...

This flavor exposure in the gut influences the beginning of the gut-brain connection.



The process of swallowing non-sterile amniotic fluid likely inoculates the healthy fetal gut with a developing microbiome.

Hypothesis: When the gut first meets the brain may be when our brain learns to feel food in the gut.



Palette Development-The Case for Array and Diversity	Source
<p>The recommendation to consume more fruits and vegetables during both pregnancy and lactation is a <u>key component</u> of dietary guidelines to boost phytochemicals and <u>protect mothers and infants</u> from oxidative damage and related diseases.</p>	<p>Apollinaire Tsopmo, Antioxidants (Basel). 2018 Feb; 7(2): 32</p>
<p>Prenatal and early postnatal exposure, at the least, predisposes the young infant to favorably respond to the now familiar flavor, which, in turn, facilitates the transition from fetal life through the breastfeeding period to the initiation of a varied solid food diet. In this way, culture-specific flavor preferences are likely initiated early in life. Significant traces of this may remain as children become adults and pass on their food habits to the next generation, often via amniotic fluid and breast milk-associated cues.</p>	<p>Mennella et al, Pediatrics. 2001 Jun; 107(6): E88.</p>
<p>A wide variety of flavors either ingested (eg, fruit, vegetables, spices) or inhaled (eg, tobacco, perfumes) by the mother are transmitted to her amniotic fluid and/or milk, significantly increasing in intensity in milk within hours after consumption. Infants' experience with these volatiles and tastes modifies their acceptance in mother's milk, formula, and solid foods.</p>	<p>Julie Mennella, Am J Clin Nutr. 2014 Mar; 99(3): 704S-711S</p>
<p>Experience with flavors that are bitter, sour or have umami characteristics, as well as volatile flavors such as carrot and garlic, occurs through flavorings in breast milk, infant formula and early foods. These early experiences mold long-term food and flavor preferences which can impact upon later health.</p>	<p>Beauchamp et al, Digestion. 2011;83 Suppl 1:1-6</p>

PHYTONUTRIENTS: COLOR = BETTER HEALTH!



PHYTONUTRIENTS



1. What are Phytonutrients?

Phytonutrients or phytochemicals are compounds found in plants. They help protect the plant's vitality and provide vital health benefits to the consumer as well! That's because those colors have health promoting properties boasting antioxidant, anti-inflammatory, and anti-cancer capabilities. And yes, every color provides a different health benefit!

2. Where can I find them?

Fruits and vegetables, legumes and beans, nuts and seeds, herbs and spices, and whole grains are concentrated sources of phytonutrients.

Deficiency rate: Eight out of ten Americans fall short in every color of phytonutrients (especially blue/purple)⁵

- Lower intake of vegetables during the first trimester associated with a higher incidence of SGA⁴
- Protects against preeclampsia¹
- High maternal plasma concentrations of **carotenoids** (β -carotene, lutein and zeaxanthin, and α - and β -cryptoxanthin) during pregnancy decrease the risk of giving birth to SGA babies²
- Phytosterol-enriched food (soy) improves lipid profile and insulin resistance in women with Gestational Diabetes Mellitus³

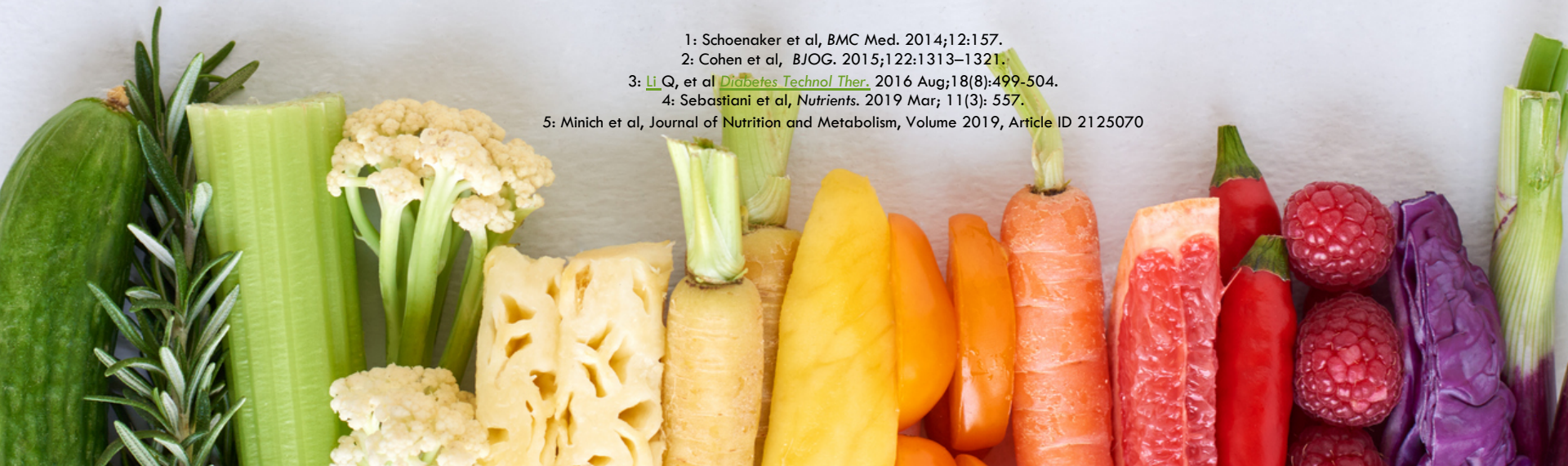
1: Schoenaker et al, *BMC Med.* 2014;12:157.

2: Cohen et al, *BJOG.* 2015;122:1313–1321.

3: [Li Q](#), et al *Diabetes Technol Ther.* 2016 Aug;18(8):499-504.

4: Sebastiani et al, *Nutrients.* 2019 Mar; 11(3): 557.

5: Minich et al, *Journal of Nutrition and Metabolism*, Volume 2019, Article ID 2125070



BLUE, BLACK & PURPLE

RICH IN:

Flavonoids

Anthocyanins

Resveratrol

Polyphenols

BENEFITS:

1. Cell Protection
2. Cognitive Health
3. Heart Health
4. Anti-inflammatory
5. Anti-cancer



1

1000000



RED & PINK

RICH IN:

Lycopene

Anthocyanins

Carotenoids

Flavones

Quercetin

BENEFITS:

1. DNA Health
2. Cell Protection
3. Anti-inflammatory
4. Anti-cancer
5. Immune Health



YELLOW

RICH IN:

Carotenoids

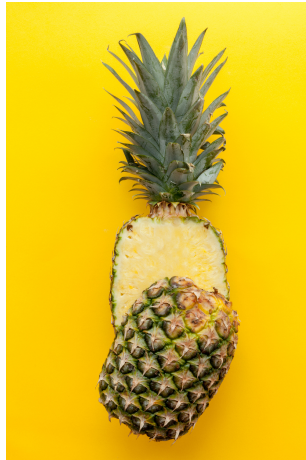
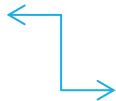
Lutein

Zeaxanthin

BENEFITS:

1. Anti-cancer
2. Cell protection
3. Eye, Heart, Skin Health
4. Anti-inflammatory

***High in Bromelain
to help with
indigestion!***





1 CUP
PINEAPPLE/PAPAYA
(FROZEN)
1/4 CUP COCONUT
MILK (FROM CAN)
1/2 CUP COCONUT
WATER

1 TBSP APPLE
CIDER VINEGAR
1 TSP ALOE
VERA



1/2 LIME
MINT LEAVES
WATER

BLEND & DRINK
2-3X WEEKLY
FOR HEARTBURN

GREEN

RICH IN:

Catechins

Phenols

Phytosterols

Isoflavones

BENEFITS:

1. Brain, Skin, Heart, and Liver Health
2. Cell Protection
3. Anti-cancer
4. Anti-inflammatory



WHITE & TAN

RICH IN:

Lignans

Tannins

Sulfides



BENEFITS:

1. Cell protection
2. Gastrointestinal Health
3. Heart, Liver Health
4. Anti-microbial



VITAMIN C

- Helps protect your cells against damage
- Improves iron absorption
- Is a key part of a healthy immune system
- Helps with wound healing and tissue repair
- Can help with constipation and muscle cramps
- Co-factor of carnitine synthesis

Makes up collagen! Include vitamin C rich foods daily to help stretching skin--Vitamin C during pregnancy is important in the production of collagen, which is a type of protein that gives structure to a developing fetus's cartilage, muscles and bones. Collagen holds cells of the skin, gums and tendons together ⁽¹⁾.

VITAMIN C RICH FOODS

1. Acerola Cherries
2. Red Chili Peppers
3. Guavas
4. Bell Peppers
5. Kale
6. Parsley
7. Collard Greens
8. Broccoli
9. Brussels Sprouts
10. Mustard Greens
11. Cauliflower



IRON

- Blood volume increases by about 50% during pregnancy!
- Protein and iron are required to help make new red blood cells
- Iron keeps your immune system healthy and helps your body produce energy
- Nerves are coated by myelin sheaths—iron will help this fatty substance speed nerve cell transmission
- Iron helps carry oxygen throughout your whole body
 - *Vitamin C helps increase absorption*
 - Take calcium separately for better absorption

IRON RICH FOODS

HEME IRON – per 3 ½ oz

1. Beef Liver
2. Beef
3. Clams
4. Pork
5. Eggs
6. Lamb



NON-HEME IRON – per 3 ½ oz

1. Kelp
2. Brewer's Yeast
3. Blackstrap Molasses
4. Pumpkin & Squash Seeds
5. Sunflower Seeds
6. Millet
7. Parsley
8. Almonds
9. Dried Prunes



Iron



Vitamin C



CALCIUM: 1,000MG

- During the second trimester, baby's bones and teeth are hardening.
- If you don't intake enough calcium through a food or supplementation, your baby will absorb it from your bones.
- Calcium also plays a role in blood clotting, nerve conduction, muscle contraction and cell membrane function, as well as bone health.
- IF Supplementing: Calcium carbonate and calcium citrate are better absorbed and should be taken separately from any iron supplementation.



1. Kelp
2. Swiss Cheese
3. Cheddar Cheese
4. Carob
5. Dulse
6. Collard Greens
7. Turnip Greens
8. Molasses
9. Almonds
10. Parsley
11. Dandelion Greens

Per 3 ½ oz or 100 grams

CALCIUM RICH FOODS

BONE BUILDING NUTRIENTS

MAGNESIUM: Spinach, squash and pumpkin seeds, soybeans, avocado, banana, figs

BORON: Raisins, nuts, avocados, broccoli, potatoes, pears, prunes, honey, oranges, onions, chickpeas, carrots, beans, bananas, red grapes, red apples

MANGANESE: Beans, Lentils, Peas, Whole grains

VITAMIN A: Chicken, beef, whole milk, cheese, eggs, carrots, peas, oatmeal, mango, papaya, apricots, spinach, kale

VITAMIN D: Fish, Eggs, Milk

VITAMIN K: Brussels sprouts, parsley, watercress, broccoli, kale

CALCIUM: Greens, yogurt, basil

PHOSPHOROUS: Pumpkin seeds, romano cheese, salmon, scallops, Brazil nuts, pork, beef, yogurt

THAT GUT FEELING

- $\frac{2}{3}$ of your immune system resides in your gut
- $\frac{3}{4}$ of all immune cells are produced in your gut



We are more bacteria than human!

Disorders such as obesity, inflammatory bowel diseases, metabolic syndrome, allergy, autoimmune disorders, and autism are increasingly linked to dysbiosis in the gut¹

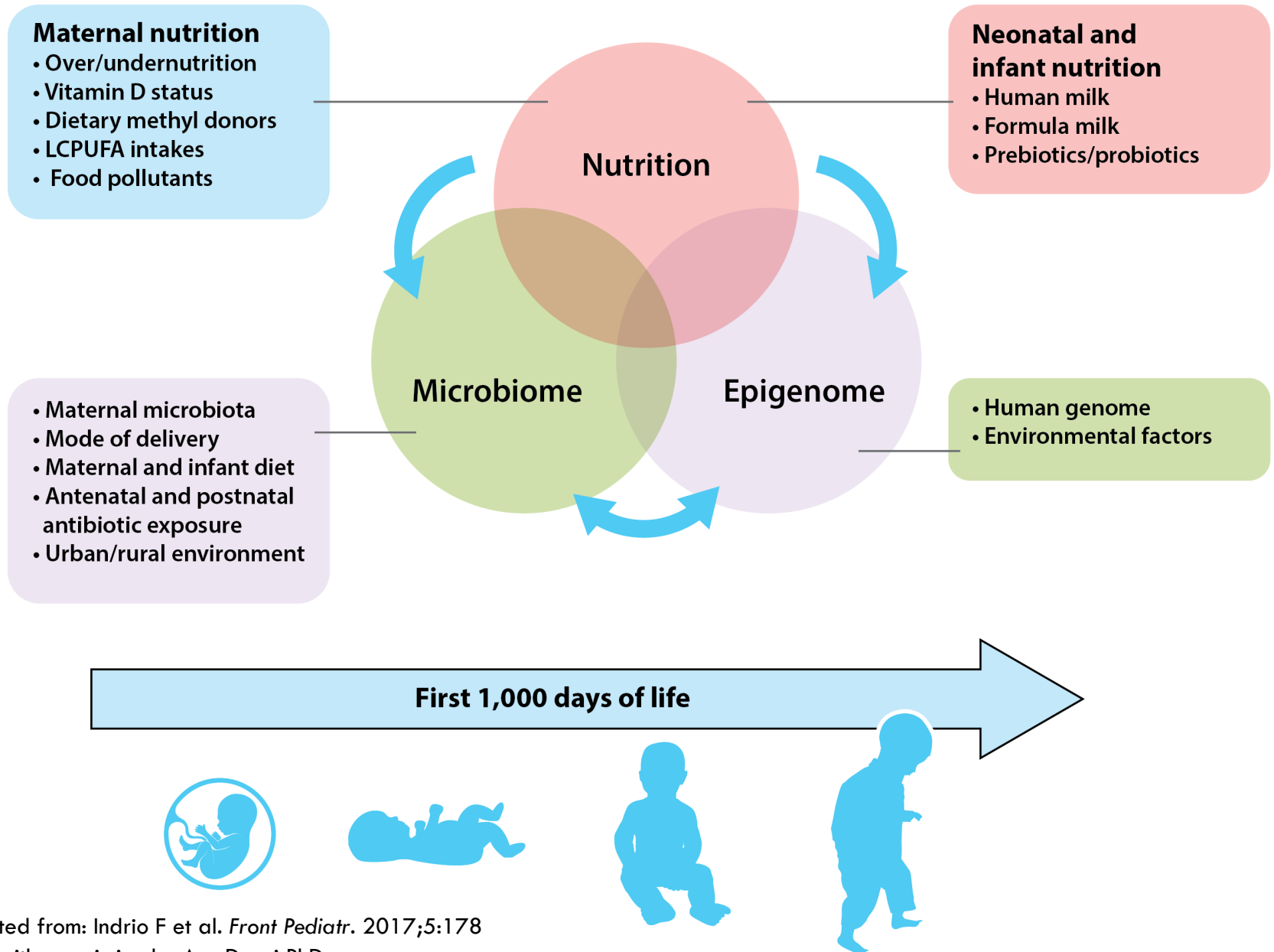
- Pre-Pregnancy weight
- Weight Gain in pregnancy
- Allergies
- Antibiotic Use
- Gestational Diabetes
- Lifestyle (diet, stress, sleep)

IMPACT Maternal and Fetal Microbiota Composition

EXCESSIVE GESTATIONAL WEIGHT GAIN (EGWG)

>40 LBS / >8 KG & *MICROBIOME HEALTH*

1. Pre-pregnancy obesity and EGWG
 - Increases fetal macrosomia
 - Increases risk of autism
 - Increases developmental disabilities
2. Lean people have more bacteroides : Obese people have more firmicutes
3. Pregnant women with more lactobacillus are protected against EGWG
4. Shifting away from SAD in obese changes the microbiome to that of typical non-obese



Adapted from: Indrio F et al. *Front Pediatr.* 2017;5:178

Used with permission by Anu Desai PhD

PROBIOTIC RICH FOODS

1. Kefir
2. Sauerkraut
3. Yogurt
4. Miso
5. Natto
6. Kimchi
7. Tempeh

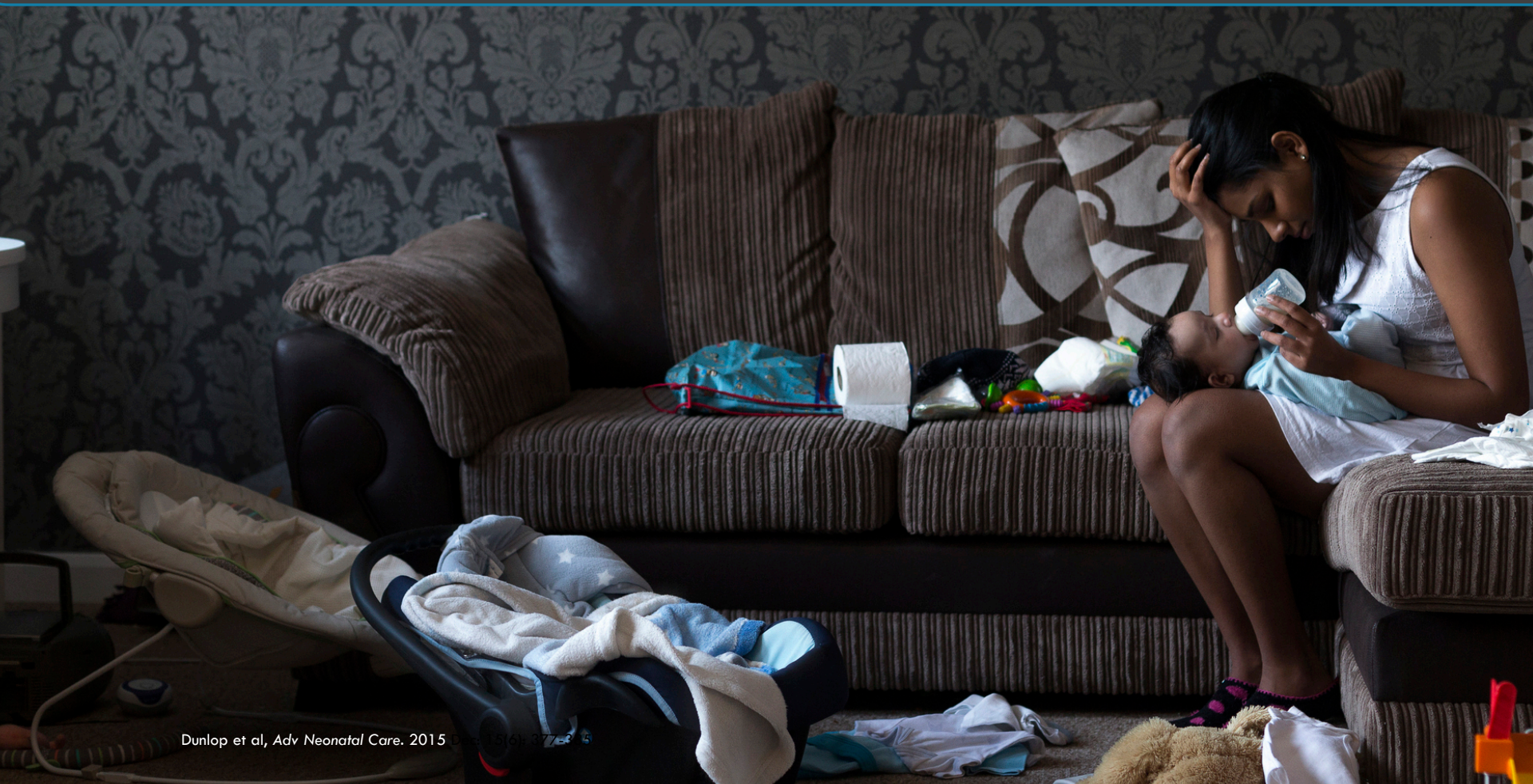
Prebiotic Foods

1. Apple Cider Vinegar
2. Asparagus
3. Onions & Garlic
4. Bananas
5. Jerusalem Artichoke

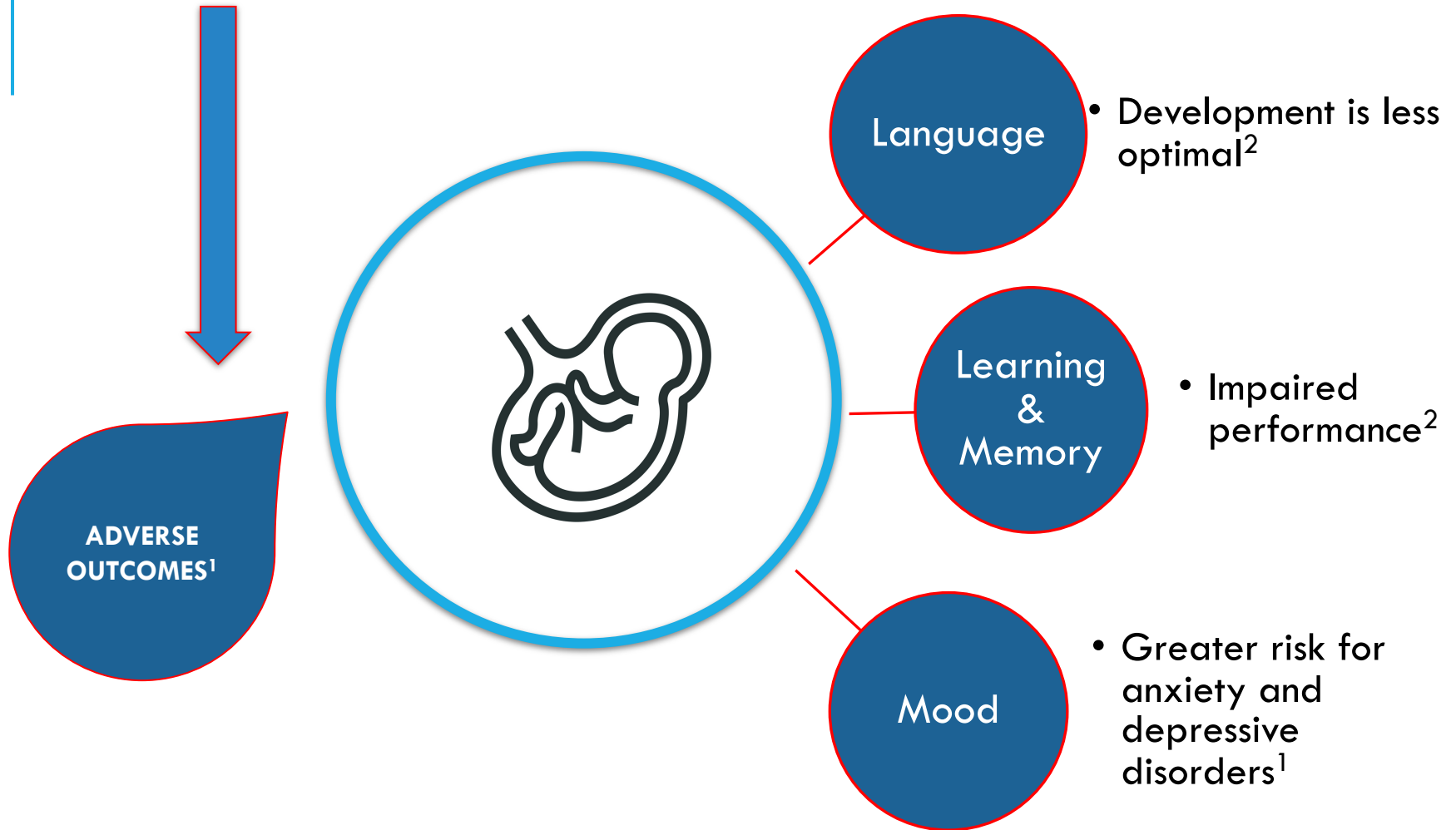


Maternal anxiety is associated with reduced blood flow to the fetus, and fetal levels of stress hormones reflect those of their mothers

A SINGLE acute stressor decreases fecal colony counts by 50% within 6 hours



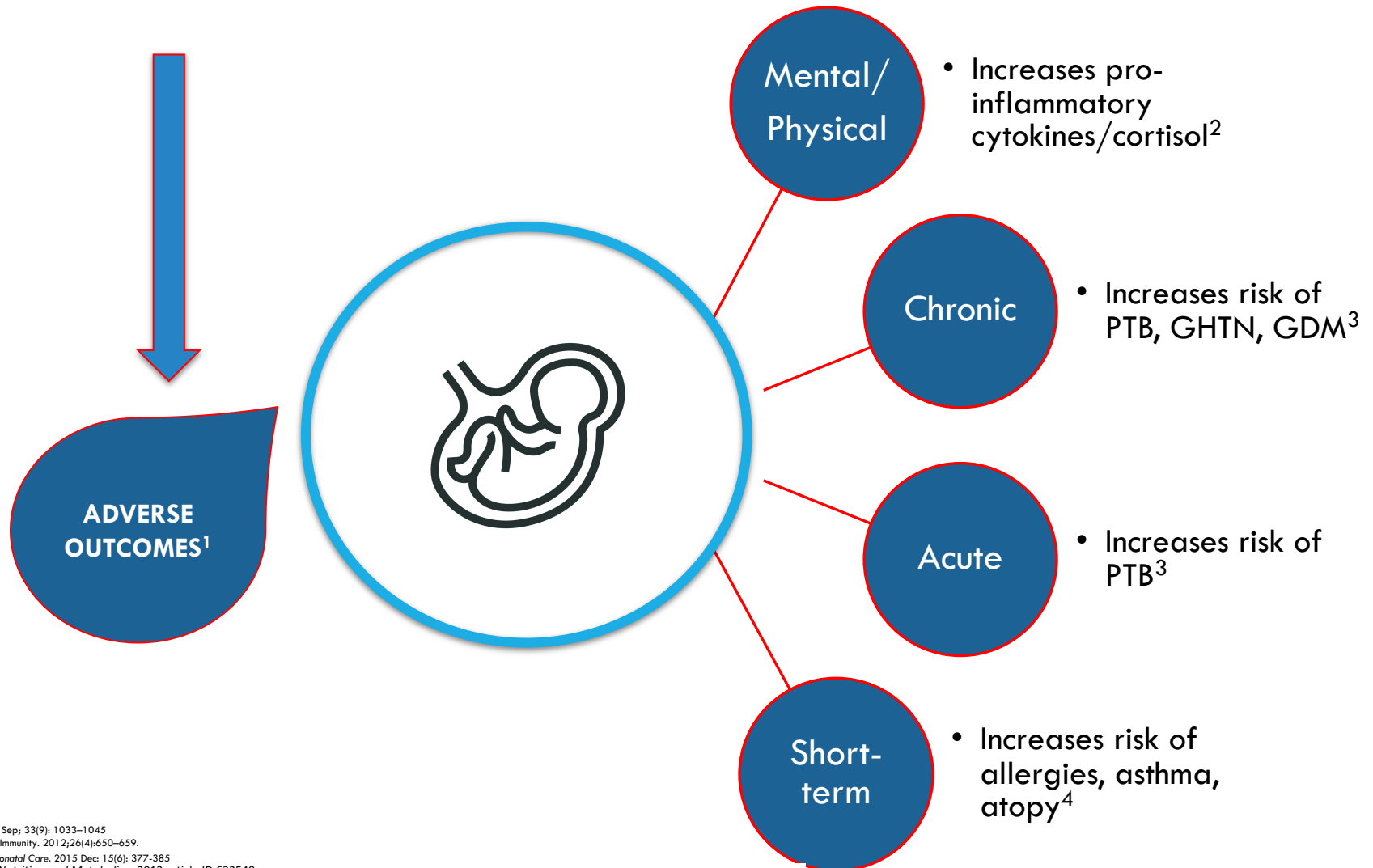
STRESS DYSREGULATION: MATERNAL DISTRESS



1. Davis, et al *Psychoneuroendocrinology* 2012; 37 (8): 1224-33

2. LeWinn et al, *Int J Epidemiol.* 2009;38(6):1700–1710

2ND & 3RD TRIMESTER STRESS



1. *Health Psychol.* 2014 Sep; 33(9): 1033–1045

2. *Brain, Behavior, and Immunity.* 2012;26(4):650–659.

3. Dunlop et al, *Adv Neonatal Care.* 2015 Dec; 15(6): 377-385

4. Entringer et al, *J Nutrition and Metabolism* 2012 article ID 632548.

STRESS—AN OPPORTUNITY.



TOUCH

Reflexology during pregnancy may help reduce low back and pelvic girdle pain and associated stress¹

Aromatherapy massage (lavender essential oil) could significantly decrease stress and enhance immune function in pregnant women²



MIND

Mindfulness training during pregnancy may effectively reduce pregnancy-related anxiety and worry³

Gratitude-based intervention has the potential to reduce stress in pregnancy⁴



AIR

Exposure to natural green (park) and blue (ocean) environments can lower stress and improve mood. Even in urban environments exposure to the outdoors improves stress response⁵.



BREATH

Relaxation breathing techniques show beneficial effects on reducing perceived stress in pregnant women⁶

2X weekly yoga decreases depression, anxiety⁷ and perceived stress⁷, and enhances immune function in pregnancy^{8,9}



*CURRENT STANDARD
RECOMMENDATIONS
FOR MODERATE
MOVEMENT AND
EXERCISE IN
PREGNANCY:*

**150 MINUTES
WEEKLY**

TOP REASONS FOR MAMA & BABY

#1 HEALTHIER

MOVE LIKE YOU CAN:

Maintenance of pre-pregnancy levels of physical activity during pregnancy may reduce the risk of gestational diabetes and preeclampsia^{1,2}

1: Sorensen et al, *Hypertension*. 2003 Jun; 41(6):1273-80.

2: Hegaard et al, *BMC Pregnancy Childbirth*. 2010;10:33.

3: Perales et al, *Eval Health Prof*. 2015 Mar;38(1):59-72.

#2 BETTER MOOD

MOVE FOR YOUR MIND:

Physical exercise during pregnancy reduces the level of depression and its incidence in pregnant women³

MAMA

#3 ↓ GDM / #4 OUTCOMES

3. At least 30 minutes, 3 times per week, is associated with a significant reduction in the frequency of gestational diabetes mellitus in overweight/obese pregnant women¹.

4. Exercise during the 2nd and 3rd trimester of pregnancy for 60 minutes, 3X weekly in sedentary women reduced excessive LDL-c and triglyceride gain and favored fewer delivery and neonatal complications without any adverse acute fetal responses².

#5 PREVENTION

5. Maternal exercise 50-55 minutes, 3X per week may be a preventative tool for hypertension and EGWG³.

6. Light-Moderate intensity Aerobic and Resistance exercises performed 3 days a week, 50-55 minutes prevents EGWG in pregnancy in normal weight women⁴.

1: Wang et al, [Am J Obstet Gynecol](#). 2017 Apr;216(4):340-351.

2: Ramírez-Vélez et al, *BMC Pregnancy Childbirth*. 2017;17(1):396.

3: Barakat et al, [Am J Obstet Gynecol](#). 2016 May;214(5):649

4: Ruiz, Jonatan R. et al. Gestational Weight Gain: A Randomized Controlled Trial Mayo Clinic Proceedings Volume 88, Issue 12, 1388 – 1397.

Conservative but,
**Validated Target Heart Rate (BMI/Age)
in Pregnant Women**

Healthy
140 beats/min⁻¹*
*There are no standard guidelines for
heart rate in pregnancy

Sedentary overweight and obese
102-124 beats/min⁻¹ (20–29 yo)
101–120 beats/min⁻¹ (30–39 yo)

~Representing an exercise intensity of 20%–39%VO₂ reserve

American College of Sports Medicine



BABY

#6 & #7 BRAIN GAIN

6. Children of mothers who exercised in pregnancy women are born with more mature brains¹.

7. Improved in cognitive performance in the children of women who exercised regularly throughout pregnancy².

#8 HEALTHIER BABY WEIGHT

8. There is also association between mothers who exercise during pregnancy and lowered risk of low birth weight at full term in their babies³.

1: Labonte-Lemoyne et al, [*J Clin Exp Neuropsychol*](#). 2017 May;39(4):347-354.

2: Gomes da Silva et al, [*Expert Rev Neurother*](#). 2015;15(9):1041-51.

3: Huang et al, [*J Matern Fetal Neonatal Med*](#). 2018 Jun;31(12):1561-1567.



Pregnancy exercise also reduced the risk of macrosomia and of childhood overweight/obesity during the first year.



**STAY TUNED! JOIN US FOR 3RD
TRIMESTER**

THANK YOU!