



# Why Can't I Eat Sushi?

The Science Behind Prenatal Guidelines



Mackenzie Carnes

Dec 6, 2018



FACULTY OF MEDICINE

let's talk  science



# Introduction



- National non-profit organization
- Affiliated with UBC and UVic
- Focused on providing information and improving accessibility to STEM topics



# Outline

- What are Prenatal Guidelines and who makes them?
- What the guidelines say and why
  - Before you are pregnant
  - During the pregnancy
  - Leading up to the big day
- Kahoot questions throughout

# Kahoot!



# Warm Up Kahoot Question



Shaunacy Ferro, 2016, Mental Floss

# Disclosures

- I am a medical student and not an expert in the field of prenatal care
- This presentation is not meant to replace prenatal counselling from a healthcare professional and anyone considering pregnancy or currently pregnant should see their primary healthcare physician
- Prenatal guidelines may vary by region and this presentation is based on BC Provincial recommendations
- This presentation will contain information on how certain things have the potential to negatively impact the health of a developing fetus, but it does not mean that a child will be unhealthy if a woman was not able to follow these guidelines from the outset of pregnancy. It is never too late to make healthy changes.



Where are these "guidelines" coming from?



- The BCPHP Obstetric Guideline 19: **Maternity Care Pathway**
  - Designed by the BC Perinatal Health Program
  - Interdisciplinary team
  - Consensus opinion based on best evidence
- **Baby's Best Chance**
  - Published by the Government of British Columbia



# Guideline Overview

- Women-centered Care: "The views, beliefs and values of the woman and her family [as defined by the woman] in relation to her care and that of her baby should be sought and respected at all times. Women should have the opportunity to make informed decisions about their care and treatment, in partnership with their healthcare professionals"



"The overarching philosophy represented in this guideline is that pregnancy is a normal physiological process and therefore any interventions offered should have known benefits and be acceptable to pregnant women."

# Evidence based healthcare

Levels of evidence

Different types of research studies

Only recommend action if benefits outweigh risks



(Rasmussen, 2016, Spraino)

Recommendation A	Good evidence to recommend the clinical action
Recommendation B	Fair evidence to recommend the clinical preventative action
Recommendation C	Conflicting evidence, need to use clinical information to guide decision
Recommendation D	Fair evidence to recommend against the clinical action
Recommendation I	Insufficient evidence, other factors may guide decision making



# Spoilers: Key Take-homes



Folic acid before you are pregnant



Exercise



Do not drink alcohol



Eat twice as healthy



Avoid raw fish



Limit your caffeine



Make your partner clean the litter box



Know your options and talk to your doctor early





# Kahoot Question



Cranbash, 2017, Medium

# Stepwise Process for Making a Healthy Baby





## Step One: Plan your pregnancy

- Speak to your doctor before you start trying
- Supplements
- Diet and exercise
- Identify and modify risk factors
- Who might need to see a specialist?





# Kahoot Question



# Folic Acid is important for the spinal cord



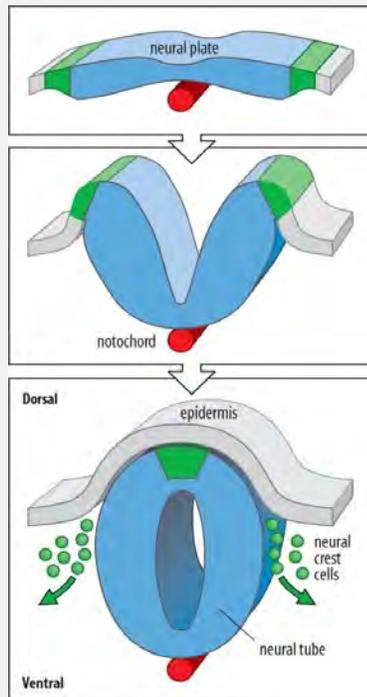
- Supplement with 0.4 mg- 5 mg per day at least 4 weeks before pregnancy



(Olsen, 2018, Medical News Today)

- Folic acid is necessary for DNA synthesis
- It is very important in the formation of the spinal cord and vertebral column.
- Reduces the risk of Neural Tube Defects by 50-70% (MacLellan DL, FRCSC & Bauer SB, 2016)

# Folic Acid is important for the spinal cord



Michael Schulz, 2015, Research Gate

## Types of Spina Bifida

Source : Wikipedia.org

Med INdia, 2016, accessed Dec 4, 2018

# Teratogens



- Teratogen= anything that can change a structure or function in a baby if it is exposed to it during development
- Review medications and supplements with health care provider
- Infection and medical history



# Fetal Growth From 8 to 40 Weeks



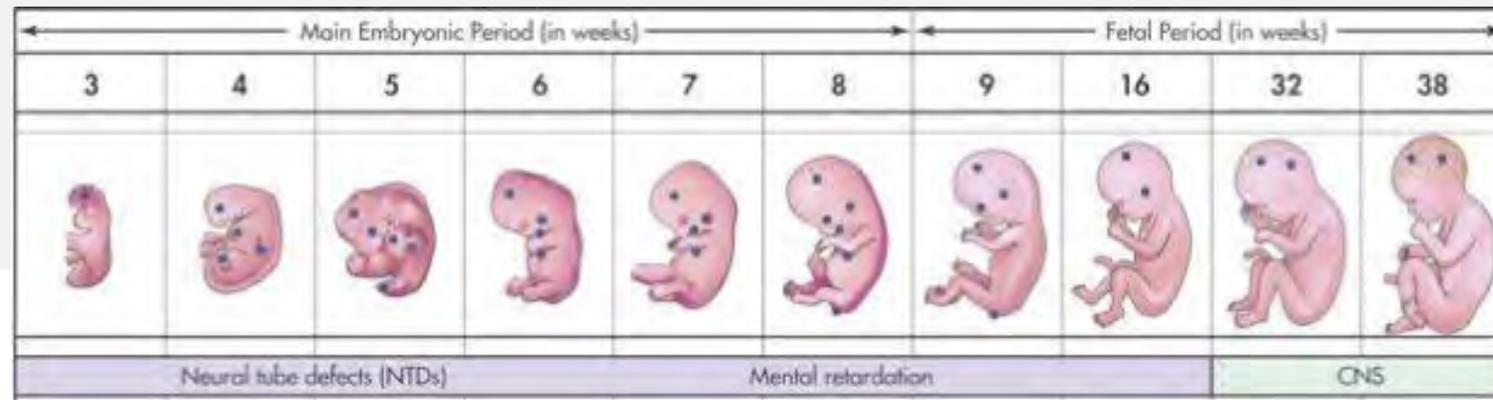
(John Hopkins Medicine, Health Library, accessed Dec 4, 2018)



# Stop drinking alcohol even before you are pregnant



- Stop using alcohol, tobacco, or other substances before you start trying to get pregnant
- It is never too late to stop
- Time when many people do not know that they are pregnant during which the embryo is particularly sensitive to the effects of alcohol





# Kahoot Question



# Females aged 19-50

7-8 Fruits and Vegetables

6-7 Grain Products

2 Dairy or dairy alternatives

2 Meat or meat alternatives

## What is One Food Guide Serving? Look at the examples below.

 Fresh, frozen or canned vegetables 125 mL (½ cup)	 Leafy vegetables Cooked: 125 mL (½ cup) Raw: 250 mL (1 cup)	 Fresh, frozen or canned fruits 1 fruit or 125 mL (½ cup)	 100% Juice 125 mL (½ cup)		
 Bread 1 slice (35 g)	 Bagel ½ bagel (45 g)	 Flat breads ½ pita or ½ tortilla (35 g)	 Cooked rice, bulgur or quinoa 125 mL (½ cup)	 Cereal Cold: 30 g Hot: 175 mL (¾ cup)	 Cooked pasta or couscous 125 mL (½ cup)
 Milk or powdered milk (reconstituted) 250 mL (1 cup)	 Canned milk (evaporated) 125 mL (½ cup)	 Fortified soy beverage 250 mL (1 cup)	 Yogurt 175 g (¾ cup)	 Kefir 175 g (¾ cup)	 Cheese 50 g (1 ½ oz)
 Cooked fish, shellfish, poultry, lean meat 75 g (2 ½ oz)/125 mL (½ cup)	 Cooked legumes 175 mL (¾ cup)	 Tofu 150 g or 175 mL (¾ cup)	 Eggs 2 eggs	 Peanut or nut butters 30 mL (2 tbsp)	 Shelled nuts and seeds 60 mL (¼ cup)

Government of Canada, Canada Food Guide, accessed Dec 4 2018

# Diet and Exercise



- Healthy body weight: BMI between 19-27
- Improve Diabetes and Hypertension
- Guidelines=  $\geq 150$  minutes/ week of moderate to vigorous aerobic activity
  - 2 days of resistance training/week
- Start healthy habits early that you can continue throughout your pregnancy and beyond

# Factors that may need a specialist



- Some conditions or circumstances may make a pregnancy more complicated
- May be referred to a specialist to address any special needs or risks
- Some factors that might need a referral:
  - Conditions in the current pregnancy
  - Pre-existing medical conditions
  - Complications with previous pregnancies





## Step One Summary

Speak to a doctor before pregnancy to identify and minimize potential risk factors

Supplement with Folic Acid

Eat healthy and exercise

Don't drink alcohol or use other substances even before you know you are pregnant

Work with your healthcare provider to manage chronic medical conditions before and during your pregnancy



Step Two:  
Navigate the do's and  
don'ts of pregnancy

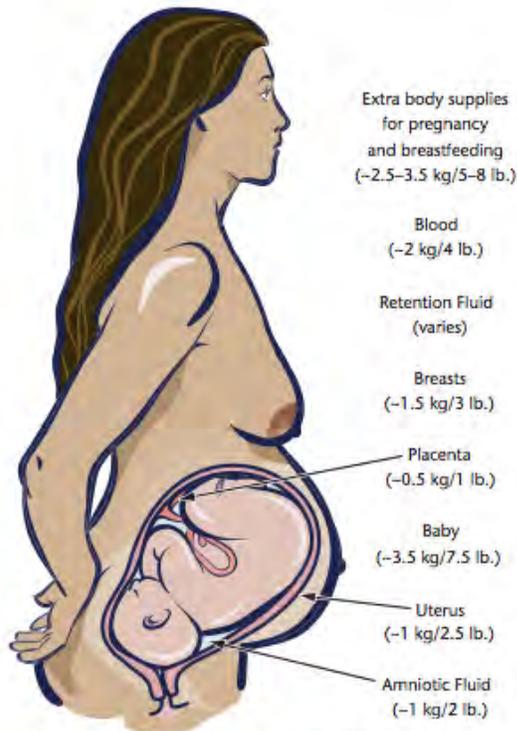




# Kahoot Question



# Eat twice as healthy not twice as much



Typical pregnancy, weight gain approximately 14 kg (30 lb.)

Baby's Best Chance, Government of BC, 2018

- Average weight gain is 30lbs
- A healthy weight gain can range from 11-40lbs
- How much weight you should gain depends on your pre-pregnancy BMI
  - BMI <18.5 will need to gain more
  - BMI > 25 need to gain less
- Eat "twice as healthy" not "twice as much"
  - 2-3 additional food guide servings per day
- Focus on healthy eating and exercise not your weight

## A Guide to Healthy Foods

This table shows you how to use *Canada's Food Guide* to get the nutrients you need.

Nutrient	Iron	Folic Acid	Calcium	Essential Fatty Acids	Fibre
<b>Benefits</b>	Needed to prevent anemia (low iron in the blood). Low iron can cause low birth weight. It can make the mother feel tired, make it hard to fight infection and cause difficulty coping with blood loss during birth.	Lessens the risk of having a baby with a neural tube defects, such as spina bifida. Folic acid is also important for healthy growth and development.	You need calcium and vitamin D for your baby's healthy bones and teeth and to protect your bones later in life.	Necessary for the normal development of your baby's nervous system and eyesight during pregnancy and breastfeeding.	Helps prevent constipation.
<b>Vegetables and Fruit</b>	apricots (dried), asparagus, broccoli, dates, prunes, raisins, spinach, Swiss chard	bananas, broccoli, romaine lettuce, Brussels sprouts, corn, beets, oranges, peas, spinach, asparagus, avocado	bok choy, broccoli, kale, mustard greens, Swiss chard		berries, dates, pears, dried figs, bananas, potatoes, prunes, kiwi, corn, peas
<b>Milk and Alternatives</b>	Ovaltine® or Instant Breakfast® added to milk	milk, all types	buttermilk, cheese, milk, skim milk powder, yogurt, ice milk, frozen yogurt		
<b>Grain Products</b>	bran cereal, cream of wheat, enriched cereals, wheat germ, whole-grain cereal, whole-grain bread	enriched bread and cereal, wheat germ, whole-grain bread, cereal	bread (calcium-fortified)		bran muffin, bran cereals, fibre cereal, fibre-enriched crackers, whole-grain cereal
<b>Meat and Alternatives</b>	tofu, baked beans, lentils, clams, dried beans, egg yolk, pumpkin seeds, meat, fish, poultry, hazelnuts, almonds, walnuts	almonds, dried beans, dried peas, lentils, peanuts, sunflower seeds, chickpeas, egg yolk, sesame seeds, hazelnuts, cashews, walnuts	almonds, baked beans, sardines, salmon with bones, soybeans, sesame, tahini, tofu made with calcium, hazelnuts	beef, pork, poultry, salmon, sardines, mackerel, walnuts, pumpkin seeds, Brazil nuts, peanut	dried beans, dried peas, lentils, nuts, seeds

# What to Eat

- On average an additional 340-450 kcal/day in the second and third trimester
- Avoid sweetened beverages or foods with added fats or sugar
- Eat whole, unprocessed food from each of the four food groups

# 30 Minutes a Day of Exercise



Cirignano, 2018, Fitness Magazine

- Exercise is important to maintain throughout pregnancy
  - Healthy level of weight gain
  - Decreases swelling, leg cramps, fatigue, shortness of breath, constipation and backache
  - Mental health
- Goal= be physically active for at least 30 minutes every day

# Kahoot Question



Sajk Nordic Online, 2016

# Exercising throughout pregnancy – Do's



- Exercises that are safe and more comfortable during pregnancy
  - Walking
  - Riding a stationary bike
  - Swimming
  - Aquafit
  - Prenatal yoga or fitness classes



PregMed, 2016, accessed Dec 4, 2018

# Exercising throughout pregnancy - Don'ts



- Stay safe while exercising during pregnancy:
  - Ligaments are more relaxed
  - Loss of balance
  - Avoid contact sports
  - Do not become overheated
  - Avoid straining while holding your breath
  - Do not lie flat on your back after four months of pregnancy
  - Use low weights and high repetitions if doing strength training and use lower weights later in pregnancy

# Kahoot Question

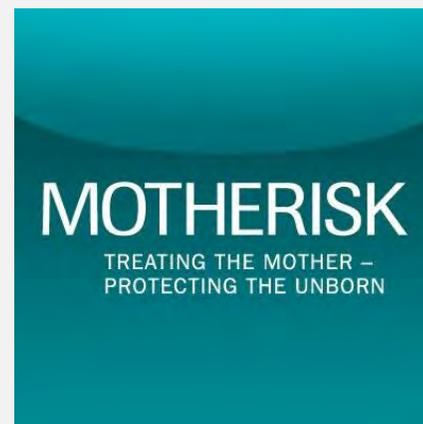




# No Amount Of Alcohol Is Safe



- NO amount of alcohol is healthy for the developing fetus at any time during pregnancy
- If you are having trouble not using alcohol or other substances there is help
  - Talk to your health care provider
  - Pregnancy outreach programs
  - Contact Motherisk at **Motherisk.org** or 1 877 327-4636
- It can be helpful for partners and other support people to stop using substances throughout the pregnancy



# Fetal Growth From 8 to 40 Weeks



(John Hopkins Medicine, Health Library, accessed Dec 4, 2018)

# Fetal Alcohol Spectrum Disorder

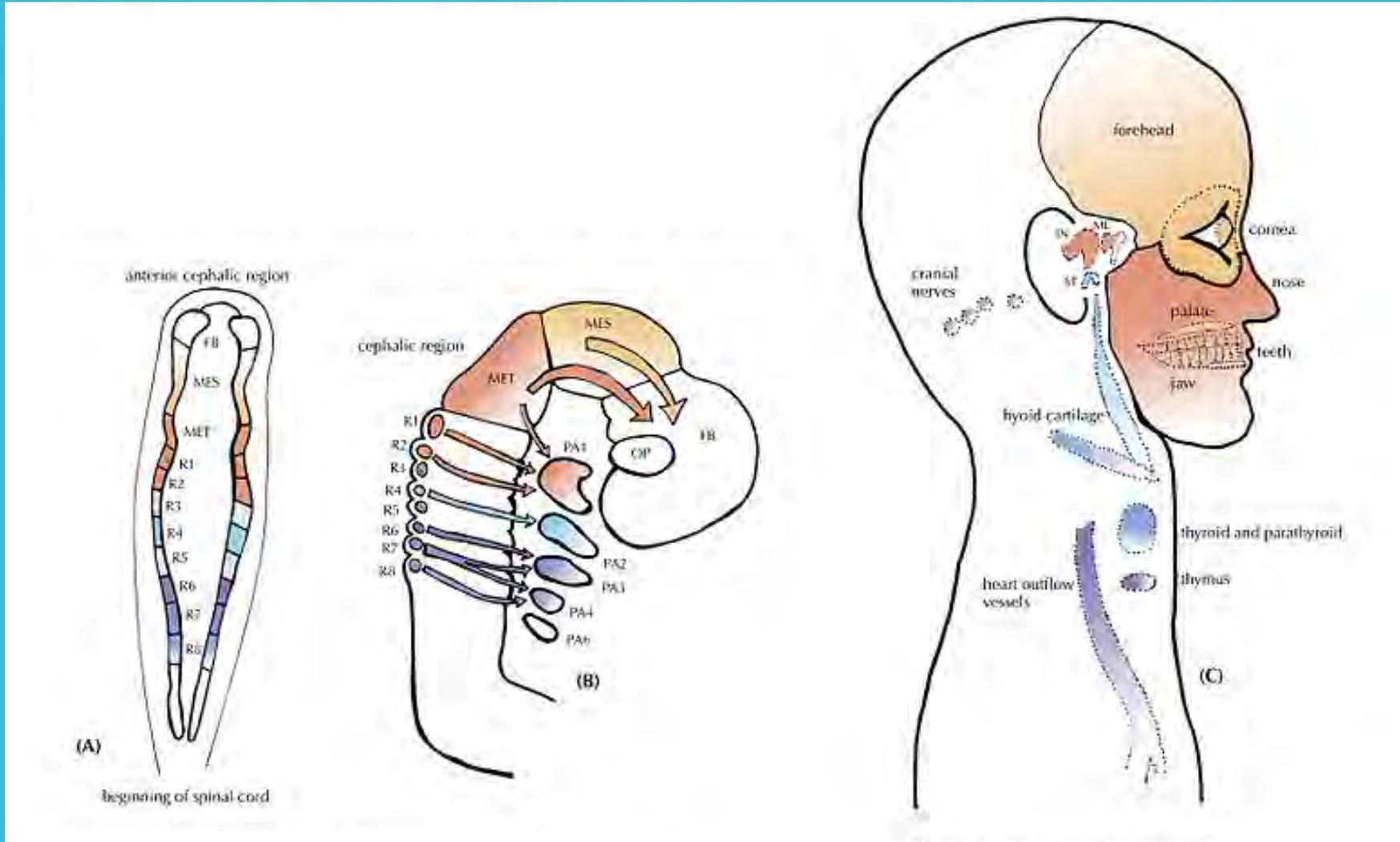
- Fetal Alcohol Syndrome: facial features only present if binge drinking occurred over a 2 day "critical phase" early in pregnancy
- Can still have cognitive and other effects from alcohol exposure at other times during pregnancy= Fetal Alcohol Spectrum Disorder
  - Growth retardation (height, weight, and head circumference)
  - Behavioral, cognitive, and or learning deficits
  - Neurodevelopmental anomalies

## FETAL ALCOHOL SYNDROME

© Lineage



<https://step2.mebullets.com/pediatrics/120599/fetal-alcohol-syndrome>



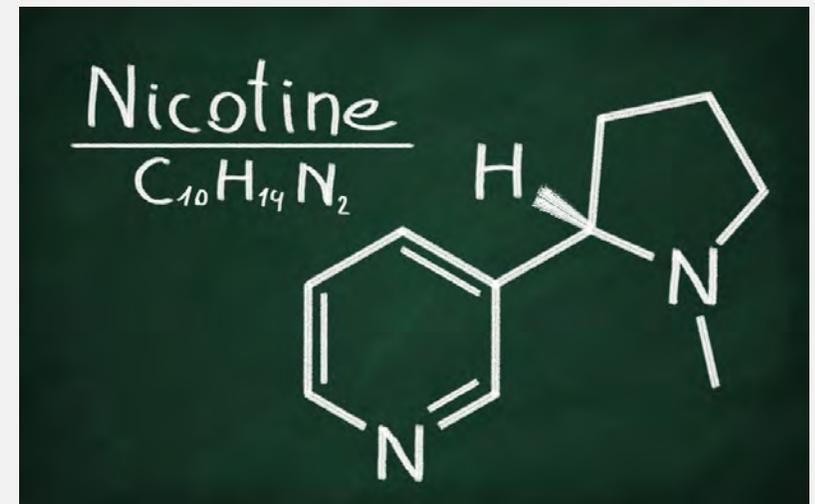
wikimediacommons

# Tobacco Cessation



- Risk for cardiovascular disease, chronic obstructive pulmonary disease, lung cancer and lower bone density
- Risk for preterm deliveries and is associated with low birth weight infants (growth restriction)
- Complete cessation advised
- Nicotine Replacement Therapy
  - Patches, gum, pharmaceuticals

(Dunaif A. Women's Health. In: Jameson J, Fauci AS, Kasper DL, Hauser SL, Longo DL, Loscalzo J. eds. *Harrison's Principles of Internal Medicine*)



(VapeGazette, 2018)



# Kahoot Question





# The big question: Why can't I eat sushi?



- Eating uncooked meat including fish puts pregnant women at risk for infection
- Cooking fish does not lower the amount of methyl mercury contained in it
- Cooked fish that are low in mercury are safe and are an important source of essential fatty acids
  - Development of baby's nervous and visual systems
  - 150 grams of cooked fish per week



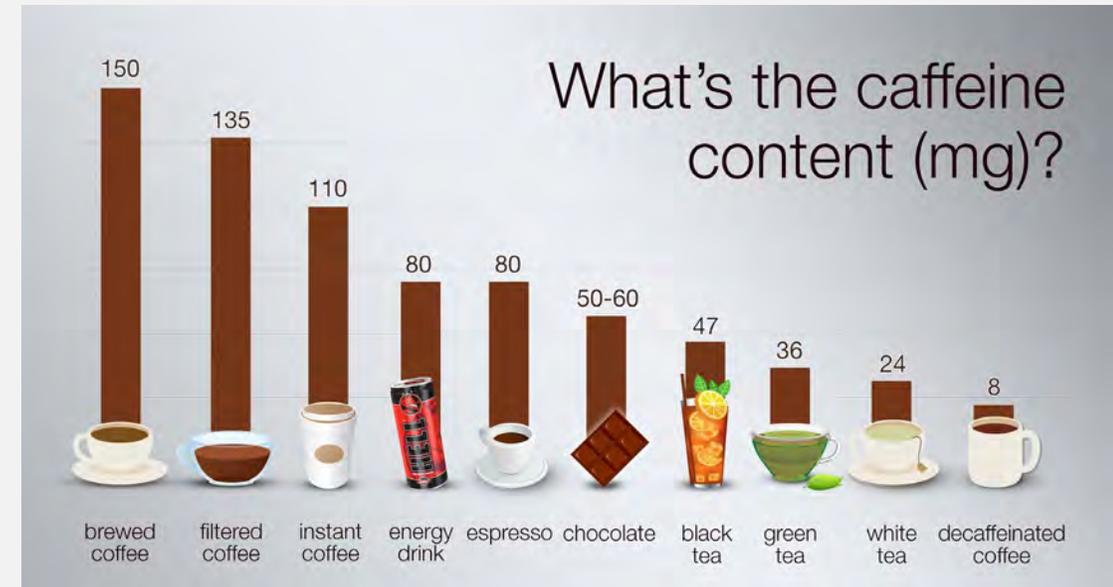
# Kahoot Question



# Caffeine



- Caffeine crosses the placenta
- Amount in mother's blood = amount in baby's blood
- Moderate caffeine consumption safe
- Limit caffeine intake to 300 mg a day
  - One cup of regular coffee has 135-179 mg of caffeine, one cup of black tea has 43 mg



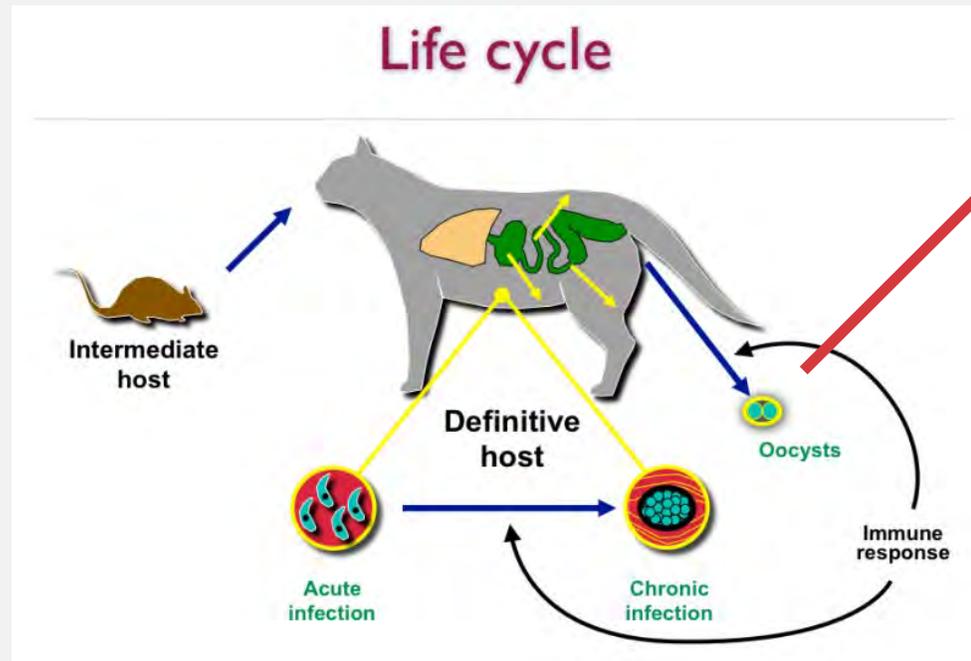
Giancarlo G, Experience Philippines, 2018



# Kahoot Question



# Cat Litter= Risk for Toxoplasmosis

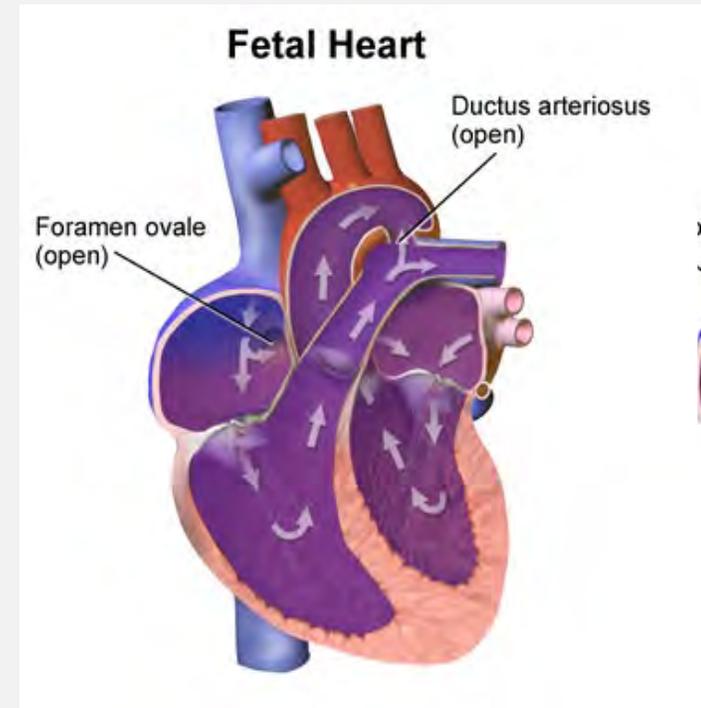


- Toxoplasmosis can be transmitted to humans from cat feces
- 90% of infections are asymptomatic, if symptoms do occur they present as non-specific, mono-like illness/fever
- Congenital Toxoplasmosis
- Effect on the fetus depends when in the pregnancy the infection occurred

# Use Tylenol not Advil



- Taking ibuprofen can change the way blood is circulated in the fetus
- Avoid NSAIDs like Advil
- Use acetaminophen (Tylenol) for headaches and other minor pain throughout pregnancy



Blausen Medical, 2018



# Kahoot Question



# Transportation and Work



- Transportation
  - Seatbelt Safety
  - Sit as far back from airbags as possible
  - Air travel is safe until 36 weeks gestational age
- Work
  - Rest during breaks
  - Plan when you will stop working
  - Adaptations



Baby's Best Chance, Government of BC, 2018



# Kahoot Question



# "Discomfort" of early pregnancy is common



- Nausea and vomiting
  - Worse in the morning but can persist throughout the day
  - On average lasts for 35 days<sup>[7]</sup>
  - Treatment can minimize discomfort
    - Herbal remedy ginger, vitamin B6 with doxylamine, antiemetics
- Constipation
  - Iron supplementation adjustment
- Fatigue
  - Daytime naps and mild sedatives at bedtime such as diphenhydramine (Benadryl) can be helpful<sup>[7]</sup>



Natan Lawrence, 2016, Hoshana Rabbah

# Baby's Best Chance has an extensive list of common first trimester changes and suggestions for management

## What's Happening?

morning sickness/nausea

## Now What?

- eat smaller amounts of food every one to two hours during the day
- eat what appeals to you. Try to follow *Eating Well with Canada's Food Guide* as much as possible.
- try taking a liquid form of vitamins
- try to keep taking your folic acid supplement even if you can't take prenatal vitamins for a period of time
- avoid fatty and fried foods
- sip small amounts of fluid often during the day. Fluids can include water, 100 percent apple juice, sparkling water or ginger ale
- try eating cold meals to avoid food smells, or have someone else cook
- have fresh air in the bedroom while resting, and in the kitchen while cooking
- try not to get too tired. Nausea may get worse if you are tired.
- wear loose clothing around your chest and waist

If you experience morning sickness and vomiting, avoid brushing your teeth for 30 minutes after vomiting. This will help protect your tooth enamel. Instead, you can try rinsing your mouth with plain water, or a teaspoon of baking soda mixed with water, or a fluoride mouth wash.



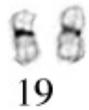
# Screening Tests and Vaccinations



- Routine Prenatal Screening for Infection
- Some screening tests are done only if indicated
- Recommended that all pregnant women receive the annual flu vaccine
- Live attenuated virus vaccines not recommended due to theoretical risk

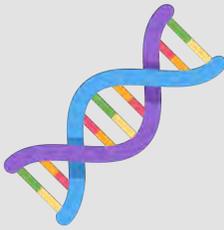
# Kahoot Question

## ZWK99024 KEY





# Genetic Screening Is A Choice



- It is a woman's choice whether she would like to have prenatal genetic screening
- Blood tests that determine the probability of a baby having Down Syndrome, Trisomy 18, or an open neural tube defect
- Screening Options:

<b>SIPS</b>	Serum Integrated Prenatal Screen	<b>NT</b>	Nuchal Translucency
<b>IPS</b>	Integrated Prenatal Screen	<b>CVS</b>	Chorionic villus sampling
<b>QUAD</b>	Measurement of second trimester serum quad markers (AFP, uE3, hCG and inhibin-A) in one blood test		

Mother's age (years)	Chance of Down syndrome	Chance of trisomy 18
25	1 in 1,250	1 in 12,500
30	1 in 840	1 in 8,400
35	1 in 356	1 in 3,560
40	1 in 94	1 in 940
45	1 in 24	1 in 240

BCPHP, Maternal Care Pathway, 2010



# Nuchal Translucency on Ultrasound



Source: F. Gary Cunningham, Kenneth J. Leveno, Steven L. Bloom, Catherine Y. Spong, Jodi S. Dashe, Barbara L. Hoffman, Brian M. Casey, Jeanne S. Sheffield. *Williams Obstetrics*, 25th Edition  
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<https://accessmedicine-mhmedical-com.ezproxy.library.ubc.ca/content.aspx?sectionid=155911338&bookid=1918&jumpsectionID=185049100&Resultclick=2#1151903932>

# Mental Health and Self Care



- Women with a family or personal history of mental health disorders are encouraged to talk to their healthcare providers early
- Perinatal depression: major depression occurs in up to 16% of women during pregnancy or the first year of their child's life (Perinatal Services BC, Mental Health Disorders Guideline, 2014)
- Anxiety disorders higher in perinatal populations
- Support and treatment available



Pressphoto, FreePik, 2018



# Step Two Summary

Eat twice as healthy not twice as much

Exercise safely within your limits

Do not drink any alcohol

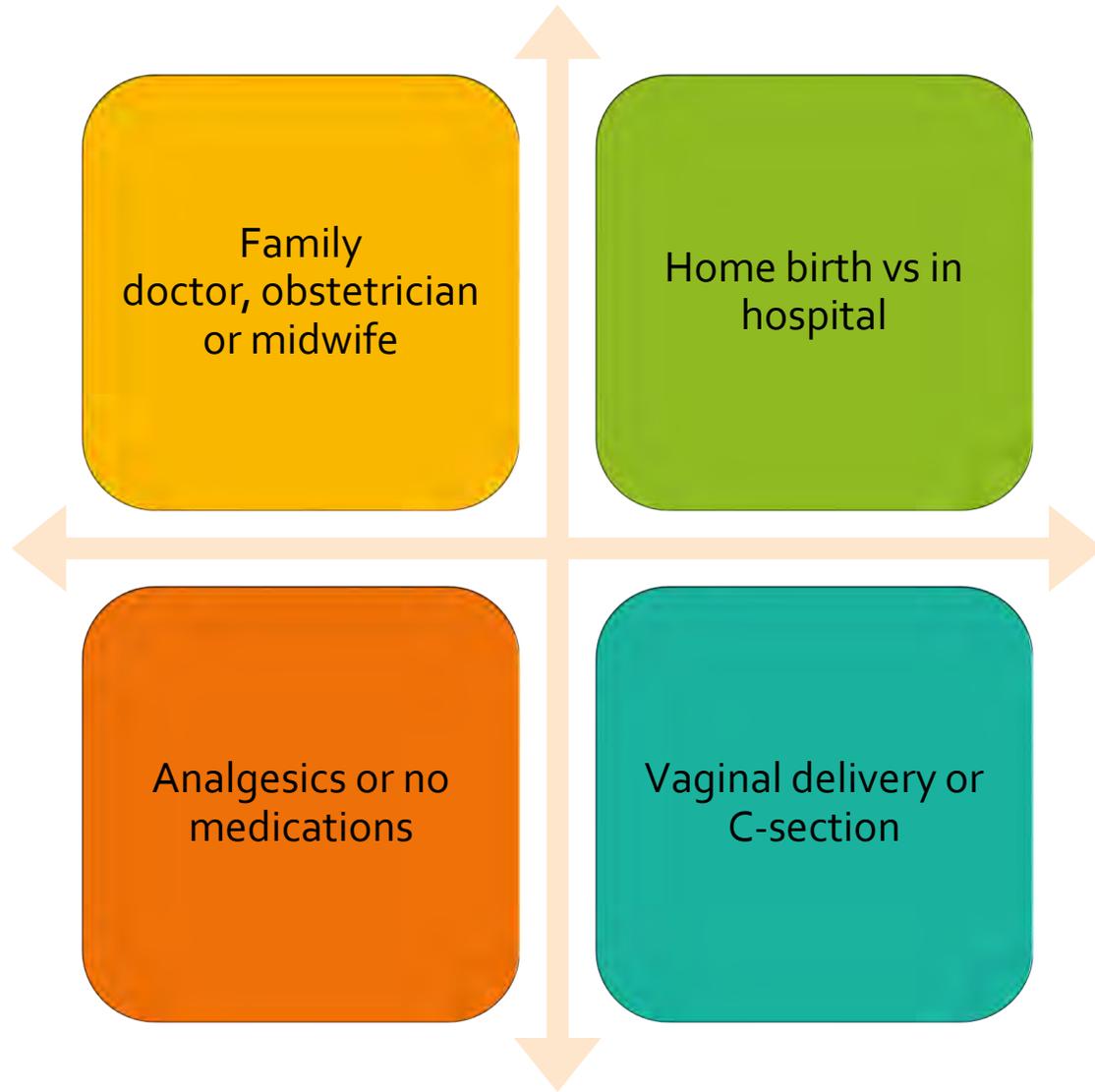
Limit coffee to two cups a day

Don't clean the litter box

Use Tylenol not Advil

Know your options for screening

Practice self-care and keep an open conversation going about your mental health with someone you trust



Step Three:  
Know your  
options for  
delivery

# Choosing a healthcare professional



- Obstetrician
- Family Doctor
- Midwife
- Decision factors:
  - Medical conditions, resources available, culture, geography, weather, spirituality, finances



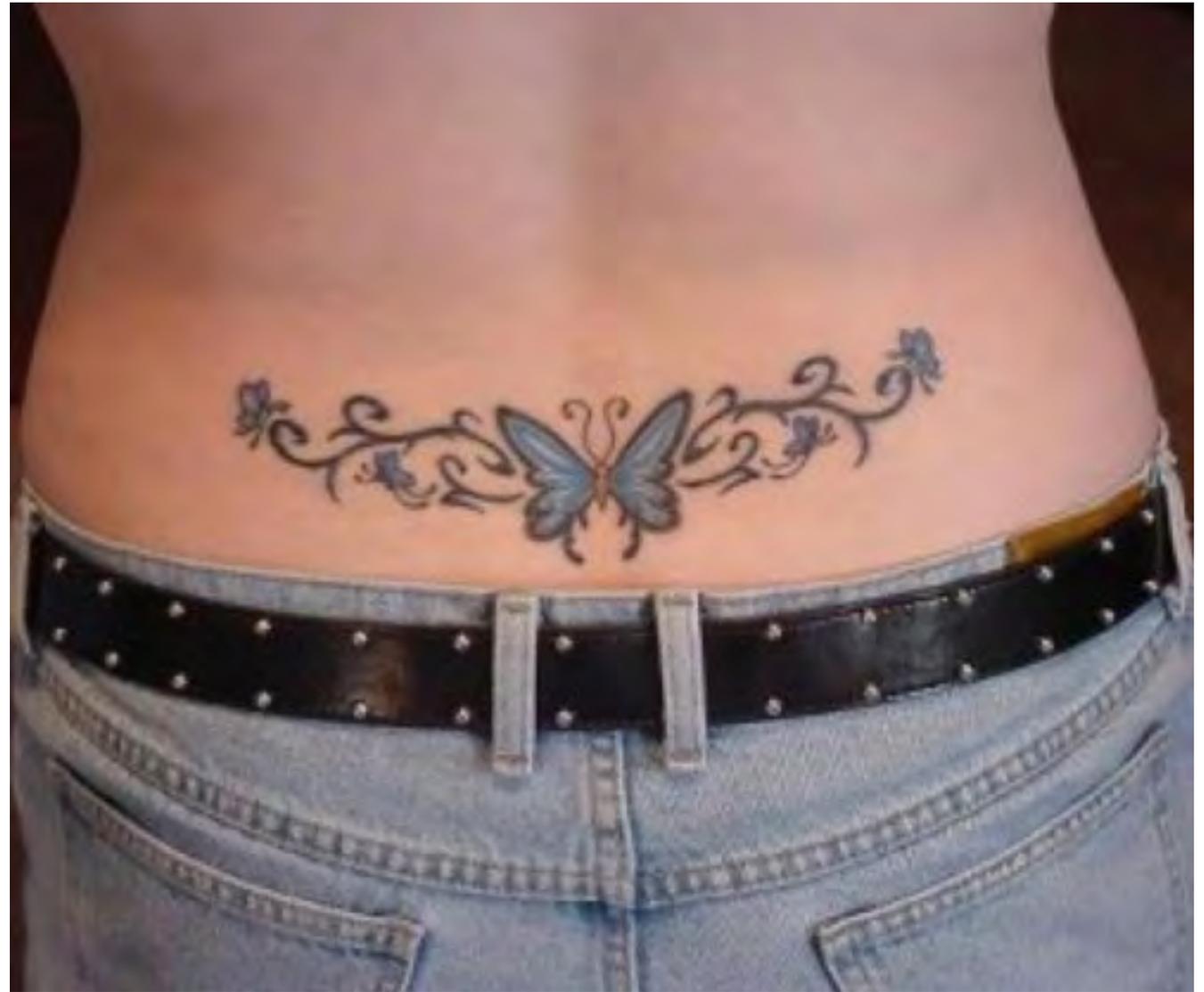
# Location, location, location



- Specialized Hospital (BC Women's Hospital)
- Regional Hospital
- Birthing Centre
- Home



# Kahoot Question

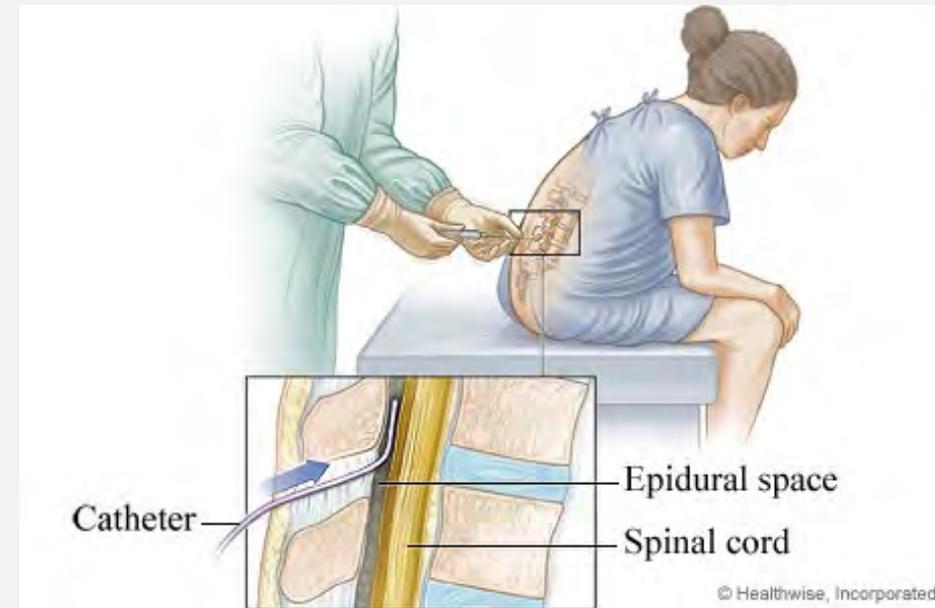


Tatoosluv, 2018

# Birth plan and medical interventions



- Possible interventions that may occur during labor:
  - Induction
  - Preventing preterm labor
  - Pain management
    - Non-pharmacological management and labor analgesia



Healthwise Staff, 2017, MyHealth Alberta

## Step Four: Good luck!



- You've got a baby! You are going to be a strong, resilient and wonderful parent that will do your best.





# Final Summary: Key Take-homes



Folic acid before you are pregnant



Exercise



Do not drink alcohol



Eat twice as healthy



Avoid raw fish



Limit your caffeine



Make your partner clean the litter box

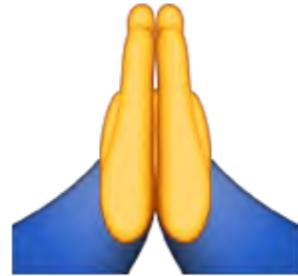


Know your options and talk to your doctor early

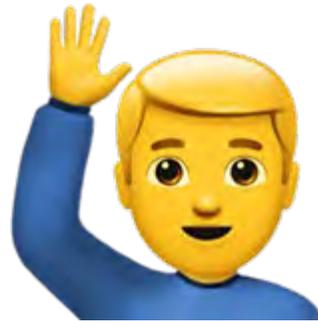




Thank you to Let's Talk  
Science, Dr. Jane Gair and  
Lena Chen for facilitating  
this presentation



Questions or  
thoughts?



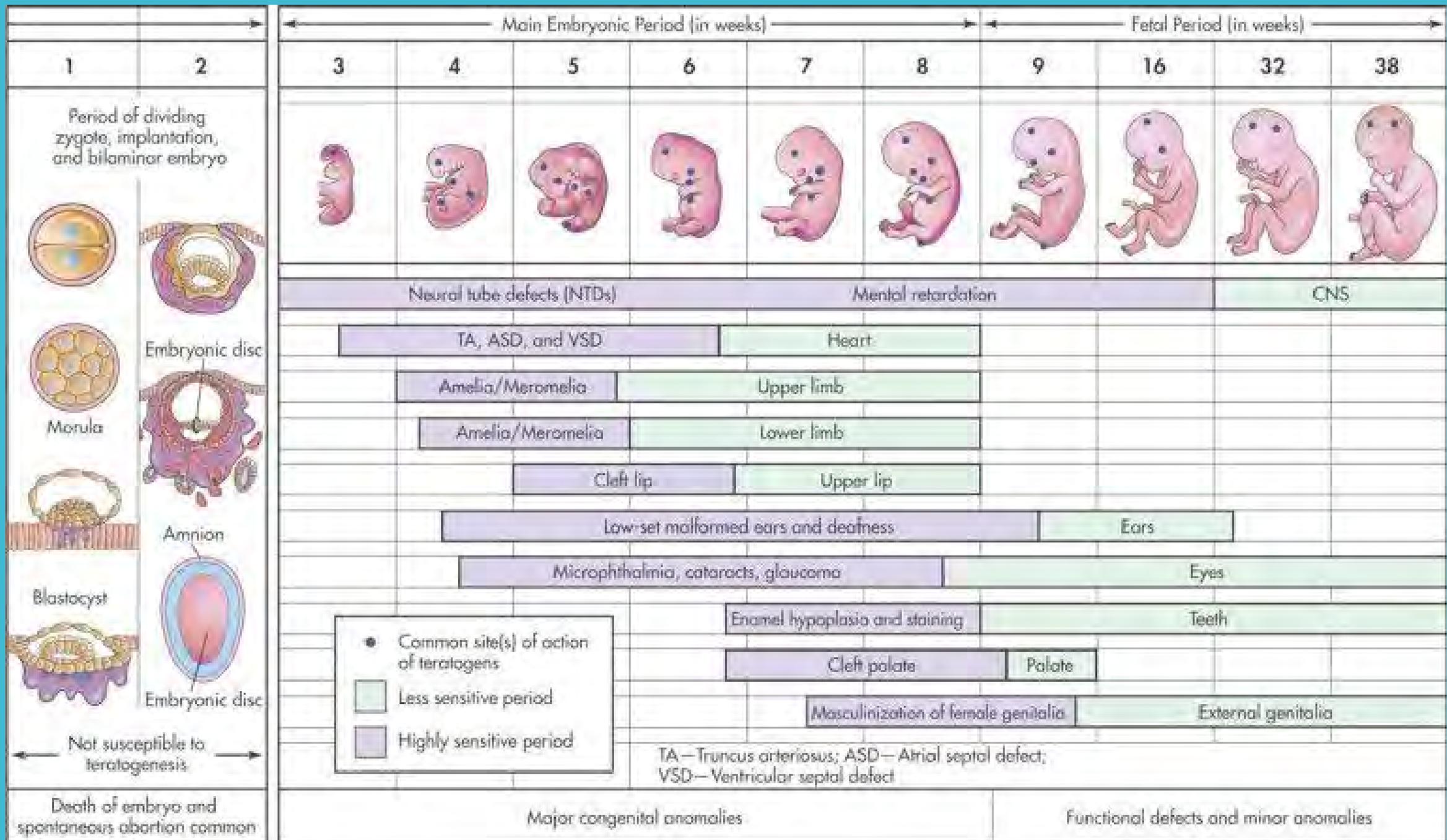
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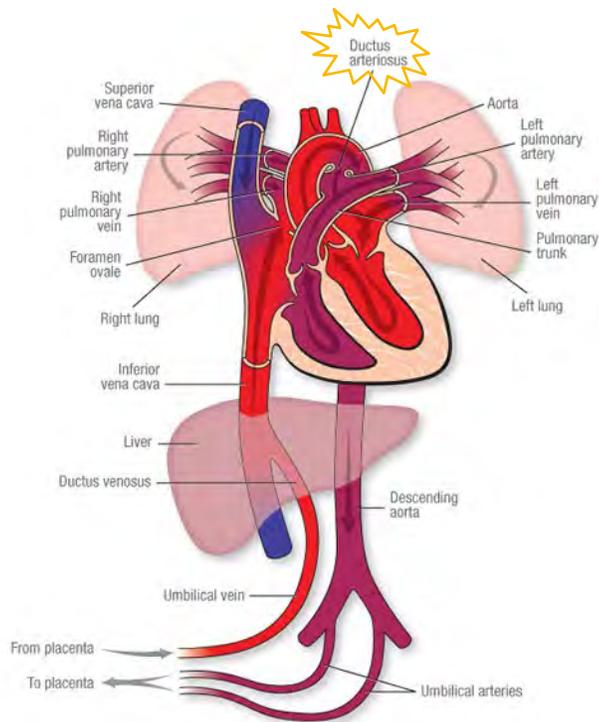


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- <https://www.fullhealthsecrets.com/diseases/pregnancy/>
- <https://www.livingandloving.co.za/pregnancy-blogs/12-tips-to-help-you-beat-pregnancy-fatigue>
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- <http://jessicafaissal.com/healthy-baby-package/>
- <https://1800251baby.org/>
- <http://www.celico.com.ar/celiaco-no-tomes-cafe/>
- <https://icatcare.org/advice/cat-health/toxoplasmosis-and-cats>
- <https://www.verywellfamily.com/morning-sickness-suddenly-stopping-in-early-pregnancy-2371247>



# Use Tylenol not Advil



- In fetal circulation the Ductus Arteriosus allows oxygenated blood to be shunted away from the lungs
- Studies have found that taking ibuprofen (Advil) for a short time during the third trimester of pregnancy can lead to premature closure of the Ductus Arteriosus [3]
- Now recommended to avoid the use of non steroidal anti-inflammatory medications like Advil, and instead use acetaminophen (Tylenol) for headaches and other minor pain throughout pregnancy