Individual nutrients

A few things that you might not have heard
Omega-3 Fatty Acids

Different kinds and sources.
Different functions.
Humans need all of them.
**Maternal pathway for formation of docosahexaenoic acid (DHA)**

### The Omega-3 Fatty Acid Family

**Alpha-linolenic acid (ALA)**

*Food sources:* walnuts and walnut oil, butternuts, canola oil, soybean oil and soybeans and soy products, eggs (yolk) from specially fed hens; ground flaxseed and flaxseed oil (*perinatally:* avoid or limit very little ALA turns into the longer chain omega-3 EPA)

↓

**EPA (Eicosapentaenoic acid)**

*Food sources:* salmon, herring, lake trout, albacore tuna, catfish, sardines, anchovy and mackerel (small varieties only, not king mackerel)

↓

**DHA (Docosahexaenoic acid)**

*Food sources:* salmon, herring, lake trout, albacore tuna, catfish, sardines, anchovy and small variety mackerel (not king mackerel); marine algae (*good source of DHA only*)

↓

**FETUS:** Incorporated into the nervous system, brain, eyes

**MOTHER:** May lower risk of preeclampsia, excessive inflammation, depression, CVD
Daily omega-3s from foods first

• “…evidence supports a nutritionally achievable DRI for EPA + DHA between 250 and 500mg/day …, protective tissue levels of EPA + DHA can be achieved only through direct consumption of these fatty acids”


• For CV health, a minimum intake of EPA and DHA combined: 500 mg/day.

  ISSFAL, Recommendation for Intake of Polyunsaturated Fatty Acids in Healthy Adults..., 2004

• For pregnant or lactating…minimum of 200 mg DHA per day

  ISSFAL/PERLIP, 2007
Folate & Folic Acid

• One of the B vitamins

Critical Periods of Development

Recommendations for women who could become pregnant:

- **Preconception RDA** = 400 mcg/day synthetic folic acid from a supplement or fortified foods, or both, concurrently with well-rounded diet. This is equivalent to 680-800 mcg of natural folate, and *should be continued* during pregnancy.

  One problem: Obese women appear to forfeit the NTD risk reduction of supplemental folic acid. Why?

- **Upper Limit of Safety** = 1,000 mcg/day folic acid (no limit to food folate)

- **Exception**: Synthetic folic acid 4,000 mcg/day from *separate* supplement if trying to prevent NTD recurrence*

Food sources of folic acid and folate:

♦ Best food sources: >100 mcg DFE

Fortified ready-to-eat cereals, enriched pastas and rice, lentils and cooked dried beans, asparagus, cooked spinach and turnip greens
**Food sources of folic acid and folate:**

- **Other good food sources:** 50-100 mcg DFE
  - Wheat germ, berries, raw greens, kidney beans, peas, orange juice
Message to patients

- Take folic acid even if you don’t plan on getting pregnant, because it can only prevent NTDs if you take it *before* the baby is created through the early prenatalal weeks when you might not know you’re pregnant.
Iron: Use food for quick rebound. Why can’t iron deficiency anemia be resolved with very high doses of iron in a short period of time?

- Percentage of iron absorbed from high single doses (supplements!) can be significantly lower than the usual 10-18% of dietary iron absorption
- ↑Side effects Result: Poor compliance
- Potential long-term consequences of oxidative damage to cells if you give high doses
- Keep a close eye on at-risk women (e.g., post-bariatric surgery patients; closely spaced pregnancies; heavy periods)
Iron-deficiency anemia dietary intervention:

♦ Eat iron-rich foods: 
  ♦ Clams, red & dark meat, certain organ meats (spleen, kidney or heart; but strictly limit liver) – the most absorbable form of iron is found in these
  ♦ Fortified cereals, spinach or greens, nuts and dried beans – good, especially when combined with a more easily-absorbed iron source

♦ Vitamin C-rich foods aid help the body absorb more iron, too.
  ♦ Eat more citrus, papaya, melon, peppers, tomatoes & tomato sauce, greens, cabbage, broccoli & cauliflower

♦ Ideally: Take iron supplement away from meals, or at least try to take iron separate from high calcium meals, supplements or antacids.
Calcium

♦ Importance of building sufficient calcium reserves before conception:
  – Women who enter pregnancy with chronically low calcium intake will lose Ca from her bones for baby; she may be at higher risk for preeclampsia, too
  – Review of research on Ca supplementation and preeclampsia
  – Remember, other substances stored in bone can be released during demineralization.
Calcium

♦ Preconception calcium recommendation = 1000 mg/day is *no different from pregnancy recommendation*

♦ Get most of calcium from foods, then cover deficit with Ca supplement (+ adequate Vit D)
  - Supplement: calcium carbonate or calcium citrate far apart from the highest iron meal of the day

♦ Upper Limit of Safety = 2500 mg Ca/day
  - What should you be on the lookout for with patients?
Handout 3: Don’t Eat That!

Discuss foods to avoid vs. items that require more scrutiny
“The red blobs are your red blood cells. The white blobs are your white blood cells. The brown blobs are coffee. We need to talk.”
### Caffeine Content of Beverages/Foods/Products

<table>
<thead>
<tr>
<th>Foods</th>
<th>Caffeine (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee, brewed, 8 fluid oz.</td>
<td>130 (up to 200)</td>
</tr>
<tr>
<td>Espresso coffee (single shot, 1 oz)</td>
<td>40-90</td>
</tr>
<tr>
<td>Energy drinks, 1 container</td>
<td>80-295</td>
</tr>
<tr>
<td>Energy gum, mints, candies (per piece)</td>
<td>10-150</td>
</tr>
<tr>
<td>Tea 6 oz., black or green, brewed 3 min.</td>
<td>36</td>
</tr>
<tr>
<td>Soft drinks, diet &amp; regular, 12 oz.</td>
<td>35-50</td>
</tr>
<tr>
<td>Milk chocolate, 1 oz.</td>
<td>6-15</td>
</tr>
<tr>
<td>Dark, sweet chocolate, 1 oz</td>
<td>20</td>
</tr>
</tbody>
</table>

**Over-the-counter drugs**

<table>
<thead>
<tr>
<th>Over-the-counter drugs</th>
<th>Caffeine (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midol Menstrual Complete 2 pills*</td>
<td>120</td>
</tr>
<tr>
<td>Excedrin Extra Strength, 2 pills*</td>
<td>130</td>
</tr>
<tr>
<td>NoDoz Maximum Strength, Vivarin, 1 pill*</td>
<td>200</td>
</tr>
</tbody>
</table>

* Do not take any prescription or non-prescription drugs while you are trying to conceive unless approved by your physician.

**Sources:** Industry data; Agriculture Handbook No. 8 series; and Starbucks Customer Relations Dept.
Caffeine & the preconceptional woman

♦ Research focus:
  – Fertility: possible delayed time to conception
  – Pregnancy outcome: miscarriage rate, premature births, fetal brain development, birth weight restriction, and even childhood IQ and attention span tests on offspring.

Caffeine & the prospective father

◆ Research focus:
  – **Fertility**: time to conception doesn’t appear to be altered until >700mg/day, if that
  – **Offspring**: Animal study using equivalent of 10-12 cups coffee/day: no fertility troubles, but offspring had high incidence of LBW, postnatal mortality; perpetuated into second generation

◆ No standard recommendations exist for preconceptional males

◆ **Recommendation (conservative)**: Until more is known, taper caffeine intake to \( \leq 300 \text{ mg caffeine/day} \) *at least* 90 days prior to trying to conceive
Alcoholic Beverages

All glasses are **not created equal** & may make binge drinking less conspicuous

What constitutes one serving?
Alcohol & Preconception

• Women’s guideline: If using reliable birth control method, \( \leq 1 \) serving max/day and watch out for portion distortion

• Ideally, quit drinking altogether two weeks prior to getting pregnant

  » Question: She thinks this is one serving of wine? Do you agree?

• Men’s rec: \( \leq 2 \) servings max/day
Food-borne infections for perinatal women to avoid:

♦ **Listeriosis infection**
  
  - Can manifest several weeks (3 to 8 wks) after the food is eaten.
  
  - **Risks:** miscarriage, preterm baby, stillbirth
  
  - **Recommendation:** Avoid raw or unpasteurized dairy products (brie, feta, blue cheese, Camembert, Mexican style cheeses such as queso blanco); ready-to-eat foods such as hot dogs, deli meats, refrigerated meat spreads & smoked fish *unless reheated to steaming hot*; do not eat unwashed raw veggies or fruits.
Food-borne infections for pre-pregnant women to avoid:

♦ **Toxoplasmosis** infection
  - **Risks:** miscarriage and birth defects
  - **Recommendation:** Avoid unwashed produce and undercooked meats (and exposure to contaminated cat feces in soil/kitty)
Most fish are excellent food choices for pre-pregnancy & pregnancy!

How to safely get 12 oz seafood per week:

◆ Eat a *variety* of cooked, low-mercury, oily seafood as part of your 12 oz each week (rich in iodine, omega-3s, vitamin D, and selenium)

◆ Examples: Salmon, anchovy, trout, canned tuna, sea bass, sardines
Methylmercury and Preconception

♢ Recommendation for prospective moms:

♢ Avoid consumption of sea mammals (whale meat/blubber!). No problem, right? 😊

♢ Say “no, thanks” to eating shark, swordfish, king mackerel, and tilefish

♢ Caution with certain freshwater fish; check USEPA/FDA advisories (or in CA, see http://www.oehha.ca.gov/fish.html)
Food Safety

♦ Teach proper food handling and storage techniques to men and women.

♦ Focus on four guidelines adapted from Fight BAC™ campaign:
  1) Clean
  2) Separate
  3) Cook
  4) Chill
Managing Morning Sickness

- Learn to identify your “triggers” & work to avoid them
- Goal: maintain or slowly gain weight; eat small meals regularly. Vow to get help if losing weight.
- Occasional junk food may help break the cycle (lemonade & chips)
What to Eat When Not Feeling Well

- **Constipation**: Eat more high fiber whole foods (e.g., veggies, oats/fiber cereal). Drink mostly water to keep well-hydrated. Monitor urine for signs of hydration.

- **Diarrhea**: Get help to determine the cause (could it be lactose intolerance, oversupplementation with iron or magnesium; sugar-free ingredients?). Another option: Daily oats/oatmeal may do the trick!

- **Heartburn**: Eat small, frequent meals throughout the day; try drinking liquids between meals (not with); avoid coffee -- even decaf is a problem. *Limited* # of antacids are ok.
Whether or not a woman indulges her cravings should depend on the food, within reason.

– For example, citrus fruit or milk are good choices
– Candy bars and hot dogs should be given a second thought
Non-food Cravings (pica)

- Might be eaten because of tradition, custom, or cultural beliefs
  - Clay keeps the baby from being marked at birth
  - Clay keeps the woman from feeling hungry
  - Starch makes the newborn lighter
  - Starch helps the baby slide out easier during delivery

(Per March of Dimes Handout #3 & excerpted from Angel Hopson, RN, MSN, MPH)
Gestational Diabetes (GDM)

- Diabetes that develops only during pregnancy.
- Some women are more prone to developing GDM, such as women who enter pregnancy with obesity or polycystic ovary syndrome (PCOS), or gain excessive pregnancy weight.
- Often controllable by customized diet and exercise alone, but insulin is often added at some point. Try to involve a RD, CDE.
Eating on a Budget

Food assistance programs can help:

- **WIC**
  - [www.fns.usda.gov/wic](http://www.fns.usda.gov/wic)

- **Supplemental Nutrition Assistance Program (SNAP)**
• Source: Environmental Working Group (EWG):
  www.ewg.org
In Conclusion:
The benefits of good nutrition during preconception and pregnancy last far beyond conception and birth.
Long-term advantages of good preconception & pregnancy nutrition:

- Offspring have healthier metabolic programming and long-term disease prevention
- Postpartum mom able to get back to “old self” more easily
- Healthy behaviors become habits that parents model for children
- Enter next pregnancy healthier: INTERCONCEPTION
Preconception & pregnancy web resources for patients & allied health care professionals:

- [www.marchofdimes.com](http://www.marchofdimes.com)
- [www.cdc.gov/preconception/freematerials-health-edu.html](http://www.cdc.gov/preconception/freematerials-health-edu.html)

Developed in conjunction with the CDC Select Panel on Preconceptional Care and in partnership with the UNC Center for Maternal and Infant Health
Additional preconception resources for patients & allied health care professionals
Thank You

Presented by:
Amy Ogle, M.S., R.D.
Co-author of *Before Your Pregnancy:*
*A 90-Day Guide for Couples on How to Prepare for a Healthy Conception*  
(Ballantine Books, 2011)

Email:  [aogle5@cox.net](mailto:aogle5@cox.net)