12. Identify and address obstacles to greater availability of safe banked donor milk for fragile infants.

Actions for Employment

13. Work toward establishing paid maternity leave for all employed mothers.
14. Ensure that employers establish and maintain comprehensive, high-quality lactation support programs for their employees.
15. Expand the use of programs in the workplace that allow lactating mothers to have direct access to their babies.
16. Ensure that all child care providers accommodate the needs of breastfeeding mothers and infants.

Actions for Research and Surveillance

17. Increase funding of high-quality research on breastfeeding.
18. Strengthen existing capacity and develop future capacity for conducting research on breastfeeding.
19. Develop a national monitoring system to improve the tracking of breastfeeding rates as well as the policies and environmental factors that affect breastfeeding.

Action for Public Health Infrastructure

20. Improve national leadership on the promotion and support of breastfeeding.

To learn more about the Call to Action, see below. This is an exciting time to be a lactation consultant!

View a webcast of the Call to Action
http://nih.granicus.com/ViewPublisher.php?view_id=7

Executive Summary of the Call to Action
http://www.surgeongeneral.gov/topics/breastfeeding/executivesummary.pdf

Full Call to Action
http://www.surgeongeneral.gov/topics/breastfeeding/calltoactiontosupportbreastfeeding.pdf

Do Recent Research Findings Mean that Mothers Should Not Take Omega-3s? (Opinion)

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In a recent issue of the Journal of the American Medical Association, Australian researchers Maria Makrides and colleagues reported on the results of a large clinical trial testing the efficacy of DHA in preventing postpartum depression and increasing children's cognitive and language development at 18 months. Women were given either 800 mg of DHA or a placebo for the last half of their pregnancy. The results of their study found no significant difference in rates of depression or baby's cognitive development in the DHA vs. placebo conditions.

In the weeks that followed publication of this article, I received several panicked emails from colleagues who were trying to understand what these findings meant. Does this mean that mothers should not take Omega-3s? But before I describe my reasons why, it might be helpful to have a small primer in Polyunsaturated Fatty Acids, known in the field as PUFAs, that will help us interpret these results.

Primer in Polyunsaturated Fatty Acids (PUFAs)

As outlined on Figure 1, PUFAs are divided into two major classes: Omega-3s and Omega-6s. Both are Essential Fatty Acids, which means that our bodies cannot manufacture them: we must consume them

directly. The Omega-6s are pro-inflammatory and our found in vegetable oils. Most Americans consume these in large amounts, way more than we need, which increases our vulnerability to disease. In contrast, Omega-3s are found in flax seed, walnuts, canola and fatty, cold-water fish and are anti-inflammatory. Most Americans are deficient in these, which also makes us vulnerable to a wide range of diseases with an inflammatory etiology, including heart disease, diabetes and depression (see Kendall-Tackett, 2007).

In terms of depression, it is the long-chain Omega-3s that are of interest: EPA and DHA. These are mostly found in fish and fish-oil supplements. (There is also a vegetarian source of DHA that is manufactured from algae and is an additive in infant formula and some prenatal supplements. ALA, the parent Omega-3, is found in vegetable sources, such as flax seed. Unfortunately, it is not sufficiently anti-inflammatory to be an effective treatment for depression. The majority of the studies showing that Omega-3s prevent depression are studies of fish consumption, where women are consuming both EPA and DHA. (See Figure 1)

In a large cross-national ecological analysis of 41 published studies with more than 14,532 women from 22 countries, Hibbeln (2002) noted that postpartum depression was up to 50 times more common in countries with low fish consumption. For example, the rate of postpartum depression in Singapore was 0.5%, where the national rate of seafood consumption was 81.1 pounds per person per year. In South Africa, it was 24.5%, where the national rate of seafood consumption was 8.6 pounds per person per year. Hibbeln also analyzed published reports of DHA, EPA, and arachidonic acid levels in mothers' milk from these sample studies. Greater national seafood consumption predicted higher levels of DHA in the milk. Mothers who ate high amounts of seafood during pregnancy, and who had high levels of DHA in their milk postpartum, had lower rates of postpartum depression. Rates of postpartum depression were not related to levels of EPA or arachidonic acid.

From the results of Hibbeln's study, it might appear as though DHA alone was key to preventing depression. But since women were consuming both EPA and DHA when they consumed fish, it's difficult to conclude that DHA alone is the effective agent. Further, studies that have examined Omega-3s as a *treatment* for depression have found that EPA, not DHA, is the effective component (for example, see Martins, 2009). DHA likely has a role, but the evidence has not supported it as a treatment, or even a protective agent alone. To understand why, it is helpful to examine Figure 1 again. EPA and ARA (a pro-inflammatory Omega-6) are structurally similar and compete for the same receptor sites. When EPA is not present, ARA attaches to the receptors and causes what is known as the "arachidonic cascade," leading to the release of proinflammatory cytokines, leukotrienes, eicosanoids, and prostaglandins. This explains why EPA helps a wide variety of conditions, including heart disease, metabolic syndrome, allergic/autoimmune diseases, chronic pain syndromes, and depression.

So Back to the Study Results

The methodology of the Makrides et al. study raises several concerns that limit the applicability of its findings, and to my mind do not present a compelling case against supplementing mothers with EPA and DHA.

1. They tested DHA alone as a preventative for postpartum depression. Based on what we know about why Omega-3s work for depression, the regimen should have also included EPA (EPA was included, but in an amount so small it was unlikely to have a clinical effect). Given the relative absence of EPA, I'm not at all surprised that DHA alone did not prevent depression.
2. Even if DHA could possibly have an effect by itself, the researchers discontinued it after the birth, and yet assessed depression at 6 weeks and 6 months postpartum. How was it supposed to help if mothers were not taking it postpartum?
3. The authors did not describe how the infants were fed in the first 18 months of life. That omission is huge. How many of these babies were breastfed? And for how long? And if babies were fed formula, did the formula contain added DHA? Kramer et al.'s recent clinical trial of more than 17,000 infants demonstrates that breastfeeding was related to increased cognitive development of children at age six (Kramer, Aboud et al. 2008). The design of the Makrides' et al. study did not control for this important contributor to infant cognitive development—namely, breastfeeding-and therefore, we must question its generalizability. Further, their design did not recognize, or control for, the role of breastfeeding in protecting maternal mental health.
4. My final point is more philosophical. DHA is being added to infant formula with promises that it boosts babies' IQ and cognitive development. There have been a number of outrageous advertisements,

particularly in developing countries, showing babies using computers and wearing mortarboards. The implied promise is that this additive will produce super-smart, über-babies. The research findings on the efficacy of DHA on cognitive development have been far more mixed, or even negative [see recent Cochrane review]. Unfortunately, the design of the Makrides et al. study was influenced by this fairly simplistic and mechanistic model of cognitive development: add a substance, boost IQ.

5. In reality, cognitive development is influenced by a wide range of factors including mother-baby interaction--and breastfeeding. It's not simply a matter of adding a substance to the milk that babies consume. It is also important to point out that all of the authors on this study have been funded by and/or serve as advisors for formula companies, including Nestle, Fonterra and Nutricia. The authors were careful to disclose their affiliations with formula companies, and their funders were not involved in the research design or analysis of results. Nevertheless, the researchers have served as advisors to companies making infant formulas with DHA. It would be difficult for them not to be influenced by the model that guides much of the research into infant formulas with added DHA (i.e., that simply adding DHA will have these profound effects).

The Bottom Line

So I don't believe that the Makrides et al. study indicates that mothers should not be supplemented with Omega-3s, as most women are deficient in these, and supplementing will likely improve their overall physical and mental well-being. [see Kendall-Tackett, 2010 for more information] But supplements should include both EPA and DHA (at least 800 mg of each). And we should continue to support breastfeeding, as it both aides in babies' cognitive development and lowers women's risk for depression.

Hibbeln, J. R. (2002). Seafood consumption, the DHA content of mothers' milk and prevalence rates of postpartum depression: A cross-national, ecological analysis. *Journal of Affective Disorders*. 69, 15-29.

Kramer, M. S., F. Aboud, et al. (2008). Breastfeeding and child cognitive development. *Archives of General Psychiatry*, 65(5), 578-584.

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