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Case No. 4, Day 1
Date Due: 101025

Learning Objective: Discuss how medical professionals and the public learn about the effects of early life and health

After more than two decades, research examining the developmental origins of health and disease is reaching wider audiences and the general public, but less the medical professionals working in the fields of preconception and prenatal care.

ABSTRACT: *The Barker hypothesis, a consistently verified public health research finding that low birth weight corresponds with the risk of heart disease,[1] is making some inroads into prenatal and preconception health care fields. The hypothesis, since it was first published in1989, has been expanded by researchers examining the effects of prenatal factors on after-birth health outcomes, regardless of a child's birth weight. While preconception and prenatal health care has always focused on fetal and maternal health care needs and on guiding mothers toward proper prenatal care, there has not been a holistic approach to tie the findings of research directly to the education of health care professionals, to the multiple communications streams directed to expecting mothers and their families, or to policy channels designed to improve women's health in the United States. That is changing, as the Barker hypothesis gains wider attention in the popular press.*

The manner in our case how our state officer learns of a new health theory accurately reflects the status of the emerging field of research called the developmental origins of health and disease, or what many call the Barker hypothesis. This began to take off in 2005.[2] Researchers have found consistent inverse relations between birth weight and insulin resistance, type 2 diabetes mellitus, and cardiovascular disease. What's more, lower birth weight together with a higher body-mass index in childhood or adulthood appears to be associated with the highest risks of these outcomes.[2] In this case, the officer attended a Chicago hospital event, where it was said that half of our health is determined from the time of conception until the time we go to school. Such theories were not prevalent in medical school curricula nearly four decades ago, according at least one University of Washington professor, Dr. Stephen Bezruchka.[3]

The case notes pediatric training never discussed such material, even though media read by millions, like the Sept. 22, 2010, edition of Time magazine, feature major spreads. That story discussed the emerging field of research regarding the critical role that the nine months of pregnancy play in a person's life, on a range of ailments, from obesity to mental illness.[4] ABC News a year earlier ran a story on findings from a study that linked prenatal exposure to the 1918 influenza virus

to a spike in heart disease among those in their 60s, 70s, even 80s—a 33% rise.[5]

It is not clear what impact the web site www.thebarkertheory.org/index.php, focusing solely on the Barker hypothesis, is having or how many are influenced by the scholarly journal called the Journal of Developmental Origins of Health and Disease. Annie Murphy Paul, who wrote the Time feature, suggests that there has been an explosion of research during the last 10 years on the fetal origins of disease and a "revolutionary shift in thinking." If there was a paradigm shift, research for this paper did not find it. Scholarly articles on the Barker hypothesis still may have not changed how maternal and prenatal care fields—obstetrics and gynecology but not midwifery practice—educate their practitioners about the importance of prenatal care for a child's health through his or her life.

Medical School: The University of Washington (UW) School of Medicine's Department of Obstetrics and Gynecology requires all residents have clinical experience in obstetrics and gynecology and training in 11 subspecialties like ultrasonography. Training is provided at the Women's Health Care Center and Harborview Medical Center. From the department's web site, http://depts.washington.edu/obgyn/, it was not possible to see if future OB-GYN specialists are learning about the developmental origins of disease in their rotations or in their community health care outreach. Two required textbooks assigned to all UW OB-GYN medical students were not in the library system. The library had a supplementary 2001 textbook, *Comprehensive Gynecology*, and it did not reference the Barker hypothesis or the concept of developmental origins. The book was clinical, outlining physiology and pathology issues. No information relating to the Barker hypothesis could be found in a 2007 textbook for gynecology called *Comprehensive Gynecology* that was on the UW library's shelves.

While the Barker hypothesis does not appear integral to some OB-GYN training, MD specialists are learning about it via continuing education and conferences. For instance, a Texas-based specialist has been offering a video grand rounds (much like in our case) in 2009-10 called *A Neonatologist's Perspective on Childhood Obesity*, reviewing aspects of the Barker hypothesis on neonatal

medicine.[6] The University of California San Francisco School of Medicine (UCSF) is also looking at current evidence-based approaches to prenatal care, with a presentation at a conference (Oct. 25-27, 2010) devoted to the Barker hypothesis,[7] all suggesting many OB-GYN specialists are not familiar with the hypothesis. If true, it confirms concerns expressed 5 years ago by Bezruchka that the field of medicine is not paying attention to the science that "those from more disadvantaged early life situations are already slated to be less healthy at birth and to become sick later."[3]

Midwifery: For its part, the American College of Nurse-Midwives (ACNM) defines midwifery as oriented to a public health care perspective, to serving vulnerable populations, and to promoting health education and health promotion, suggesting attention to women most at risk of having low birth weight children and to research that promotes better outcomes for expecting mothers.[8] Midwives' practices require them to assess a patient's physical, mental, and social health as part of their primary care provided to women. Their guidelines portray a holistic approach looking at patient health beyond pathologies and toward multiple factors that impact health.

The Public: The public receives maternal care information from many streams, and this paper did not find studies on their individual efficacy. They include popular media, the Web, advertising, for-profit broadcast media, and public service messaging from government agencies and health care groups. As seen in the Time article, information can filter first from the "expert" community to the wider public, and this paper will focus on key medical expert sources, whose communications influence secondary messengers.

With the issue in this case, experts on preconception and prenatal care have discussed low birth weight issues for decades, though not exactly why low birth weight may signify later certain health risks. In 1985, the Institute of Medicine published a report on preventing low birth weight children, which led to a 1989 report on prenatal care called *Caring for Our Future*. The U.S. Centers for Disease Control and Prevention (CDC) in 2006 released a definitive report defining best practices and interventions to modify behavioral and social risks to a women's health or pregnancy outcomes.[9]

The U.S. government also has intervened to promote healthy pregnancies since the 1980s, requiring the supplementation of foods with folic acid to prevent birth defects and mandating that cigarette and alcohol manufacturers to highlight potential risks to pregnant mothers.

The American College of Obstetricians and Gynecologists (ACOG), another respected expert body, publishes dozens of publications to help mothers with everything from nutrition to pregnancy risks.[10] The ACOG's publications do not address the development origins of disease topic directly. Regardless of intentions, larger population health concerns are not being factored in messages. Commenting on links between the high rates of heart disease in India and the poor nutrition of women there, Amartya Sen says such concerns are critical for maximizing public health outcomes for society: "What begins as neglect of the interests of women ends up causing adversities in the health and survival of all, even at an advanced age."[11] ACOG data from 2006[12] notes the lack of health insurance in the United States continues to pose risks for expecting mothers and their children, and thus the future health of the U.S. population. About 13% of all pregnant women are uninsured, and uninsured pregnant women are less likely to seek prenatal care in the first trimester and receive less than recommended visits during their pregnancy.[12]

Still another expert source, the U.S. Department of Health and Human Services' (DHHS) web site for women's health issues, www.womenshealth.gov, also has prenatal care guidance, but no data on the Barker hypothesis. The prenatal care FAQ sheet notes babies of mothers who do not get prenatal care are three times more likely to have low birth weight, but does not say what low birth weight means for chronic disease risk. Women are told not to smoke or drink alcohol, take vitamins and folic acid, and regularly have caregiver visits—advice universal to most prenatal care communications.[13] There is no discussion of stress issues or factors parents cannot control—local environmental exposures related to their income and neighborhoods. Rather, women are told to avoid chemicals like rat poisons, cat litter, and all forms of smoke.

This body of evidence from studies looking at single-risk associations or risk factors with poor

birth outcomes, according to Dr. Michele Curtis, amounts to a "deeply fragmented epidemiology around birth outcomes and an ongoing failure to address the impact of integrated and interrelated factors."[9] She claims that at least in preconception care, "the medical care system will need to deemphasize its current procedure-based, acute care perspective and more broadly embrace the provision of preventative care measures."[9] The irony, she points out, is that such advice has been shared for two decades. Curtis argues that providing better preconception care will require not better communication approaches, but structural changes how medical care is financed. She suggests that Medicaid programs are best suited to reach most women and yield costs savings to society through improved maternal and birth outcomes.[9] She proposes expanding the Healthy Start program (under Medicaid), which serves groups at high risk of adverse perinatal health outcomes—a program that is using the findings of research that show that environmental, behavioral, and biological stressors occurring during a mother's life span may harm children of disadvantaged women.[14] Healthy Start's nearly $900 million, six-year budget through 2013,[15] however, represents a small fraction of Medicaid's more than $470 billion in annual spending.

Back to the Case and Questions:

Healthy Start, mainstream media articles on the Barker hypothesis, and greater attention from population health researchers all point to the traction that the field of the developmental origins of health and disease has made. But, as the case notes, training for the most advanced practitioners in prenatal and maternal care appears less focused on the emerging paradigm of how later chronic diseases are associated with prenatal health. A change in thinking in the medical community, and its prenatal communications materials, may be close, but not quite here.

1. Is there research how mainstream articles and broadcast stories on emerging trends in population health or medicine lead to measurable shifts in practices within the medical profession?
2. Will the millions of low-income, uninsured women of child-bearing age be more receptive to messages that focus on the long-term health outcomes of good prenatal care for their children, or more receptive to helpful, how-to messages about nutrition and healthy pregnancy practices?

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