

# Preconception care: a clinical case of “think globally, act locally”

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In 1900, the life expectancy for a woman in the United States was 48.3 years; by 2004, that life expectancy had risen to 80.4 years.<sup>1</sup> Most of the increase is attributable to improvements in nutrition, sanitation, and other public health efforts that are focused at the population level; however, medical advances in secondary and tertiary prevention efforts that target individual patients also played a significant role. Despite evidence of the synergy between medicine and public health, the full integration of these disciplines has never been realized. This dichotomy has fostered the perception that medicine cares for individuals and that public health cares for populations. At the clinical level, health care practitioners often struggle with how to “translate” population-based risk data to the individual who is seated in front of them. To paraphrase the vernacular, “think global, act local” health care providers are grappling with the challenge to “think population, treat individual.”

The concept and practice of preconception care epitomizes the difficulty, and concurrent simplicity, of translating population-based primary prevention data to individual patient care. For centuries, there have been theories and observational reports to support the idea that the health of the mother impacts directly on the health of the fetus, but it has only been in the last 60 or so years that rigorous scientific evidence and study have been able to demonstrate clearly the direct relationship between a woman’s health or health risks and her current or future health and between her health and pregnancy outcomes. Most women are well aware of the long-term health risks of smoking, but many women are not aware of the adverse impacts of smoking during pregnancy or the long-term health risks that they impose on others in the household, including infants and children.

Folic acid supplementation for all women of reproductive age has achieved clear success in decreasing neural tube defects in developing fetuses, which is an accomplishment that led to fortification of the US food supply with folic acid in 1998.<sup>2,3</sup> Evidence is also mounting to support the idea that folate supplementation may decrease the long-term risk of cardiovascular disease, particularly in individuals with methylenetetrahydrofolate reductase mutations.<sup>4,5</sup> Research on the fetal origins

of adult disease has demonstrated that certain adult-onset diseases (eg, hypertension, metabolic syndrome) are influenced by fetal epigenetic alterations in gene function. Gene silencing requires methyl groups, and folic acid levels impact methyl group availability. It is not unreasonable to hypothesize that folic acid supplementation will impact not only the woman’s future health and the immediate health of developing fetuses but also may impact the future adult health status of that developing fetus.

There is currently an explosion of scientific research and understanding of environmental and genetic influences, which include their interactions, not only on the health of children and adults but also on that of developing fetuses and in some instances on their future progeny.<sup>6,7</sup> Although undernutrition had been shown previously to affect a developing fetus adversely, there is now evidence that fetal overnutrition results in adverse health outcomes in childhood and adolescence and may even contribute to intergenerational cycles of obesity.<sup>8,9</sup>

As obesity has increased in the United States, so too has the prevalence of diabetes mellitus. Despite medical treatment for this condition, many women of reproductive age with diabetes mellitus are not aware of the risks that this condition may impose on a developing fetus. In 1 managed care study, only 52% of the women of reproductive age with diabetes mellitus recalled any discussions with their providers about the need for glucose control before pregnancy, and only 37% of the women said that they had received any family planning advice from their providers.<sup>10</sup> Women who experience gestational diabetes mellitus are at increased risk for fetal macrosomia and obstetric complications during pregnancy, but the risk does not end with delivery. Women who experience gestational diabetes mellitus are at increased risk for the development of type 2 diabetes mellitus throughout their lifetime; the risk of the development of the disease is highest in the first 5 years after delivery and levels out after 10 years.<sup>11,12</sup> Because of this, the American Diabetes Association and the American College of Obstetricians and Gynecologists recommend either a fasting blood sugar or oral glucose tolerance test at 6-8 weeks after delivery. Evidence shows that many women with gestational diabetes mellitus are not being screened appropriately during the postpartum period, and that many women with a history of gestational diabetes mellitus were unlikely to contact their primary clinicians until they actually experienced signs of type 2 diabetes mellitus.<sup>13-15</sup>

In 2006, the Centers for Disease Control and Prevention Select Panel on Preconception Care defined *preconception* care as a series of “. . . interventions that aim to identify and modify biomedical, behavioral, and social risks to a woman’s health or pregnancy outcome through prevention and management. . . .”<sup>16</sup> Public reaction to this was swift and divided. Some groups took offense at the effort of the Centers for Disease

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Control and Prevention to define preconception care at the population level, perceiving it as an erosion of reproductive choices for the individual woman through an effort to maximize women's health based on a view that all women are current or potential fetal incubators. Other groups welcomed the efforts to improve the health of reproductive-age women, regardless of whether they ever became pregnant, particularly because most of a woman's life is spent not being pregnant. An overwhelming number of women will become pregnant at some point during their reproductive lives, but a significant number never will, either by choice or circumstance. So how do we exercise the global thought process that requires us to consider how a woman's current or past life circumstances may impact a possible future pregnancy without denigrating the individual woman's right locally to make her own reproductive choices? In short, how do we "think population, treat individual" to help women lead both long and healthy lives?

In its Committee Opinion on Preconception Care, the American College of Obstetricians and Gynecologists recommended that every woman of reproductive age have a reproductive life plan.<sup>17</sup> In clinical practice, this requires health care providers to explore whether a woman of reproductive age is either planning or at risk for a pregnancy in the next year or sooner. Because half of all pregnancies are unplanned, most women will respond "no"; but the questions also incorporate those women who may not be planning a pregnancy but who are not consistently and proactively taking steps to avoid it. For these women, the opportunity for discussion about contraception and risk factors to their own health and the health of future pregnancies and children would then be available. For women who answer "yes," that they are hoping to achieve pregnancy within the next year or so, the clinician would be able to screen and counsel the women for any risk factors that are associated with adverse health outcomes and pregnancy outcomes.

The bridge between "think population, treat individual" in the instance of preconception care may be as straightforward as asking a single question about pregnancy risk or intent. Yet this simple concept has been difficult to practice on a routine basis; the general population does not expect it to be asked, and time taken to provide the appropriate counsel to a woman on the basis of her answer is not reimbursed. In some instances, the time that is needed to do this may require a separate counseling visit and more frequent medical visits to treat any conditions that she may have. The articles in this special supplement clearly illustrate the benefits of preconception care to women and their families; however, without some significant changes in the current health care system, it will remain yet another unrealized opportunity. These changes include integrating the concept and practice of preconception care into the training of health care practitioners, restructuring the health care finance system so that prevention is rewarded commensurate with intervention, and influencing the will of the general public to demand more money for research, demonstration, and implementation projects that are related to preconception care.

Without such changes, preconception care will remain another example of how, although science can prove the need to "think population," it is never translated into action at the "treat individual" level. The tragedy of this is that although local individuals suffer unnecessarily, so too do populations globally. ■

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