

A Paradigm Shift in Preconception and Interconception Care

Using Every Encounter to Improve Birth Outcomes

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Abstract

As U.S. infant mortality remains relatively unchanged and maternal mortality is rising, it is increasingly clear that service providers need to address many of the modifiable risks that determine birth outcomes prior to pregnancy. Health professionals have promoted preconception care for decades as a way to improve women's and infant's health. Yet few women receive this type of care. Strategies to identify and reduce maternal preconception health risks will require system-level changes and a paradigm shift toward assessing pregnancy desires and risks at every encounter and in every setting possible. The author presents current strategies and opportunities for advancing preconception wellness.

Infant mortality is the measure of infant deaths occurring in the first year of life. It is a key indicator for the health of a population. Despite being one of the wealthiest nations on earth and spending more than twice as much on health care than any other country, the U.S. currently ranks 26th in the world in infant mortality (Organisation for Economic Co-operation and Development, 2016). The U.S. continues to lag behind countries of similar economic standing with birth outcomes being fairly stagnant for more than a decade. Of additional concern, the U.S. maternal mortality rate is increasing—more women are dying during or around childbirth now than 20 years ago (Kassebaum et al., 2014). In fact, the US is the only developed country in the world with a rising maternal mortality rate. This fact should give all Americans pause—across communities, professions, and political spectrums—and create a sense of urgency for action and solutions.

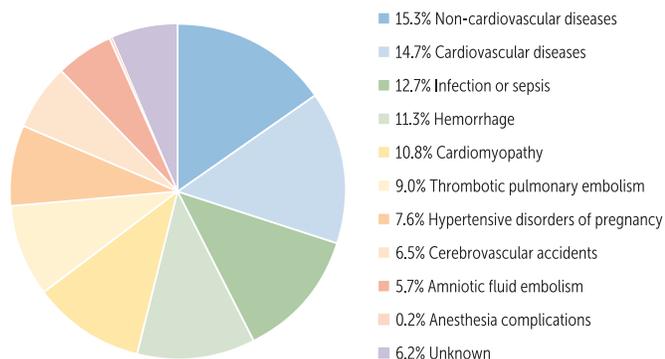
It may come as a surprise that the top two leading causes of death in pregnant women are not pregnancy related (see Figure 1). Cardiovascular and non-cardiovascular chronic conditions (e.g., diabetes) account for 30% of maternal mortality. Congenital birth defects (20%) and preterm birth/low

birth weight (18%) are the leading drivers of infant mortality in the US and have remained relatively unchanged for decades. Maternal complications account for 7% of infant deaths and are the third largest contributing factor (Mathews, MacDorman, & Thomas, 2015).

Despite decades of effort, there have been disappointingly few scientific advances in preventing preterm birth (defined as delivery before 37 weeks gestation). Interventions such as the medication 17-hydroxyprogesterone and the Centering Pregnancy Model of group prenatal care (Tanner-Smith, Steinka-Fry, & Lipsey, 2014) have shown promise in reducing preterm birth rates but recent studies suggest their benefits may not be as significant as hoped (Prior & Thorton 2016).

There was a worsening trend in preterm births in the mid-1990s, followed by a slow decline for the past several years (Child Trends Databank, 2015). Unfortunately, the latest data available from 2014 reports the preterm birth rate is worsening once again (Hamilton, Martin, Osterman, Curtin, & Matthews, 2015). Moreover, there remain significant disparities in outcomes among racial groups, particularly among non-Hispanic blacks and Native Americans. Not only have these

Figure 1. Causes of Pregnancy-Related Deaths, US 2011–2012



Source: Centers for Disease Control and Prevention. (2016). Pregnancy Mortality Surveillance System. Retrieved from www.cdc.gov/reproductivehealth/maternalinfanthealth/pmss.html

gaps not improved, but the relative disparity has actually widened (see Figure 2). In 1980, black infants were dying at twice the rate of white infants. In 2014, it is now 2.2 times the rate (Kochanek, Murphy, Xu, & Tejada-Vera, 2016).

Improving Birth Outcomes Through Preconception Care

How is the US going to positively change the trend in poor birth outcomes? Most efforts to reduce infant and maternal mortality have historically focused on prenatal care and interventions during labor and delivery. Unfortunately, after several decades of emphasis in this area, birth outcomes are not improving and, in some cases, worsening. The importance of optimal prenatal care and delivery management cannot be

overstated, but there remain many additional ways to make a great impact on improving birth outcomes for mothers and babies. But these supports and services need to occur prior to pregnancy.

Preconception care is defined as a set 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 before pregnancy occurs (Centers for Disease Control and Prevention [CDC], 2006).

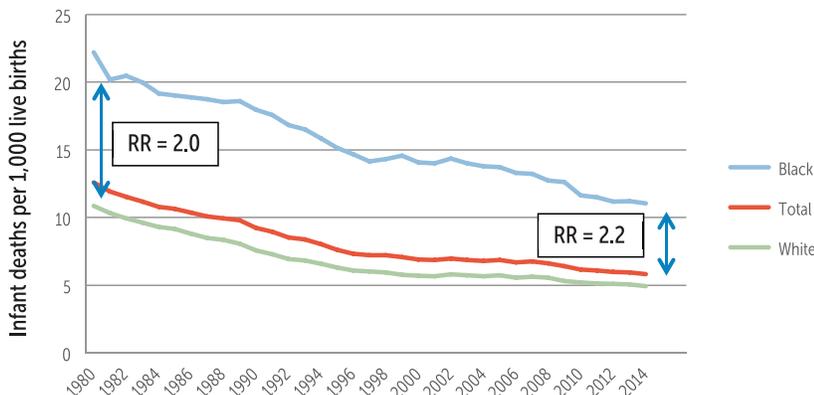
Examples of common modifiable risk factors that influence birth outcomes (both maternal and infant) include: pregnancy intention, interpregnancy interval, maternal age, folic acid supplementation and other nutritional factors, exposure to substances, teratogenic medications, chronic disease control, and toxic stress. In order to improve future birth outcomes, these risks need to be addressed prior to conception—before the first missed menstrual period and before the first prenatal appointment.

Once the pregnancy is confirmed and prenatal care begins, the opportunity to reduce many of these risks and affect birth outcomes has passed. Fetal development of the central nervous system and heart begin in the 5th week, before many women are even aware of the pregnancy. Despite the fact that the most critical periods of fetal development are complete by 9 weeks gestation, the average woman enters into prenatal care at 11 weeks (Moos & Bernstein, 2013).

The Need for System Change

Preconception care is not a new concept. For more than 4 decades it has been promoted as an important part of women’s health. The traditional strategy for providing this type of care has been through a dedicated preconception health visit. This approach focuses on working with women who are planning pregnancy. Reproductive planning occurs at scheduled

Figure 2. U.S. Mortality Rate by Race, 1980–2014



RR = Relative rate

Source: Kochanek, K. D., Murphy, S. L., Xu, J., & Tejada-Vera, B. (2016, June 30). Deaths: Final data for 2014. *National Vital Statistics Reports*, 65(4).

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The importance of optimal prenatal care and delivery management cannot be overstated.

contraception visits with a medical provider or at annual wellness exams.

This traditional approach, however, is systematically challenged. Almost half of pregnancies in the US are unintended (mistimed or unwanted; *Finer & Zolna, 2016*). Only 18.4% of women report having had a preconception care visit prior to their pregnancy. Only 1 in 5 women report taking folic acid prior to conception, an important diet supplement to prevent brain and spinal cord abnormalities.

One in 4 women of reproductive age in the U.S. have no health insurance coverage. Although all states have enacted Medicaid coverage to fill this gap, eligibility begins only after pregnancy is confirmed, and coverage generally ends shortly after giving birth. Many women miss their postpartum visit, thus missing the opportunity for future reproductive planning and the chance to be connected back to primary care and address any identified risks for the next pregnancy. Lastly, U.S. women of reproductive age are increasingly experiencing more health risks: more than 50% are overweight or obese, 43% have some type of chronic disease requiring frequent follow up or medication, more women are having pregnancies later in life, and substance use and mental health issues are common (*CDC, 2009; Mathews & Hamilton, 2014*).

The former administrator for the Center for Medicare and Medicaid, Dr. Donald M. Berwick, made the observation: “Every system is perfectly designed to achieve exactly the results it gets.” (*Berwick, 2000, p. 71*). For the U.S. health care system, the results have been high health care costs, rising maternal mortality rates, and stagnant infant mortality with widening racial disparities.

If different results are desired, system-level changes will be required. What would a system designed to reduce infant and maternal mortality through enhanced preconception health care look like? Keep in mind: (a) most women are not seeking

this type of care; (b) many women have no insurance coverage; (c) most women have competing priorities for their attention such as children, work, and school; (d) almost half of all pregnancies are unintended, so the new system cannot just focus on “planners;” and (e) half of women with unintended pregnancies report using some form of birth control in the month prior to conception, so documenting contraceptive use alone may not be enough.

In 2006, the CDC Select Panel published *Recommendations to Improve Preconception Health and Health Care—United States*. Recommendation #3 stated “As a part of primary care visits, provide risk assessment and educational and health promotion counseling to all women of childbearing age to reduce reproductive risks and improve pregnancy outcomes.” Recommendation #5 targeted the care between pregnancies: “Use the interconception period to provide additional intensive interventions to women who have had a previous pregnancy that ended in an adverse outcome (i.e., infant death, fetal loss, birth defects, low birthweight, or preterm birth).”

That was 2006. It is now 2017. What progress toward actualizing these recommendations has been made, and who is taking responsibility? Many initiatives are led by those in the medical system who traditionally focus on improving birth outcomes, but few obstetricians/gynecologists or midwives are providing primary care and less than 10% of family medicine physicians provide obstetrical care (*Cohen & Coco, 2014; Ferrer 2017*). Clearly, these recommendations were not meant solely for providers of maternity care. Almost all primary care providers (family medicine, internal medicine, pediatrics) see women and children. Preconception care is/should be important for all providers, irrespective of specialty or setting. Leaders in maternal child health, including physicians, midwives, community nursing programs, and public health workers, need to assist, challenge, and embrace those who do not traditionally see themselves as providers of maternal child health into the effort. This collaboration is the kind of systematic change that is needed.

The timing is right. A steady momentum for preconception health has been growing as federal, state, and local groups have increasingly turned their focus to preconception care. In 2003, Debra Hobbins referred to Joseph Stanford’s famous statement that “If you take care of women of reproductive potential, it’s not really a question of whether you provide preconception care, rather it’s a question of what kind of preconception care you are providing.”

In her 2013 presidential address to the American Congress of Obstetrician Gynecologists, Dr. Jeanne Conry promoted the concept of “Every woman, every time” as a preconception health mantra, recognizing that providers and other professionals see women every day in multiple settings. Providers need to take the opportunity to ask about and address reproductive health risks and needs whenever possible—when patients or clients are in front of us for whatever reason. Primary care providers can and should be leaders in this effort. A paradigm shift toward a life course approach inherently holds within

it the health of the next generation. If a woman is prepared and healthy to have a healthy pregnancy and child, the health care system has achieved its goal. Preconception care is primary care.

One argument against an “every woman, every time” approach is the concern that women should not be viewed solely through the lens of their reproductive potential. “I am more than my uterus!” This certainly is not the intention of this effort, and great care should be made to avoid any sense that this issue defines a view of women’s health. That said, most of the elements of preconception health promotion are appropriate for all women, irrespective of pregnancy plans. At the same time it must be emphasized that almost half of pregnancies are unintended. Providers must be respectful of the whole woman and where she is in her life plans while recognizing that optimal primary health prevention includes preconception care for all women. Reducing infant and maternal mortality depends on it.

What Does Preconception Care Look Like?

As stated previously, preconception health care is a set of interventions that aim to identify risks to a woman’s health or pregnancy outcome through prevention and management before pregnancy occurs. The content areas of preconception care include:

- family planning
- nutrition
- infectious disease and immunizations
- chronic disease management
- medication exposures
- substance use and environmental exposures
- previous pregnancy outcomes
- genetic history
- mental health
- interpersonal violence/abuse

Ten areas have significant evidence for improving birth outcomes for both mother and child. The ten areas can be divided into four intervention categories: (1) giving protection; (2) managing medical conditions; (3) avoiding exposures known to be teratogenic (harmful to a developing fetus); and (4) identifying risks due to family, past obstetrical, and social history to allow for shared decision making. Identifying and reviewing risks in each category during a patient visit can allow for an informed discussion centering on shared decision making about when and if to conceive. The key components of each category are listed below (The 2008 *American Journal of Obstetrics & Gynecology* supplement is devoted to a review of the evidence for preconception care, see Jack et al., 2008).



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Giving Protection

Examples: A multivitamin with folic acid taken 3 months prior to pregnancy can prevent 50–70% of neural tube defects; infection screening and prevention (ensuring immunizations such as rubella, varicella, and hepatitis B are up to date and identifying and treating HIV, tuberculosis, other sexually transmitted infections); family planning to prevent unintended pregnancy and rapid repeat pregnancy (interpregnancy intervals of less than 18 months); and screening and referral for interpersonal violence and sexual abuse.

Managing Medical Conditions

Examples: Management of common chronic primary care issues such as diabetes (reduction in birth defects from approximately 10% to 2–3% with strict glycemic control prior to pregnancy; Guerin, Nisenbaum, & Ray, 2007), obesity, hypothyroidism, hypertension and cardiovascular disease, asthma, autoimmune disorders, coagulopathies, HIV disease, seizure disorders, and depression and other mental health conditions.

Avoiding Teratogenic Exposures

Examples: Alcohol, tobacco, drugs (prescribed opiates, methadone, and street drugs); environmental toxins (mercury, lead, radiation, pesticides, bisphenol-A [BPA—found in plastic bottles]); and medications (common ones include anti-seizure and psychiatric medications such as valproic acid and lithium, anticoagulants, ACE-inhibitors for blood pressure, statins for cholesterol, and isotretinoin for acne).

Identifying Family, Past Obstetrical, and Social Risks

Examples: Genetic and family history; ethnic background; maternal age (timing matters, sometimes earlier might be safer); prior pregnancy outcomes such as preterm birth,

gestational diabetes, and preeclampsia; and prior congenital anomalies or recurrent miscarriages.

The volume of information covered in thorough preconception care is comprehensive and therefore a bit challenging to accomplish in busy primary care settings (Before, Between, and Beyond Pregnancy, 2017). There are several resources available to help health care providers frame the discussion through the reproductive life plan. The CDC (n.d.) provided an example of provider questions about family planning as follows:

“Do you plan to have any (more) children at any time in the future?”

If YES: How many? How long would you like to wait until you become pregnant? What family planning method would you like to use until you are ready? How sure are you that you will be able to use this method without any problems?

If NO: What family planning method will you use to avoid pregnancy? How sure are you that you will be able to use this method without any problems? People’s plans change. Is it possible you or your partner could ever decide to become pregnant?

Opportunities and Challenges

Although the idea of reproductive life planning has been around for some time, it has become clear that it is not a one-time discussion. Much of the work ahead lies in developing a system to have this discussion frequently. Recognizing the unintended pregnancy rate as well as the challenges inherent in planning anything in life, it can be helpful to think about an opportunistic approach to reproductive risk and planning. An opportunistic triage of risk involves routinely identifying reproductive risks and needs at every encounter. The Oregon Foundation for Reproductive Health (2012) developed a focus group tested strategy called the “One Key Question” (OKQ). Although originally intended for primary care clinicians, asking the OKQ, “Would you like to become pregnant in the next year?” can really happen anywhere, including at pharmacies, the emergency department, urgent care visits, upon hospital discharge, at well woman visits, and at community services intake.

When the OKQ is asked, there are four possible answers: yes, no, unsure, or OK either way. In non-clinical settings, the response can lead to education and referral to appropriate community resources. In the clinical setting, the response will influence the medical decision making of prescriptions, follow-up care, and preventive reproductive health services provided. For each woman of reproductive age, the provider should review recommendations for multivitamins with folate for all. Depending on a patient’s plan, a quick review of medical conditions and medications can bring specific risks to light. Of key importance is identifying contraceptive needs and addressing them in a patient-centered approach maximizing same-day provision of services (including emergency contraception) and minimizing barriers to access. Discussion of optimal timing of pregnancy (birth spacing and optimizing

chronic disease management prior to pregnancy) with planned follow up is a reasonable approach to starting the preconception care process.

There are many unanswered questions about how to do this work. While the question seems simple, how to best ask this question to women in different life situations may vary. Issues of bias and concerns about reproductive justice need to be thoughtfully addressed in each individual setting. Important considerations include how people are counseled on options, the resources available to support training, and access to quality care and services.

Even when whittled down to the OKQ, incorporating something additional into the routine workflow of patient care is challenging. Although there may be concern about adding “one more thing,” there needs to be acceptance of the paradigm shift for the provision of routine care to include the potential for poor future reproductive outcomes. There are a few questions that can be asked of an individual practice: Should it be provider-driven or could a medical assistant or other staff ask the questions and provide resources? How can the OKQ and identified needs be incorporated into the electronic health record? And, most important, what happens after the answer? Is there a standard process to meet the patient’s needs? Finally, what ways can the current reimbursement structure support this added service?

Barriers to change will be ongoing but not insurmountable. Practices will need systematic ways to address identified needs in a timely manner. It is realistic that not all issues will be able to be handled in the moment. Care must also be taken to not hijack or ignore the patient’s initial agenda, which may not have been about reproductive health. At the same time, it must be recognized that an acute visit for a chest cold may be the only opportunity to reduce unintended pregnancy and preconception health risks! When future pregnancy occurs, the value of what was done (or not done) at that encounter will be apparent.

What About the Men?

Most of the focus of preconception health has been for women. Much work is still needed to increase engagement with men around preconception health and to recognize the valuable role they play in supporting healthy birth outcomes. However, the OKQ approach can be used to engage with men, too. Paternal intervention categories are similar: reproductive planning and contraception, infection/immunizations, genetics/family history, social and behavioral issues, and domestic violence. These conversations with health care providers also provide an opportunity to counsel men about their important role in parenting.

What Does Interconception Care Look Like?

Interconception care (ICC) is the preconception care provided from the end of one pregnancy to the beginning of the next. It has been challenging to develop a standard model for

provision of this care for many of the same reasons as preconception care—many women lose coverage after pregnancy is over, miss their postpartum visit, or have competing demands on time and focus. A successful model for reconnecting postpartum women identified with risks is the Interconception Care Project of California. Multiple evidence-based algorithms are available to the public to assist with postpartum management by the maternity care provider and transition back to a primary care provider for ongoing care (Every Woman California, 2011).

A novel model of ICC in the context of pediatric care has been developed by the IMPLICIT (Interventions to Minimize Preterm birth and Low birthweight Infants using Continuous Improvement Techniques) Network with support from the March of Dimes. A newborn is seen about 10 times in the first 2 years of life while the average mother may only be seen twice. Mothers bring their children to well-child visits (WCV) routinely even though they may not seek care for themselves. Because a mother's health and behaviors directly impact the child's health—both positively and negatively (e.g., tobacco use, depression, breastfeeding), the WCV offers an ideal opportunity to screen mothers in the interconception period and provide brief interventions for risk reduction that could improve future birth outcomes (see box Using Well-Child Visits to Improve Birth Outcomes). Studies have confirmed that women accept inquiry and advice about their own health at pediatric visits. (Fagan, Rodman, & Sorensen, 2009; Heneghan, Mercer, & DeLeone, 2004; Rosener et al., 2016)

The IMPLICIT Model of ICC (see box Using Well-Child Visits to Improve Birth Outcomes) focuses on four maternal risk factors that have strong evidence for influencing outcomes in a future pregnancy: smoking, interpregnancy interval, depression, and use of a multivitamin with folic acid. Initial results are very promising, particularly in increasing access to long-acting reversible contraception and use of multivitamins.

Advancing Preconception Wellness in Communities and Health Systems

So what is it going to take to transform the system to include preconception health promotion and risk reduction into routine care? What do primary care providers need in order to change? They need at least four things: (a) buy-in (individual and organizational) regarding its urgency and importance, (b) education and support, (c) motivation in the form of aligned financial incentives and quality measures, and (d) system supports.

Measuring Quality Health Care

Harrington and McNellis (2006) observed

Measurement is the first step that leads to control and eventually to improvement. If you can't measure something, you can't understand it. If you can't understand it, you can't control it. If you can't control it, you can't improve it.

Using Well-Child Visits to Improve Birth Outcomes

The following are examples of influencing maternal behaviors at a well-child visit (WCV) in a way that may positively impact future birth outcomes:

Sandra:

Sandra is a mother with Type 1 diabetes. At her child's 6 month WCV, the provider discovered that, despite a high-risk medical condition and not desiring pregnancy, Sandra was not on any contraception or multivitamins. She actually had been discharged from her previous primary care practice for financial reasons and had no follow-up plans. The health care provider identified risks, offered emergency contraception, and gave a prescription for oral contraceptives as a bridge to a future family planning appointment. Thus, the risks for unintended pregnancy and poor birth outcome were averted.

Sofia:

Sofia was the mother of a 10-month-old, who brought her child in to the clinic for "ER follow up." Sofia had missed the 9-month WCV. The provider performed the IMPLICIT ICC risk assessment and all four were positive: she had restarted smoking, had stopped taking the birth control pill, screened positive for depression with increased stress at home, and had stopped taking multivitamins. The intervention performed that day included providing multivitamins, referring to a behavioral health specialist for assessment and support, reinforcing smoking cessation, and providing contraception. At the next WCV, all four screens were negative, revealing highly successful family-centered care.

The Institute of Healthcare Improvement has led major reforms in the medical field to push quality measurement. A transformation is underway to move payment away from a fee-for-service model, in which providers are paid based on the number patients seen or procedures done, to a value-based model in which payment is based more on outcomes. The Centers for Medicare & Medicaid Services and other insurers are currently holding providers and health systems accountable on the basis of quality measures. Current measures are focused on chronic disease management and preventive service delivery, such as immunizations (e.g., influenza, pneumococcal); weight assessment and dietary counselling; tobacco screening and counselling; hypertension/diabetes/heart failure evidence-based screens, management, and targeted goals; and colon/breast/cervical cancer screening. Despite all of these measures, none focus on reproductive age women as a special group.

For pregnancy outcomes, there are measurements for prenatal care access and appropriate infection screening, labor management (e.g., not performing elective deliveries before 39 weeks gestation, cesarean section rates), and birth outcomes (appgar scores, prematurity, birthweights, neonatal and infant mortality, and maternal morbidity and mortality).

But what about for preconception care? No current preconception care measures exist. Well, none that are currently being reported and used as such. As has been already established, good preconception care starts with good women’s health. Recommendations for immunizations, weight, depression screening, tobacco, screening for sexually transmitted infections, management of diabetes, and more could all be used for demonstrating quality preconception care if reported in this way.

Measuring Preconception Wellness

Preconception wellness is the state of a woman’s health at the time of conception. Preconception care is the care provided to promote and achieve preconception wellness. The goal of preconception care is to achieve optimal preconception wellness. Preconception care is provided in multiple settings across clinical and public health sectors. Thus it is difficult to measure and difficult to hold any one group or domain accountable!

If there is agreement that women in the US are not achieving a high level of preconception wellness, then there needs to be some accountability for improvement. An intermediate measure of a woman’s “preconception wellness” captured upon entering pregnancy would serve as a surrogate marker of the state of preconception care in the community. This indicator could drive decisions on processes, programs, and quality improvement (see Figure 3).

In 2015, the National Preconception Health and Healthcare Initiative’s Clinical Workgroup convened a consensus panel comprised of broad expert representation (maternal-fetal

medicine, family medicine, obstetrics/gynecology, certified nurse midwives, public health professionals, and nursing). After reviewing the available evidence-based preconception care recommendations and comparing them with current quality measures and practical issues of feasibility and reliability of data, a set of nine health system measurements was proposed. (see box Clinical Measures of Preconception Wellness; Frayne et al., 2016).

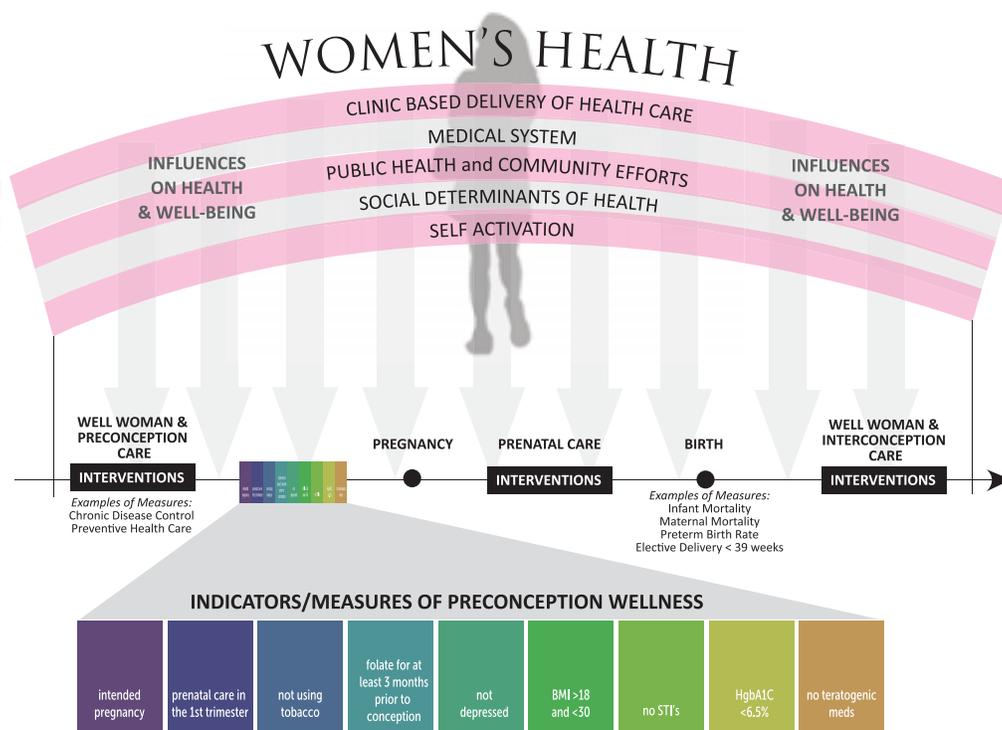
No single measure alone is sufficient to describe “preconception wellness,” but taken in aggregate these can be a marker of wellness and receipt of quality preconception care. A woman who presented to prenatal care with all of these issues positively addressed would be a significant sign the system is achieving the results it desires. Initially these would be considered process measures and health indicators. Over

Clinical Measures of Preconception Wellness

The nine measurements of preconception wellness are the following:

- intended/planned to become pregnant
- entered prenatal care in the 1st trimester
- daily folic acid/multivitamin consumption
- tobacco free
- not depressed (mentally well/under treatment)
- healthy weight
- free of sexually transmitted infections
- optimal blood sugar control
- medications (if any) are not teratogenic

Figure 3. Women’s Health



time, upstream linkage can be made to provider and program measures which feed into and drive the preconception wellness outcomes, thus holding each member or community organization accountable for their part in advancing preconception wellness.

Preconception Health Leads to Community Health

In closing, it is important to note that provider and system engagement is only half the story. Patient/consumer engagement is the other critical element. Without engaged, knowledgeable, and proactive women and men, preconception wellness will never achieve its potential. The National Preconception Health and Healthcare Initiative in partnership with the CDC launched a national consumer awareness campaign in 2013 called Show Your Love. In 2016, the campaign was reinvented with enhanced messaging and web-based platform. The website (Show Your Love Preconception Health, 2016) is designed to activate consumers to:

1. Show Your Love to your friends and family today by sharing realistic healthy goals & tips (easy-to-share social media links).
2. Learn about wellness, preconception health, and life planning. Provide a trustworthy resource for men and

Learn More

IMPLICIT Model of ICC

For more information see the recently published toolkit on the March of Dimes website online at <https://prematurityprevention.org/Toolkits-Reports/IMPLICIT-interconception-care-toolkit>

Institute for Healthcare Improvement
www.ihl.org/Pages/default.aspx

women 18–44 years old about broad aspects of physical, mental, emotional, and financial health.

3. Talk to your health care provider about your health and reproductive goals, and know what to expect before, during, and after a visit.
4. Join the campaign: Show Your Love for yourself and your community by getting involved on social media or as a volunteer, ambassador, partner

The responsibility for advancing preconception wellness lies with all Americans. Each person and professional is encouraged to relook at what they might be doing differently in their unique setting that could influence preconception wellness. Preconception health care is really intergenerational health care. A healthy woman leads to a healthier pregnancy which leads to healthier birth outcomes which leads to healthier children and families, which lead to healthier communities which ultimately leads to a healthier nation.

So let's take the challenge: Preconception care is primary care. The right setting is where you are, and the right time is every time.

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