



Pregnancy as a Window to Future Health

The development of complications in pregnancy provides a new window of opportunity for early heart disease risk screening and intervention for women.

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The Problem

The prevention of chronic diseases in adults and children is a national priority in the United States due to the rising rates of these conditions as well as rising mortality rates. According to the Centers for Disease Control and Prevention, “in 2005, almost 1 in every 2 adults had at least one chronic illness.” With 7 out of 10 deaths annually attributed to chronic diseases like heart disease, diabetes and stroke, the rising rates of chronic illnesses are a national public health problem.

To address these problems and focus more on preventive measures, the Affordable Care Act (P.L. 111-148) includes a full title dedicated to prevention. It establishes the National Prevention, Health Promotion and Public Health Council, Prevention and Public Health Fund, and for the first time provides annual wellness visits through Medicare as well as no copay requirement for preventive visits. A greater focus on preventive measures along with incentives for patients to seek care prior to developing chronic diseases presents a shift in the U.S. model of healthcare.

For women, whose rates of heart disease, Type 2 diabetes and obesity are rising, the tools and information to assess risk can be expanded to include the time during pregnancy. Clues during this period can set up red flags for a woman’s health later in life.

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The signs and symptoms of chronic illnesses and cardiovascular disease (CVD) differ between men and women, and a large proportion of women die of CVD without prior warning. This significant health issue should be addressed through improving cardiovascular awareness and prevention, and reducing care inequities for women in general and younger women in

particular. Given the costs of screening for and treating CVD, novel and innovative ways to identify women at risk, including biochemical testing, is critical to achieve this goal.

There are three times during a woman's life that she accesses the health care system on a regular basis and is seen by a trained health-care provider: as an infant, for pregnancy and postpartum care and when she develops a chronic disease. Given that chronic diseases like CVD are usually decades in development, for the majority of women of reproductive age, pregnancy and the postpartum provides a new early window of opportunity to identify risk factors and improve their long-term health.

It is scientifically well established that pregnancy is essentially a cardiovascular stress test such that the development of common pregnancy complications - pre-eclampsia (PE), gestational hypertension (GH), gestational diabetes (GDM) or gestational impaired glucose intolerance, clinically significant placental abruption, preterm birth and/or delivery of a growth restricted baby (IUGR) - are perhaps the earliest clinically identifiable markers for a woman's increased risk of premature CVD and cardiovascular death. Many women who develop these conditions either already have underlying (typically undiagnosed) cardiovascular risks (CVRs), or are prone to develop them; persistence or progression of these CVRs over years following delivery likely leads to the subsequent development of CVD. These common pregnancy complications share many risk factors and features in common with CVD, including hyperlipidemia, endothelial dysfunction and lipid deposition in blood vessel walls. Unfortunately, despite these findings being well established, surveys have found that health care providers and patients are largely unaware of the association between the development of these novel pregnancy-related CVR indicators and a woman's future risk for CVD, and there are no national guidelines relating to implementing any type of follow up or CVR screening. As further example, none of the large

national and international prospective studies (eg. Women's Health Initiative) asked subjects about their pregnancy history. The most recent update (2011) for the *American Heart Association's Evidence-Based Guidelines for the Prevention of CVD in Women* now identifies PE as relevant in the determination of a woman's CVD risk.

A recent review on the topic in the American Heart Association's journal *Hypertension* recommends postpartum CVR assessment for all women with these pregnancy complications in order to give them the best possible long-term outcomes. Furthermore, they encourage obstetric units to develop clearly defined local protocols concerning postpartum CVR screening in conjunction with local general practice. Along these lines, such a clinic has been run at Queen's University in Canada for that last two years (<http://www.themothersprogram.ca/after-delivery/postpartum-health>). Women are automatically referred to the clinic at the time of delivery for further assessment at six months postpartum. At that time, they undergo a complete CVR assessment (physical examination and biochemical testing). Of the women who've gone through the clinic, over half have been found to be at high lifetime risk for CVD and/or meet the criteria for the diagnosis of metabolic syndrome; metabolic syndrome is a composite of CVRs which when present increase the risk of developing CVD and/or diabetes. Based on having either a high lifetime risk for CVD and/or metabolic syndrome, women are further referred on for additional assessment, lifestyle modification, drug therapy and further follow-up for health preservation and CVD prevention as needed. This program ensures women receive effective and equitable cardiovascular health care. The goal is to identify women at risk for CVD as early as possible in order to prevent all the future consequences and health care burden of chronic diseases such as diabetes, hypertension, and coronary insufficiency. In addition, early

intervention and optimization of the woman's health status before the next pregnancy is likely to improve the outcome of future pregnancies.

Obesity can be central to CVR and pregnancy may play a role in this regard. Excessive weight gain in pregnancy and failure to return to pre-pregnancy weight postpartum are risk factors for long term obesity. Breastfeeding has been shown to decrease the risk of obesity, as well as the risk for long term chronic diseases. Consultation regarding lactation, and follow up beyond the 6 weeks postpartum period, can also be integrated within the Pregnancy as a Window to Future Health program. Women with pregnancy complications or with weight gain during pregnancy above recommended should be informed of the benefits of breastfeeding, not only to their baby but also to their own health. They can be seen 6 months to 1 year from delivery. At that time they can be evaluated for glucose intolerance, elevated lipid levels, weight gain, and hypertension. Those with findings that are considered to precede frank disease (pre-diabetes, pre-hypertension) would then be managed with lifestyle modifications and have appropriate scheduled follow up and testing. Those with frank abnormalities would then be treated with appropriate medications such as antihypertensives, lipid lowering agents, or anti-diabetics.

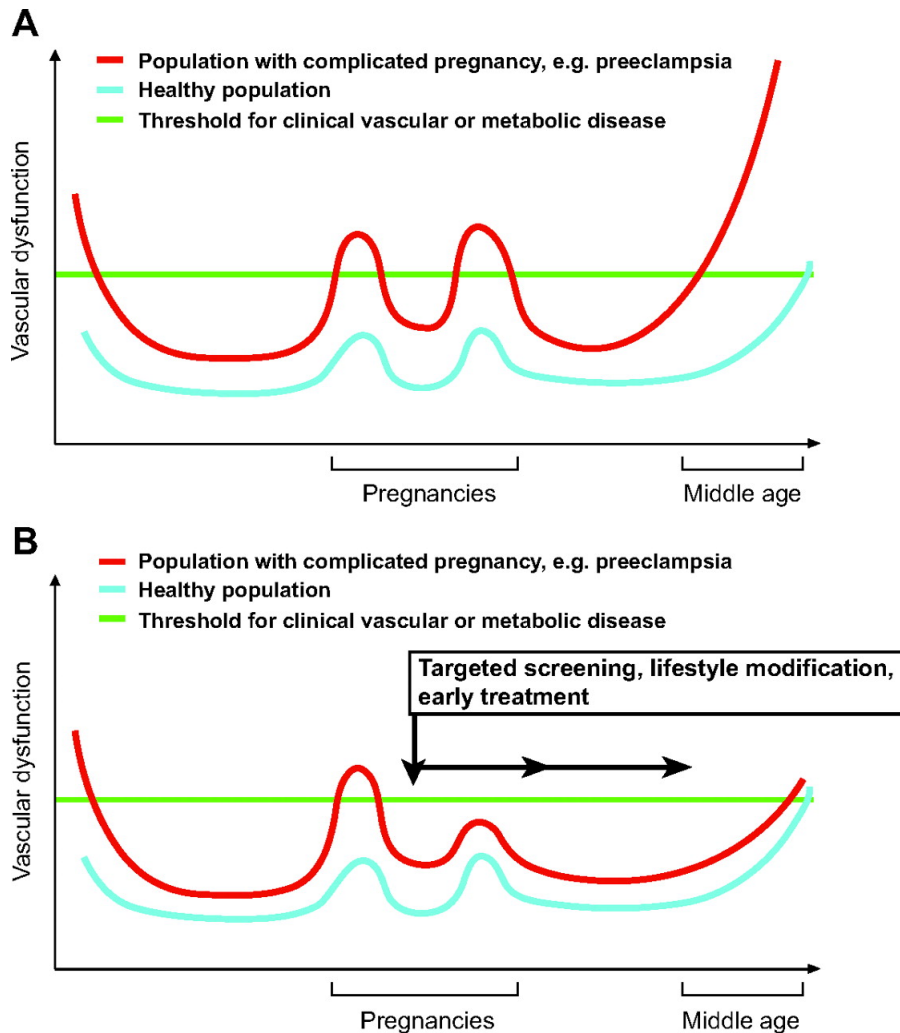
Policy Implications

While most pregnant women have some type of coverage for their pregnancy and immediate postpartum period, many lose that coverage 6 weeks from delivery. With 40 percent of the nation's birth covered by Medicaid, this program could be used as a way to improve women's health outcomes beyond pregnancy. Continuing coverage, at least for women with pregnancy conditions described above, will provide them the opportunity to seek preventive care. This preventive care would consist of a check up visit 6 months to 1 year after delivery where blood

pressure, morphometrics, and metabolic profiles will be determined. Targeted management will then be followed based on the findings, which could include more follow up visits, lifestyle interventions, and/or drug therapy.

Beyond coverage, the issue of transition of care from the prenatal to the postpartum period may present opportunities to lower chronic disease risk in women. A seamless “hand off” from the obstetrician to the primary care physician including notes on the pregnancy with suggestions for follow up would go a long way to close a major gap in care. The transition could occur via paper hospital discharge order or, more preferably once the technology allows, as part of the patient’s electronic medical record.

Finally, ensuring that physicians, patients and payers all understand that pregnancy can be a window to future health, and why this information is important will be essential. Collaboration between the professional societies, government and third party payers would shed more light on this issue and would go a long way to ensure better, more seamless care for women



Schematic diagrams showing how pregnancy can be a window to future health by uncovering predispositions for chronic diseases in women who develop pregnancy complications (A), and how early intervention after these women are identified following their pregnancy can improve outcome of future pregnancy and prevent long term diseases (B). From J.W.Rich-Edwards et al. *Hypertension* 2010;56:331-334

For further reading: