Preconception Care: Preventing and Managing Risks Before Pregnancy to Improve Perinatal Outcomes

National Healthy Start Association
“Ask the Expert” Webinar
March 10, 2015

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Department of Family Medicine
BU School of Medicine/
Boston Medical Center
Objectives

• Present rationale for preconception care (PCC)
• Review the CDC PCC Initiative
• Discuss the content of PCC
• Introduce a new health IT system called “Gabby”
Infant, Neonatal, and Postneonatal Annual Mortality Rates* US, 1940-2005

*Per 1,000 live births for each group: infant (<1 year), neonatal (0-27 days), and postneonatal (28 days to <1 year).

From 1940 to 2005 infant, neonatal, and postneonatal annual mortality rates in the US declined substantially.
The infant mortality rate decreased 85%, from 47 in 1940 to 6.9 in 2005.
The neonatal rate decreased 84%, from 28.8 to 4.54.
The postneonatal rate decreased 87%, from 18.3 to 2.34.

International Ranking of IMRs

NOTES: Canada’s 2010 data were not available from the Organisation for Economic Co-operation and Development (OECD) at the time of manuscript preparation. The 2009 infant mortality rate for Canada was 4.8. If the 2010 data for Canada had been available, the U.S. ranking may have changed. Deaths at all gestational ages are included, but countries may vary in completeness of reporting events at younger gestational ages.

SOURCES: CDC/NCHS, linked birth/infant death data set (U.S. data); and OECD 2014 (all other data). Data are available from: http://www.oecd.org.

Figure 1. Infant mortality rates: Selected Organisation for Economic Co-operation and Development countries, 2010
Infant Mortality Rates Vary Greatly By Race and Ethnicity US, 2005 and 2010

- Total: 6.86 (2005), 6.14 (2010), -10%
- Non-Hispanic black: 13.63 (2005), 11.46 (2010), -16%
- American Indian or Alaska Native: 8.06 (2005), 8.28 (2010)
- Puerto Rican: 8.30 (2005), 7.10 (2010), -14%
- Non-Hispanic white: 5.76 (2005), 5.18 (2010), -10%
- Mexican: 5.53 (2005), 5.12 (2010), -7%
- Central and South American: 4.68 (2005), 4.43 (2010)
- Asian or Pacific Islander: 4.89 (2005), 4.27 (2010), -13%

# Risk Factors Are Common

<table>
<thead>
<tr>
<th>At birth</th>
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<tbody>
<tr>
<td>Smoked during pregnancy</td>
<td>11.0%</td>
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<tr>
<td>Consumed alcohol in pregnancy</td>
<td>10.1%</td>
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<tr>
<td>Preexisting medical conditions</td>
<td>4.1%</td>
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<tr>
<td>Rubella seronegative</td>
<td>7.1%</td>
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<tr>
<td>HIV/AIDS</td>
<td>0.2%</td>
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<tr>
<td>Received inadequate prenatal care</td>
<td>15.9%</td>
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</table>

<table>
<thead>
<tr>
<th>At risk of getting pregnant</th>
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<tbody>
<tr>
<td>Cardiac Disease</td>
<td>3%</td>
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<td>Hypertension</td>
<td>3%</td>
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<tr>
<td>Asthma</td>
<td>6%</td>
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<tr>
<td>Dental caries or oral disease (women 20-39)</td>
<td>&gt;80%</td>
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<td>Diabetic</td>
<td>9%</td>
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<td>On teratogenic drugs</td>
<td>2.6%</td>
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<td>Overweight or Obese</td>
<td>50%</td>
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<tr>
<td>Not taking Folic Acid</td>
<td>69.0%</td>
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CDC Preconception Health and Health Care Initiative
We Currently Intervene Too Late
Critical Periods of Development

*Weeks gestation from LMP*

Most susceptible
time for major
malformation

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<thead>
<tr>
<th>4</th>
<th>5</th>
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<td><strong>Central Nervous System</strong></td>
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<td><strong>Eyes</strong></td>
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<td><strong>Legs</strong></td>
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<td><strong>Teeth</strong></td>
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<td><strong>Palate</strong></td>
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<td><strong>External genitalia</strong></td>
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<td><strong>Ear</strong></td>
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Missed Period

Mean Entry into Prenatal Care
About Half of All Pregnancies are not Planned

![Bar chart showing intendedness of births at conception among women aged 15–44, by race/ethnicity, 2006–2010.]

Why Preconception Care?

- Poor pregnancy outcomes continue to be unacceptably high
- There are many risk factors for poor pregnancy outcome that can be identified before pregnancy
- We currently intervene too late
- Not all pregnancies are planned, therefore PCC should be delivered to all women

There is evidence that intervening before pregnancy will improve outcomes!
Preconception Health (PCH) (including Interconception Health)

Preconception health and health care focuses on taking steps now to protect the health of a baby in the future. However, preconception health is important for all women and men, whether or not they plan to have a baby one day.

“The physical treatment of children should begin as far as may be practicable, with the earliest formation of the embryo; it will, therefore, necessarily involve the conduct of the mother, even before her marriage, as well as during her pregnancy.”

William Potts Dewees 1825
first American textbook on Pediatrics
Some History

Caring for Our Women: The American College of Obstetricians and Gynecologists' (ACOG) Committee on Gynecologic Practice


The Importance of Preconception Care in the Continuum of Women's Health Care

Abstract: The goal of preconception care is to reduce the risk of adverse health effects for the woman, fetus, or neonate by optimizing the woman's health and knowledge before planning and conceiving a pregnancy. Because reproductive capacity may last almost four decades for most women, optimizing women's health before and between pregnancies is an ongoing process that requires access to and the full participation of all segments of the health care system.

Although most pregnancies result in good maternal and fetal outcomes, some pregnancies may result in adverse health effects for the woman, fetus, or neonate. Although some of these outcomes cannot be prevented, optimizing a woman's health and knowledge before planning and conceiving a pregnancy—also referred to as preconception care or pregnancy care—may eliminate or reduce the risk. The importance of preconception care is even more critical in women in whom delayed childbearing results in an increased risk of adverse health effects.

Preconception care should include counseling on appropriate reproductive health practices, including weight management, tobacco cessation, and the use of fertility-enhancing medications. It also should include an assessment of the woman's medical history, including an assessment of her current and past health status, and a discussion of the potential risks and benefits of pregnancy. Preconception care should also include counseling on the use of medications, including any nonprescription medications, and the potential risks and benefits of conception.

Preconception care should be provided by a qualified health care provider, such as an obstetrician-gynecologist, nurse-midwife, or other health care provider with expertise in obstetrics and gynecology. The provider should be knowledgeable about the potential risks and benefits of pregnancy and be able to provide appropriate counseling on the use of medications, including any nonprescription medications.

This Committee Opinion reinforces the importance of preconception care, provides resources for the woman's health care clinic, and promotes that every reproductively capable woman create a reproductive health plan. The specific clinical content of preconception care is outlined elsewhere (5–6).

Several national and international medical organizations and advocacy groups have focused on the optimization of health before conception, result-
Why such slow progress in PCC?

1. those most in need of services are those least likely to receive them
2. provision of services is often badly fragmented
3. there is a lack of available treatment services for high-risk behaviors
4. reimbursement for risk assessment and health promotion activities is inadequate
5. health promotion messages are not effective unless received by a motivated couple
6. for only a few conditions is there data that intervention prior to conception is better than intervention early in pregnancy
7. many clinical training programs do not emphasize risk assessment and health promotion skills.

National Summit on Preconception Care

Select Panel Meeting

June 21 - 22, 2005

The Atlanta Marriott Century Center
Atlanta, Georgia
• 3 national preconception summits
• In 2006, the CDC Select Panel put forth 4 goals, 10 recommendations, and more than 50 action steps for the national preconception initiative.

Workgroups
• Clinical
• Public Health
• Consumer
• Policy/Finance
• Research and Surveillance
Focus of the CDC Clinical Work Group -
June 2005 - present

1. What clinical conditions should be addressed as part of PCC?
2. What is the evidence?
3. How can the conditions be best identified?
4. What interventions are available?
5. How can we deliver this material in clinical practice?
Content of Preconception Care: 2008

Health promotion
Immunization
Infectious disease
Medical conditions
Psychiatric conditions
Parental exposure
Family and genetic history
Nutrition
Environmental exposure
Psychosocial risk
Medication
Reproductive history
Special populations
## Preconception Interventions Reviewed

<table>
<thead>
<tr>
<th>Category</th>
<th>Potential Components of Preconception Care</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Family planning</strong></td>
<td>Physical Activity, Weight Status, Nutrient Intake, Folate, Immunizations, Substance Use, Sexually Transmitted Infections, Human Papillomavirus (HPV), Hepatitis B, Varicella, Measles/Mumps/Rubella, Influenza, Diphtheria/Tetanus/Pertussis (DTaP)</td>
</tr>
<tr>
<td><strong>Infectious diseases</strong></td>
<td>HIV, Hepatitis C, Tuberculosis, Toxoplasmosis, CMV, Listerosis, Parvovirus, Malaria, Gonorrhea, Chlamydia, Syphilis, History of Genital Herpes, Asymptomatic bacteruria Periodontal disease, Bacterial Vaginosis, Group B Strep</td>
</tr>
<tr>
<td><strong>Medical conditions</strong></td>
<td>Diabetes, Thyroid Disease, PKU, Seizures, Hypertension, Rheumatoid Arthritis, Lupus, Renal Disease, Cardiovascular, Thrombophilia, Asthma</td>
</tr>
<tr>
<td><strong>Psychiatric</strong></td>
<td>Depression/Anxiety, Bipolar disease, Schizophrenia</td>
</tr>
<tr>
<td><strong>Exposures</strong></td>
<td>Alcohol, Tobacco, Illicit Substances</td>
</tr>
<tr>
<td><strong>Family History</strong></td>
<td>All Individuals, Ethnicity-based, Family history, Personal history</td>
</tr>
<tr>
<td><strong>Nutrition</strong></td>
<td>Dietary Supplements, Vitamin A, Folic Acid, Multivitamins, Vitamin D, Calcium, Iron, Essential Fatty Acids, Iodine, Underweight, Overweight, Eating Disorders</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>Mercury, Lead, Soil and Water Hazards, Workplace Exposure, Household Exposure</td>
</tr>
<tr>
<td><strong>Psychosocial Risks</strong></td>
<td>Inadequate Financial Resources, Access to Care, Physical / Sexual Abuse</td>
</tr>
<tr>
<td><strong>Medications</strong></td>
<td>Prescription, Over-the-counter, Medication, Dietary Supplements</td>
</tr>
<tr>
<td><strong>Reproductive History</strong></td>
<td>Prior Preterm Birth Infant, Prior C-Section, Prior Miscarriage, Prior Stillbirth, Uterine Anomalies</td>
</tr>
<tr>
<td><strong>Special Populations</strong></td>
<td>Women with Disabilities, Immigrant and Refugee Populations, Cancer</td>
</tr>
</tbody>
</table>
Each Component Presented in a Standard Format

- Burden of suffering
- How to identify
- Description of effective treatments
- Impact of treating in the preconception period.
- Recommendation
- Related recommendations by other groups.
- Strength of Recommendation + Quality of Evidence
Available as a full text and free download at:

http://www.beforeandbeyond.org/
Preconception Risk Identified at the Time of a Negative Pregnancy Test

- Domestic/Sexual Violence: 7%
- STD: 2%
- Family Planning: 10%
- Fetal Exposure: 12%
- Barriers to Care: 8%
- HIV: 5%
- Hepatitis: 9%
- Reproductive: 6%
- Genetic: 9%
- Medical: 9%
- Psychiatric: 21%
- Nutrition: 9%

Preconception Interventions Work

- Smoking
- Alcohol
- Diabetes
- Medications
- NTDs
- HIV
- Rubella
- Family Planning
# The Effect of Maternal Cigarette Smoking on Pregnancy Complications

<table>
<thead>
<tr>
<th>Fetal/Infant Outcome</th>
<th>No. of Studies</th>
<th>Pooled Risk</th>
<th>CI</th>
<th>P - value</th>
<th>% of All Cases</th>
<th>No. of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spontaneous abortion</td>
<td>7</td>
<td>1.24</td>
<td>1.19-1.30</td>
<td>&lt;.001</td>
<td>3-8</td>
<td>19,000-141.00</td>
</tr>
<tr>
<td>Low birthweight</td>
<td>6</td>
<td>1.32</td>
<td>1.18-1.48</td>
<td>&lt;.001</td>
<td>1-11</td>
<td>4,800-61,000</td>
</tr>
<tr>
<td>Perinatal morality</td>
<td>23</td>
<td>1.26</td>
<td>1.19-1.34</td>
<td>&lt;.001</td>
<td>3-8</td>
<td>1,900-4,800</td>
</tr>
</tbody>
</table>
Frequency of Alcohol Consumption Among Patients with a Negative Pregnancy Test

n=136

Jack JFP 1991
Congenital Anomalies in Infant’s of Women with Preconception Control of Diabetes vs. Postconception Control Control

Kitzmiller JL et al. JAMA 1991:245;731-734
Exposure to Teratogens

Occupational Exposures
heavy metals – lead, mercury
inorganic solvents

Medications
Gold          ACE inhibitors
Lithium       Quinolones
Isotretinoin (Acutane) Tetracycline
Valproic acid Warfarin
Nutrition

• Overweight or Underweight
• Availability
• Eating Disorders
• Pica
• NTDs
“All women of child bearing age in the United States who are capable of becoming pregnant should consume 0.4 mg of folic acid per day for the purpose of reducing their risk of having a pregnancy affected with spina bifida or other NTDs”

US Public Health Service
Infectious Disease History

- HIV
- HBV
- Toxoplasmosis
- Rubella
- Varicella
- STDs
Rubella
Probability of Vertical Transmission of HIV According to Treatment Group

- Zidovudine: 8.30%
- Placebo: 25.50%

Connor EM et.al. NEJM 1994:331;1173-80
Family Planning

Patients Not Using BC and Not Ready for Pregnancy with a Negative Pregnancy Test

- Not Desiring Pregnancy: 57.4%
- Not Emotionally Ready: 42.1%
- Not Financially Ready: 69.1%
The Dilemma

How can we possibly do all of this?
One Key Question ® (OKQ) Campaign

- Will be launched by BPHC in 2015
- Part of the Boston Healthy Start Initiative (BHSI)
- To be asked of all women 18-50 as a routine part of care

“Would you like to become pregnant in the next year?”

www.onekeyquestion.org
The need

There is a need for an efficient way to **assess** a woman’s preconception risks, in order to **prioritize** valuable appointment time with a provider, and to **support** the woman in taking action to minimize her risks.
Now Introducing: Gabby
Video: Meet Gabby

http://www.bu.edu/familymed/programs-and-research/project-preconception-care/meet-gabby/
1. Take Risk Assessment
2. Meet Gabby
3. Review results (“My Survey Results”)
4. Choose risk to learn about with Gabby
5. Listen to first informational script(s) from Gabby.

Achieve Goal

8a. Longitudinal behavior change scripts
8b. Choose new risk to discuss from “My Survey Results” OR “My Health To-Do List”

6. Answer Stage of Change question for that risk and listen to stage-appropriate scripts

Precontemplation
Contemplation & Planning
Contemplation, Planning, Action, Maintenance

7a. Add to risk to MHTDL
7b. Don’t Add to MHTDL

Motivational Interviewing
- Shared Decision Making (Family Planning)
- Sequential Discrete (“Go to the Doctor” risks)
- Problem Solving/Tips
- Homework
- Goal Setting
- Educational Info (Nutrition, Activity, and Stress Management)
Gabby Projects

**RCT of 530 participants (NIMHD, R01MD006213)**
- Enrollment began March 2014
- National sample, enrolled via phone
- One-year intervention period

**Kellogg Foundation (P3024018) – 2 years of development to Prepare for Implementation at Healthy Start Sites**
- Comprehensive content overview and update
- Expand Family Planning Discussion
- Make connections between risks to leverage past success

**PCC for Men – Administrative Supplement from HRSA-BMCH**
- Created a Men’s Health Survey; focus groups (n=17); pilot testing (n=29)
- Create Gabe
How you can help us recruit!

Be part of a Women’s Health Research Study
Help us test a computer program and learn more about your health

What is it?
We are inviting African American women to be a part of a study about an online women’s health program, called The Gabby Project. It’s all about being healthy for yourself now, and also to help you have a healthier pregnancy and baby in the future.

What will you do?
There will be about 530 women in the study. About half will use the online program for one year, and the other half will not. The group you will be in will be chosen at random. After 6 months and 12 months we will call the women from both groups to talk about their health status and ask the group that used the online program for feedback.

Are you eligible?
You may be eligible if you speak English and are:
- 18-34 years old
- Black or African American
- Not currently pregnant

All participants are eligible to receive $50 in gift cards for completing both the 6-month and 12-month follow up phone calls. You may also be eligible to win $100 gift card(s) in a monthly raffle. Feel free to share this information with friends who might also be eligible and want to participate. Thank you!

For more information contact our research team at:
pccstudy@bmc.org
Or text GabbyStudy to: 857-293-9874

Gabby
Preconception Care: Baby of the Future
Final Comments

• Societal need to improve reproductive outcomes
• Preconception Care offers an opportunity to impact outcomes
• HIT offers a way to provide this care
• Gabby shown to engage women and reduce health risk – more to come in upcoming webinar!
Thank you!

We would like to thank our funders:
AHRQ: contract # HHSA290200600012I, TO #7
HRSA B-MCH: R40 MC21510
NIMHD: R01 MD006213
W.K. Kellogg Foundation: P3024018
Kirby Foundation

And everyone who has contributed to developing and testing Gabby:

- Brian Jack, MD (PI)
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- Cathryn Imperato, DNP
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- Stephen Martin, MD
- Divya Mehta
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- Huong Tran, MD
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- Lazlo Ring
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- Meryl St. John, MA
- Daniel Schulman, PhD
- Emily Vishnja
- Leanne Yinusa-Nyahkoon, ScD

...and more...
Final Comment About Preconception Care