Using Implementation Science to Reduce Racial Disparities in Preterm Births:
Lessons from an Urban Safety Net Hospital

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Asst. Dean for Patient Safety and Quality Improvement
Associate Professor
Department of Ob/Gyn
I have no financial disclosures
Learning Objectives
At the Completion of this talk attendees will:

1) Understand barriers to the implementation of medical knowledge into clinical practice
2) Be able to describe a framework which allows the development of skills to assess implementation strategies
3) Discuss prevention of preterm birth nationally and locally as an example of both the delay in translating medical knowledge into universal clinical practice and as an etiology of racial disparities in preterm birth
4) Be able to utilize a barrier analysis to analyze a clinical implementation systems failure
Elements of Today’s Discussion

Obstetric Outcome Stakeholders
- Insurers & Legislators
- Professional Organizations
- Healthcare Systems
- Providers and Practices
- Patients and Families

Frameworks for Implementation
- IHI Quality Improvement
- CFIR Implementation Science

Boston Medical Center Project Models
- Decreasing Decision to Incision Time for Cesarean Delivery
- Centering Pregnancy
- Improving utilization of 17OHP to reduce recurrent preterm delivery
- Implementation of Low Dose Aspirin
Racial and Ethnic Disparities in Obstetrics and Gynecology

ABSTRACT: Projections suggest that people of color will represent most of the U.S. population by 2050, and yet significant racial and ethnic disparities persist in women’s health and health care. Although socioeconomic status accounts for some of these disparities, factors at the patient, practitioner, and health care system levels contribute to existing and evolving disparities in women’s health outcomes. The American College of Obstetricians and Gynecologists is committed to the elimination of racial and ethnic disparities in the health and health care of women and encourages obstetrician-gynecologists and other health care providers to engage in activities to help achieve this goal.

Recommendations

Reducing racial and ethnic disparities in health and health care should be a priority for all obstetrician-gynecologists and other women’s health care providers. Obstetrician-gynecologists can help to meet this objective by

- raising awareness among colleagues, residents, staff, and hospital administrators about the prevalence of racial and ethnic disparities and the effect on health outcomes
- understanding the role that practitioner bias can play in health outcomes and health care
- strongly encouraging the adoption of federal standards for collection of race and ethnicity information in clinical and administrative data to better identify disparities
- promoting research that not only identifies structural and cultural barriers to care but also tests the effectiveness of interventions to address such barriers
- educating patients in a culturally sensitive manner about steps they can take to prevent disease conditions that are
**Racial and Ethnic Disparities in Obstetrics and Gynecology**

Table 1. Select Examples of Disparities in Obstetric and Gynecologic Health and Health Care

<table>
<thead>
<tr>
<th>Disparities in Health Outcomes</th>
<th>AI/AN</th>
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<tbody>
<tr>
<td>Infertility in last 12 months (% of women)</td>
<td>N/A</td>
<td>10</td>
<td>12</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Unintended pregnancy (% of pregnancies)</td>
<td>N/A</td>
<td>N/A</td>
<td>69</td>
<td>56</td>
<td>42</td>
</tr>
<tr>
<td>Preterm birth (% of live births)</td>
<td>13</td>
<td>10</td>
<td>17</td>
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</tr>
<tr>
<td>Fetal death (/1,000 live births + fetal deaths)</td>
<td>N/A</td>
<td>N/A</td>
<td>11</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Maternal death (/100,000 live births)</td>
<td>N/A</td>
<td>8</td>
<td>26</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Gonorrhea (/100,000 population)</td>
<td>96</td>
<td>18</td>
<td>570</td>
<td>N/A</td>
<td>24</td>
</tr>
<tr>
<td>Cervical cancer (/100,000 population)</td>
<td>7</td>
<td>7</td>
<td>10</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Breast cancer deaths (/100,000 population)</td>
<td>15</td>
<td>11</td>
<td>31</td>
<td>15</td>
<td>22</td>
</tr>
<tr>
<td>Diabetes-related deaths (/100,000 population)</td>
<td>22</td>
<td>11</td>
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<tr>
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<tbody>
<tr>
<td>Birth control provided in past year (% of women aged 15–44 years)</td>
<td>N/A</td>
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<td>29</td>
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<td>37</td>
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<td>Pap testing within 3 years (% of women aged 21–65 years)</td>
<td>79</td>
<td>75</td>
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<td>83</td>
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<tr>
<td>Mammography within 2 years (% of women aged 50–74 years)</td>
<td>69</td>
<td>64</td>
<td>73</td>
<td>70</td>
<td>73</td>
</tr>
<tr>
<td>Ever received infertility treatment (% of women)</td>
<td>N/A</td>
<td>N/A</td>
<td>11</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>Prenatal care in first trimester (% of births)</td>
<td>69</td>
<td>84</td>
<td>75</td>
<td>76</td>
<td>89</td>
</tr>
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# Racial and Ethnic Disparities in Obstetrics and Gynecology

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<td>Emergency live births (% of women)</td>
<td>N/A</td>
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<tr>
<td><strong>Pregnancy outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Congenital abnormalities</td>
<td>↔</td>
<td>↔</td>
<td>→</td>
<td>↑ (NTDs)</td>
</tr>
<tr>
<td>Fetal demise</td>
<td>↔</td>
<td>↑</td>
<td>↔</td>
<td>↔</td>
</tr>
<tr>
<td>Preterm birth</td>
<td>↑</td>
<td>↔</td>
<td>↑</td>
<td>↑ (Puerto Ricans)</td>
</tr>
<tr>
<td>FGR</td>
<td>↔</td>
<td>↔</td>
<td>↑</td>
<td>↔</td>
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<tr>
<td><strong>Maternal outcomes</strong></td>
<td></td>
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<td>Hypertensive disorders</td>
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<td>Diabetes</td>
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<td>↑</td>
<td>↑</td>
<td>↑</td>
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FGR, fetal growth restriction; NTD, neural tube defects. White women are the reference group. ↑, higher risk; ↓, lower risk; ↔, available data do not support higher or lower risk.

# Racial/ethnic disparities in obstetric outcomes and care: prevalence and determinants

Allison S. Bryant, MD, MPH; Ayaba Worjoloh, MD, MPH; Aaron B. Caughey, MD, PhD; A. Eugene Washington, MD, MSc

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2016 PREMATURE BIRTH REPORT CARD

West Virginia 11.3% D

The March of Dimes Prematurity Campaign aims to reduce preterm birth rates across the United States. Premature Birth Report Card grades are assigned by comparing the 2015 preterm birth rate in a state or locality to the March of Dimes goal of 8.1 percent by 2020. The Report Card also provides county and race/ethnicity data to highlight areas of increased burden and elevated risks of prematurity.

RACE & ETHNICITY IN WEST VIRGINIA

The March of Dimes uses a Disparity Index score to measure and track progress towards the elimination of racial/ethnic disparities in preterm birth. The score represents the average percent difference in the preterm birth rate across all groups compared to the group with the lowest rate in the state. Index scores range from 0 (achievement of equity) to 44 (highest score in 2016).

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Percentage of live births in 2012-2014 (average) that are preterm</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>10.6</td>
</tr>
<tr>
<td>Black</td>
<td>13.8</td>
</tr>
</tbody>
</table>

In West Virginia, the preterm birth rate among black women is 30% higher than the rate among all other women.

Disparity index 30
State rank #42

For details on data sources and calculations, see Technical Notes. For more information on how we are working to reduce premature birth, visit www.marchofdimes.org.
marchofdimes.org/reportcard
Who are our Stakeholders? What are their Priorities?
Obstetric Priorities to Reduce Health Disparities in Preterm Birth and Infant Mortality

- Shortening Decision to Incision Time
- Centering Pregnancy
- Implementing 17OHP to prevent recurrent preterm birth
- Baby ASA in at risk prenatal patients
Tool to Teach Universal Protocol: Checklist Manifesto

2010 NEJM Patient Outcomes
Total Complications/100 pts: 27.3>16.7 (10.6 ARR)
% Pts with complication 15.4>10.6%
Hospital mortality 1.8>.8% mortality

Surgical checklists: a systematic review of impacts and implementation

Jonathan R Treadwell, Scott Lucas, Amy Y Tsou

ABSTRACT

Background Surgical complications represent a significant cause of morbidity and mortality with the rate of major complications after inpatient surgery estimated at 3–17% in industrialised countries. The purpose of this review was to

THE PROBLEM

Although surgery represents a mainstay of medical treatment, in industrialised countries, the rate of perioperative death directly due to inpatient surgery has been estimated at 0.4–0.8%, and the rate of

2014 Review of implementation

• 90% of US Hospitals reported use
• Only 60% reported compliance with items
What framework can I use to ascertain how my team is doing implementing evidence based guidelines for care?

- Quality Improvement
- Knowledge Translation
- Improvement Research
- Translational Science
- Design and Implementation
- Implementation Science
What framework can I use to ascertain how my team is doing implementing evidence based guidelines for care?

**Quality Improvement**

**Knowledge Translation**

**Improvement Research**

**Translational Science**

**Design and Implementation**

**Implementation Science**
W. Edwards Deming
Gandhi of Quality Improvement

“Without data you’re just another person with an opinion.”

- W. Edwards Deming, Data Scientist
Quality Improvement

- Model of the Institute for Healthcare Improvement
- Don Berwick MD Guiding Light
- Developed from principles of Edward Deming & the Toyota Production System
- Includes implementation and process improvement
- Academic Dissemination via SQUIRE 2.0 Guidelines
Quality Improvement is the big tent

Implementation Science

Process Improvement
Implementation science

The study of methods that influence the integration of evidence-based interventions into practice settings
CFIR: Consolidated Framework for Implementation Research

“A framework to assess context such as potential barriers and facilitators to successful implementation”

- Structured framework to focus on interventions in the context of the individual system’s characteristics
- Utilizes already evidence proven interventions
- Individualizes implementations to the environment
- DOESN’T REALLY INCLUDE PROCESS IMPROVEMENT
Framework for Analyzing the Adoption of Innovations

Evidence Based Improvement Science:

Classification of professional interventions from Cochrane Effective Practice & Organization of Care

- DISTRIBUTION OF EDUCATIONAL MATERIALS
- EDUCATIONAL MEETINGS
- LOCAL CONSENSUS PROSESSES
- LOCAL OPINION LEADERS
- PATIENT MEDIATED INTERVENTIONS; NEW INFORMATION FROM PATIENT COLLECTED INFORMATION
- AUDIT AND FEEDBACK
- REMINDERS (PROMPTS)
- MARKETING
- MASS MEDIA

EPOC TAXONOMY: Cochrane Effective Practice and Organization of Care
Evidence Based Improvement Science: What are Effective WAYS to implement guidelines?

- Passive dissemination (emailing article) largely ineffective
- Reminders and educational dissemination mostly effective
- Multifaceted interventions which include:
  - HARD STOPS IN THE EHR
  - AUDIT AND FEEDBACK
    are most effective

• New England’s Largest Safety Net hospital
• 50% Families have an income <$20,000 (Federal Poverty Level)
• 30% non English Speaking
• 68% Speak language other than English at home
• 68% of our patients identify as Hispanic/Black or Black
• We deliver 70% of Black and Latina women in the City of Boston
Obstetric Priorities to Reduce Health Disparities in Preterm Birth and Infant Mortality

- Shortening Decision to Incision Time
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How building a process map helped us prevent delays in Emergency Cesarean Deliveries

Improvement Science
Problem: Series of Bad Babies

Cool Cap for treatment of hypoxic neonatal asphyxia
Problem: Series of Bad Babies
Cause: Delay in Cesarean Delivery

Cool Cap for treatment of hypoxic neonatal asphyxia
Post-Intervention Process Map of Cesarean Delivery at BMC

Streamlined tasks
Fewer People
Task Focused Flow
Emergent C-Section Decision to Incision Time

- **Initial State**
- **Development of Algorithm**
- **Staff education of new algorithm in SIM center**

Chart shows the timeline from July 2012 to February 2016 with various data points indicating the median, goal, and benchmark timeframes.

Slade courtesy of Ron Iverson, Tirah Samura and the Emergency Cesarean QI team at BMC
Emergent C-Section Decision to Incision Time

- Initial State
- Development of Algorithm
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Centering Pregnancy
Comprehensive Curriculum

- Nutrition and weight gain goals
- Common discomforts
- Relaxation and stress reduction
- Birth options
- Early parenting
- Contraception options
- Breastfeeding
- The hospital experience
- The “blues” and depression
- Personal goals
**Group Prenatal Care: Improved Health Disparities Outcomes by Academic Medical Center**

<table>
<thead>
<tr>
<th>Academic Site:</th>
<th>Base: (N=)</th>
<th>Ethnic Disparities:</th>
<th>Preterm (% reduction):</th>
<th>LBW reduction: (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yale/Emory¹</td>
<td>1047</td>
<td>80% (Black)</td>
<td>9.8 (33%)</td>
<td>7.7 % (33%**)</td>
</tr>
<tr>
<td>Vanderbilt²</td>
<td>355</td>
<td>40% (Black)</td>
<td>9.7(26%)</td>
<td>8.58% (36%)</td>
</tr>
<tr>
<td>U-South Carolina³</td>
<td>316</td>
<td>34% (Black)</td>
<td>7.9(47%)</td>
<td>8.9 (22%*)</td>
</tr>
<tr>
<td>BMC</td>
<td>220</td>
<td>75% (Black)</td>
<td>5.7(43%)</td>
<td>7.26% (26%)</td>
</tr>
</tbody>
</table>

** LBW reduction associated with 5 or more CP group visits

*LBW reduction not statistically significant

Centering Value

Better Care
- More time with provider:
- Assessment
- Education
- Support
- Patient-centered care
- Provider satisfaction
- Postpartum visit attendance
- Patient satisfaction
- Patient access

Better Health
- Preterm births avoided
- Lower C-section rate
- Babies born at a healthy weight
- Mothers breastfeeding at discharge
- Women have lower incidence of obesity
- Greater screening: Identification & treatment of PP depression
- Contraception use at 6 months

Lower Cost
- Savings from preterm births avoided – averted NICU days
- Cost savings from increased breastfeeding
- Prevention and/or better management of chronic disease
- Productivity of clinical practice
- Decreased use of emergency visits
March of Dimes, UnitedHealth Group Launch Group Prenatal Care Program to Help Improve Health Outcomes for Mothers and Babies, and Reduce Health Care Costs

- UnitedHealth Group contributes $700,000 to help launch and evaluate new group prenatal care program for pregnant women
- New program aims to reduce nation's preterm birth rate to 5.5 percent by 2030 from the 2015 rate of 9.6 percent
Depression and Preterm Birth

• Odds ratio of PTD/LBW 4.08
  95% CI, 1.27-13.15
Boston Medical Center
Centering Pregnancy and Depression

68% scored positive depression scale at 1st visit

Women attended >5 Centering visits

Almost half of Women screened negative at postpartum visit
Centering Pregnancy PLUS
Trauma Informed Care

Trauma Informed Care is an organizational structure and treatment framework that involves understanding, recognizing, and responding to the effects of all types of trauma.

http://www.traumainformedcareproject.org/
Obstetric Priorities to Reduce Health Disparities in Preterm Birth and Infant Mortality

Implementing 17OHP to prevent recurrent preterm birth

Shortening Decision to Incision Time

Centering Pregnancy

Baby ASA in at risk prenatal patients
The problem

Series of women with prenatal care presenting with recurrent spontaneous preterm birth
Barrier Analysis

Rapid assessment tool used to identify behavioral determinants associated with a particular behavior so that more effective behavior change messages and support activities can be developed.
Process of Barrier Analysis

IDENTIFY DO-ER’s and NON DO-ER’s

IDENTIFY DETERMINANTS
Why people do or not do the behavior
AIM:

The underlying goal of this project is to decrease health disparities in infant mortality and preterm birth and to diminish the number of preterm deliveries

90% of women at Boston Medical Center (BMC) with a prior spontaneous preterm delivery (SPTD) will have counseling for progesterone and serial cervical ultrasounds in a subsequent pregnancy by January 2015
- Lack of knowledge
- No self advocacy
- Language barrier

- Type
- Knowledge
- Site

- Discharge
- EHR communication

- Prior authorization
- Late presentation
Patients

Barrier
• Lack of knowledge of preterm birth
• No information that their history is a risk factor for preterm birth
• No history of self advocacy
• 64% non English speaking
• Perception of divine will

Intervention
• Campaign to standardize identification and counseling of patients at index spontaneous preterm birth
Counseling and Documentation at Index SPTD

- Education campaign for faculty & residents
- SPTD pts on MFM pp service
- Stickers & Emails Posting protocol

Date Range: Jan-Aug-Sep-Oct-13-Nov-Dec-Jan-Feb-Mar-Apr-May-Jun-Jul-15

Goal
Median
Values
Goal
Providers

Barriers
• Patients see a variety of physician and non-physician providers
• Providers are unaware of history of preterm birth
• Providers are unaware of SMFM/ACOG recommendations

Interventions
• Series of educational events at grand rounds
• Reminders at workstations
• Transfer of patients with SPTD to MFM pp service
• Enhanced Partnership with Community Health Centers and Boston Public Health Commission
Challenges of Obtaining 17 OHP

Barriers

• Myriad sites and providers trying to obtain 17 OHP
• Providers unaware of process of obtaining 17OHP
• Prior Authorizations needed for publically & privately insured patients with different forms
• Women who present after 20wks cannot obtain 17OHP

Interventions

• Centralized resource for process of prior authorizations
• Centralize pharmacy so med available
• Increased the number of women identified before 20 wks who are candidates for 17OHP
This patient has had a spontaneous preterm delivery. She has been counseled that she is at risk for recurrence. The following have been recommended: prolonged interpregnancy MFM consult, serial cervical US and 17-OH progesterone for the prevention of recurrent preterm birth.
% of Women with Hx of SPTD & Serial Cervical US, and Progesterone Counseling

- Faculty Resident education campaign
- Median
- MFM ATU Patient Screening
- Added partnership with BPHC and CHC education and newsletter

% Preterm Births

- Jan-Feb 2013: 29%
- Sep-Oct 2013: 17%
- Jan-Feb 2014: 21%
- Sep-Oct 2014: 15.7%
- Jan-Feb 2015: 8%

Date Range

- Jan-Feb 2013
- Sep-Oct 2013
- Jan-Feb 2014
- Sep-Oct 2014
- Jan-Feb 2015
Boston Public Health Commission: Decline in Black Infant Mortality
Progress attributed to citywide partnerships to improve black women's health

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Friday, October 10, 2014

### Infant Mortality Rates by Race/Ethnicity by Year

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Obstetric Priorities to Reduce Health Disparities in Preterm Birth and Infant Mortality

- Shortening Decision to Incision Time
- Centering Pregnancy
- Implementing 17OHP to prevent recurrent preterm birth
- Baby ASA in at risk prenatal patients
• Internal Data Demonstrate our American Born Black Patients bear a disproportionate burden of

PRETERM BIRTHS DUE TO HYPERTENSIVE DISEASE
Timing Aspirin Administration- Ayala RCT, 2013

- Type: Prospective, randomized, double-blind, placebo-controlled clinical trial.
- Population: 350 women (176 ASA, 174 placebo)
- RFs for inclusion: High risk unit stay for F/MHx of gHTN/Pre-E, cHTN, CV/Endo/Met Dx, multiple pregnancy, obesity.
- Treatment: **100mg aspirin vs. placebo from 12-16wk to delivery, taken on awakening, 8h after or at bedtime.**

**Results:**

ASA is superior to placebo

✓ 13 RCTs (12,184 participants) analyzed for ASA vs placebo in pre-E risk
✓ 24% reduction in pre-E on ASA prophylaxis, statistically significant (RR 0.76, CI 0.62-0.95)
✓ No difference in timing of ASA based on GA and no significant ASA dose effect.

## Low-Dose Aspirin Prophylaxis

**Annals of Internal Medicine**

**Low-Dose Aspirin Use for the Prevention of Morbidity and Mortality From Preeclampsia: U.S. Preventive Services Task Force Recommendation Statement**

Michael L. LeFevre, MD, MSPH, on behalf of the U.S. Preventive Services Task Force

### Table. Clinical Risk Assessment for Preeclampsia

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<tr>
<th>Risk Level</th>
<th>Risk Factors</th>
<th>Recommendation</th>
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<tbody>
<tr>
<td>High†</td>
<td>History of preeclampsia, especially when accompanied by an adverse outcome</td>
<td>Recommend low-dose aspirin if the patient has ≥1 of these high-risk factors</td>
</tr>
<tr>
<td></td>
<td>Multifetal gestation</td>
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<td>Nulliparity</td>
<td>Consider low-dose aspirin if the patient has several of these moderate-risk factors§</td>
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<td>Obesity (body mass index &gt;30 kg/m²)</td>
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</tr>
<tr>
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<td>Do not recommend low-dose aspirin</td>
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Low-Dose Aspirin Prophylaxis

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Recommend low-dose aspirin if the patient has ≥1 of these high-risk factors

Consider low-dose aspirin if the patient has several of these moderate-risk factors§
Next Steps: Intervention of Low Dose Aspirin
For ALL eligible women

* Only LOW RISK group: LEAN MULTIPARAS without prior HTN
Suggested Actions that Ob/Gyn’s can take to address disparities in their practices and communities:

• Raise Awareness of Disparities among colleagues, practice staff, and administrators
• Recommend and support quality improvement projects that identify and develop initiatives to target specific disparities within healthcare systems
• Educate staff about community resources for women with limited access to healthcare
• Work collaboratively with local public health authorities to address disparities in women’s health services and outcomes
• Encourage health system leadership to advocate for local, state and national policies to improve women’s health care and reduce disparities.
Part IV - Improvement in Medical Practice

The ABOG MOC process requires that each Diplomate complete a practice improvement activity. ABOG supplies a long list of topics, and the physician chooses one that is most appropriate to their practice.

Completion of the activity requires reading a summary of the most recent literature on the topic followed in most cases by a review of actual charts to determine if their practice coincides with best practice. One month later the physician is queried regarding the impact of the practice improvement activity has had on their individual practice.

For complete information about Part IV from the current MOC Bulletin, click here.
Rates of Unintended Pregnancy in West Virginia

- Unintended pregnancies have an increased risk of preterm birth
  
  Shah OR 1.58 (CI 1.1-1.6)
  Orr OR 1.82 (CI 1.1-3.2)

- West Virginia’s unintended pregnancy rate is 52%
- 63/1,000 Teen Pregnancy Rate
- 76% for women below FPL
- 15,000 pregnancies: 9,500 births
- Leading to a Preterm Birth Rate of 31% and 2,957 preterm births/year

A reduction in West Virginia’s unintended pregnancy rate to 40% would lead to 539 fewer preterm births

Cost savings of $34 million dollars


Guttmacher Institute West Virginia Fact Sheet 2015
Obstetric Priorities to Reduce Health Disparities in Preterm Birth and Infant Mortality

I am for keeping the thing going while things are stirring. Because if we wait till it is still, it will take a great while to get it going again.

Sojourner Truth
Who are our Stakeholders?  
What are their Priorities?