

# Diagnostic Challenges in Maternal Healthcare

## ADVANCING DIAGNOSTIC EXCELLENCE IN MATERNAL HEALTH CARE: A WORKSHOP

### July 27, 2023

Dena Goffman, MD  
Vice Chair for Quality and Patient Safety  
Professor in Obstetrics and Gynecology  
Columbia University Irving Medical Center  
System Associate Chief Quality Officer for Obstetrics  
NewYork Presbyterian Hospital

# Disclosure

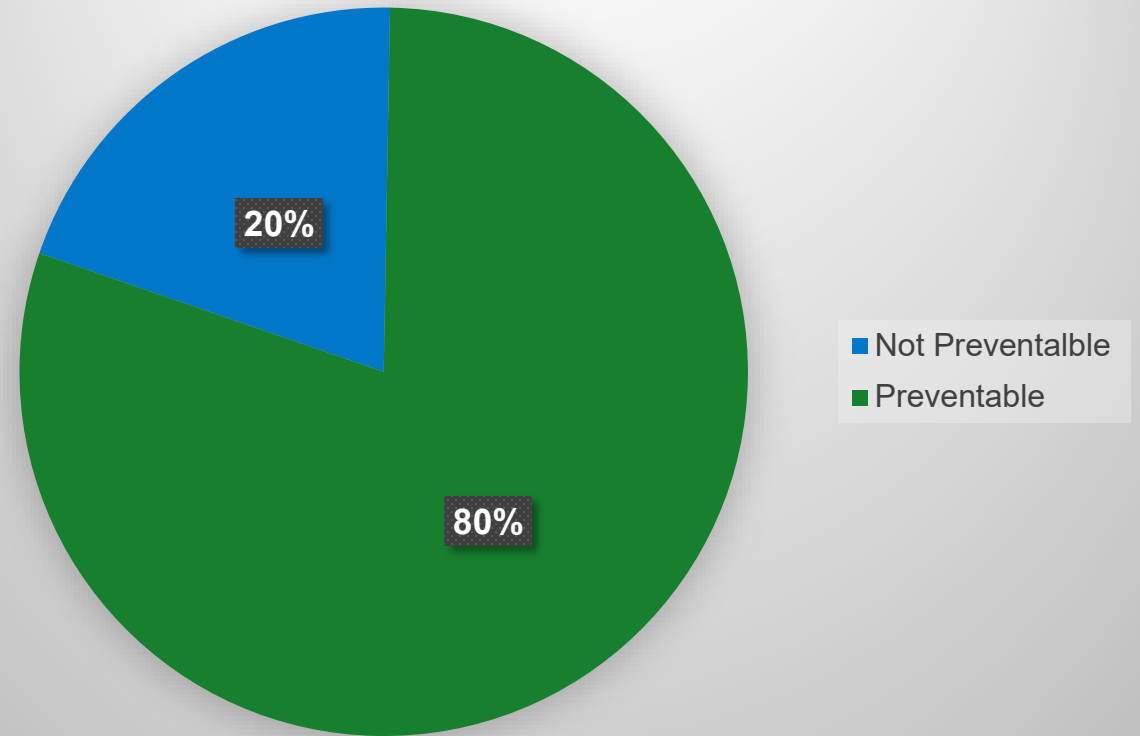
Dr. Dena Goffman developed Postpartum Hemorrhage Educational Videos with Haymarket and PRIME, is on the Obstetrical Safety Council for Cooper Surgical, is an expert consultant for Organon, and served as a PI for the Jada Pivotal Trial and Postmarket Registry

# Maternal Mortality in US

- Increasing
- Exceeds other high-income countries
- Significant racial disparities
- Tip of iceberg



## Maternal Mortality: Most are Preventable



# Maternal Safety Bundles



Obstetric Hemorrhage



Severe Hypertension in  
Pregnancy



Safe Reduction of  
Primary Cesarean Birth



Cardiac Conditions in  
Obstetrical Care



Care for Pregnant and  
Postpartum People with  
Substance Use Disorder



Perinatal Mental  
Health Conditions



Postpartum Discharge  
Transition



Sepsis in Obstetrical  
Care

READINESS

Every unit

- Hemorrhage cart with supplies, checklist, and instruction cards for intrauterine balloons
- Immediate
- Establish advanced
- Establish negative
- Unit education

RECOGNITION

Every patient

- Assessment appropriate
- Measurement
- Active response

RESPONSE

Every hemorrhage

- Unit-standardized plan with
- Support

RECOGNITION

Every unit

- Establish identity
- Multidisciplinary
- Monitor commitment

Standardization  
Safety in Women's  
Health Care  
The Council on  
the course of treatment  
within an institution  
The Council on  
of safe health care



Obstetric Hemorrhage  
Patient Safety Bundle

Readiness — Every Unit/Team

Develop processes for the management of patients with obstetric hemorrhage, including:

- A designated rapid response team co-lead by nursing, obstetrics, and anesthesia with membership appropriate to the facility's Level of Maternal Care.\*
- A standardized, facility-wide, stage-based obstetric hemorrhage emergency management plan with checklists and escalation policy.\*
- Emergency release and massive transfusion protocols to ensure immediate access to blood products.\*
- A protocol, including education and consent practices, to collaborate with patients who decline blood products, but may accept alternative approaches,\* and
- Review of policies to identify and address organizational root causes of racial and ethnic disparities in outcomes related to the diagnosis, management, and surveillance of obstetric hemorrhage.

Maintain a hemorrhage cart or equivalent with supplies, checklists, and instruction cards for devices or procedures where antepartum, laboring, and postpartum patients are located.\*

Ensure immediate access to first- and second-line hemorrhage medications in a kit or equivalent per the unit's obstetric hemorrhage emergency management plan.\*

Conduct interprofessional and interdepartmental team-based drills with timely debriefs that include the use of simulated patients.\*

Recognition & Prevention — Every Patient

Assess and communicate hemorrhage risk to all team members as clinical care is identified, at a minimum, on admission to labor and delivery, during third stage postpartum care.\*

Measure and communicate cumulative blood loss to all team members, vs. actively manage the third stage of labor per department-wide protocols.

Provide ongoing education to all patients on obstetric hemorrhage risk and postpartum complications.\*

Appendix C: Obstetric Hemorrhage Care Guidelines: Table Format

	Assessments	Medi/Procedures	Blood Bank
<b>Stage 0</b>	<b>All births</b> <ul style="list-style-type: none"> <li>• Risk assessment</li> <li>• Active management of 3rd stage</li> </ul>	<b>Active Management of 3rd Stage</b> <ul style="list-style-type: none"> <li>• Oxytocin IV infusion or 10u IM</li> </ul>	<b>Medium Risk: T&amp;C 2 U</b> <ul style="list-style-type: none"> <li>• High Risk: T&amp;C 2 U</li> <li>• Positive Antibody Screen (prenatal or current, exclude low level anti-D from RhGam): T&amp;C 2 U</li> </ul>
<b>Stage 1</b>	<b>Triggers: CBL ≥ 500mL vaginal / ≥ 1000 mL cesarean with continued bleeding</b> <ul style="list-style-type: none"> <li>• VS, O2 Sat q5 min</li> <li>• Record quantitative cumulative blood loss q5-15 min</li> <li>• Careful inspection with good exposure of vaginal walls, cervix, uterine cavity, placenta. If intra-op, inspect broad ligament, posterior uterus and placenta.</li> </ul>	<b>IV Access: Minimum 18 gauge</b> <ul style="list-style-type: none"> <li>• Increase IV fluid (LR) and oxytocin rate</li> <li>• Fundal/bimanual massage</li> <li>• <b>MOVE ON</b> to 2nd level uterotonics if no response (see Stage 2 meds below)</li> <li>• Empty bladder: Straight cath or Foley with urometer</li> </ul>	<b>Convert to High Risk and take appropriate precautions</b> <ul style="list-style-type: none"> <li>• Consider T&amp;C 2 Units PRBCs where clinically appropriate (if not already done)</li> </ul>
<b>Stage 2</b>	<b>Triggers: Continued bleeding w/ CBL ≥ 1500 mL qz VS remain abnormal</b> <ul style="list-style-type: none"> <li>• OB to bedside</li> <li>• Mobilize team: 2nd OB, OB Rapid Response, assign roles</li> <li>• Continue VS &amp; record cumulative blood loss q5-15 min</li> <li>• Complete evaluation of vaginal wall, cervix, placenta, uterine cavity and blood products</li> <li>• Send additional labs including DIC panel</li> <li>• If in Postpartum: Move to L&amp;D/OR</li> <li>• Evaluate for special cases: <ul style="list-style-type: none"> <li>- Uterine inversion</li> <li>- Amniotic fluid embolism</li> </ul> </li> </ul>	<b>2nd Level Uterotonics:</b> <ul style="list-style-type: none"> <li>• Methylergonovine 0.2mg IM (if no HTN) or Carboprost 250 mcg IM (if no asthma) <b>or</b></li> <li>• Only if hypertensive and asthmatic: Misoprostol 800 mcg SL</li> <li>• 2nd IV access (minimum 18 gauge)</li> <li>• Bimanual/uterine massage</li> <li>• TXA 1 gram – may repeat in 30 min</li> <li>• Vaginal (typical order): <ul style="list-style-type: none"> <li>- Move to OR</li> <li>- Repeat any tears</li> <li>- D&amp;C: 1/0 retained placenta</li> <li>- Place intrauterine balloon</li> <li>- Uterine sutures</li> <li>- Place intrauterine balloon</li> <li>- Uterine artery ligation</li> </ul> </li> </ul>	<b>Notify Blood Bank of OB hemorrhage</b> <ul style="list-style-type: none"> <li>• Bring 2 Units PRBCs to bedside, consider use of Emergency Release products (un-crossmatched) and transfuse per clinical signs – do not wait for lab values</li> <li>• Use blood warmer for transfusion</li> <li>• Consider activating MTP if there is continued bleeding</li> </ul>
<b>Stage 3</b>	<b>Triggers: Continued bleeding with CBL &gt; 1500mL qz &gt; 2 units PRBCs given qz abnormal VS at suspicion of DIC</b> <ul style="list-style-type: none"> <li>• Expand team</li> <li>• Advanced OYN surgeon</li> <li>• 2nd anesthesia provider</li> <li>• OR staff</li> <li>• Adult intensivists</li> <li>• Repeat coag &amp; ABGs</li> <li>• Central line</li> <li>• Family support</li> </ul>	<b>Selective embolization (IR)</b> <ul style="list-style-type: none"> <li>• Laparoscopy</li> <li>• Uterine sutures</li> <li>• Uterine artery ligation</li> <li>• Hysterectomy</li> <li>• Patient support</li> <li>• Warmer for IV fluids</li> <li>• Upper body warming device</li> <li>• SCDs</li> </ul>	<b>Activate Massive Transfusion Protocol Transfuse aggressively</b> <ul style="list-style-type: none"> <li>• Near 1:1 PRBC: FFP</li> <li>• 1 PLT apheresis pack per 4-6 units PRBCs</li> </ul>

This table was adapted from the Improving Health Care Response to Obstetric Hemorrhage: A California Quality Improvement Toolkit, funded by the California Department of Public Health, 2015; supported by Title V funds.



Obstetric Hemorrhage  
Patient Safety Bundle

Response — Every Event

Utilize a standardized, facility-wide, stage-based, obstetric hemorrhage emergency management plan, with checklists and escalation policies for stage-based management of patients with obstetric hemorrhage, including:

- Advance preparations made based on hemorrhage risk (e.g. cell saver, blood bank notification, etc.)
- Evaluating patients for etiology of hemorrhage;
- Use of obstetric rapid response team;
- Evidence-based medication administration or use of nonpharmacological interventions,\* and
- Appropriate activation of expanded care team and clinical resources as necessary.

Provide trauma-informed support for patients, identified support network, and staff for all obstetric hemorrhages, including discussions regarding birth events, follow up care, resources, and appointments.\*

Reporting and Systems Learning — Every Unit

Establish a culture of multidisciplinary planning, huddles, and post-event debriefs for every obstetric hemorrhage, which identify successes, opportunities for improvement, and action planning for future events.

Perform multidisciplinary reviews of serious complications per established facility criteria to identify system issues.\*

Obstetric hemorrhage, with disaggregation by race and ethnic hemorrhage outcomes.

Utilize the obstetric rapid response team, care management systems, as necessary.\*

Every Unit/Provider/Team Member

Engage and their identified support network as respected team and as participants in patient-centered huddles

Engage with pregnant and postpartum people and their families, and treatment plans, including consent regarding

# Obstetric Hemorrhage Change Package

Obstetric Hemorrhage Change Package

## Response

Every Event

Change Concept	Change Idea	Key Resources and Tools
1. Utilize a standardized, facility-wide, stage-based, obstetric hemorrhage emergency management plan, with checklists and escalation policies for stage-based management of patients with obstetric hemorrhage, including:	Designate a patient and identified support network liaison to provide updates in real-time and include these communications on emergency checklist	Florida Obstetric Hemorrhage Initiative Tool Kit (p.33) <sup>17</sup> Preparing for Clinical Emergencies in Obstetrics and Gynecology, ACOG CO #590. <sup>18</sup>
a. Advance preparations made based on hemorrhage risk (e.g., cell saver, blood bank notification, etc.)	Perform multi-disciplinary debriefing at the following timepoints:	Obstetric Team Debriefing Form I ACOG <sup>17</sup>
b. Evaluate patients for etiology of hemorrhage	<ul style="list-style-type: none"> <li>• After resolution of an acute hemorrhage</li> <li>• At the time of transfer to reassess hemorrhage risk and to convey risk to the postpartum team</li> </ul>	
c. Use of obstetric rapid response team		
d. Evidence-based medication administration or use of nonpharmacological interventions	Communicate directly with patient about clinical concerns and planned management, prior to performing any physical interventions such as bimanual pelvic exam, tamponade placement, or speculum exam	The SHARE Approach LAHQ <sup>18</sup> Partnering in healthcare: A framework for better care and outcomes <sup>19</sup>
	Include patient-reported pain in assessment and have clear plans for pain management	

## Obstetric Hemorrhage Checklist

EXAMPLE

Complete all steps in prior stages plus current stage regardless of stage in which the patient presents.

Postpartum hemorrhage is defined as cumulative blood loss of greater than or equal to 1,000mL or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours. However, blood loss 500mL in a vaginal delivery is abnormal, and should be investigated and managed as outlined in Stage 1.

### RECOGNITION:

- Call for assistance (Obstetric Hemorrhage Team)
- Designate: ☐ Team leader ☐ Checklist reader/recorder ☐ Primary RN ☐ Cumulative blood loss ☐ Vital signs ☐ Debriefing stage

Stage 1: Blood loss > 500mL after delivery with normal vital signs and lab values. Vaginal delivery 500-999mL should be treated as in Stage 1.

### INITIAL STEPS:

- Ensure V&C or S&C IV Access
- Increase IV fluid (crystalloid without oxytocin)
- Insert indwelling urinary catheter
- Fundal massage

### MEDICATIONS:

- Ensure appropriate medications given patient history
- Increase oxytocin, additional uterotonics

### BLOOD BANK:

- Confirm active type and screen and consider crossmatch of 2 units PRBCs

### ACTION:

- Determine etiology and treat
- Prepare OR, if clinically indicated (optimize visualization/examination)

Stage 2: Continued Bleeding (CBL up to 1500mL OR 2+ uterotonics) with normal vital signs and lab values. Two or more uterotonics in addition to retained oxytocin with intervention, or 2+ uterotonics if the same is necessary.

### INITIAL STEPS:

- Mobilize additional help
- Place and IV (16-18G)
- Draw STAT labs (CBC, Coags, R/trogens)
- Prepare OR

### MEDICATIONS:

- Continue Stage 1 medications, consider TXA

### BLOOD BANK:

- Obtain 2 units PRBCs (DO NOT wait for labs. Transfuse per clinical signs/symptoms)
- Have 2 units FFP

### ACTION:

- For uterine atony – consider uterine balloon or packing, possible surgical interventions
- Consider moving patient to OR
- Escalate therapy with goal of hemostasis

Handle and move to Stage 3 if continued blood loss and/or abnormal VS

Safe Motherhood Initiative

Revised September 2020





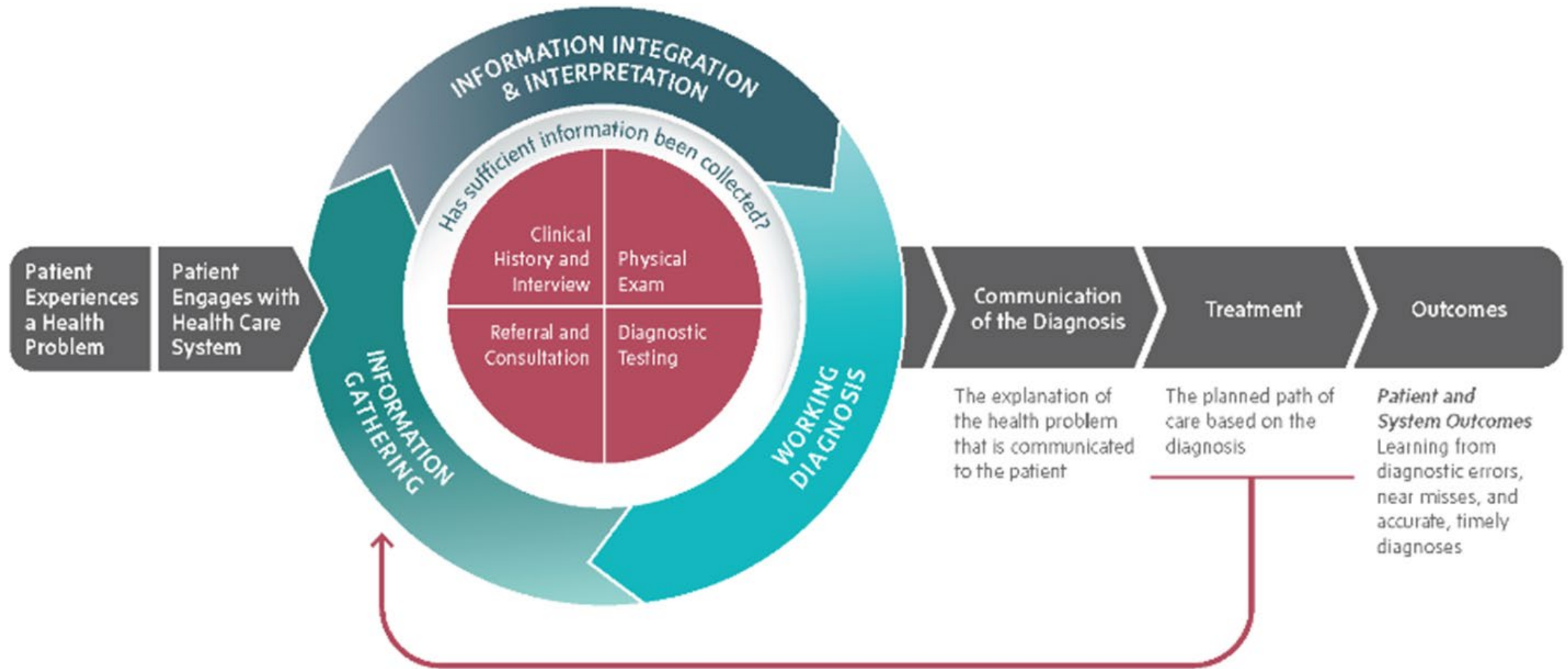
## Diagnostic Safety

- Accurate and timely identification of the explanation for a patient's health problem(s)
- Effective communication of that health problem to the patient (NASEM)

## Diagnostic Error

- Diagnostic error can be defined as a diagnosis that is missed, wrong or delayed

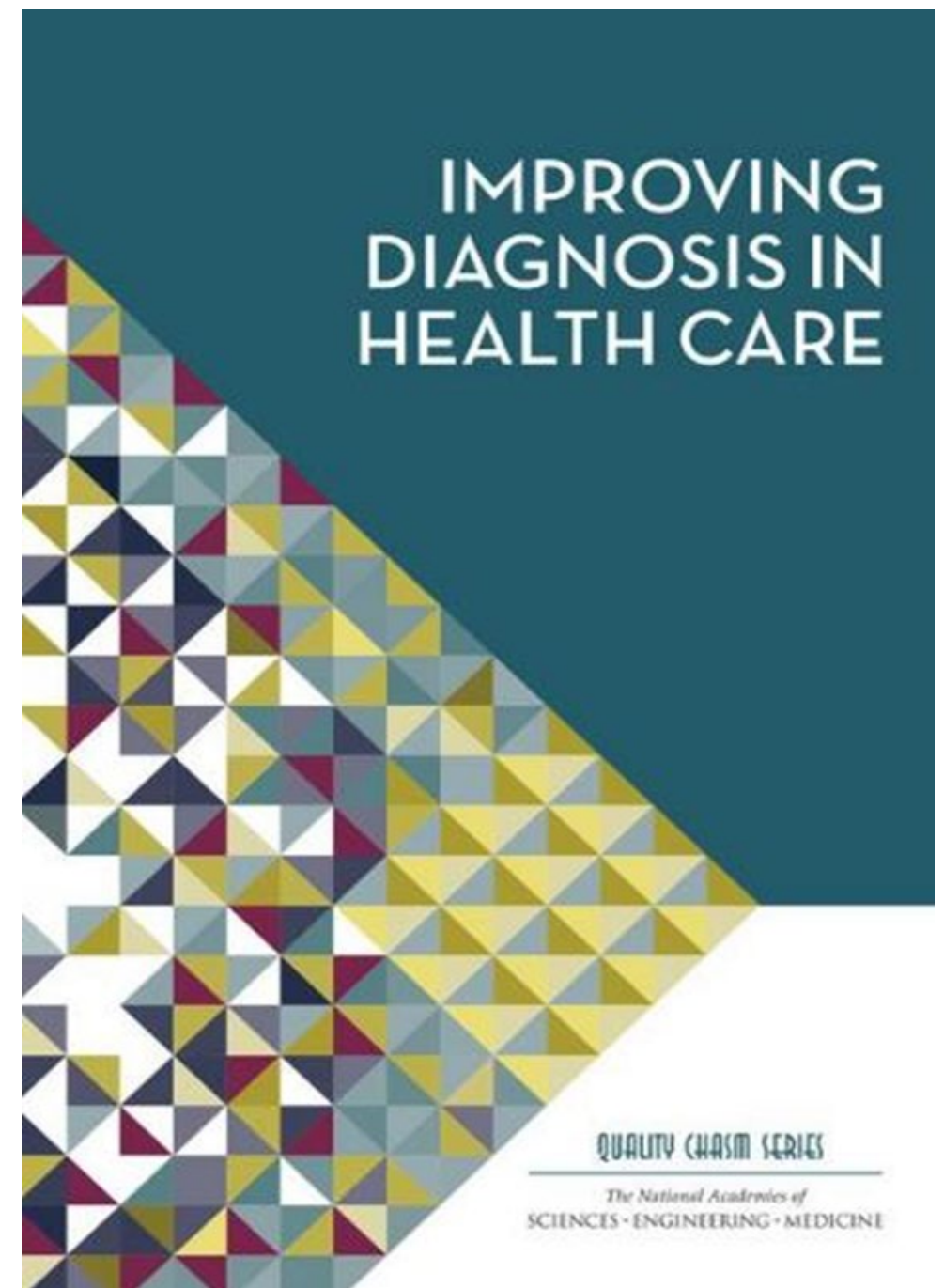
# The Diagnostic Process



# Diagnostic Process

Dynamic, team-based activity that involves:

- uncertainty
- plays out over time
- requires effective communication and collaboration among multiple providers, diagnostic services, and the patient

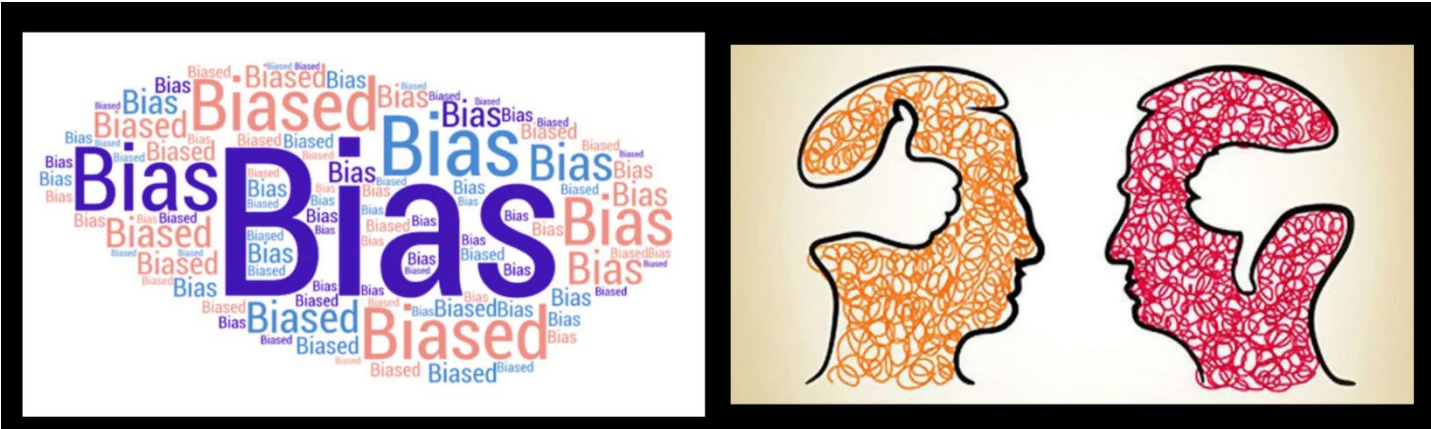





# Diagnostic Challenges in Maternal Healthcare




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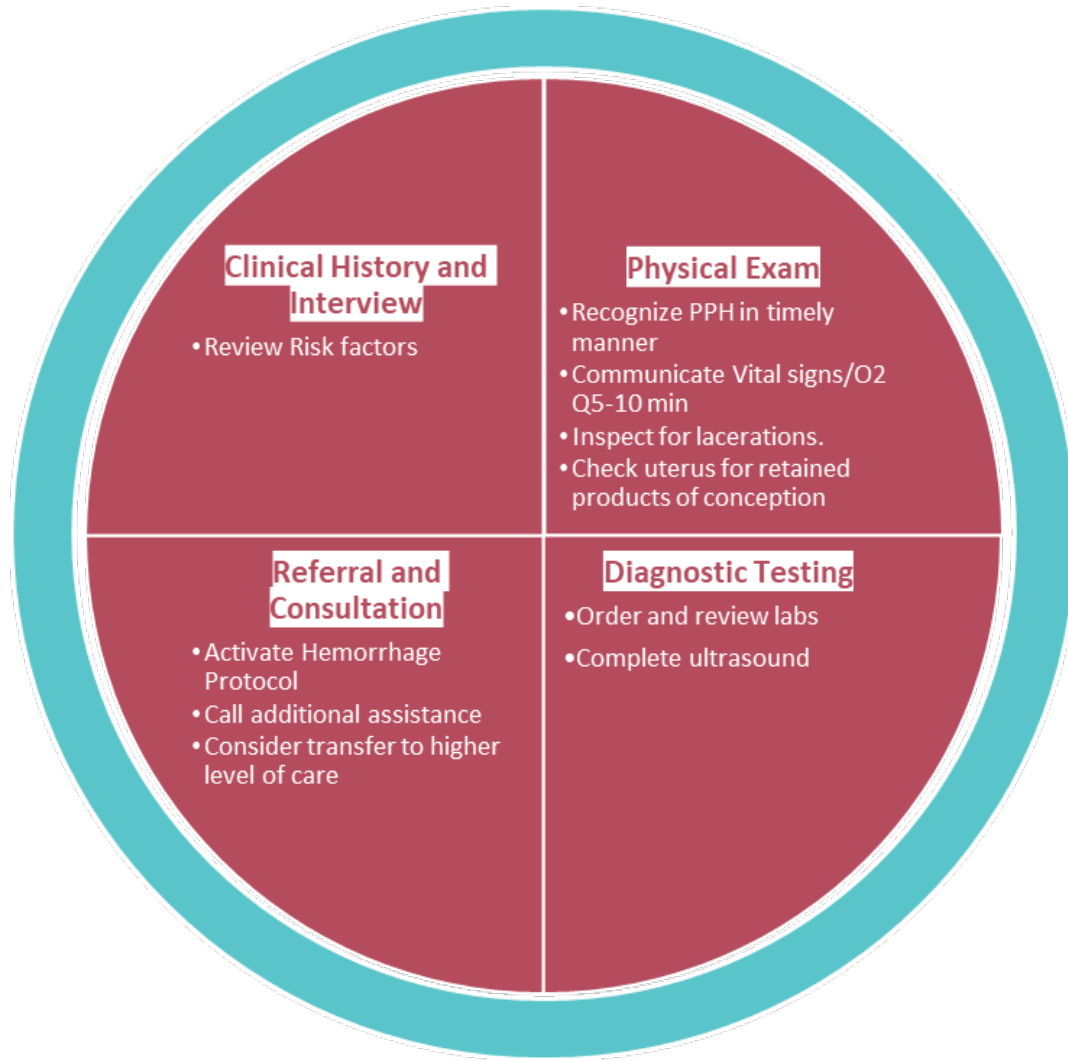
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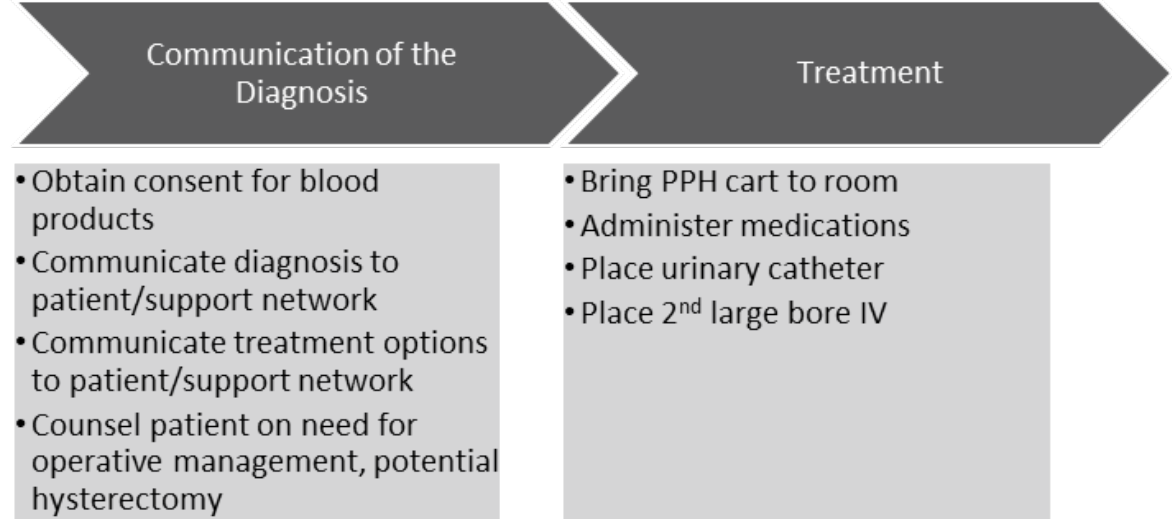
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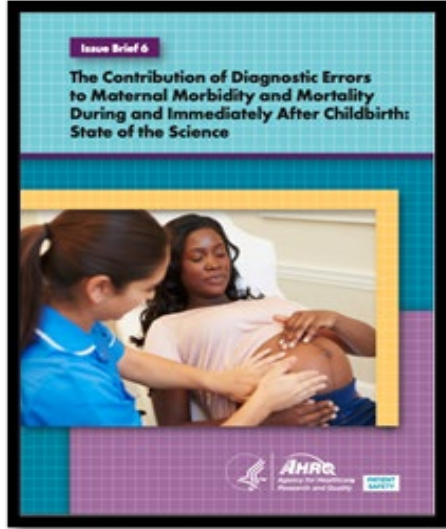
# Diagnostic Challenges in Maternal Healthcare

# PPH Diagnostic Process



- Team members
- Tasks
- Technologies and tools
- Organization
- Physical Environment
- External Environment





## Potential Opportunities

Partner with community organizations to inform implementation and evaluation of person-centered communication best practices

Evaluate strategies to identify and mitigate biases

Standardize and evaluate risk assessments, with linkage to expected clinical interventions

Develop standardized approaches to education including characterizing what combination and frequency of training improves care

Explore the role of simulation as a vehicle of study or a test of change

Evaluate how electronic health records contribute to obstetric diagnostic error

## Opportunities:

- **Improve healthcare for women**
- **Reproductive planning and intended pregnancies with preconception evaluation**
- **Attention to optimizing care in 4<sup>th</sup> Trimester**
- **Risk prediction models leveraging AI**
- **Innovation in developing and evaluating therapies targeting causes of SMM and mortality**
- **Further definition of metrics delineating standards for treatment/intervention**

