Institute for Healthcare Improvement

AIM
ALLIANCE FOR INNOVATION ON MATERNAL HEALTH

Sepsis in Obstetric Care Change Package

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Introduction

The Alliance for Innovation on Maternal Health (AIM) is a national data-driven maternal safety and quality improvement (QI) initiative. AIM works through state and community-based teams to align national, state, and hospital-level QI efforts to reduce preventable maternal mortality and severe morbidity across the United States.

The AIM Patient Safety Bundles are a core part of this work. To promote the successful implementation of these bundles, AIM partnered with the Institute for Healthcare Improvement (IHI) to create a series of associated change packages. This specific change package is designed to support Perinatal Quality Collaboratives (PQCs) and other state-based initiatives to leverage the AIM Sepsis in Obstetric Care Patient Safety Bundle more effectively.

Why is this important?

Obstetric sepsis remains a leading cause of maternal mortality in the United States and throughout the world.[1] Maternal deaths due to sepsis have been found to be largely preventable with timely recognition, appropriate treatment, and escalation of care.[2] Sepsis disproportionately affects those from underrepresented minority groups. National rates of obstetric sepsis are 2.4 times higher for Black patients, 1.5 times higher for Asian/Pacific Islander patients, and 1.8 times higher for Native American patients compared with White patients.[3] These differences directly reflect the effects of racism on maternal morbidity and mortality.

This change package is meant to provide teams with the necessary steps for preparation to recognize, treat, and escalate care to improve outcomes through implementation of the AIM Sepsis in Obstetric Care Patient Safety Bundle.[4] The change ideas and culture shifts focusing on equitable and respectful care outlined in this document will serve to improve patient-centered care not only for obstetric patients with sepsis but for all obstetric patients.

What is a change package?

A change package is a document listing evidence-based or best-practice changes specific to a topic and is usually organized around a framework or model. In this case, the Sepsis in Obstetric Care Change Package is structured around the Sepsis in Obstetric Care Patient Safety Bundle.[4]

Changes packages, including this one, are structured around the following components:

- **Primary Drivers**: Major processes, operating rules, or structures that will contribute to moving toward the aim. In this change package, the primary drivers are based on AIM's Five Rs Framework (Readiness, Recognition & Prevention, Response, Reporting/Systems Learning, and Respectful Care).
- **Change Concepts:** Broad concepts (e.g., "move steps in the process closer together") that are not yet specific enough to be actionable but that will be used to generate specific ideas for change.
- **Change Ideas**: Actionable, specific ideas for changing a process. Change ideas can come from research, best practices, or from other organizations that have recognized a problem and have demonstrated improvement on a specific issue related to that problem.

Taken as a whole, a change package has the potential to seem overwhelming. Based on the priorities of your state and community, we encourage you to start small by testing a couple of ideas connected to the aim you set. Through iterative tests of change (also known as Plan-Do-Study-Act (PDSA) cycles), you will have an opportunity to learn what works and what does not in your efforts to improve your processes. Initially, these cycles are carried out on a small scale (e.g., one patient on one day) to see if they result in improvement. Teams can then expand the tests and gradually incorporate larger and larger samples until they are confident that the changes will result in sustained improvement.

How to prioritize changes?

No team is expected to test all the listed change ideas. Consider this a menu of options from which you may choose what to tackle first. Each team will review their baseline data, progress to date, organizational priorities, and select an area(s) to prioritize. For example, some may start with one driver. Others may start by tackling one idea across all drivers. Start by choosing an area that you think could lead to an easy win.

You can also leverage the following tools to help you decide where to start:

1. Pareto chart: A type of bar chart in which the various factors that contribute to an overall effect are arranged in order according to the magnitude of their effect. This ordering helps identify the "vital few" — the factors that warrant the most attention.[5]
2. Priority matrix: A tool that can better help you to understand important relationships between two groupings (e.g., steps in a process and departments that conduct that step) and make decisions on where to focus.[6]
3. Impact-effort matrix: A tool that helps identify which ideas seem easiest to achieve (least effort) with the most effects (highest impact). The ideas identified via this tool would be a great place to start.[7]

Change Package

A Note on Symbols

Respectful, Equitable, and Supportive Care

In the latest revision of the AIM Sepsis in Obstetric Care Patient Safety Bundle, a fifth R was added; Respectful, Equitable, and Supportive Care. This R is integrated throughout the change package, and all change ideas that fall under this R are marked with a ◊ symbol.

Additional Considerations

It is understood that every team utilizing this change package will be at a different point in this work. If your organization is further along in your obstetric sepsis improvement work and has found reliability in some of the change ideas below, we suggest testing the additional considerations in *italics* and marked by the * symbol.

Readiness

Change Concept	Change Idea	Key Resources and Tools
Establish inter- and intradepartmental protocols and policies for the care of patients experiencing obstetric sepsis or suspected sepsis	Establish a reliable and efficient system to order, obtain, and promptly administer appropriate antimicrobials *Have antibiotics in an automated medication dispensing system with a reliable system to monitor expiration date* * *Implement "code sepsis" to alert pharmacy to immediately dose, prepare, and deliver antibiotics to the bedside* *	Risk Factors, Etiologies, and Screening Tools for Sepsis in Pregnant Women: A Multicenter Case-Control Study[8] California Maternal Quality Care Collaborative (CMQCC): Improving Diagnosis and Treatment of Maternal Sepsis: A Quality Improvement Toolkit, Part III. Assessment and Treatment of Maternal Sepsis: Antibiotics and Source Control[9]
	Create an obstetric-focused, multidisciplinary rapid-response team with the ability to consult at the bedside and recognize/respond to rapid deterioration	AIM: Sepsis in Obstetrical Care: Element Implementation Details[10]
	In hospitals without 24/7 in-hospital obstetrician coverage, establish "first responder" protocol for when sepsis is suspected	AIM: Sepsis in Obstetrical Care: Element Implementation Details[10]
	Create an obstetric-specific protocol for suspected or identified sepsis that includes notification of the obstetric rapid-response team, order sets for prompt treatment (antimicrobials, fluid administration, and vasopressor use), and bedside evaluation for escalation of care. Include criteria for when a patient must be seen in person by an MD or certified nurse midwife (CNM). *Involve patients with lived experience in development of protocol* ◊ *	CMQCC: Improving Diagnosis and Treatment of Maternal Sepsis: A Quality Improvement Toolkit, Part III. Assessment and Treatment of Maternal Sepsis: Antibiotics and Source Control[9]

		Sepsis Bundle Project: National Hospital Inpatient Quality Measures[11] Internal Validation of the Sepsis in Obstetrics Score to Identify Risk of Morbidity from Sepsis in Pregnancy[12]
	Establish protocol for when an obstetrician consult is needed for patients who are <20 weeks pregnant or postpartum	
Provide multidisciplinary education on obstetric sepsis to all clinicians and staff that provide care to pregnant and postpartum people, including in non-labor & delivery settings such as emergency departments, intensive care units, and outpatient clinics	Require routine team training based on real-life scenarios, regardless of level of experience/education *Include sepsis scenarios in regular unit simulations and drills for obstetric emergencies to engage learners in immediate recognition and treatment of sepsis (e.g., can use "mystery shopper" model where mock patient calls front desk complaining of weakness/shortness of breath) ****	
	Provide didactic education (such as multi-departmental grand rounds) about obstetric sepsis and related policies, procedures, and teamwork skills *Conduct education at orientation, whenever changes to processes or procedures occur, and every two years**	
	Ensure that ED, outpatient clinics, nurse advice line, front-desk staff, and any other "entry points" are included in education efforts	
	Include education on pregnancy-specific presentation and treatment of sepsis	AIM: Urgent Maternal Warning Signs[13] The UK Sepsis Trust: How to Spot Sepsis[14]

		End Sepsis: What is Sepsis?[15] Sepsis Alliance: Pregnancy & Childbirth[16] Top 10 Pearls for the Recognition, Evaluation, and Management of Maternal Sepsis[17]
Utilize evidence-based criteria for sepsis assessment for all pregnant and postpartum patients, in all units, including obstetric-specific criteria, when appropriate	Utilize a sepsis screening tool on admission throughout hospitalization to identify patients who may develop sepsis To avoid missing patients: • Use pregnancy-adjusted tool >20 weeks pregnancy and <3 days postpartum • Use a non–pregnancy-adjusted tool for early pregnancy (<20 weeks) and >3 days postpartum	Sepsis Bundle Project: National Hospital Inpatient Quality Measures[11] CMQCC: Improving Diagnosis and Treatment of Maternal Sepsis: A Quality Improvement Toolkit[9] American College of Obstetricians and Gynecologists (ACOG) District II: Maternal Safety Bundle for Sepsis is Pregnancy (slides 22 – 23)[18] United Kingdom Obstetric Surveillance System (UKOSS)[19]
Create a culture that utilizes non-hierarchical communication so that all team members, including the patient, feel empowered to speak up about a concern and know that their input is valued by the entire care team	Empower nurses to speak up when they have concerns, and respect nurses' concerns when they do speak up	IHI: Three Ways to Create Psychological Safety in Health Care[20] IHI White Paper: A Framework for Safe, Reliable, and Effective Care[21]
	Empower patients to speak up when they have concerns and thoroughly evaluate their concerns	Centers for Disease Control and Prevention (CDC): Hear Her Campaign[22]

	Empower physicians to feel safe saying, "I don't know, but I will find out" in team communications	IHI: Three Ways to Create Psychological Safety in Health Care[20] IHI White Paper: A Framework for Safe, Reliable, and Effective Care[21]
	Conduct team training in communicating across power dynamics	Agency for Healthcare Research and Quality (AHRQ) TeamSTEPPS[23]
	Take the time to ask patients questions, listen to their concerns, and better understand their specific context ◊ • Suggestion: sit down so you are at eye level with patient prior to asking about concerns	

Recognition and Prevention

Change Concept	Change Idea	Key Resources and Tools
Implement evidence-based measures to prevent infection	Implement a comprehensive list of evidence-based practices to reduce risk of surgical-site infection	ACOG Practice Bulletin Number 195: Prevention of Infection After Gynecologic Procedures[24]
	Ensure prevention measures address pelvic and non-pelvic categories in all phases of care	
	Build pregnancy-specific vital sign change alerts into electronic health record (EHR) systems for >20 weeks of gestation and <3 days postpartum. Use non-pregnant criteria <20 weeks of gestation and >3 days postpartum	CMQCC: Improving Diagnosis and Treatment of Maternal Sepsis: A Quality Improvement Toolkit[9] Severe Maternal Sepsis in the UK, 2011–2012: A National Case-Control Study[25] The maternal early warning criteria: a proposal from the national partnership for maternal safety[26] Use of Maternal Early Warning Trigger tool reduces maternal morbidity[27]
	Consider concerns of patients, doulas, and identified support network to be critical information for further evaluation ◊	
	Consider antibiotic treatment in case of isolated fever during labor, unless another source can be identified	Committee Opinion No. 712 Summary: Intrapartum Management of Intraamniotic Infection[28]

	Utilize order sets for suspected obstetric sepsis	CMQCC: Improving Diagnosis and Treatment of Maternal Sepsis: A Quality Improvement Toolkit[9]
	Conduct routine screening for asymptomatic bacteriuria (to prevent maternal progression to pyelonephritis), group B streptococci (GBS) colonization, and sexually transmitted infections during prenatal care (to prevent fetal infection) • Evaluate at the time of admission for unresolved infections and/or need for GBS prophylaxis	
Consider sepsis on the differential diagnosis of a person with deteriorating status, even in the absence of fever	Ask follow-up questions to determine severity to nonspecific symptoms that could be misattributed to common challenges during pregnancy and postpartum (such as postsurgical pain, fatigue, and anxiety)	Rutgers Robert Wood Johnson Medical School: Stop. Look. Listen![29]
	Reframe to a high-acuity, low-occurrence mindset to increase suspicion of sepsis	
In all care environments, assess and document if a patient presenting is pregnant or has been pregnant within the past year	Incorporate assessment, ideally in EHR system, in all entrance portals of care (such as ED and urgent care), and ensure gender inclusivity in assessment	
	Train associates/departments on the "why" behind screening for current or recent pregnancy	
Provide patient education focused on general life-threatening pregnancy and postpartum complications and early warning signs, including sepsis signs and symptoms other than fever, and	Standardize discharge education for patient and their identified support network • Include standardized education in child-birthing classes and prenatal appointments • Use teach-back to assess understanding	AIM: Urgent Maternal Warning Signs[13] CDC: Urgent Maternal Warning Signs[30] The UK Sepsis Trust: How to Spot Sepsis[14]

instructions for who to notify with concerns		End Sepsis: What is Sepsis?[15] Sepsis Alliance: Pregnancy & Childbirth[16] Association of Women's Health, Obstetric, and Neonatal Nurses (AWHONN): Save Your Life Poster[31] to be used in conjunction with the AWHONN Post-Birth Warning Signs Education Program[32]
	Ensure patient education materials are aligned with patients' health literacy, culture, language, and accessibility needs ◊ *Engage community-based organizations in development of culturally appropriate and language-specific materials◊ **	CDC: Urgent Maternal Warning Signs[30] Centers for Disease Control and Prevention (CDC): Hear Her Campaign[22] Sepsis Alliance: Pregnancy & Childbirth[16]

Response

Change Concept	Change Idea	Key Resources and Tools
Initiate facility-wide standard protocols and policies for assessment, treatment, and escalation of care for people with suspected or confirmed obstetric sepsis	Immediately triage patients when they present with sepsis symptoms	AIM: Sepsis in Obstetrical Care: Element Implementation Details[10]
	Reduce time to initiate appropriate antimicrobials	
	Ensure all antibiotics can be started within one hour concurrently rather than in tandem, with closed-loop communication with nursing and physician leadership to start additional IVs as needed	
	Perform source control urgently when indicated using the least invasive means	
	Use ideal body weight to calculate resuscitation fluids (30mL/kg is likely 1-2 liters)	University of Washington: Identification and Management of Sepsis in Pregnancy: Obstetric Consensus Statement[33]
	Start norepinephrine after adequate fluid resuscitation to avoid fluid overload (if needed to maintain MAP >65 mm Hg)	Society for Maternal-Fetal Medicine Consult Series #47: Sepsis during pregnancy and the puerperium[34]
	Call for support and/or consultation from services such as Infectious Disease, ICU, and Maternal-Fetal Medicine	
	Include “equity pause” to look at bias risk within multidisciplinary care planning and to ask, “What are considerations to ensure respectful care without discrimination?” ◊ *Consider race, ethnicity, language, gender identity, obesity, mental health history, unplanned pregnancy and history of pregnancies,*	

	marital status, housing status, education level, etc. as potential areas of bias for providers ◊ *	
	Designate provider to take lead on patient and family communication during a crisis and ensure use of interpreter when needed ◊	
Initiate facility-wide standard protocols and policies for post-stabilization management of people with sepsis	Identify hospital maternal level of care and determine if the hospital has ICU capabilities for pregnant or postpartum patients. If no capabilities exist, create a pathway for transfer to an appropriate facility.	AIM: Sepsis in Obstetrical Care: Element Implementation Details[10] Levels of Maternal Care: Obstetric Care Consensus No, 9[35] ACOG Practice Bulletin No. 106: Intrapartum fetal heart rate monitoring: nomenclature, interpretation, and general management principles[36]
	Coordinate daily multidisciplinary team communication, and for any major changes in clinical care, and have a designated team member provide updates to the patient and designated support network	
Facilitate comprehensive post-sepsis care, including screening and proper referrals for post-sepsis syndrome	Provide mental health support post-diagnosis/discharge ◊ • Perform anxiety, depression, and PTSD screening at regular intervals • Provide HRSA maternal mental health hotline	Sepsis Alliance: Post-Sepsis Syndrome[37] ACOG Committee Option Number 757: Screening for Perinatal Depression[38] HRSA: Primary Care PTSD Screen for DSM-F (PC-PTSD-5)[39] Massachusetts General Hospital (MGH) Center for Women's Mental Health: Screening for Perinatal Anxiety Using PASS – the

		Perinatal Anxiety Screening Scale[40] HRSA Maternal & Child Health: National Maternal Mental Health Hotline[41]
	Provide information about post-sepsis syndrome and include identified support network in education upon discharge ◊	Sepsis Alliance: Post-Sepsis Syndrome[37] PostICU Resources[42]
	Screen and, if applicable, refer to rehabilitation care (occupational therapy (OT), physical therapy (PT), and/or speech therapy)	Enhancing Recovery from Sepsis: A Review[43]
	Coordinate referrals for continuing multidisciplinary care, such as wound care or nutrition, and include social work for support	

Reporting and Systems Learning

Change Concept	Change Idea	Key Resources and Tools
Conduct multidisciplinary reviews for systems improvement of each sepsis case to assess the screening program, the quality of care provided to patients with sepsis, and whether instances of bias may have impacted care	Conduct formal after-action review with designated leader and standardized content *Reflect on the equity in case as part of review* ◊ * *Share findings from reviews with all associated staff and facility stakeholders at regular staff meetings** *Larger hospital systems can consider having trained personnel from the risk department in dialogue with patients during review process, speaking on the patients' behalf during internal multidisciplinary review* *	
	Review time from alert to ordering antibiotics, time to start of administration, and time for all antibiotics to be infused. Identify barriers and address them.	
	Consider processes of care and patient outcomes in the context of race, ethnicity, and social determinants of health ◊	Developing Tools to Report Racism in Maternal Health for the CDC Maternal Mortality Review Information Application (MMRIA): Findings from the MMRIA Racism & Discrimination Working Group[44]
	Create a systematic process to screen patient chart language for instances of bias (i.e., "refused" vs. "declined," using race to describe a patient, using adjective "difficult," etc.) ◊	Negative Patient Descriptors: Documenting Racial Bias In The Electronic Health Record[45]
Establish a culture of multidisciplinary planning, huddles, and post-event debriefs	Implement huddles, specifically in the following circumstances: • Concern for any patient condition • Worsening of patient condition	

	• Patient thinks concerns are not being heard	
	Establish standardized briefing documentation to capture successes and determine actionable follow-up *Archive debriefing documentation for obstetric sepsis and review systematically with unit-specific and QI leadership teams**	
	Establish unit-specific and QI leadership teams to review and address quality and safety issues	
	Conduct post-event debriefing with an equity lens for support and learning ◊	
	Create systemic plan to follow up on bad experiences noted in standard surveys *Consider Patient Reported Experience Measures (PREM) for patients to complete **	
	Include patients and their identified support networks in rounds ◊	
	Regularly clarify what goals and values for care are essential to include in a patient's treatment plan ◊	

Respectful, Equitable, and Supportive Care

Change Concept	Change Idea	Key Resources and Tools
Include each pregnant or postpartum person and their identified support network as respected members of and contributors to the multidisciplinary care team	Engage patients and their care team in decision making about their care at every point, from admission through discharge, including during rounds ◊ *Provide tools and scripts for providers to use for shared decision-making conversations* ◊ *	AHRQ: The SHARE Approach: 5 Essential Steps of Shared Decision Making[46]
	Facilitate open conversations to ensure that patient concerns are adequately addressed, and investigate possible causes when patients express that something is "off." Consider ways in which implicit bias and structural racism may influence response to patient concerns and response to pain. ◊ *Make an organizational policy and train teams to use an antiracism, birth equity, and social justice lens* ◊ *	CDC HEAR HER Resources for Healthcare Professionals[47] 15 Bedside Manner Techniques to Improve Patient Experience[48]
Engage in open, transparent, and empathetic communication with pregnant and postpartum people and their identified support network about sepsis diagnosis and recommended treatment plans that are aligned with their health literacy, culture, language, and accessibility needs	Do not minimize patient complaints or concerns; explore them with follow-up questions and assessment ◊	
	Educate clinicians on providing respectful care by engaging in the life-long learning of cultural humility, understanding that individuals cannot learn all aspects of any culture, including their own ◊	AWHONN Respectful Maternity Care Implementation Toolkit[49] ACOG Respectful Care eModules[50] The Cycle to Respectful Care: A Qualitative Approach to the Creation of an Actionable Framework to Address Maternal Outcome Disparities[51]
	Provide communication in the patient's preferred language and support access to interpretation services; provide educational	National Standards for Culturally and Linguistically Appropriate

	materials for patients in common languages spoken in your community ◊	Services (CLAS) in Health and Health Care[52]
	Ask patients if they would like to be accompanied by their support network for any exams, procedures, and discussions ◊ *Create and use wall signage to inform patients that they can be accompanied by their support person for any exams, procedures, and discussions about their care* ◊ *	
	Ask patients how they would prefer to be addressed, get pronunciation correct, and share with the entire care team ◊	
Because maternal mortality and severe maternal morbidity related to sepsis disproportionately affect Black, Indigenous, and Hispanic people because of systemic racism, but not race itself, it is necessary to mitigate this bias by having a high index of suspicion for sepsis	Create system where staff can actively seek feedback on their presentation of biases and be open to correction ◊	
	Set aims for closing identified disparities using the SMARTIE format (strategic, measurable, ambitious, realistic, time-bound, inclusive, and equitable) ◊	IHI: Science of Improvement: Setting Aims[53] IHI: Science of Improvement: Tips for Setting Aims[54] IHI: Applying an Equity Lens to Performance Improvement[55]
	Collect and analyze REAL (Race, Ethnicity, and Language) data ◊ *Have staff training on importance of REAL data and respectful collection* ◊ *	
	Review all process and outcome data disaggregated by REAL to assess for inequities with unit-specific and QI leadership teams ◊ *Engage leaders in messaging about destigmatizing discussion and identification of inequities to move toward action* ◊ * *Identify alternative strategies to integrate equity considerations into reporting and systems learning in settings where use of*	

	disaggregated data may cause potential patient identifiability or unstable data ◊ *	
	Assess quality of REAL data and develop processes for improved data collection ◊ *Identify a champion focused on inequities* ◊ *	

Appendix

1. Pregnancy-Related Deaths: Data from Maternal Mortality Review Committees in 36 US States, 2017–2019. Centers for Disease Control and Prevention. Accessed March 9, 2023. https://www.cdc.gov/reproductivehealth/maternal-mortality/erase-mm/data-mmrc.html

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