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CMQCC
California Maternal Quality Care Collaborative

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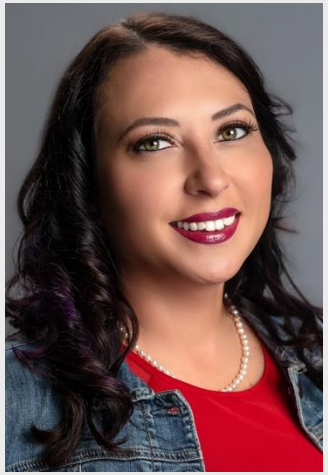
Maternal Sepsis background, Diagnosis and Screening

Melissa E Bauer, D.O.
Associate Professor
Duke University

Turning lessons learned from patients and community into clinical tools

Kendra L. Smith, PhD, MPH

How Community Co-Leadership Works



Christa Sakowski, MSN, RN, C-ONQS, C-EFM, CLE
Clinical Lead, CMQCC

PRIHSM collaborative model

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Maternal Sepsis: Background, Diagnosis, and Screening

Elliott K. Main, MD

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National Implementation Director, ACOG/AIM
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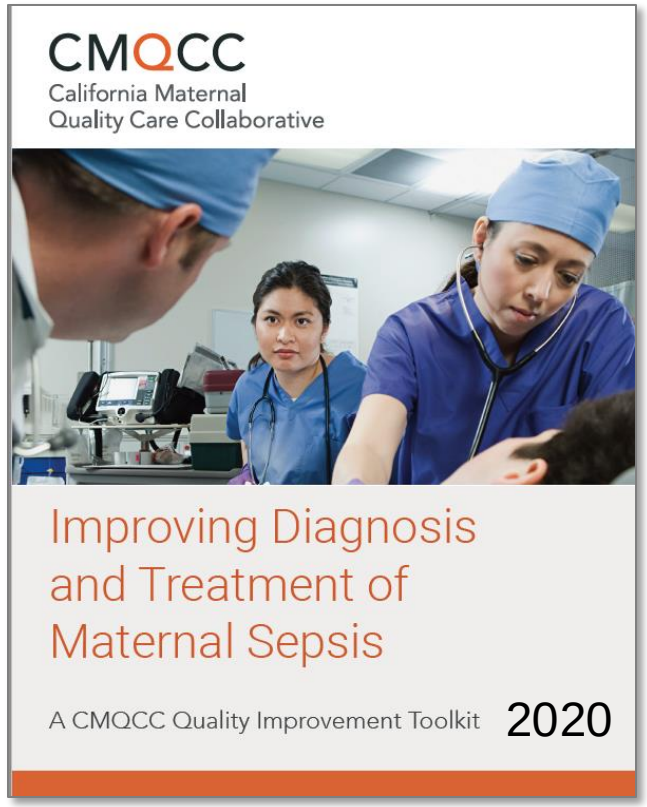
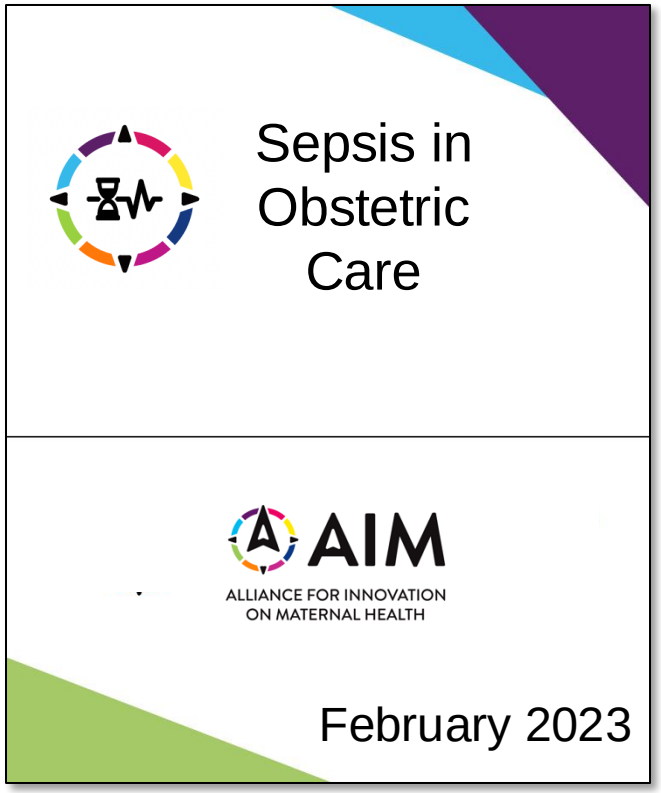
Maternal Sepsis Background Efforts



Lead Editors:
Melissa Bauer, DO
Ron Gibbs, MD
Elliott Main, MD



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Large-scale Implementation of Community Co-led Maternal Sepsis Care Practices to Reduce Morbidity and Mortality

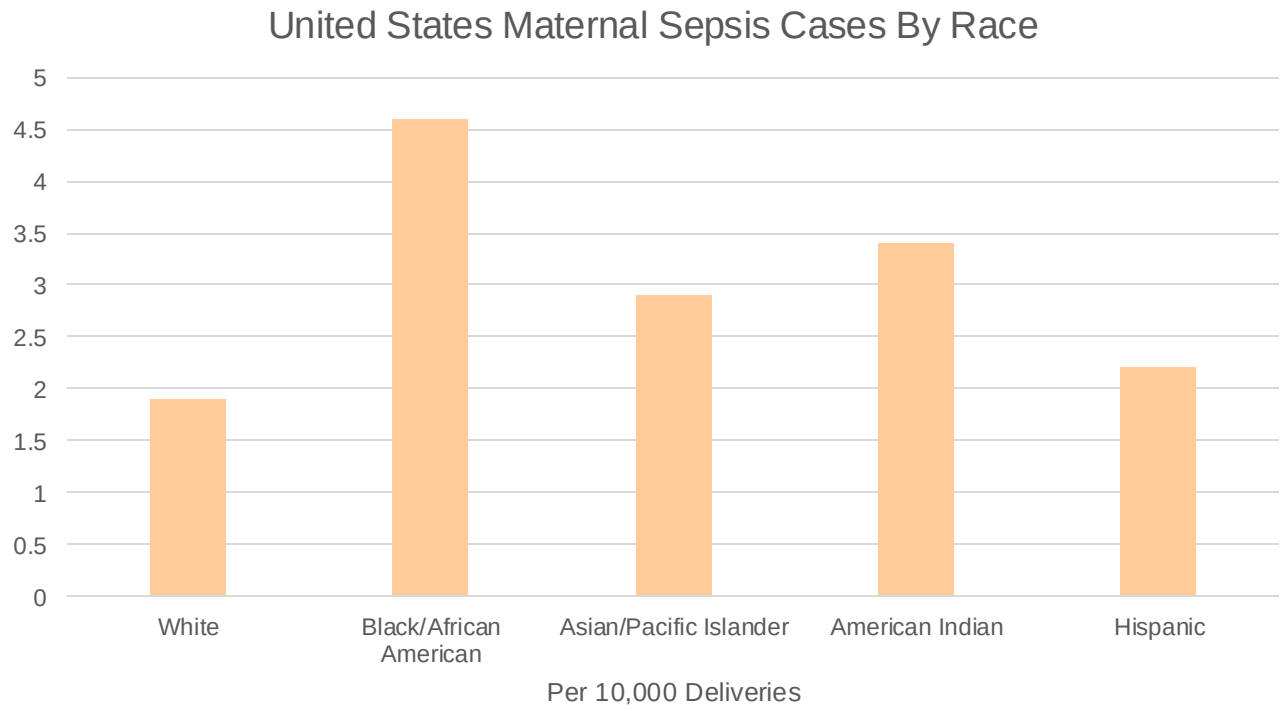
NICHD Funding: 2022-2023

- Identify clinician and patient based barriers to care
- Improve screening and diagnosis criteria
- Translate above findings into improved care plan for sepsis

Co-PIs/Leads:
Melissa Bauer, DO
Elliott Main, MD
Kendra Smith, PhD

Burden of Infection on Maternal Mortality and Morbidity

- 2nd leading cause of maternal mortality
- 3rd leading cause of Severe Maternal Morbidity (SMM) at delivery but it is 1st leading cause in antepartum and postpartum periods
- Significant racial inequities:



Trost et al, CDC DHHS, 2022
Creanga AA et al. *Obstet Gynecol 2017*
Petersen EE et al, *MMWR Morb Mortal Wkly Rep* 2019
Kendel et al. AJOG 2019

(1) Why are we doing poorly with Maternal Sepsis?
after all, we know how to treat sepsis…

- Relatively rare (but deadly when it happens)
- Definition of Maternal Sepsis is not standardized
- Diagnostic approach is not established
- Treatment often delayed and piecemeal
- Special Challenge of Chorioamnionitis

Many Maternal Infections Can Lead to Sepsis

Antepartum	Intrapartum/ Immed. Postpartum	Post-discharge
Pyelonephritis	Chorioamnionitis/ intraamniotic infection	Endometritis
Septic abortion	Endometritis	Pyelonephritis
Chorioamnionitis/ intraamniotic infection	Pyelonephritis	Wound Infection/ Necrotizing Fasciitis
Pneumonia/ influenza	Pneumonia/influenza	Pneumonia/influenza
Appendicitis	Wound Infection/ Necrotizing Fasciitis	Cholecystitis, Mastitis, Other GI

Diagnostic Criteria for Sepsis: United States

- Sepsis-2 (2001): Infection + 2 or more SIRS criteria
- Sepsis-3 (2016): life-threatening organ dysfunction caused by a dysregulated host response to infection

- CMS still defines sepsis as Infection + SIRS and Severe Sepsis as Sepsis with Organ Injury (SEP-1 metric)

Maternal Sepsis: World Health Organization (WHO) 2017

- Maternal sepsis is “a life-threatening condition defined as **organ dysfunction** resulting from infection during pregnancy, childbirth, postabortion, or postpartum period.” This definition has been endorsed by FIGO and is generally followed worldwide.
- WHO also emphasizes that the criteria of systemic inflammatory response syndrome (SIRS) are **not appropriate** for diagnosing maternal sepsis and should not be used.

http://apps.who.int/iris/bitstream/10665/254608/1/WHORHR-17.02-eng.pdf

Current studies should help provide direction

- How well do Sepsis Screening tools work in pregnancy?
  - What are the sensitivity and false positive rates?
  - How do physiologic changes of pregnancy affect the tests?
  - How do the screening tests perform if defining sepsis as having end-organ injury?
  - What about early pregnancy and postpartum patients?
  - What about patients with chorioamnionitis?
- Testing for end-organ injury
  - Should the criteria for end-organ injury change in pregnancy?

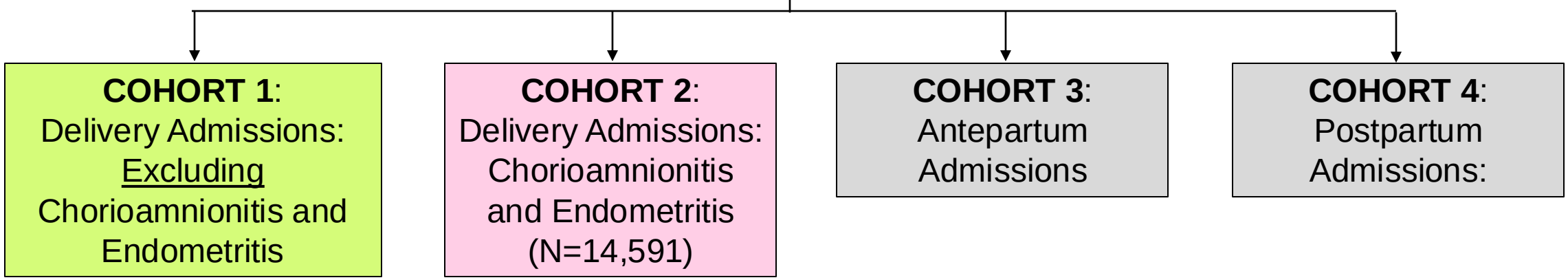
Main E et al and Bauer M et al in press, Obstet Gynecol

Evaluation of Screening Criteria for Maternal Sepsis: Electronic Health Record Analyses

Electronic Health Record data collected on EPIC, available using Clarity

Hospital Admissions from 59 hospitals in 12 states during the years 2016-2021 (estimated N >580,000 births)

2,900 Cases of Maternal Sepsis were identified



Sepsis Screening Systems Evaluated

Standard Non-Pregnant Sepsis Screen

Screening System and Criterion	Threshold
SIRS (Systemic Inflammatory Response Syndrome)	
WBC	< 4 or > 12
Heart rate	> 90
Respiratory rate	> 20
Temperature	< 36 or > 38
Any two	

Goal: Find the balance between Sensitivity and the Screen Positive Rate

Pregnancy Screens for Severe Morbidity

Screening System and Criterion	Threshold
MEWC (Maternal Early Warning Criteria)	
Systolic BP	< 90 or > 160
Diastolic BP	> 100
Heart rate	< 50 or > 120
Respiratory Rate	< 10 or > 24
Pulse oximetry	< 95
Temperature	< 36 or > 38
WBC	< 4 or > 15
Any one	
MEWT (Maternal Early Warning Triggers)	
Severe MEWT (1 red flag)	
Pulse	> 130
Respiratory rate	> 30
MAP	< 55
SpO2	< 90
Blood Pressure	> 160/110
Non-severe MEWT (2 yellow flags)	
Temperature	< 36 or > 38
Blood Pressure	< 85/45
Pulse	< 50 or > 110
Respiratory rate	> 24 or < 10
Pulse oximetry	< 93
Overall MEWT	

Pregnancy-Adjusted Screens for Sepsis

Screening System and Criterion	Threshold
CMQCC (California Maternal Quality Care Collaborative Sepsis Toolkit)	
WBC	< 4 or > 15
Heart rate	> 110
Respiratory rate	> 24
Temperature	< 36 or > 38
Any two	
UKOSS (UK Obstetric Surveillance System)	
WBC	< 4 or > 17
Heart rate	> 100
Respiratory rate	> 20
Temperature	< 36 or > 38
Any two	

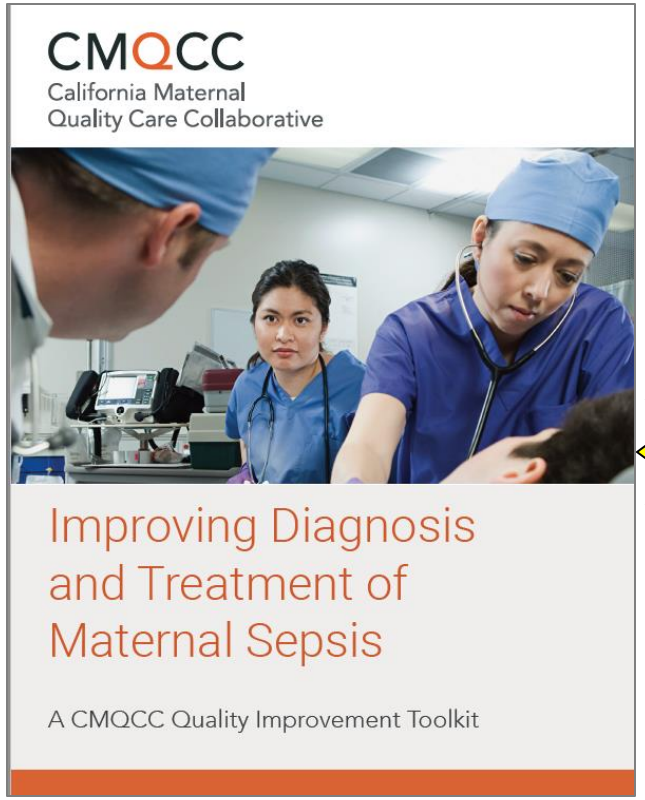
Performance of Screening Tools for Intrapartum Sepsis and Sepsis with Organ Injury

COHORT 1: Cases *excluding* Chorioamnionitis and Endometritis						
	Sepsis by Diagnosis Codes N=647			Sepsis with End Organ Injury by Diagnosis Codes N=228		
Screening System	Screen Positive Rate	Sensitivity (95% CI)	C statistic (95% CI)	Screen Positive Rate	Sensitivity (95% CI)	C statistic (95% CI)
CMQCC	6.9%	90.6% (88.1-92.7)	0.92 (0.91, 0.93)	9.2%	96.9% (93.8-98.8)	0.94 (0.92, 0.95)
SIRS	21.3%	96.9% 95.3-98.1	0.88 (0.87, 0.89)	23.9%	98.7% 96.2-99.7	0.87 (0.86, 0.89)
MEWC	38.3%	96.9% 95.3-98.1	0.79 (0.78, 0.80)	43.9%	98.2% 95.6-99.5	0.77 (0.75, 0.79)
UKOSS	9.6%	92.0% 89.6-93.9	0.91 (0.90, 0.92)	11.6%	96.1% 92.6-98.2	0.92 (0.91, 0.94)
MEWT (overall)	15.8%	79.9% 76.6-82.9	0.82 (0.80, 0.84)	19.8%	90.8% 86.3-94.2	0.85 (0.83, 0.88)

Performance of Screening Tools for Intrapartum Sepsis and Sepsis with Organ Injury

COHORT 2: Chorioamnionitis and Endometritis Cases						
	Sepsis by Diagnosis Codes N=1049			Sepsis with End Organ Injury by Diagnosis Codes N=238		
Screening System	Screen Positive Rate	Sensitivity % (95%CI)	C statistic (95%CI)	Screen Positive Rate	Sensitivity % (95%CI)	C statistic (95%CI)
CMQCC	60.2%	93.6% 92.0-95.0	0.67 (0.66, 0.68)	60.2%	93.7% 89.8-96.4	0.67 (0.65, 0.68)
SIRS	86.6%	99.4% 98.8-99.8	0.56 (0.56, 0.57)	86.6%	99.2% 97.0-99.9	0.56 (0.56, 0.57)
MEWC	92.3%	97.7% 96.6-98.5	0.53 (0.52, 0.53)	92.3%	97.9% 95.2-99.3	0.53 (0.52, 0.54)
UKOSS	67.5%	95.2% 93.2-96.0	0.64 (0.63, 0.65)	67.5%	95.0% 91.4-97.4	0.64 (0.63, 0.65)
MEWT (Overall)	45.7%	78.5% 75.8-80.9	0.66 (0.65, 0.68)	45.7%	87.4% 82.5-91.3	0.71 (0.69, 0.73)

CMQCC Sepsis QI Toolkit



www.CMQCC.org/toolkits

Maternal Sepsis Evaluation Flow Chart

Suspected Infection

Routine Vital Signs Screening

Step 1: Initial Severe Infection Screen
- Oral temp <36C (98.6F) or ≥38C (100.4F)
- Heart rate >110 bpm
- Respiratory rate >24 breaths per min
- WBCs >15,000/mm^3 *or* <4,000/mm^3 *or* >10% bands

Positive if any 2 criteria met

Key step: Need formal direction for RNs, Hospitalists

Patient-Centered BEDSIDE EVALUATION

Action
- If infection suspected:
- Start source-directed antibiotics and IV fluid bolus
- Increase monitoring and surveillance.

Step 2: Confirmation of Sepsis with End Organ Injury
- Laboratory: Chem, Coags, Lactate
- Mental Status evaluation
- Persistent MAP <65 with infection

Only one criterion needed

Sepsis Treatment
- Sepsis appropriate antibiotics and fluids
- Attention to Source
- Escalation of Care

Bedside Evaluation

- Red Flag levels of VS
  - P, RR, dBP (MAP), T are most promising
  - Study underway
- Clinical evaluation
  - Pt appears toxic, ill
  - Sepsis symptoms ➔
- Evaluate for bleeding
- Listen to patient's concerns!

Neonatal Early-Onset Sepsis Calculator (Kaiser 2023)

Please enter details below.

Predictor	Scenario
Incidence of Early-Onset Sepsis	
Gestational age	weeks / days
Highest maternal antepartum temperature	Fahrenheit
ROM (Hours)	
Maternal GBS status	Negative / Positive / Unknown
Type of intrapartum antibiotics	Broad spectrum antibiotics > 4 hrs prior to birth / Broad spectrum antibiotics 2-3.9 hrs prior to birth / GBS specific antibiotics > 2 hrs prior to birth / No antibiotics or any antibiotics < 2 hrs prior to birth

Calculate » Clear

Risk per 1000/births	
EOS Risk @ Birth	

EOS Risk after Clinical Exam	Risk per 1000/births	Clinical Recommendation	Vitals
Well Appearing			
Equivocal			
Clinical Illness			

Classification of Infant's Clini… resentation Clinical Illness Equivocal Well Appearing

Most Important Parts of Calculator

1. Standardized Clinical Evaluation

2. Enhanced Observation

Bill Benitz 2019, 2020

Evaluation for Organ Injury

- Lactate (can be elevated at the end of a long labor)
- Chemistry Panel (kidney and liver functions)
- CBC (WBC and Plts)
- Coagulation Panel (PTT, PT, INR)

Study underway to identify pregnancy appropriate cut-offs

- Need for O2, pressors?
- CNS symptoms

Key Steps to Reduction of Deaths and Severe Complications from Sepsis in Pregnancy

- **Diagnostic criteria are not standardized:** Use a two–step approach (as per CMQCC and WHO)
- **Think Sepsis:** Ask / Listen Carefully / Screen vital signs / Draw labs
- **Treatment must be Timely:** Give early antibiotics and early fluid support (<1 Hour!)
- **Special Challenge of Chorioamnionitis:** Evaluate carefully, reevaluate, *Think Sepsis!*

(2) Why are we doing poorly with Maternal Sepsis?
after all, we know how to treat sepsis…

- Patients and family members do not know the signs and symptoms of sepsis
- Sepsis not on patient's or doctor's mind: symptoms are dismissed
- Patients do not know how to best advocate for themselves

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Maternal Sepsis Community Leadership Board

Kendra L. Smith, PhD, MPH

Maile's Story

- In 2015, Maile gave birth to her second child.
- Soon after arriving home, she felt unwell and began calling her doctor's office over the course of the week
- She went into severe septic shock
- This video tells her story

https://m.youtube.com/watch?v=w0tag0R9EBk

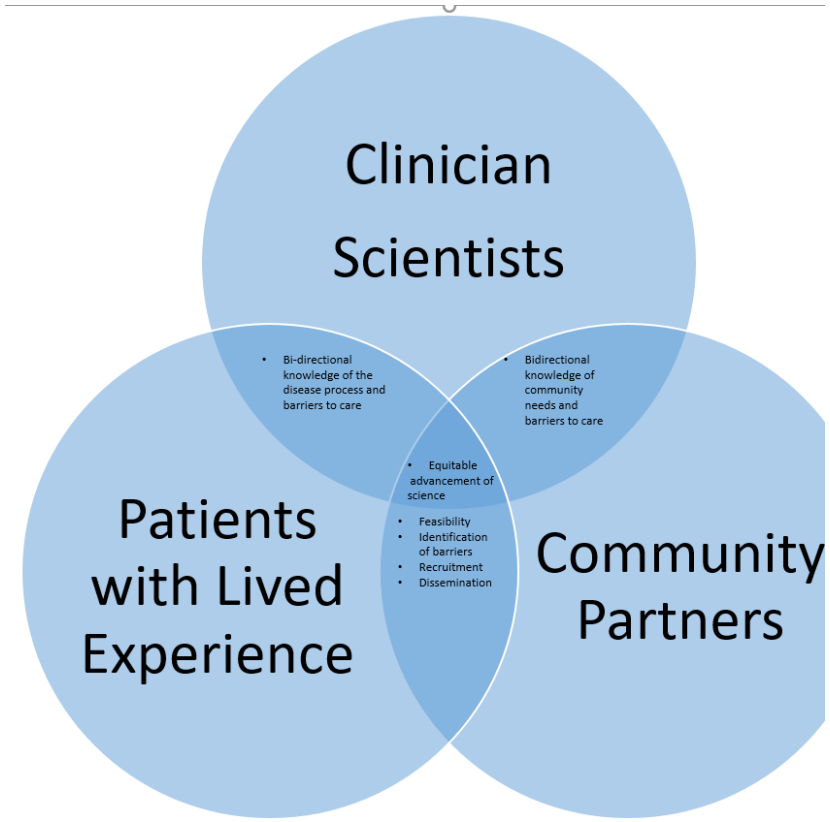
Maternal Sepsis Community Leadership Board

- The purpose of the Maternal Sepsis Community Leadership Board (MSCLB) is to engage in research activities designed to understand and reduce maternal morbidity and mortality from maternal sepsis while leveraging community experiences and voices.

- Membership:
  - Maternal Sepsis Survivors
  - Health Equity Advocates
  - Public Health Experts
  - Community members (rural, urban, tribal communities)

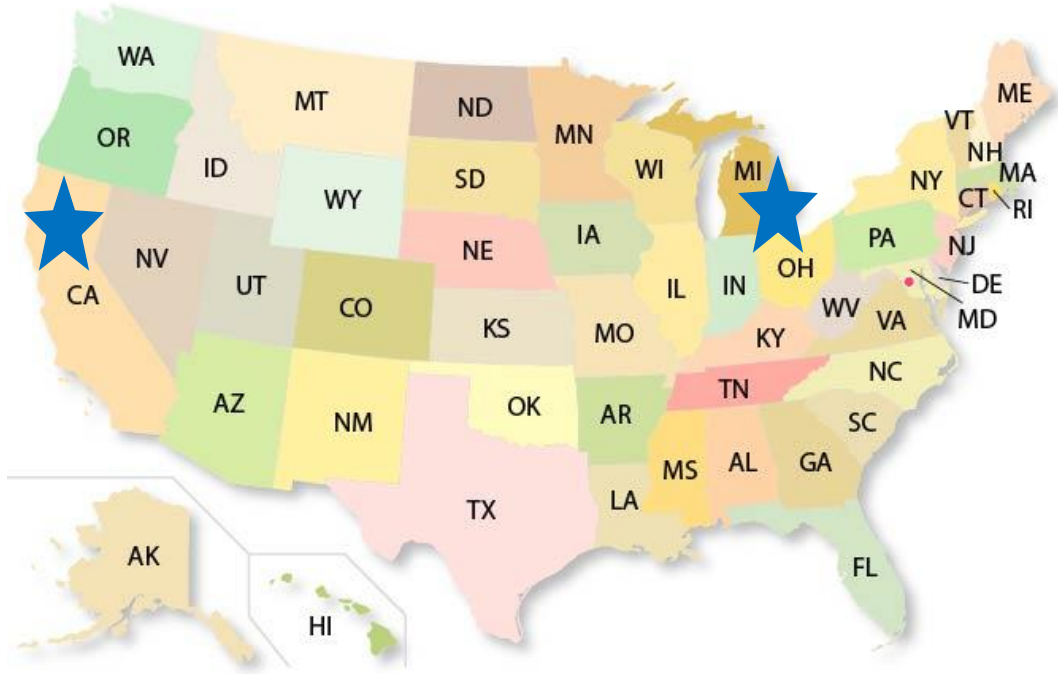
Maternal Sepsis Project Structure

- Planning Phase- Maternal Sepsis Community Leadership Board
- Patients with lived experience
- Patient advocates
- Birth equity Advocates
- Community leaders engaged in reducing disparities
- Diverse membership geographically & ethnically



Leverage Experience in California & Michigan

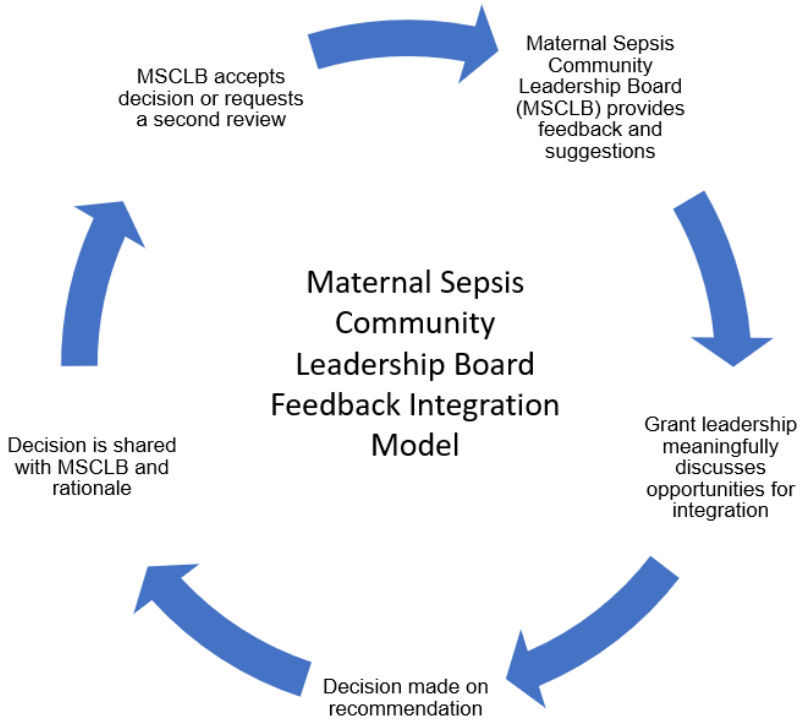
- SEMPQIC, Intertribal Council of Michigan, Rural Michigan
- California Maternal Quality Care Collaborative



Reducing Power Differentials

- Community Liaison, Kendra Smith PhD, empowered community members by level-setting activities
- Integrated Community and Patient Co-Leadership with Researchers
- Create an equitable compensation structure

Maternal Sepsis Community Leadership Board Feedback Integration Model



Warning Signs: Questions to Ask

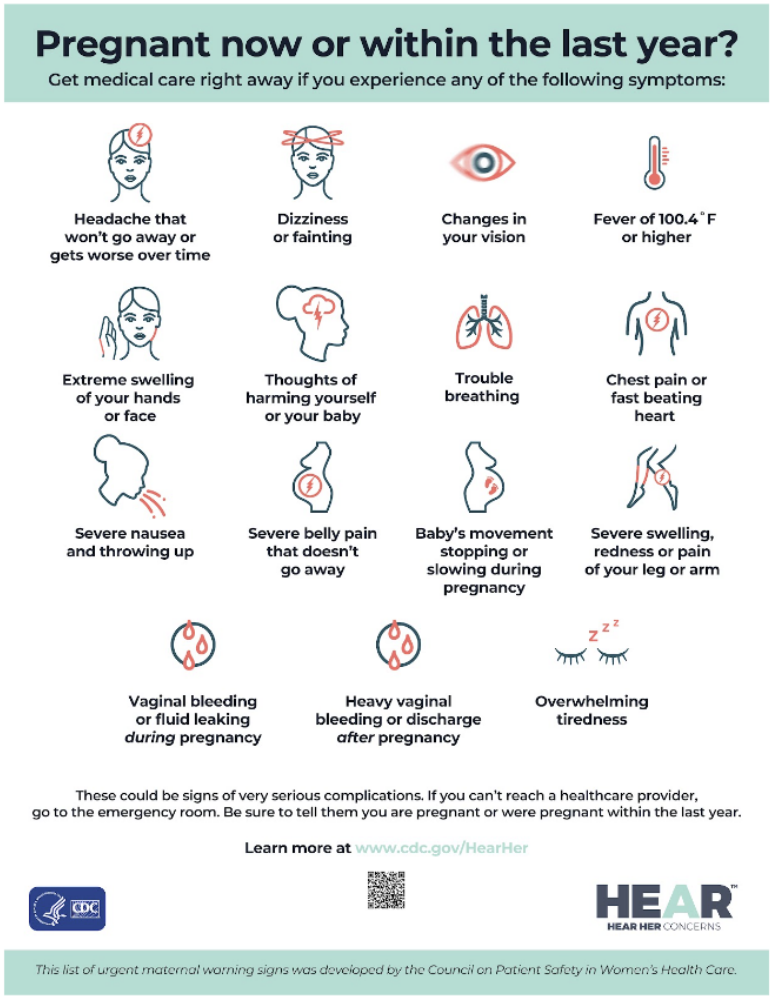
WARNING SIGNS QUESTIONS TO ASK: Please add questions to ask when patients call with one of these warning signs for assessment overall and specifically for "fever", "overwhelming tiredness", "severe belly pain that doesn't go away", "dizziness or fainting"

Im so sorry you are not feeling well. What else can you share with me about how you feel?

When a patient calls in, review this list to ask if any of the symptoms are present. If they are, ask when they started, are they constant, how long they last.

I would like to see you in person. Do you need assistance in getting a ride or child care?

Also ask what their temperature is in case it is low which can also be a problem. How does their current temperature compare to their normal temperature?



If the patient states that they "don't feel right" and requests to be seen, they should be seen. Whether that be office or hospital triage.

Red flag if the patient's partner or family member is calling on behalf of the patient

Are you able to perform normal day-to-day functions?

Are there any barriers that are preventing you from coming in to physically be seen?

To providers: Believe the patient and listen to what they are saying

To providers: Clearly state "I'm Nurse Betty and here to help you today, let me start by listening to your concerns today, please tell me your name and DOB"

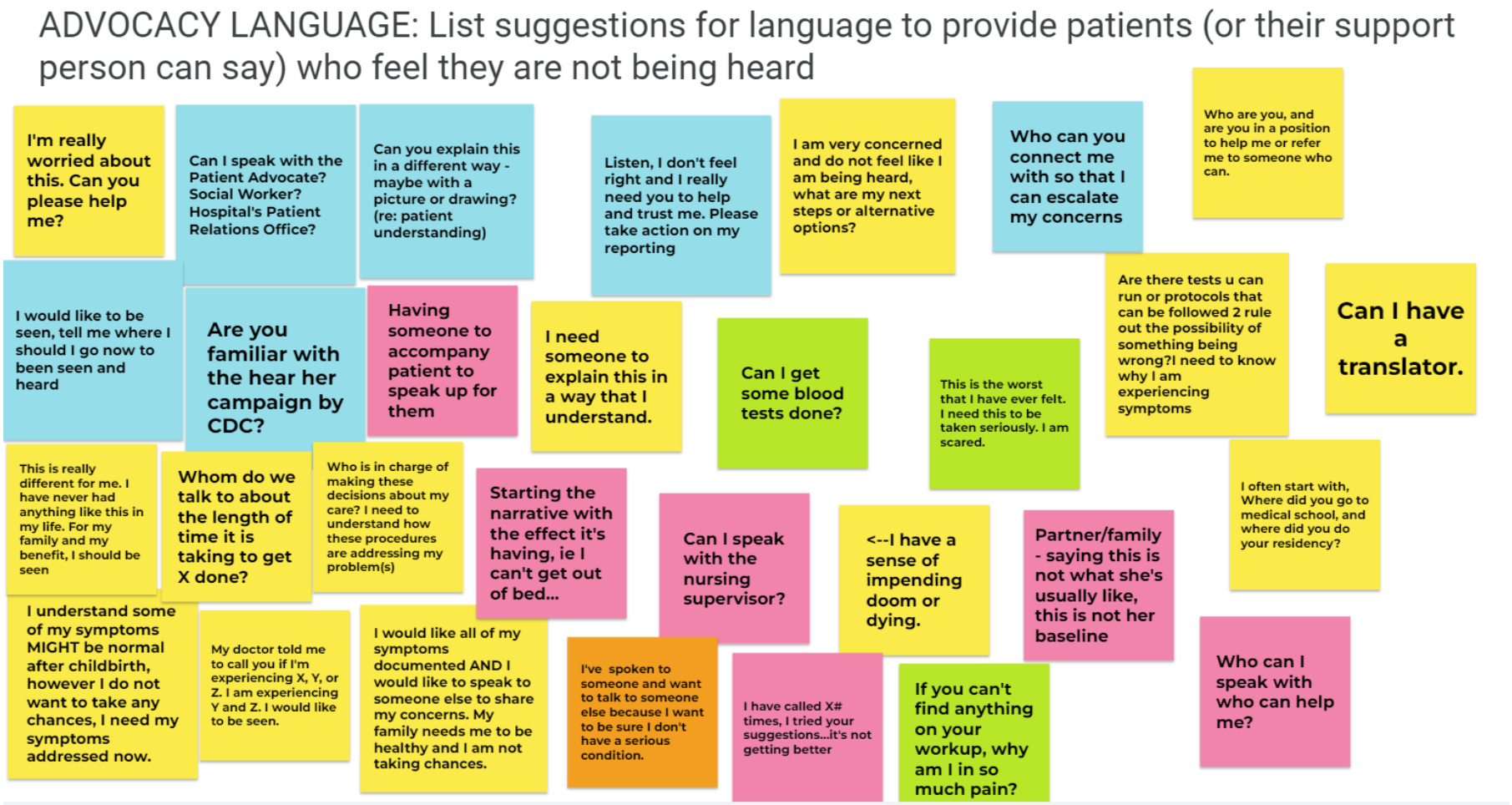
How much do your symptoms worry you?

How concerned about your symptoms from a 1-10.

What prompted you to call? Is this your 1st time reporting or calling?

How is this different from your baseline?

Advocacy Language



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Turning Lessons Learned from Community and Patients into Clinical Tools

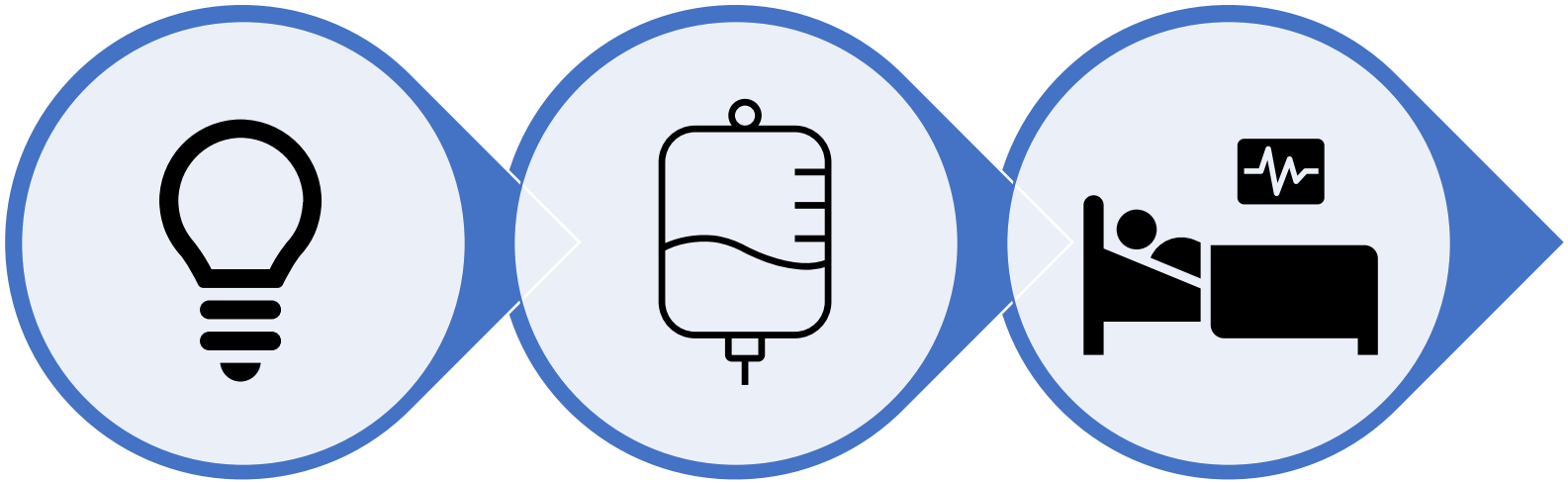
Melissa E Bauer, D.O.
Associate Professor
Duke University

Preventability

California	North Carolina	Michigan
39% Preventable	43% Preventable	73% Preventable

Bauer *et al. Obstet Gynecol* (2015)
Berg CJ *et al. Obstet Gynecol* (2005)
Main EK *et al. Obstet Gynecol* (2015)

Three Deadly Delays

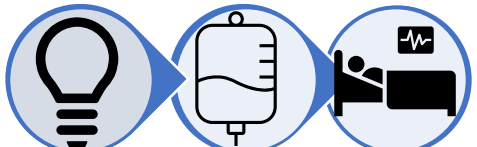


Recognition

Treatment

Esclation of Care

Seacrist et al. *JOGNN* 2019
Bauer et al. *Obstet Gynecol* 2015



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Recognition

In-hospital Recognition Pearls

- Most patients do not have any risk factors
- No fever (or hypothermia) ≠ No sepsis
- Be curious
- What is not in the chart can be most important

Bauer *et al.*, Anesth and Analg 2013
Bauer *et al.*, *Obstet Gynecol* 2015.

Outside of the Hospital

- Over 50% of cases occur during postpartum readmission
- How can we also help the patient identify when to seek care?
- How can we help the patient be listened to and feel heard?

Hensley et al. JAMA 2019

Survivor Interviews

- 20 total interviews
  - 19 survivors with 8 support persons
  - 1 support person of a non-survivor

Patient Barriers to Care

- Goals:
  - Identify barriers to care
  - Listen to patient's stories and lessons learned
  - Solutions to address barriers

Patients did not remember education about warning signs

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- *"If I had known that was a sign to look for, I would have known it when I saw it."*
- *"I think if when they discharged me, if they had said be on the lookout for these symptoms, if you have any of them, call and check in. If they had taken five minutes to do that, I think it would've made a huge difference."*

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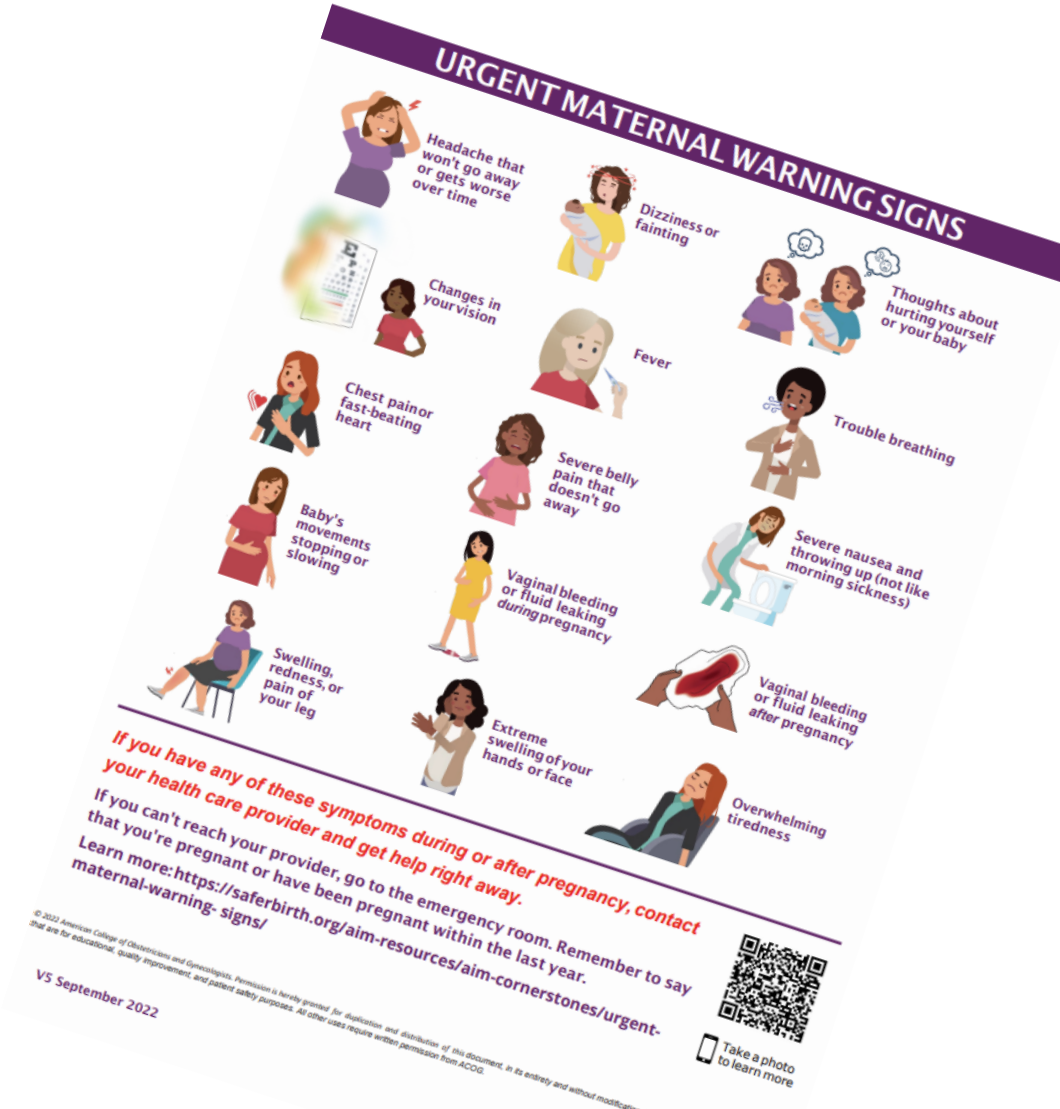
Urgent Maternal Warning Signs

- AIM Cornerstone resource, originally developed by the Council for Patient Safety in Women's Health Care
- Translated into 14 languages
- Standardized patient education

www.saferbirth.org/aim-resources/aim-cornerstones/urgent-maternal-warning-signs/



Phone Discharge Education

For iPhone go to:

https://saferbirth.org/aim-resources/aim-cornerstones/urgent-maternal-warning-signs/

Choose your preferred language.

Once selected, choose:

Scroll down until **"Add to Home Screen"** appears, click on:

It will now appear on your home screen.

Patients wanted a way to advocate

- *"It would have been helpful to have this list to give me the language. I had these symptoms and knew something was wrong. My husband and I thought we should be advocating for ourselves but didn't know what we were supposed to be advocating for."*
- *"Patients and their support person should be taught to watch for warning signs and know what they could potentially mean and what to say when entering an emergency room"*

Co-Created with Community and Patients with Lived Experience

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- Advocacy Language
- Advocacy Actions

ADVOCACY

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EXAMPLES OF ADVOCACY LANGUAGE

- I am very concerned and do not feel like I am being heard. What are my next steps or alternative options?
- This is really different for me. I have never felt this way in my life. For my benefit and my family's benefit I should be seen.
- I understand that some of these symptoms may be normal for pregnancy or postpartum, but I am very concerned and need to be evaluated.
- I have called a number of times and tried suggestions that have been provided, but I am not getting better.
- Can you please refer me to someone who can help me? I'm really worried.
- My doctor told me to call if I am experiencing X, Y, or Z. I am having X, Y, or Z. I would like to be seen.
- I want to speak to someone else to make sure that I do not have a serious condition. Can you please refer me to someone who will help me? I am really worried.
- I do not feel right, I am concerned that something bad is happening to me.

ADVOCACY ACTION TIPS

- Your concerns and feelings are valid, be persistent in getting the answers or care you need.
- If you have a medical emergency, please dial 911 or go to the nearest emergency room.
- Ask to speak to the charge nurse or patient relations if you are not being heard
- If you are not getting the response you need, you can go to triage or the emergency room. You do not need permission from anyone to do so.
- You can also go to a different hospital or urgent care facility if you are not receiving the care you need.
- Consider having another person to accompany you to help advocate for you (support person, family member, doula, etc.)
- Bring a list of your concerns you would like to be addressed.
- Start your concern with the effect that it is having such as the following: "I am so tired I am unable to get out of bed"; "I am having so much pain I cannot sleep"; etc.

Patient Concerns dismissed as normal

“I was telling all my symptoms, but I was basically just getting like, "Oh, that's normal. That's normal." So, I was very brushed off and I didn't know any better.”

But if they had asked further…

"I had no strength; I couldn't even go to the kitchen to get a glass of water"

"I was so weak; I couldn't stand up"

"I was short of breath after brushing my teeth and had to lie down on the bed"

WARNING SIGNS FOLLOW-UP GUIDE

MICHIGAN ALLIANCE FOR INNOVATION ON MATERNAL HEALTH

BACKGROUND

These questions, tips, and red flags were created based on near-miss cases of patients who suffered severe maternal morbidity.

Many patients called in with symptoms but were met with reassurance that symptoms were typical of pregnancy or postpartum rather than follow up questions that would have identified severe illness to allow prompt treatment.

FOLLOW UP QUESTIONS

These follow up questions are suggested to evaluate when patients call with symptoms of concern.

- Please tell me in your own words what is wrong.
- Is this your first time calling about this?
- How long has this been going on?
- Is it getting better, staying the same, or getting worse?
- On a scale of 1 to 10 (worst) how bad is _____? (pain/tiredness/symptoms of concern)
- Are you able to perform your normal day-to-day activities and take care of yourself?
- Are you able to eat, drink, urinate, pass gas, have bowel movements?
- Can you explain how this is limiting you?
- What prompted you to call?
- Have you had this before?
- Can you explain how you are feeling and how this is different from your baseline?
- Are there any barriers to coming in today?

ACTION ITEMS

- If the patient does not need assessment now, explain red flag warning signs when the patient should call back or come in for evaluation.
- Express empathy and concern. Many patients reported feeling like a burden and not feeling heard and subsequently delayed calling and seeking care when symptoms worsened.
- Keep track of a list of patients to reach back out to follow up on and encourage them to call back if not improving or getting worse.

RED FLAGS (should prompt in-person evaluation)

- Patient reaching out multiple times with concerns.
- A support person calling on behalf of the patient with concerns.
- Patient requests to be seen.
- Symptoms that are worsening over time.
- Patient unable to perform activities of daily living (climbing stairs, showering, brushing teeth, holding baby, etc.)
- Signs of severe dehydration: inability to urinate, inability to make tears, abrupt stopping of milk production.
- Severe pain.

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Treatment

Importance of prompt antibiotic therapy In Pregnant Patients

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- Antibiotics within one hour
  - 8% mortality
- Antibiotics after one hour
  - 20% mortality

Bauer ME *et al.* Anesth Analg (2018)

CMQCC Toolkit

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TABLE 9. Proposed Empiric Antibiotic Coverage for Patients with Sepsis of Unknown Source (with End Organ Injury) or Septic Shock

Antibiotic Choices *Empiric coverage for sepsis of unknown source or for septic shock should include at least one antibiotic for Gram-negative and anaerobic coverage **PLUS** one for Gram-positive coverage*	Duration
Gram-negative plus anaerobic coverage Piperacillin/tazobactam 3.375 g IV q8h (extended infusion) or 4.5 g IV q6h **OR** Meropenem 1 g IV q8h (if recent hospitalization or concern for MDRO organisms) **OR** Cefepime 1-2g IV q8h plus metronidazole 500 mg IV q8h **OR** Aztreonam 2 g IV q8h (for women with severe penicillin allergy) Plus metronidazole 500 mg IV q8h **OR** Aztreonam 2g IV q8h plus clindamycin 900 mg IV q8h **PLUS** **Gram-positive coverage** Vancomycin 15-20 mg/kg q8h-q12h (goal trough 15-20 mcg/mL) **OR** Linezolid 600 mg IV/PO q12h (for women with severe vancomycin allergy)	7-10 days is adequate for most infections

Systems-based solutions

- Automated dispensing system availability
- IV access
- Pharmacy
- Waiting for transport

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Escalation of Care

Sepsis in Obstetrics Score

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FIGURE 1
Sepsis in Obstetrics Score

Variable	High abnormal range				Normal	Low abnormal range			
Score	+4	+3	+2	+1	0	+1	+2	+3	+4
Temperature (°C)	>40.9	39-40.9		38.5-38.9	36-38.4	34-35.9	32-33.9	30-31.9	<30
Systolic Blood Pressure (mmHg)					>90		70-90		<70
Heart Rate (beats per minute)	>179	150-179	130-149	120-129	≤119				
Respiratory Rate (breaths per minute)	>49	35-49		25-34	12-24	10-11	6-9		≤5
SpO_2 (%)					≥92%	90-91%		85-89%	<85%
White Blood Cell Count (/μL)	>39.9		25-39.9	17-24.9	5.7-16.9	3-5.6	1-2.9		<1
% Immature Neutrophils			≥10%		<10%				
Lactic Acid (mmol/L)			≥4		<4				

Scoring template for S.O.S., a sepsis scoring system designed specifically for obstetric patients.

S.O.S., Sepsis in Obstetrics Score; SpO_2, blood oxygen saturation.

Albright. The Sepsis in Obstetrics Score. Am J Obstet Gynecol 2014.

Albright *et al. AJOG* (2014)

Sepsis Calculator

Sepsis Obstetrics Scoring System			
Temperature (Centigrade) (° C) 36 - 38.4 C (96.8 - 101.1 F)		SpO2% blood oxygen saturation >= 92%	
Systolic blood pressure (mmHg) > 90		White blood count uL 5.7 - 16.9	
Heart Rate (beats per minute) <=119		% Immature Neutrophils <10%	
Respiratory Rate (breaths per minute) 12 - 24		Lactic Acid (mmol/L) <4	
Calculate Sepsis Obstetrics Score (S.O.S)			

http://perinatology.com/calculators/Sepsis%20Calculator.htm

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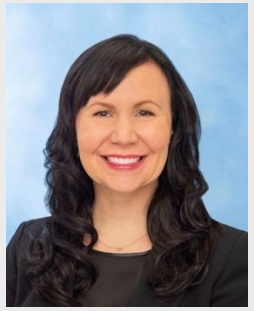
Elliott K. Main, MD

Kendra L. Smith, PhD, MPH



Melissa E Bauer, D.O.

The Q&A box is now open for questions!

Please specify <u>who</u> your question is for.

Thank you!

Introduction to the Improving Diagnosis and Treatment of Obstetric Sepsis Collaborative

Christa Sakowski, MSN, RN, C-ONQS, C-EFM, CLE

Clinical Lead - CMQCC
csakowski@Stanford.edu

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CMQCC Collaborative History and Structure

CMQCC Collaboratives

- Improving Health Care Response to Preeclampsia - *Complete*
- Improving Health Care Response to Obstetric Hemorrhage - *Complete*
- Support Vaginal Birth and Reduce Primary Cesareans - *Complete*
- Mother & Baby Substance Exposure - *Complete*
- Birth Equity
  - Pilot Collaborative - *Ongoing*
  - Learning Initiative for Supporting Vaginal Birth with an Equity Lens - *Current*
- Low Dose Aspirin to Prevent Preeclampsia - *Current*
- Community Birth Partnership Initiative (Pilot) - *Current*
- Maternal Sepsis – *Current*

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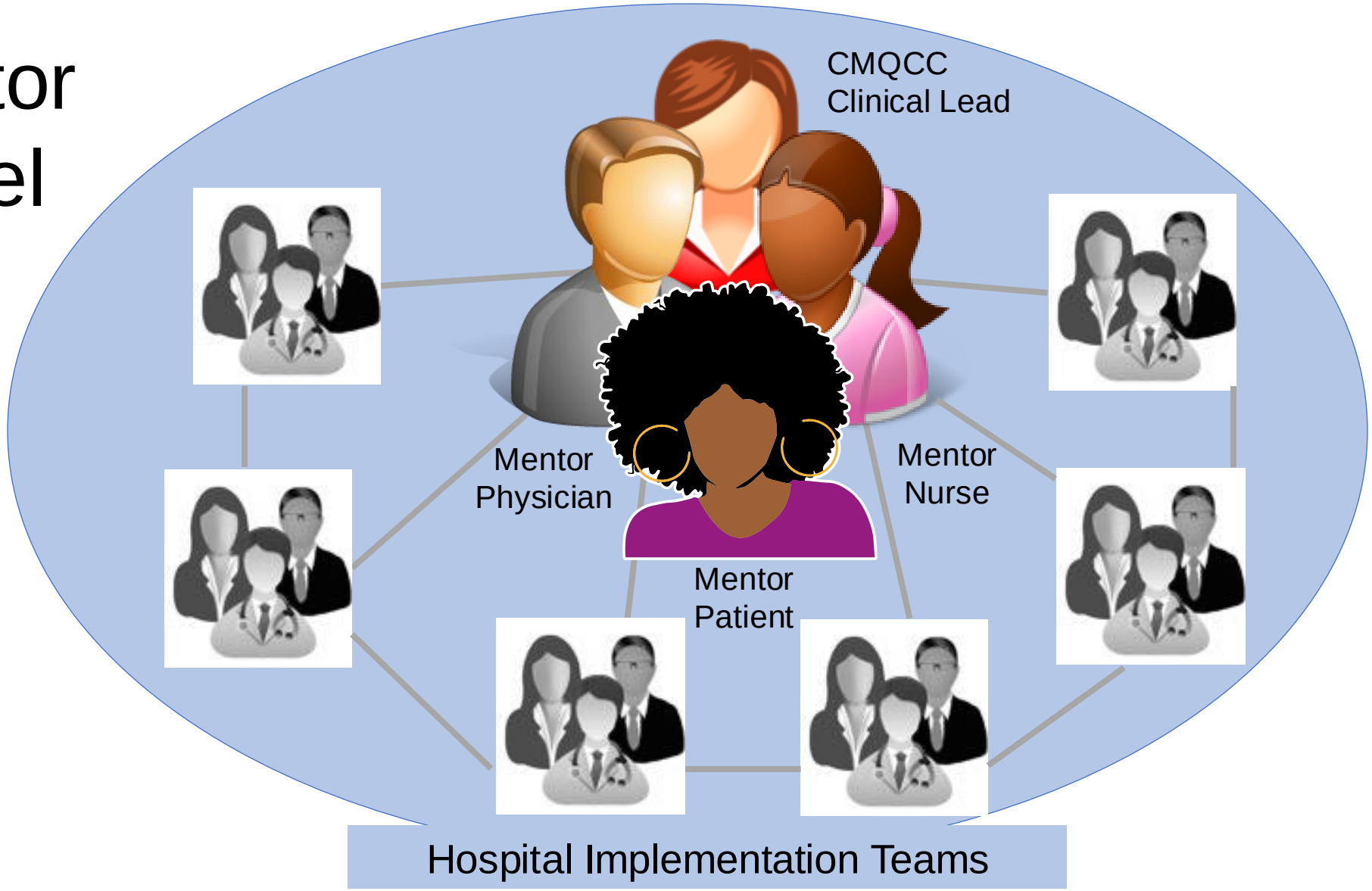
Mentor Model



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Build the Team before you Build the Plan

- Set the expectation that bedside staff is integral
  - Expand QI knowledge
- Timely Communication
  - Who
  - How
  - When
- Prepare for scheduled meetings

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Standard Team Members

- Physician Leaders – OB, MFM
- Midwifery Leaders
- Nurse Leaders – Director, Manager, CNS, Educator
- Informal Leaders
- Data Colleagues
  - Quality Staff
  - Patient Safety/Risk Management
  - Health Information Management Staff
  - Analyst

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Supportive Team Members

- **Patient Representatives**
- **Community Representatives**
- Administrative Leaders
- Board of Directors
- Community Leaders
- Marketing
- State Collaborative

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Why a Collaborative?

The Problem

- Obstetric sepsis is the #2 cause of maternal mortality
- Obstetric sepsis is the #3 cause of severe maternal morbidity
- The Joint Commission (TJC) / Centers for Medicare & Medicaid Services (CMS) are introducing a severe maternal morbidity (SMM) quality measure this year
- Implementation of the Sepsis bundle is one of 3 safety bundles (HEM and HTN are the others) that CMS is requiring for designation as Birthing-Friendly

Introduction to the Collaborative

- Multi-stakeholder, multi-hospital effort to improve the prevention, diagnosis, and treatment of sepsis in California and Michigan.
- Activities will assist hospitals across the states of California and Michigan in improving obstetric sepsis outcomes through
  - The implementation of the patient safety bundle developed by the Alliance for Innovation on Maternal Health (AIM)
  - The use of the Improving Diagnosis and Treatment of Obstetric Sepsis Toolkit, developed by CMQCC and a task force of experts from across California.

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Why now?

- Received a National Institutes of Health (NIH) grant to further our work on obstetric sepsis.
- Also in the last few months, ACOG/AIM released a new national safety bundle “Sepsis in Obstetric Care” that includes great resources.

The Collaborative will start in November 2023 and run through November 2024.

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Collaborative Structure

- All virtual sessions
- Kick-off webinar November 2023
- Mentor Training November 2023
- Quarterly educational webinars that include clinical protocols and lived experience presentations
- Twice quarterly small group (6-8 hospitals) sharing with peers led by a physician, nurse, and patient mentor
  - 1st meeting of the quarter – Clinical Protocols
  - 2nd meeting of the quarter – Patient Considerations
- Other experts in patient safety, implementation, quality improvement, and data analytics will help hospital teams during small group meetings
- Closing webinar November 2024

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KEY RESOURCES:

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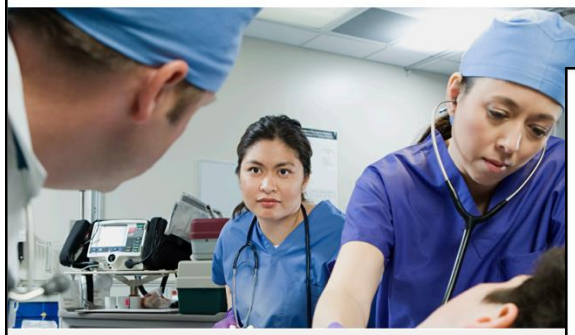

Improving Diagnosis and Treatment of Maternal Sepsis

A CMQCC Quality Improvement Toolkit

AIM
ALLIANCE FOR INNOVATION ON MATERNAL HEALTH

Sepsis in Obstetric Care

OPEN

Consensus Statement

Alliance for Innovation on Maternal Health

Consensus Bundle on Sepsis in Obstetric Care

Melissa E. Bauer, DO, Catherine Albright, MD, MS, Malavika Prabhu, MD, R. Phillips Heine, MD, Chelsea Lennox, MPH, Christie Allen, MSN, RN, Carol Burke, MSN, APRN/CNS, April Chavez, MA, Brenna L. Hughes, MD, MSc, Susan Kendig, MSN, JD, Maile Le Boeuf, BA, Elliott Main, MD, Tiffany Messerall, DNP, WHNP-BC, Luis D. Pacheco, MD, Laura Riley, MD, Rachel Solnick, MD, MSc, Andrew Youmans, MSN, CNM, and Ronald Gibbs, MD

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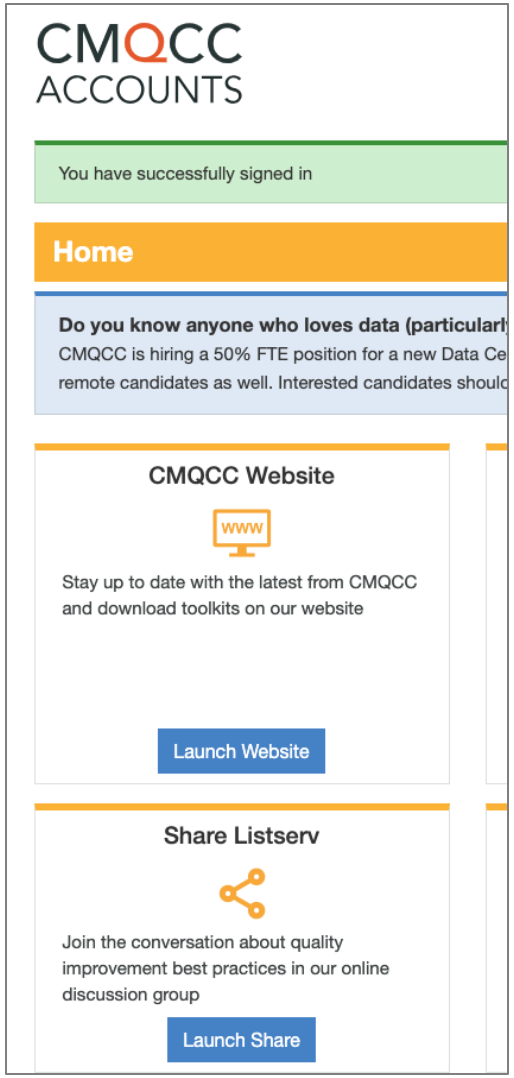
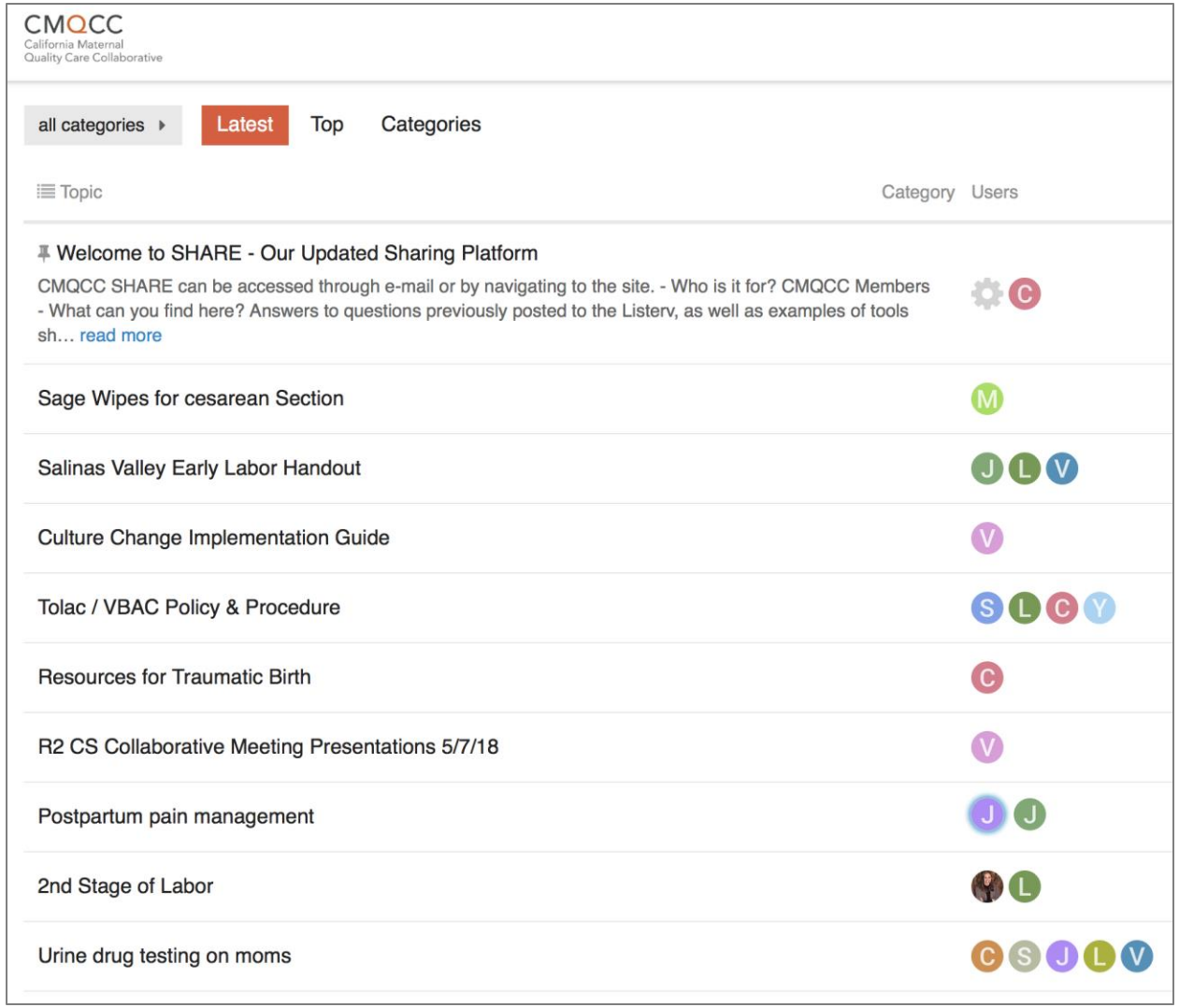
SHARE





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Benefits of Hospital Participation

- Participating hospital teams will experience a significant extension of your hospital's quality improvement capacity through
  - Training materials
  - Educational webinars
  - Development and implementation of consistent and standardized approaches to care
  - Mentor support for the implementation of bundle elements
  - Assistance from quality improvement experts
  - Networking opportunities with hospital teams across the state that are also participating in this project

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MDC Tools

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Sepsis Structure Measures Checklist

- 10 Structure Measures total
- Used to track implementation progress

Sepsis Structure Measures Checklist

	Item	Confirmed in Place on (estimated)
1	Patient Event Debriefs - *Has your department established a standardized process to conduct debriefs **with patients** after a severe event*?*	MM/DD/YYYY or Not In Place
2	Clinical Team Debriefs - *Has your department established a system to perform regular formal debriefs **with the clinical team** after cases with major complications*?* WHY: Routine immediate post-event debriefing to assess what went well and what could have been improved is standard practice. Criteria for triggering a debrief will vary among facilities and should be decided on by your perinatal QI team. Case reviews should occur after the event and focus on identifying system improvements. CMQCC recommends that, at minimum, you review all hemorrhage cases that resulted in severe maternal morbidity (as defined by the CDC).	MM/DD/YYYY or Not In Place
3	Multidisciplinary Case Reviews for Obstetric Sepsis - *Has your hospital established a process to perform multidisciplinary systems level reviews on cases of sepsis that occur during pregnancy, birth, and the postpartum period?* WHY: Every case provides lessons as to where the team performs effectively and what needs improvement.	MM/DD/YYYY or Not In Place
4	Obstetric Sepsis Screening & Diagnosis System - *Has your facility implemented a system for screening and diagnosis of pregnant and postpartum people for sepsis?*	MM/DD/YYYY or Not In Place
5	Protocols for Management of Suspected and Confirmed Obstetric Sepsis - *Has your facility established standard protocols and escalation policies for management of pregnant and postpartum people with suspected sepsis and sepsis that include:*	MM/DD/YYYY or Not In Place

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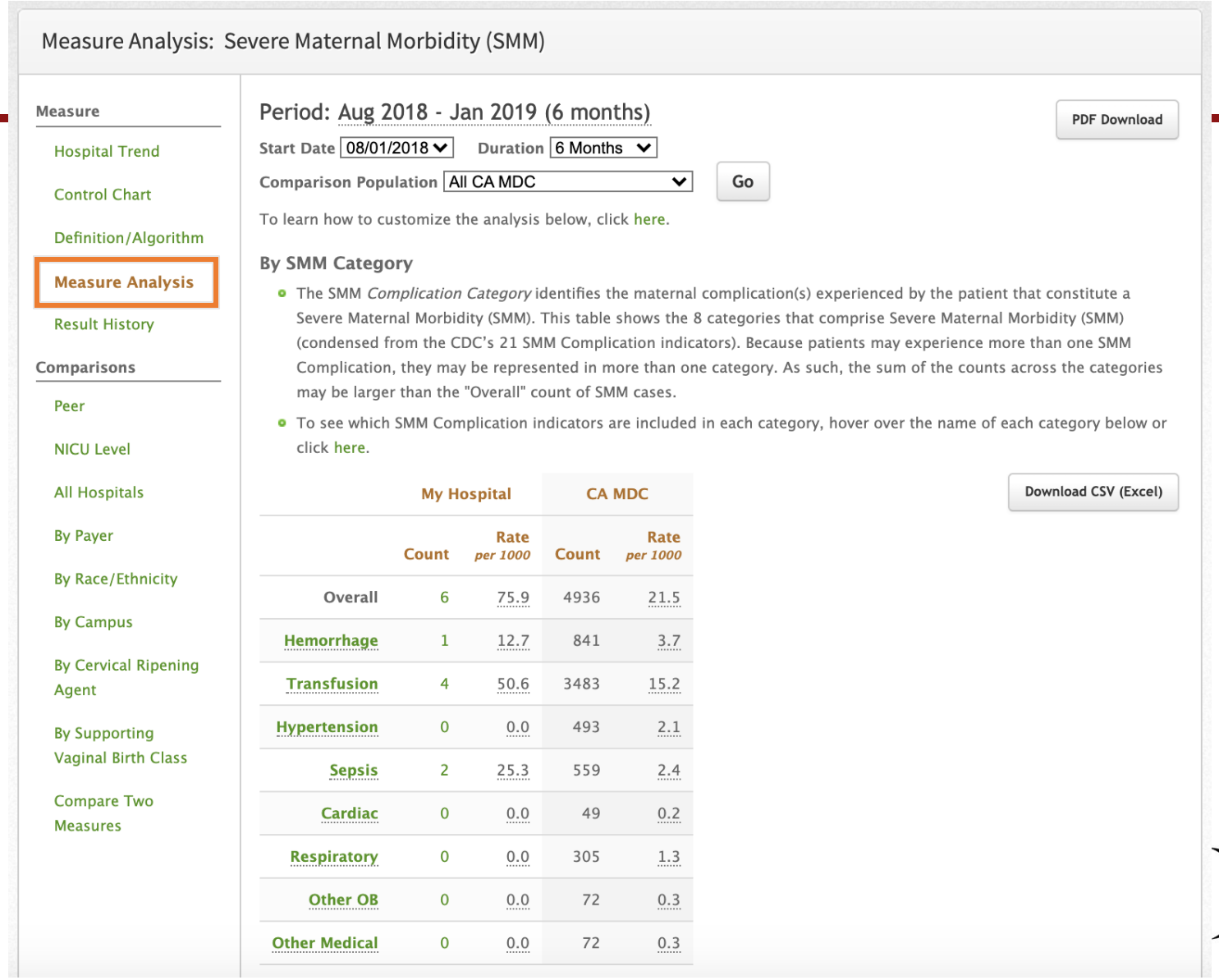
SMM Measure Analysis: Updates



Measure Analysis: Severe Maternal Morbidity (SMM)

Measure

- Hospital Trend
- Control Chart
- Definition/Algorithm
- Measure Analysis
- Result History

Comparisons

- Peer
- NICU Level
- All Hospitals
- By Payer
- By Race/Ethnicity
- By Campus
- By Cervical Ripening Agent
- By Supporting Vaginal Birth Class
- Compare Two Measures

Period: Aug 2018 - Jan 2019 (6 months)

PDF Download

Start Date 08/01/2018 Duration 6 Months

Comparison Population All CA MDC Go

To learn how to customize the analysis below, click here.

By SMM Category

- The SMM *Complication Category* identifies the maternal complication(s) experienced by the patient that constitute a Severe Maternal Morbidity (SMM). This table shows the 8 categories that comprise Severe Maternal Morbidity (SMM) (condensed from the CDC's 21 SMM Complication indicators). Because patients may experience more than one SMM Complication, they may be represented in more than one category. As such, the sum of the counts across the categories may be larger than the "Overall" count of SMM cases.
- To see which SMM Complication indicators are included in each category, hover over the name of each category below or click here.

Download CSV (Excel)

	My Hospital		CA MDC	
	Count	Rate *per 1000*	Count	Rate *per 1000*
Overall	6	75.9	4936	21.5
Hemorrhage	1	12.7	841	3.7
Transfusion	4	50.6	3483	15.2
Hypertension	0	0.0	493	2.1
Sepsis	2	25.3	559	2.4
Cardiac	0	0.0	49	0.2
Respiratory	0	0.0	305	1.3
Other OB	0	0.0	72	0.3
Other Medical	0	0.0	72	0.3

- Condense 21 SMM *Indicators* into 8 *Complication* categories
- Hover over the category to see which *Indicators* are included
- Click into each category to see a trend screen for each category

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SMM Measure Analysis:

- *NEW:* By SMM *Underlying Cause*
- Hover over the *Underlying Cause* to see examples of what would be included
- Click into each *Underlying Cause* to see a trend screen for each
- Help focus your QI efforts by seeing what drives your SMM rate

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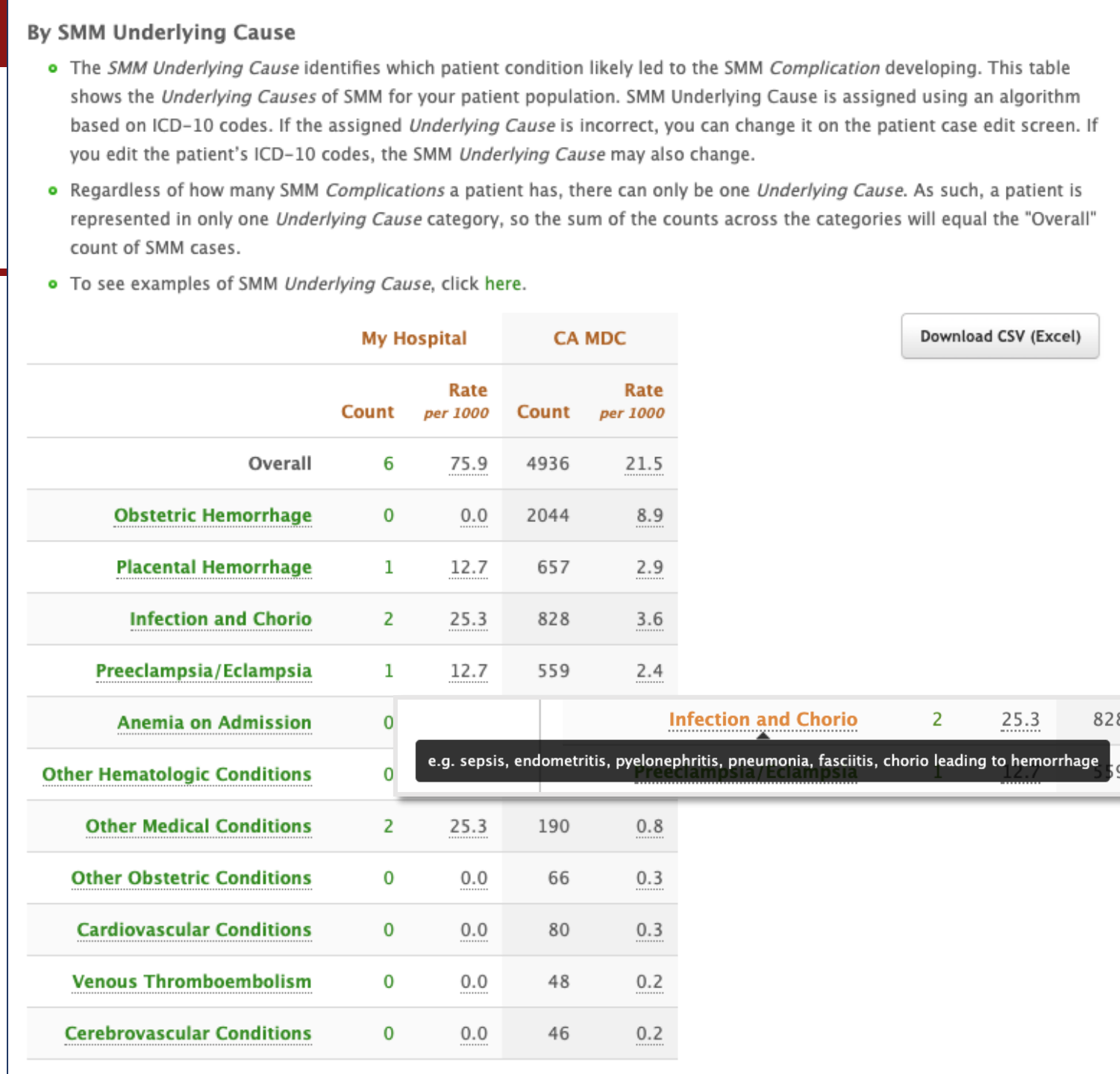

By SMM Underlying Cause

- The *SMM Underlying Cause* identifies which patient condition likely led to the SMM *Complication* developing. This table shows the *Underlying Causes* of SMM for your patient population. SMM Underlying Cause is assigned using an algorithm based on ICD-10 codes. If the assigned *Underlying Cause* is incorrect, you can change it on the patient case edit screen. If you edit the patient's ICD-10 codes, the SMM *Underlying Cause* may also change.
- Regardless of how many SMM *Complications* a patient has, there can only be one *Underlying Cause*. As such, a patient is represented in only one *Underlying Cause* category, so the sum of the counts across the categories will equal the "Overall" count of SMM cases.
- To see examples of SMM *Underlying Cause*, click here.

Download CSV (Excel)

	My Hospital		CA MDC	
	Count	Rate *per 1000*	Count	Rate *per 1000*
Overall	6	75.9	4936	21.5
Obstetric Hemorrhage	0	0.0	2044	8.9
Placental Hemorrhage	1	12.7	657	2.9
Infection and Chorio	2	25.3	828	3.6
Preeclampsia/Eclampsia	1	12.7	559	2.4
Anemia on Admission	0			
Other Hematologic Conditions	0			
Other Medical Conditions	2	25.3	190	0.8
Other Obstetric Conditions	0	0.0	66	0.3
Cardiovascular Conditions	0	0.0	80	0.3
Venous Thromboembolism	0	0.0	48	0.2
Cerebrovascular Conditions	0	0.0	46	0.2

Infection and Chorio 2 25.3 828

e.g. sepsis, endometritis, pyelonephritis, pneumonia, fasciitis, chorio leading to hemorrhage

Quality Improvement Pearls

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All Improvement is Multidisciplinary

- QI teams must cast a wide net to get the right people to the table…including patients and community partners
- Informal leaders can produce favorable results
- Engagement of hospital-level QI personnel has improved effectiveness

Lessons from the Field

- Robust teams most effective
- Easy wins matter
- Goals and timelines are very useful
- It takes time and persistence to get the systems running smoothly
- Must have champions

Disciplines & Departments	Needed?
Obstetrics	Yes
Nursing	
Anesthesia	
IT/EMR	
Laboratory	
Emergency Department	
Support personnel	
QI	
Outpatient Clinics	
Patients	
Others unique to your setting?	

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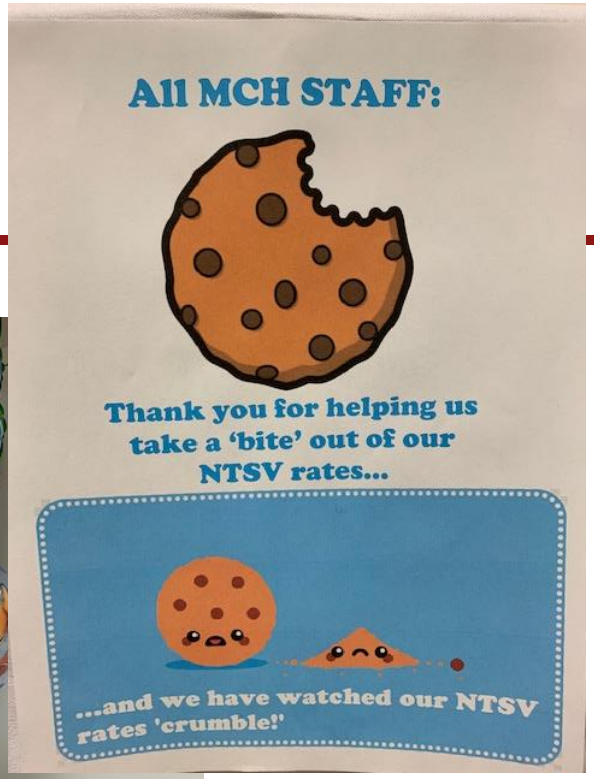
Celebrate!!!



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Questions

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Let's Talk Perinatal Equity Webinar Series for California Hospitals

November Topic:
Patient Experience Baseline Assessments & Respectful Care

SCAN ME

Register online today!
Scan the QR code or go to:
https://tinyurl.com/NovEquityWebinar

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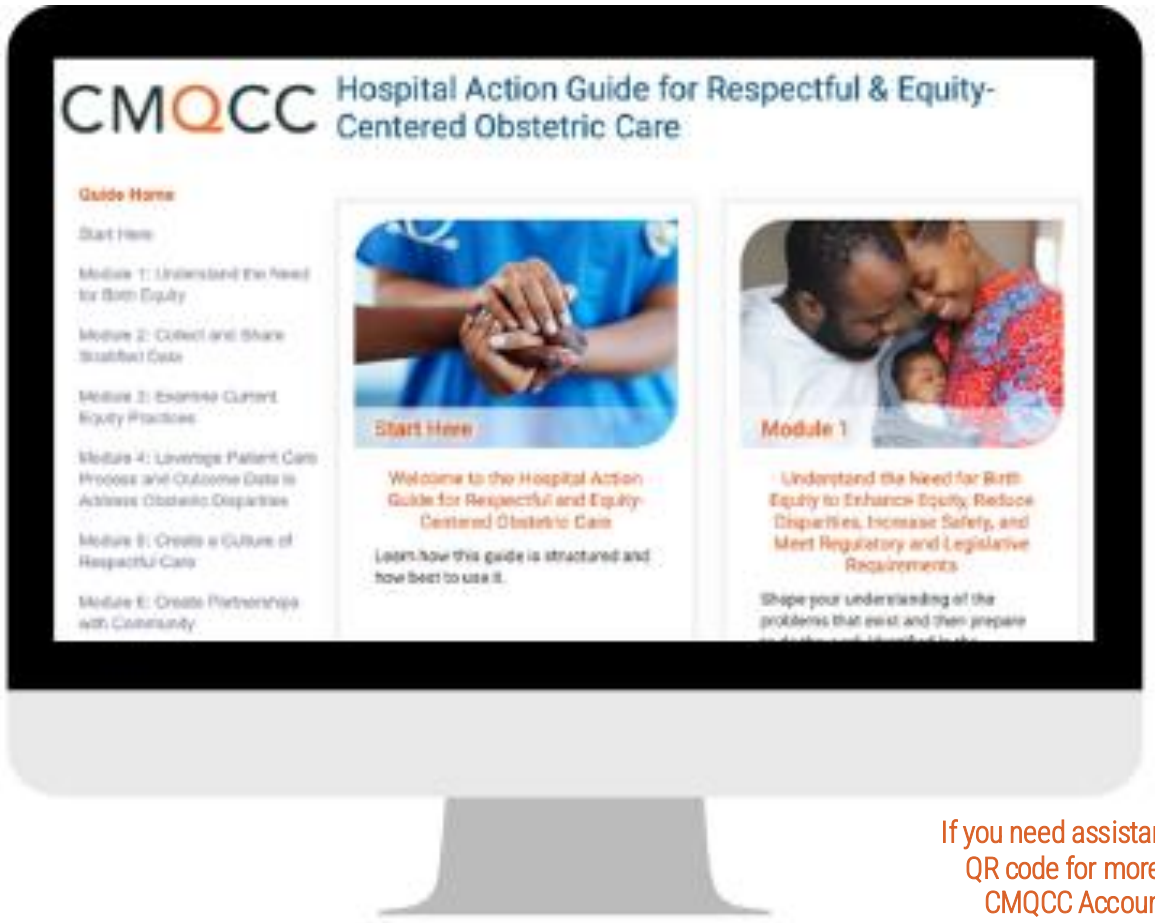
November 15, 2023, 12 p.m. - 1 p.m.

Attention: Physicians, nurses, quality improvement leaders, and obstetric champions.
A new tool is now available to support moving beyond implicit bias training to improve outcomes for all California moms and birthing people in California.

Now available!

CMQCC's Hospital Action Guide for Respectful and Equity-Centered Obstetric Care



If you need assistance, please follow this QR code for more on how to create a CMQCC Accounts Profile tutorial.

How to access the Hospital Action Guide

The Hospital Action Guide is available now through the CMQCC Accounts portal available at CMQCC.org, exclusively for California member hospitals.

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Thank you for joining us!