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Dunlevie Maternal-Fetal Medicine
Center for Discovery, Innovation and Clinical Impact

CMQCC
California Maternal
Quality Care Collaborative

Obstetric Sepsis Implementation Sprint

Session 4: Implementation Science, Staff Education, and Working with the Emergency Department

April 21, 2026

Welcome and FAQs

- **Will this webinar be recorded? Will the slides be available?**
  - YES. Both the recording and slides from each session will be available within 1 week on the CMQCC Sepsis webpage: https://www.cmqcc.org/toolkits-quality-improvement/sepsis
- **Do I need to attend all four sessions?**
  - We encourage you to attend all four webinars in this series because each covers different topics, key to implementation.
- **How do I ask questions?**
  - During this webinar, you may drop your questions into the Q&A box at any time. Presenters will write out answers to your questions during the webinar and we will have time at the end to address questions live.
  - If you have remaining questions after the webinar, please email rnath@stanford.edu and the team would be happy to follow-up with an answer.
- **What type of implementation support will your team be providing after the webinar?**
  - The team is unable to provide direct support for individual hospital implementation challenges. However, we are happy to answer any general sepsis implementation questions.
- **There will be a two question poll during the Q&A to evaluate this session! We want your feedback!**

Objectives and Disclosures for the Sepsis Sprint

- Prepare staff and facilities to implement improvements in screening, diagnosis, and treatment of obstetric sepsis
- Prepare staff and facilities to implement improvements in listening and supporting patients and families

Conflicts/Disclosures: None

Supported by: NICHD UG3-HD108053: Large-scale Implementation of Community Co-led Maternal Sepsis Care Practices to Reduce Morbidity and Mortality from Maternal Infection

Obstetric Sepsis Implementation Sprint Team

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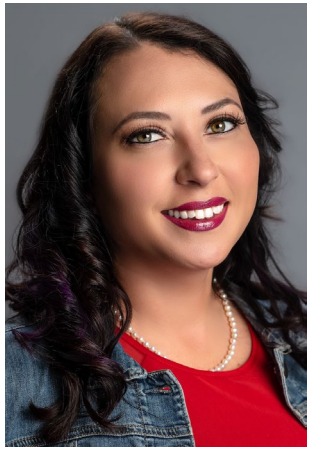

Christa Walczak, MSN RN
Clinical Lead
California Maternal Quality
Care Collaborative
Stanford University

Session 4 Agenda: Successfully Implementing Sepsis Tools and Protocols at Your Facility

- Applying Implementation Science to OB Sepsis
- OB Sepsis Staff Education Approaches—Hospital Presentations
- OB Sepsis—Implementation in the Emergency Department
- Summary and Action Steps

There are references throughout this slide set to the CMQCC OB Sepsis Toolkit: CMQCC Improving Diagnosis and Treatment of Obstetric Sepsis, V2.0 (2025) and links to specific Appendix Resources.

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Applying Implementation Science to Obstetric Sepsis

Melissa G Rosenstein, MD, MAS
Professor, Medical Director of Quality & Patient Safety for Obstetrics
Division of MFM, Dept of OB/GYN and RS
University of California, San Francisco (UCSF)
Associate Director of Implementation Science
California Maternal Quality Care Collaborative (CMQCC)

Disclosures

- No commercial disclosures or conflicts of interest

Objectives

- How can Implementation Science enhance our Quality Improvement efforts?

Implementation Science and Quality Improvement

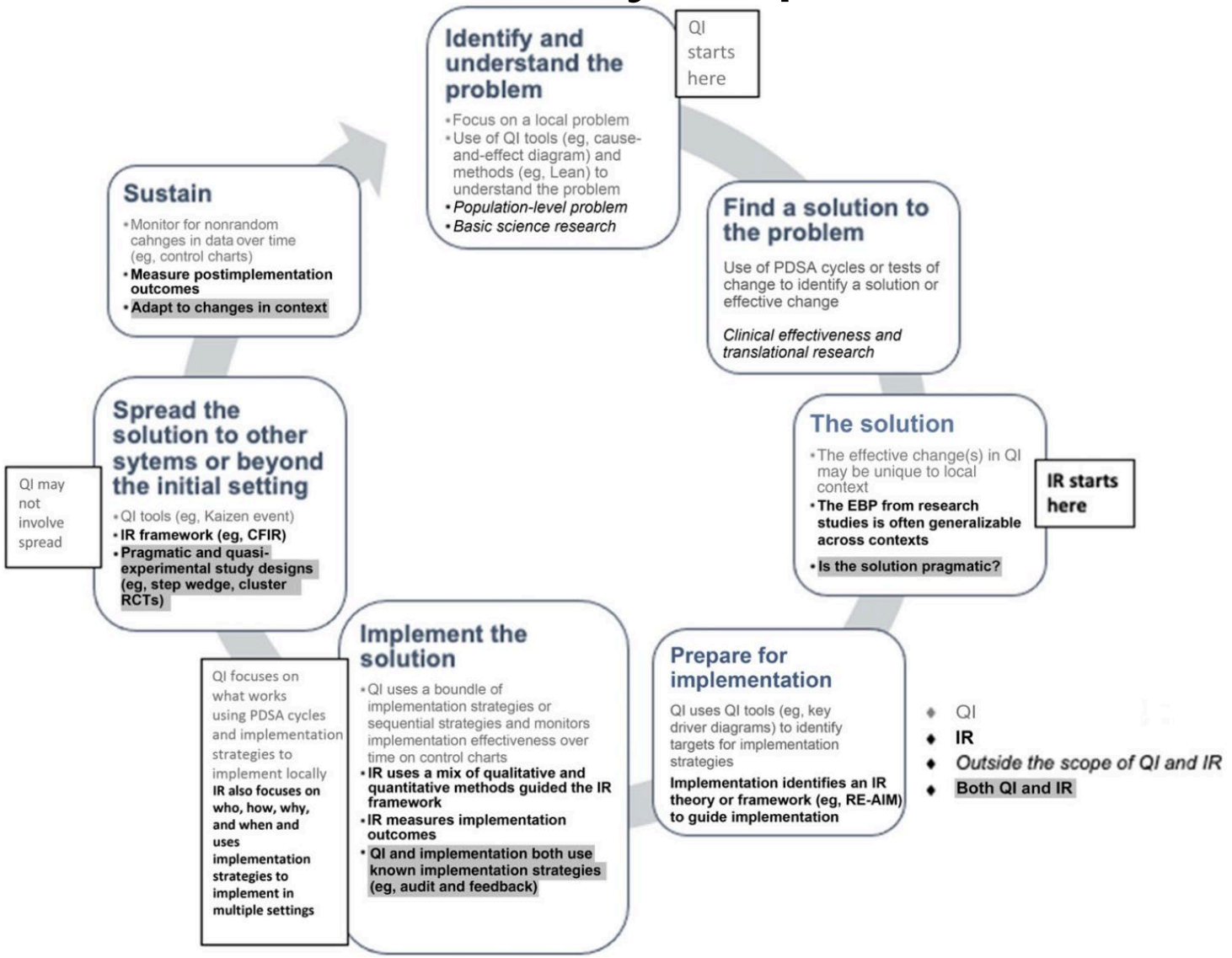
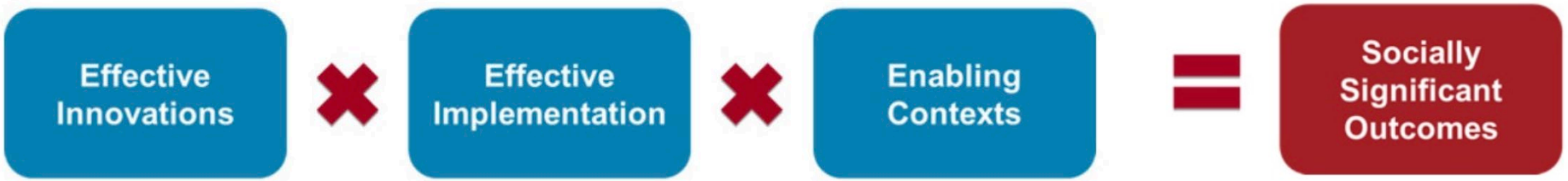


FIGURE 2 Principal differences and overlap between QI and IR.

Tyler & Glasgow,
Hosp Pediatr. 2021;11(5):536-545.
doi:10.1542/hpeds.2020-002246

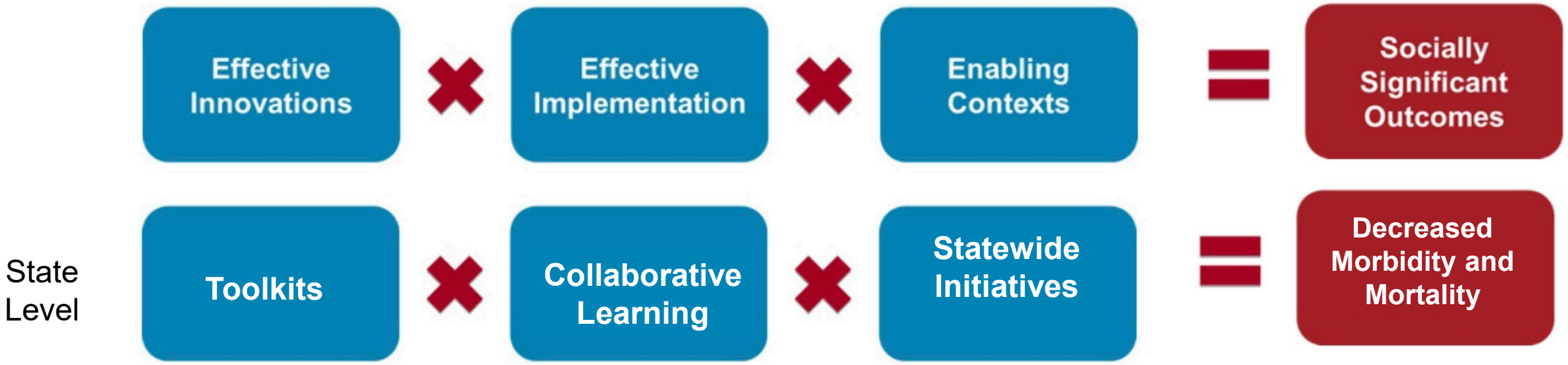
Formula For Success



"Implementation Science is the study of factors that influence the full and effective use of innovations in practice. The goal is not to answer factual questions about what is, but rather to determine what is required." (NIRN, 2015)

https://www.cde.state.co.us/mtss/implementationscience

Implementation Science at CMQCC



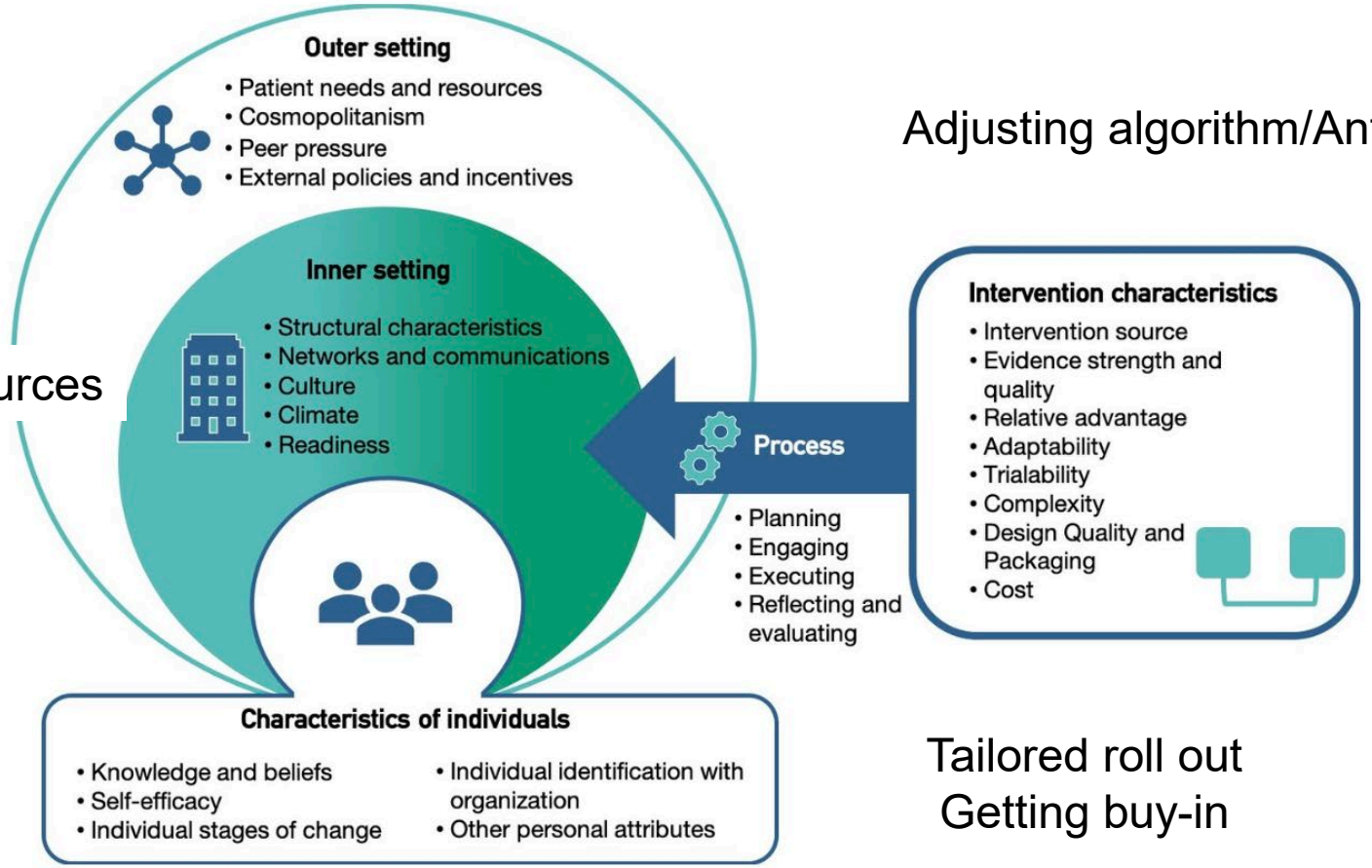
Implementation Science at CMQCC/Hospitals

Consolidated Framework for Implementation Research

CMQCC Sprint!

Hospital-level norms, resources

Education, Champions
Readiness for change



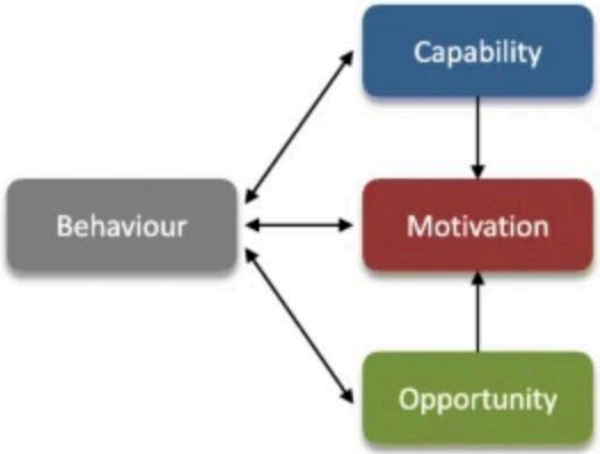
Adjusting algorithm/Antibiotics to local norms

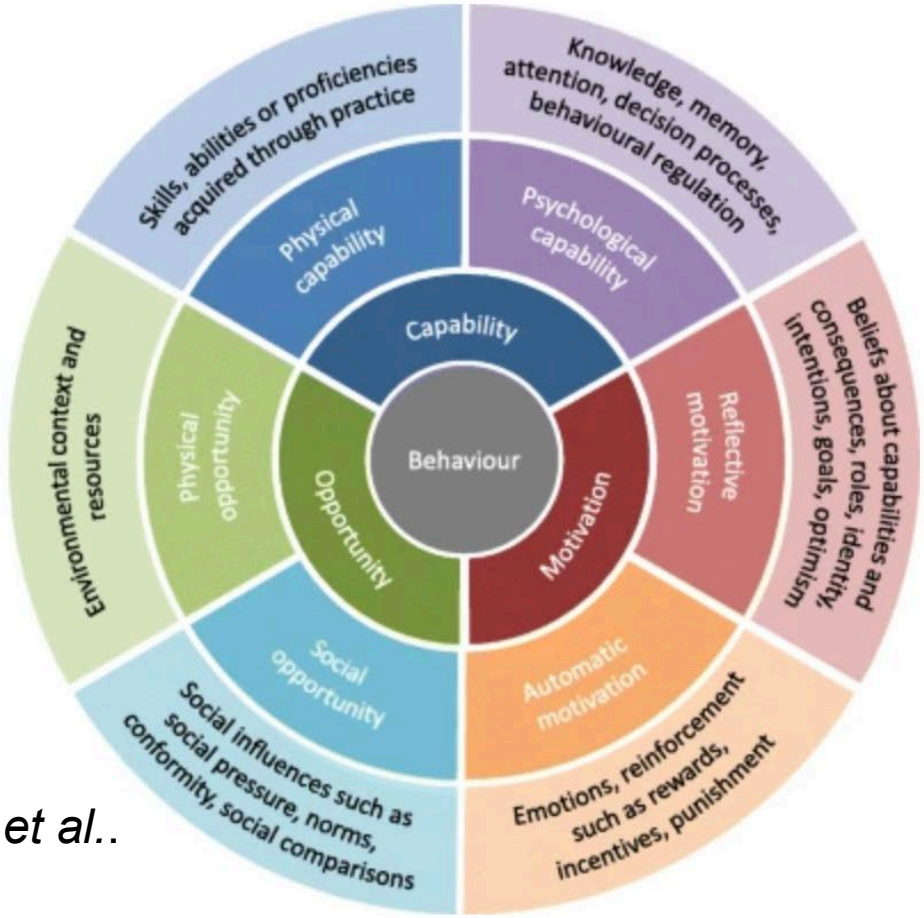
Tailored roll out
Getting buy-in

Consolidated Framework for Implementation Research (CFIR) - for more info see:
https://cfirguide.org/

Implementation Science Model for Behavior Change

COM-B





McDonagh, L.K., Saunders, J.M., Cassell, J. *et al.*. *Implementation Sci* **13**, 130 (2018). https://doi.org/10.1186/s13012-018-0821-y

COM-B Model for Behavior Change

Simulations

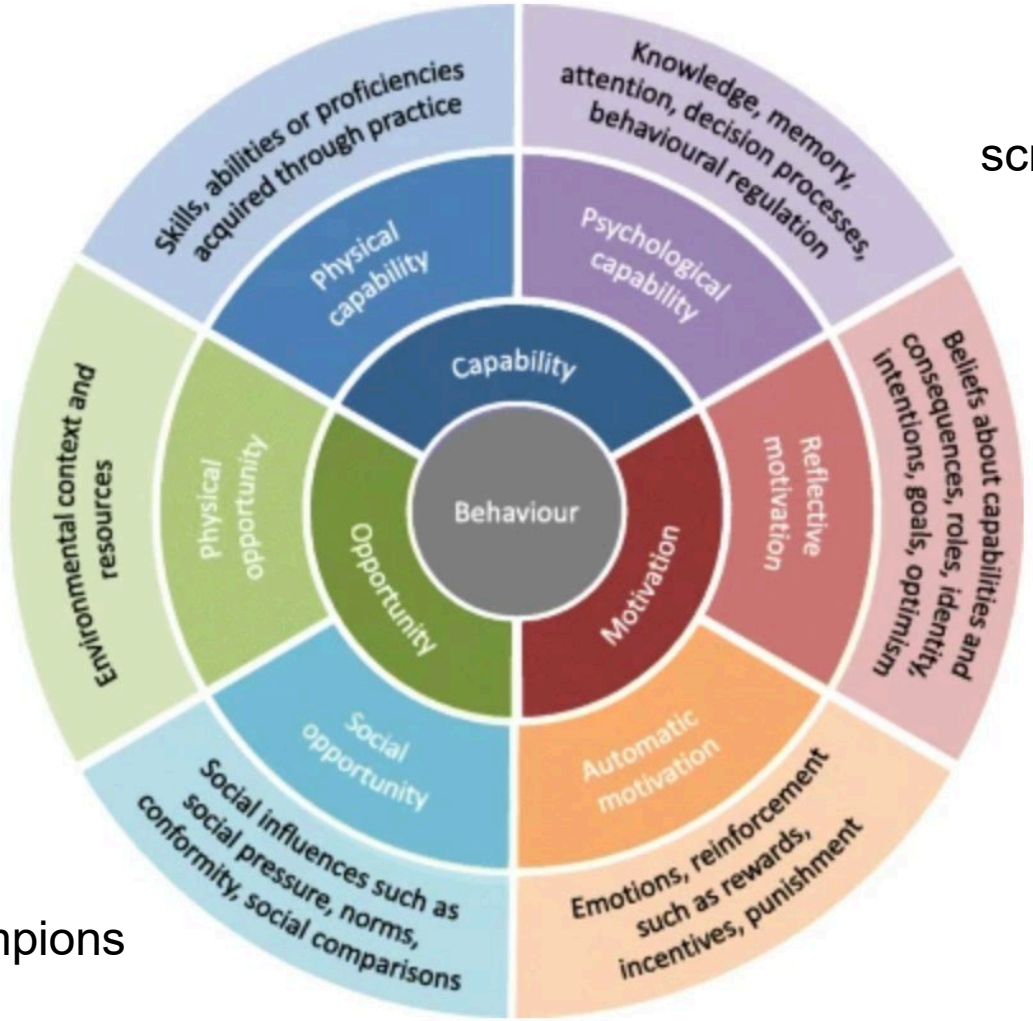
Making sepsis screening expected

Ordersets easy to find/use

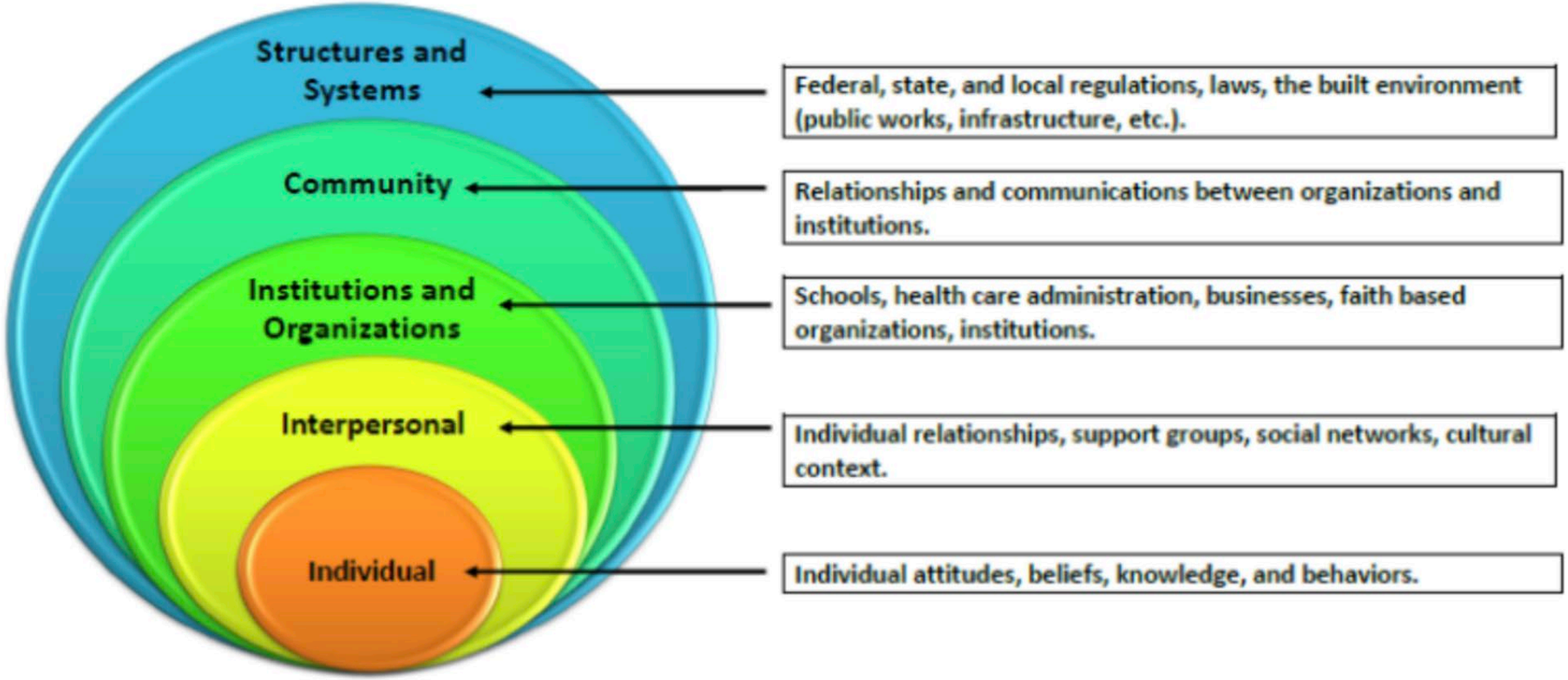
Telling stories about sepsis cases

Super-users/Champions

Celebrations



Ecological Perspective



Six Sources of Influence

	Motivation	Ability
Personal	*Do they want to engage in the behavior?* **Make the Undersirble, Derisable**	*Do they have the right skills and strengths to do the right thing?* **Helping Them Surpass Their Limits**
Social	*Are other people encouraging and/or discouraging behaviors* **Harness Peer Pressure**	*Do others provide the help, information, and resources required at particular times?* **Find Strength in Numbers**
Structural	*Are systems rewarding the right behavior and discouraging ineffective ones?* **Design Rewards and Demand Accountability**	*Are there systems that keep people in place and on progress?* **Change the Environment**

Six Sources of Influence – Improving Sepsis Care

	Motivation	Ability
Personal	• Tell stories about unrecognized sepsis • Highlight nurse-driven protocol as standard of care	• Antibiotics administration is discussed/practiced • Triage scripting is practiced
Social	• Super-users! • Nurse driven protocol champions • Collaborate with ID	• Expectation is clear for bedside assessments • Superusers can assist at bedside • Collaboration with ICU/Rapid response
Structural	• Follow compliance stats • Review cases at M&M	• Antibiotics easy to get in Pxyis • Order sets are easy to find • Algorithm posted

Sutter Health

How We Educated MDs and CNMs During OB Sepsis Rollout: A Sutter Health Perspective

Monica Devoy, MD
Medical Director Clinical Informatics- OB/GYN
Sutter Health

6/8/2026

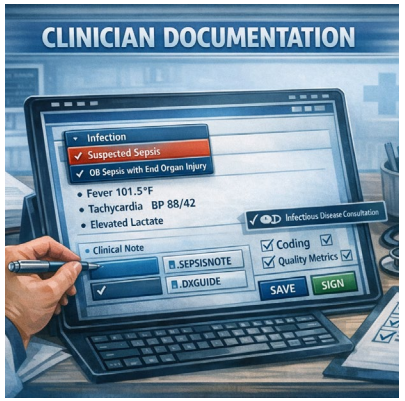
Objective of Physician Education

Clarifying Sepsis Definitions

Education focused on differentiating infection, suspected sepsis, and true OB sepsis, which requires end organ injury.

Supporting Clinical Decision Making

Clear definitions enhance clinical accuracy, inform escalation of care and antibiotic selection for patient safety.



Ensuring Proper Documentation

Accurate terminology aids documentation and coding, improving quality reporting and patient record management.

Clinical and System Changes Requiring Education

Patient Safety and Quality Reporting

Education emphasized the importance of new tools for patient safety and quality reporting to ensure consistent adoption.

Introduction of New Order Sets

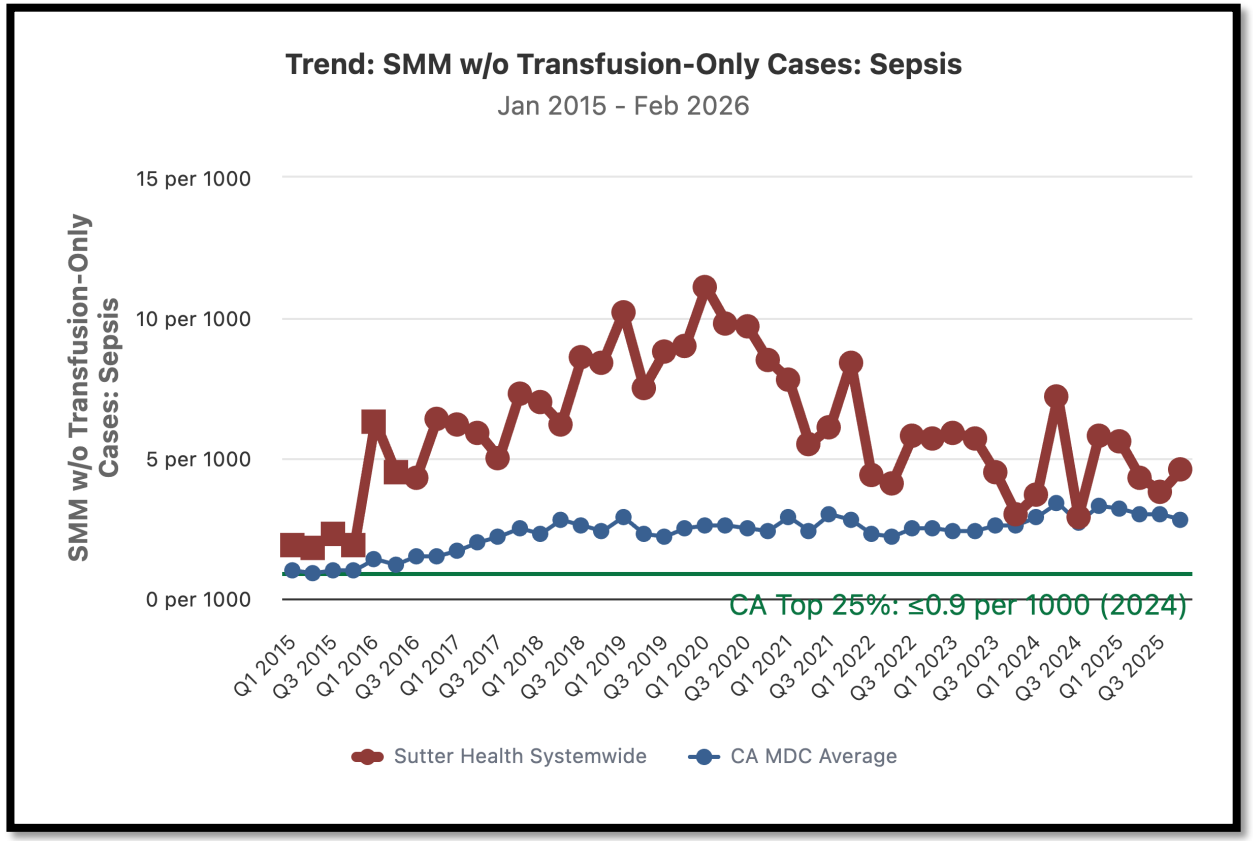
Updated obstetric sepsis order sets and algorithms were introduced requiring focused education for clinicians.

Embedded Decision Support Tools

Embedded clinical decision support tools within the EHR assisted in improving clinical decision-making during sepsis management.

Documentation Expectations

Clinicians needed refined guidance to distinguish suspected versus confirmed sepsis in documentation accurately.



Multi-Modal MD and CNM Education Strategy

Blended Formal Education

Formal education used slide decks, knowledge decision support (KDS), and structured updates to train clinicians effectively.

Embedded EHR Education

Education embedded within EHR via order sets, SmartText, and direct algorithm links supports real-time clinician learning.

Ongoing Reinforcement

Continuous reinforcement through huddles, emails, leadership forums, and informal channels ensures evolving education relevance.

Know Do Share

Know

Since Sutter Health implemented OB Sepsis screening in 2016, there has been variation in sepsis rates across the system. Sepsis data is publicly reported. Our OB Sepsis average is 5.3 per thousand (Jan.- Nov. 2024) compared with California's average of 3.1 per thousand, indicating that many of our hospitals have OB Sepsis rates above the state average. Inconsistent OB Sepsis definitions are leading to variation of diagnosis of sepsis across our system. Standardizing OB Sepsis definitions will decrease variation and improve accuracy of our publicly reported data.

Sepsis Screening Versus Sepsis Diagnosis

- Positive sepsis screen is **NOT** a diagnosis of sepsis.
- Infection (e.g. Chorio, Pyelo, etc.) should **NOT** be documented as sepsis unless end organ injury is present.
- Providers: Documentation of sepsis diagnosis is in both problem list and notes. Use SmartTexts below for accurate documentation.
- End organ injury will change the diagnosis from infection to sepsis.

Complication	Sepsis Screen	Diagnosis
Infection (i.e. Chorio, Pyelo, etc.)	Negative	Infection
Infection **WITHOUT** end organ injur	Positive	Infection
Infection **WITH** end organ Injury	Positive	Sepsis

Sutter Health is revising the OB Sepsis Algorithm and order sets based on recent California Maternal Quality Care Collaborative (CMQCC) OB Sepsis Collaborative recommendations.

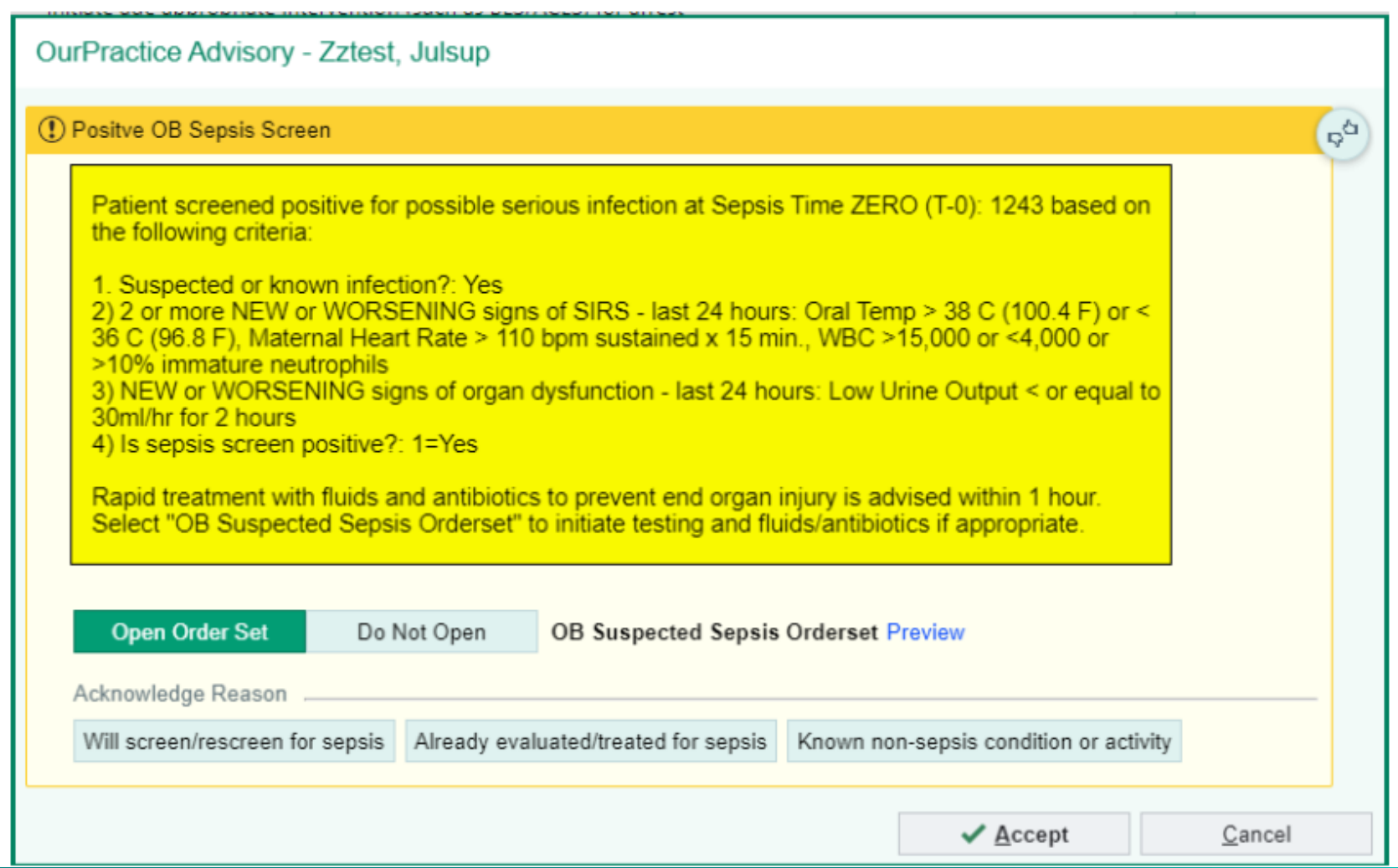
Lactate Levels

- Intrapartum
  - May rise due to skeletal muscle contractions
  - Elevated levels may NOT indicate end organ injury
  - Trend (Q3 hours), treat and closely monitor patients with elevated levels
- Antepartum/Postpartum
  - Elevated levels may indicate end organ injury

Do

- Acknowledge positive sepsis screening OPA and utilize link to orders.
- Use "Chorioamnionitis and PP Endometritis Treatment" order set for Chorio with negative sepsis screen.
- Use "OB Suspected Sepsis" order set for positive sepsis screen.

OPA: Our Practice Advisory for OB providers



Sutter Health

	Recommended Antibiotics For Treatment		C-Section SSI antibiotics guidance IF **already on antibiotics** and/or in **Labor/SROM**
Scheduled C-section (not in labor/ no SROM present)	*1st line*	Cefazolin	
	2nd Line (severe PCN allergy)	Clindamycin + Gentamicin	
	3rd Line (severe PCN and clindamycin allergy)	Vancomycin + Gentamicin	
C-section after labor or SROM (NOT currently on antibiotics)	*1st line*	Cefazolin + Azithromycin	
	2nd Line (severe PCN allergy)	Clindamycin + Gentamicin + Azithromycin	
	3rd Line (severe PCN and clindamycin allergy)	Vancomycin + Gentamicin + Azithromycin	
GBS	*1st Line*	Ampicillin	Cefazolin** + Azithromycin
	2nd line (not severe allergy to PCN)	Cefazolin	Cefazolin** + Azithromycin
	3rd Line (if sensitivities confirmed)	Clindamycin	Clindamycin* + Gentamicin +Azithromycin
	4th Line (if severe PCN allergy)	Vancomycin	Vancomycin* + Gentamicin +Azithromycin
Chorioamnionitis / Endometritis or OB Suspected Sepsis	*1st line*	Ampicillin/Sulbactam (Unasyn) +Gentamicin	Ampicillin/sulbactam (Unasyn)** + Gentamicin* +Azithromycin
	2nd line	Cefoxitin	Cefoxitin** + Gentamicin +Azithromycin
	3rd line (if severe PCN allergy)	Vancomycin + Gentamicin	Vancomycin* + Gentamicin* +Metronidazole +Azithromycin

*Does not need to be re-dosed at time of C/S unless it is due

**Redose if last administration was more than 2 hrs

-If blood loss >1500 mL: vancomycin, gentamicin and azithromycin DO NOT need to be re-dosed, only ampicillin, cefazolin, cefoxitin

-Severe penicillin allergy is defined as IgE mediated response potentially resulting in hospitalization and respiratory issues. Allergic reactions resulting in a skin rash can safely use cephalosporins such as Cefazolin or Cefoxitin.

CHORIOAMNIONITIS/ENDOMETRITIS

☑ Chorioamnionitis/Endometritis

If **sepsis is suspected** or the **patient is not improving on current antibiotics**, initiate the **"OB SUSPECTED SEPSIS"** orderset/section.

Antibiotic Guidance (per Sutter ID CIC):
The traditional **ampicillin + gentamicin** regimen for chorioamnionitis is **no longer recommended**, based on updated **local antibiogram data** and **resistance patterns**.
Refer to the **antibiotic recommendations** in this orderset and chart.

-Cesarean delivery: Use **OB Labor to Cesarean Delivery Preoperative [9796]** orderset for appropriate intraoperative coverage.

-Penicillin allergy: If **no history of anaphylaxis, angioedema, respiratory distress, or immediate hives**, then **Cefazolin or Cefotixin** are reasonable alternatives.

-Post-Delivery Treatment Duration:

***Vaginal delivery (chorioamnionitis):** Usually **0–1 additional dose** if clinically improving.

***Cesarean delivery:** Stop after **one postoperative dose** if afebrile and improving; extend if **bacteremia or persistent fever**.

***Postpartum endometritis:** Continue IV antibiotics until **afebrile ≥24–48 hrs** and improving.
No oral antibiotics are typically needed if good IV response.

OB SEPSIS

Rapid recognition and treatment of suspected sepsis in obstetric patients is essential to prevent progression to end-organ injury.
Initiate **broad-spectrum antibiotics and IV fluids within 1 hour of sepsis recognition.**

Note:

- A **lactic acid >2 mmol/L (in the absence of labor)** is consistent with **end-organ injury.**
- During **labor**, lactate levels may be physiologically elevated and should **not be used for diagnosis**, but may help **guide response to treatment.**

Documentation Reminder:
Use .OBSEPSIS SmartPhrase for documentation. Ensures accurate sepsis evaluation, coding and medico-legal compliance.

Patient Population:
This orderset applies to patients:

- **≥ 20 weeks gestation**, and
- **≤ 72 hours postpartum.**
  For patients outside these timeframes, use the **standard (non-pregnancy–adjusted) sepsis criteria** to avoid missing non-obstetric sepsis.

- Sutter Health Obstetrical Sepsis Standard Work Algorithm

☐ OB Sepsis Orders

Sutter Health

Sepsis smart phrase

Link to Check: *Sutter OB Sepsis Work-up Algorithm* for guidance on testing/treatment

Note Editor

Arial 10

{TIP | *Check Sutter OB Sepsis Work-up Algorithm* for guidance on testing/treatment (OPTIONAL):133748}

BP 139/73 Comment: BP cuff adjusted | Pulse 71 | Temp 98.6 °F (37 °C) (Oral) | Resp 16 | Ht 1.778 m (5' 10") | Wt 115.5 kg (254 lb 9.6 oz) | SpO2 99% | BMI 36.53 kg/m²

No results for input(s): "LACTATE" in the last 24 hours.

Recent Labs

	04/18/26 1930
WBC	18.3*
NEUTP	89
HGB	11.8
HCT	36.3
PLT	203
GLU	136*
CREATININE	0.79
TBILI	0.4
AST	15
ALT	<15

The patient has the following suspicious signs and symptoms of possible maternal infection (2 of 4 considered positive screen) warranting further evaluation: SIRS Criteria

The suspected source of infection is: Suspected Source of Infection

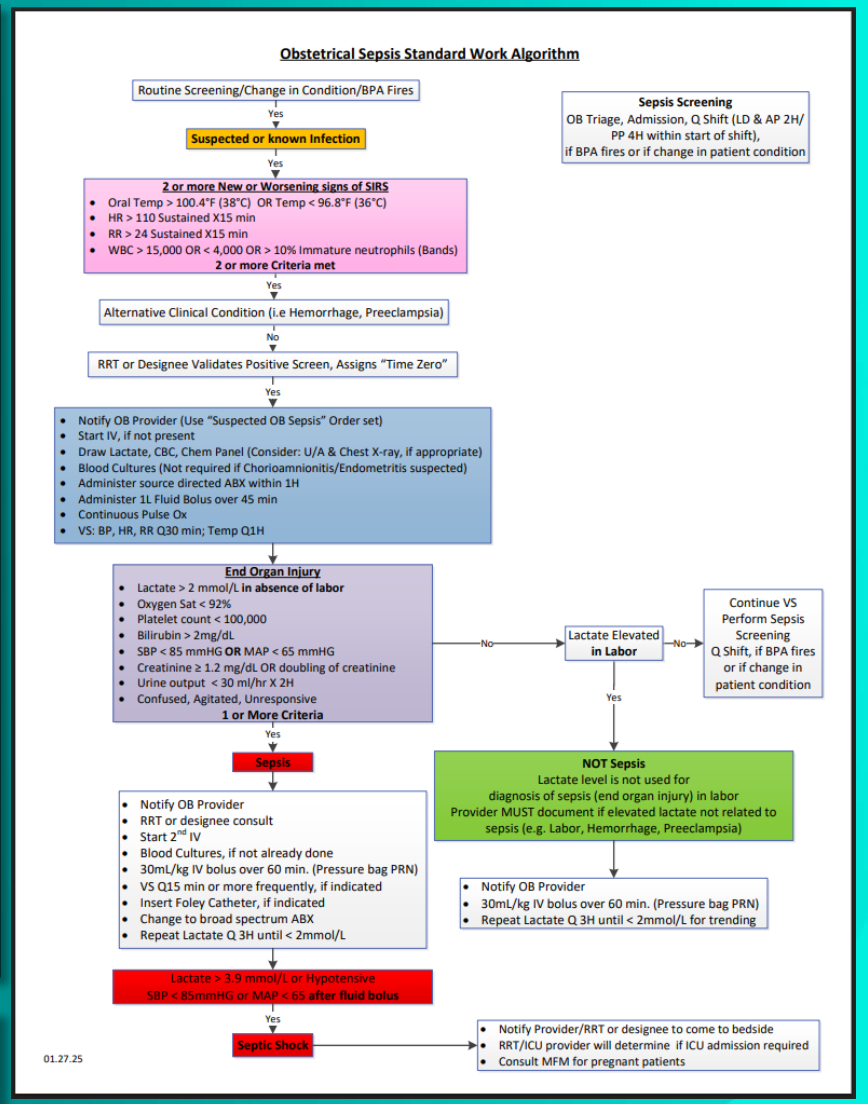
Alternative diagnosis ruled out: Alternative Dx ruled out
Alternative diagnosis ruled in: Alternative Dx ruled in

End Organ Injury (EOI) criteria present?: End Organ Injury

Meets criteria for OB Maternal Sepsis due to one or more EOI confirmed?: YES/NO**: yes

Final Plan:
Sepsis Plan

- [ ] NO SEPSIS- No EOI or sepsis identified at this time. Findings are consistent with non-infectious causes and infection appears less likely. Since these patients remain at risk for developing serious inf
- [ ] INFECTION/MONITORING FOR PROGRESSION- EOI criteria NOT met, this represents a serious infection, monitoring for progression, rather than confirmed sepsis. ***Lactate is elevated in labor, les
- [ ] SEPSIS: Given the positive EOI criterion meets Maternal Sepsis criteria. Will continue antibiotics, increase IV fluids to complete 30 ml/kg over 60 min, collect blood cultures if not already collected, ins
- [ ] SEPTIC SHOCK: Given the positive EOI criterion and unstable blood pressures despite fluid bolus, suspect Septic Shock. ***RRT/ICU team has been asked to evaluate patient. Will continue antibiotic
- [ ] ***



Late Adopters, Barriers, and Reinforcement Strategy

Barriers to Adoption

- Late adopters were most often confused adopters rather than resistant clinicians.
- Workflow confusion, overlapping pathways, documentation anxiety, and cognitive overload during rollout created hesitation.

Identifying Challenges

- Questions from frontline clinicians highlighted gaps between expected workflows and real-world practice, particularly around infection versus suspected sepsis versus sepsis with end organ injury.

Mitigation and Reinforcement Strategies

- Repeated, multi-channel messaging through KDS, OB SME, and leadership forums
- Targeted follow ups to address real questions from clinicians
- Simplified documentation tools and aligned antibiotics to reduce friction and fear of undertreatment

Adaptive Education Approach

- Viewing confusion as feedback enabled education strategies (materials, messaging, workflows) to adapt and support sustained adoption successfully.

Strategies That Supported Sustainable Adoption

Teaching the Rationale

- Framing education around physiology and end organ injury

Embedded EHR Education

- Education integrated into order sets and documentation tools to reduce cognitive load and support real time decision making

Normalization and Iteration

- Ongoing clarification and iteration were treated as expected, supporting psychological safety and practice improvement

Interdisciplinary Education

- Paired physician and nurse educator messaging reinforced consistency across disciplines


Thank you!
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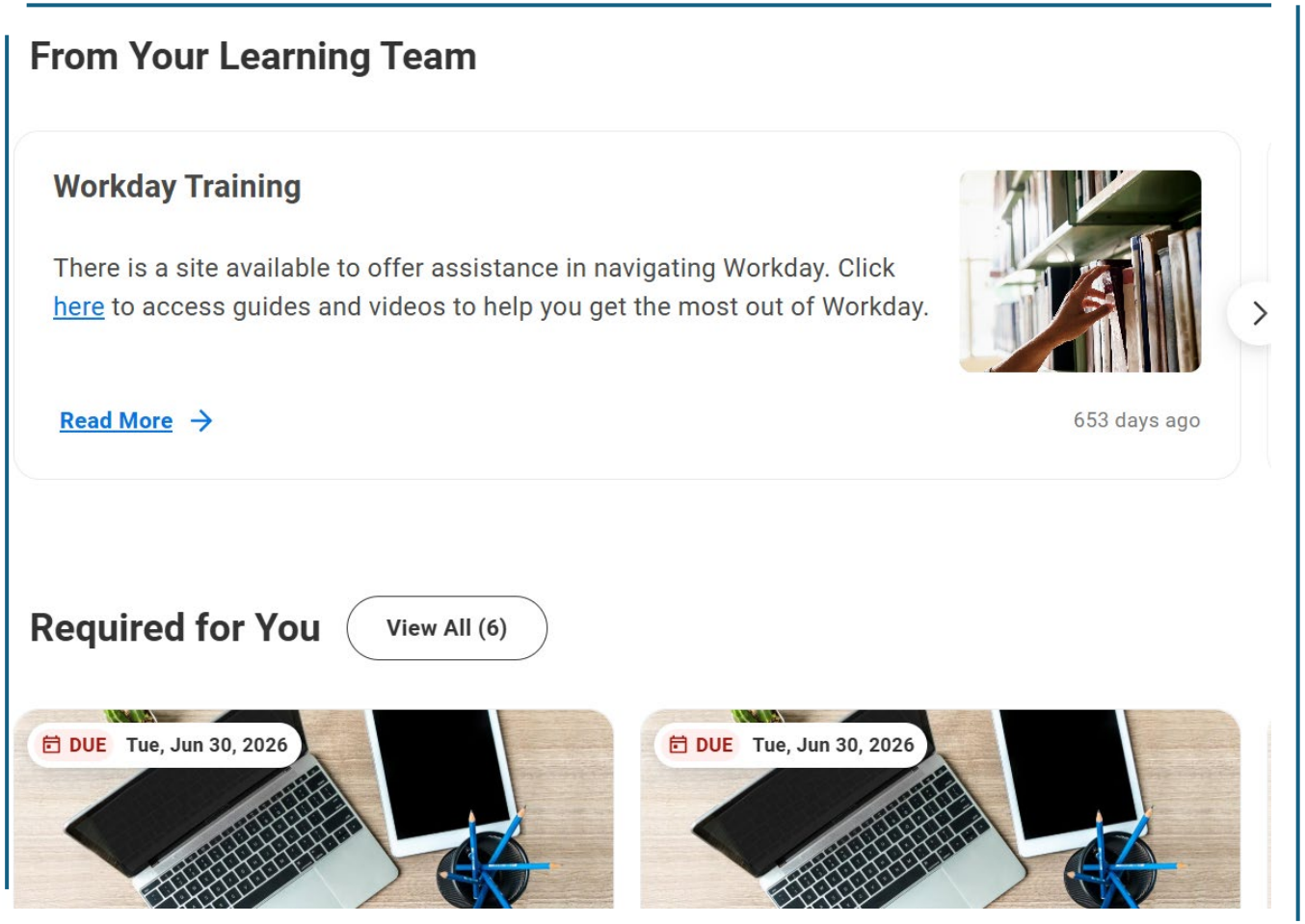
Staff Education Case Study: Mills Peninsula Medical Center

Marlene Cristales MSN/NE, RNC-OB, C-EFM
Clinical Nurse Educator

2026 Sepsis Sprint

- **Yearly completion of mandatory Workday Module in LMS**



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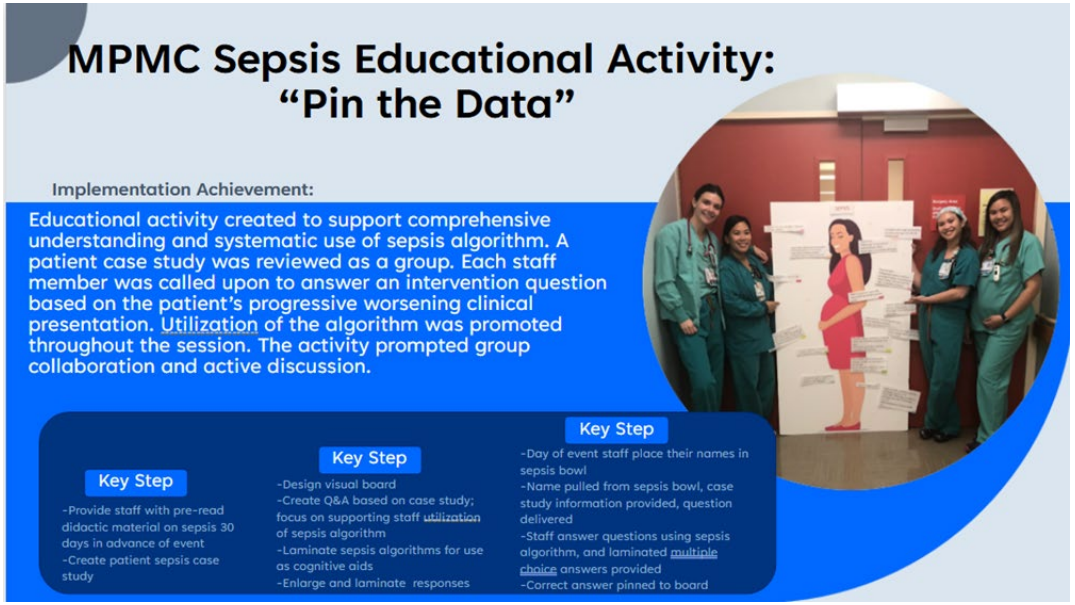
2026 Sepsis Sprint

- Dissemination of OB Sepsis Algorithm [email, poster, huddles, staff meetings]
- OB Sepsis didactic education orientation/onboarding
- 2024 Sepsis Competency Validation “Pin the Data”
- 2026 Obstetric Sepsis Drill
- 2026 MPMC Sepsis: Opportunity for Improvement [OFI] education event

2024 Pin the Data



- Flipped classroom (pre-read materials)
- Case Study:
  - Q & A (multiple choice answer)
- Sepsis Bowl
- Question
  - Reference algorithm
  - Select correct multiple-choice answer
  - Correct answer pinned to board
- Exchange of ideas, discussion, informal Q&A

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2026 OB Sepsis Drill

Photo cred: iStock

- Case audits
- Deficiencies/gaps identified
- Integrated into OB sepsis drill:
  - Utilization of OB sepsis algorithm
  - Early identification of suspected infection
  - Focus on use of sepsis screen, communication, integration of interdisciplinary teams
  - Order set familiarization

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2026 MPMC Sepsis OFI Event

Photo cred: iStock

- **Frontline staff leading presentation of sepsis cases @ MPMC**
- **Synopsis**
- **Opportunities for improvement [OFI] identified by audience via mentimeter.com**

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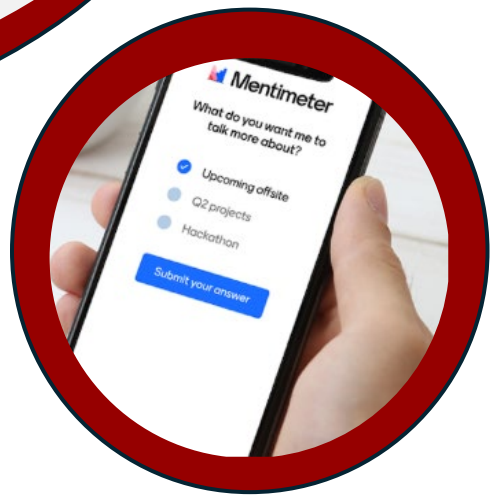
Mentimeter



- Review of sepsis
- Psychologically safe environment
- Self awareness
- Tools (advocacy, communication, chain of command, use of sepsis bundles, etc.)

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Thank you

Marlene Cristales MSN/NE, RNC-OB, C-EFM
Marlene.cristales2@sutterhealth.org

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Staff Education Case Study: Kaiser San Jose

Cindy Mekis DNP, CNS, RNC-OB, C-EFM, C-ONQS, C-MNN, C-OBE, NPD-BC

Janna Doherty MD, FACOG
Chief of Obstetrics

Overview

PLANNING
UNIT CHAMPIONS (MD, CNM, RN)
MULTIMODAL EDUCATION
JOB AIDS
MICRO-LEARNINGS AND REINFORCEMENT
RESOURCES ON UNIT AND CHECK-INS
MONITORING UNDERSTANDING AND COMPLIANCE
FORM MATERNAL SEPSIS COMMITTEE
CONTINUOUS QUALITY IMPROVEMENT

Planning-Education and Implementation

- LEADERSHIP DISCUSSIONS AND ALIGNMENT-INVOLVE KEY STAKEHOLDERS
- ENLIST CHAMPIONS-INTERDISCIPLINARY INCLUSION
- DECIDED ON CONTENT AND MODE OF EDUCATION-PROVIDER AND RN
- CREATED AND PRODUCED JOB AIDS AND CLASS MATERIALS
- REDUNDANCY OF KEY POINTS FOR ALL EDUCATIONAL OPPORTUNITIES
- JOB AIDS ON UNIT AND SOCIALIZED PRIOR TO EDUCATION
- EDUCATION PLANNED CLOSE TO GO LIVE SO STAFF RETAINED INFORMATION

Education Plan

LMS pre-work (30min-1 hour)

- General Sepsis
  - Pathophysiology
  - SIRS, S/SX, Labs
  - Treatment
- Maternal Sepsis
  - Differences between non-pregnant and maternal/postpartum
  - CMQCC Toolkit Overview/Key Points
  - Monitoring

In Person (2 hours)

- General
  - The Why-Impact
  - Personal Stories
- CMQCC Toolkit
  - Overview
  - Algorithm
- Kaiser specific
  - Best Practice Alert (BPA)
  - Order Sets
  - Decisions on items without definitive evidence

RN CHAMPIONS: Lynette Edwards; Claudia Henriquez; Kirsten Niehaus; Leilani Gonzalez; Nicole Torrez; Lori Mayer; Cindy Mekis

THANK YOU

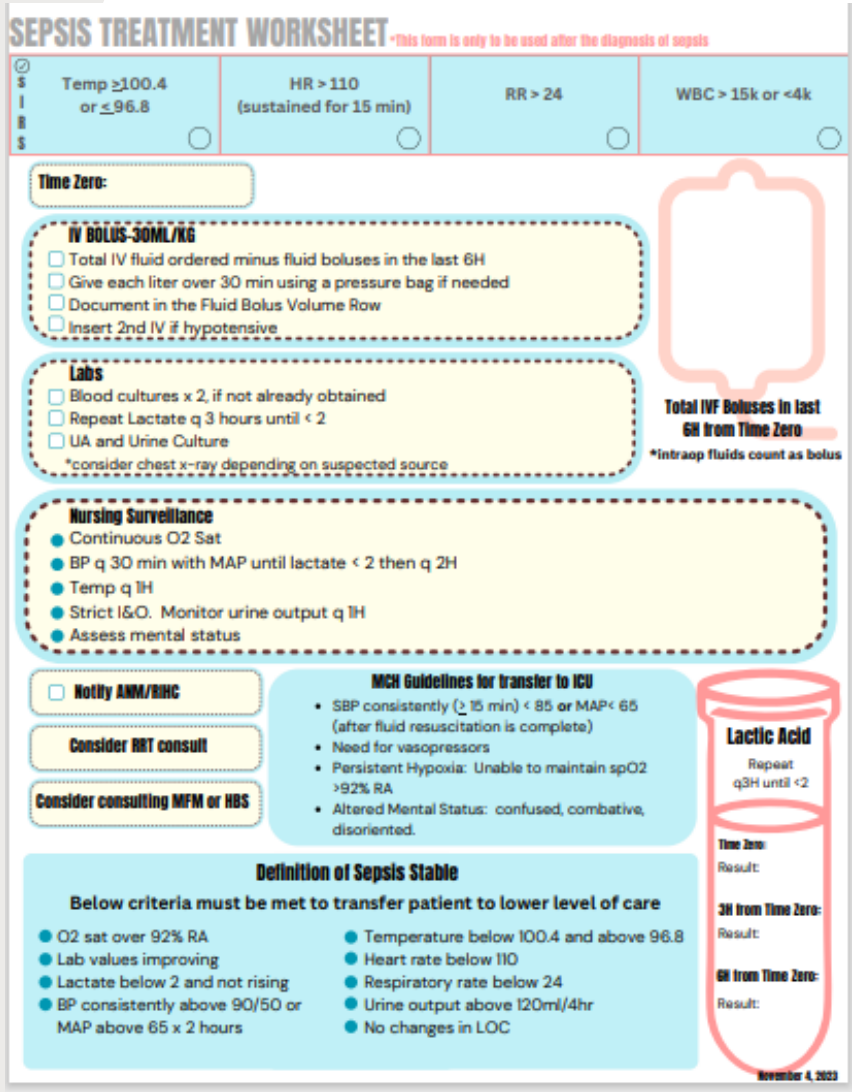
San Jose Medical Center for being our pilot site to test the tool

SJ Maternal Sepsis Committee

Dr Janna Doherty, OB MD
Sandy Pineda, CNM
Cindy Mekis, CNS
Barbara Vaughn – MCH Director
Lynette Edwards, RN -Lead Sepsis RN
Leilani Gonzalez, RN
Lori Mayer, RN Assistant Manger
Claudia Henriquez, RN
Harjinder Bhella– Laboratory Director
Anita Nguyen- Pharmacy Director
Alice Tang – Pharmacy Supervisor
Jim Yates – Quality Director
Neha Patel – Quality RN

Bedside Job Aids

- Original bedside worksheet/job aid
- Creates efficient, organized tracking
- Communication and used for bedside handoff



SEPSIS TREATMENT WORKSHEET *This form is only to be used after the diagnosis of sepsis

SIRS

Temp ≥100.4 or ≤ 96.8	HR > 110 (sustained for 15 min)	RR > 24	WBC > 15k or <4k

Time Zero:

IV BOLUS-30ML/KG
- Total IV fluid ordered minus fluid boluses in the last 6H
- Give each liter over 30 min using a pressure bag if needed
- Document in the Fluid Bolus Volume Row
- Insert 2nd IV if hypotensive

Labs
- Blood cultures x 2, if not already obtained
- Repeat Lactate q 3 hours until < 2
- UA and Urine Culture

*consider chest x-ray depending on suspected source

Total IVF Boluses in last 6H from Time Zero

*Intraop fluids count as bolus

Nursing Surveillance
- Continuous O2 Sat
- BP q 30 min with MAP until lactate < 2 then q 2H
- Temp q 1H
- Strict I&O. Monitor urine output q 1H
- Assess mental status

- Notify ANM/RHC
- Consider RRT consult
- Consider consulting MFM or HBS

MCH Guidelines for transfer to ICU
- SBP consistently (≥ 15 min) < 85 or MAP< 65 (after fluid resuscitation is complete)
- Need for vasopressors
- Persistent Hypoxia: Unable to maintain spO2 >92% RA
- Altered Mental Status: confused, combative, disoriented.

Lactic Acid

Repeat q3H until <2

Time Zero:
Result:

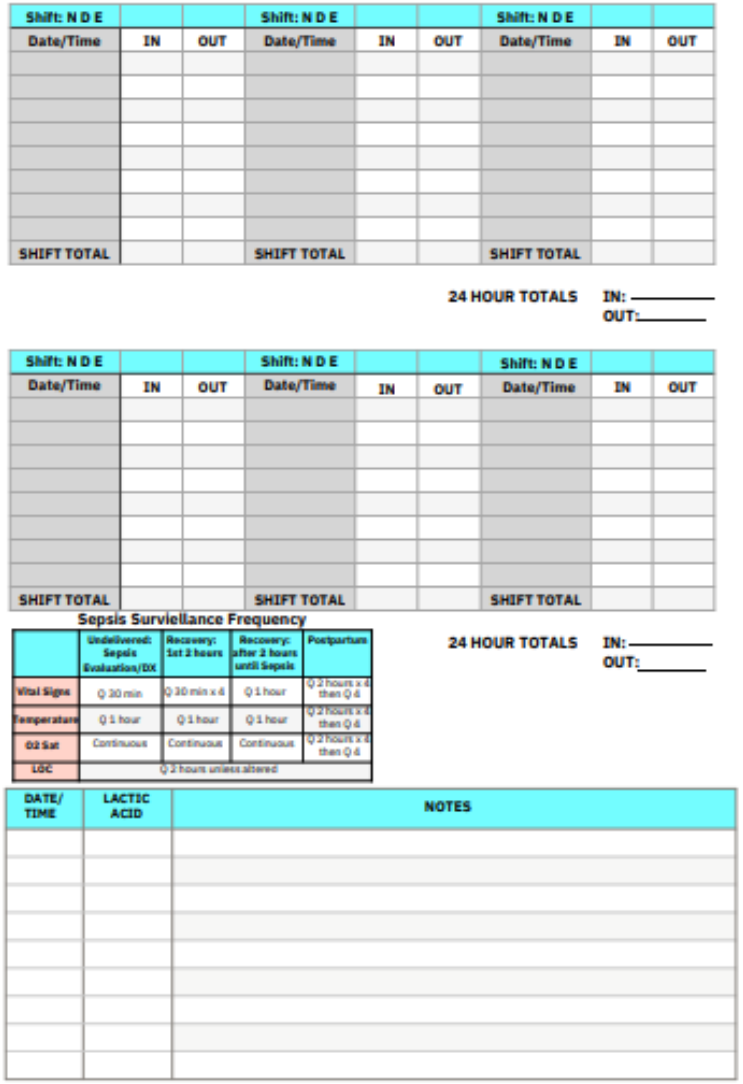
3H from Time Zero:
Result:

6H from Time Zero:
Result:

Definition of Sepsis Stable

Below criteria must be met to transfer patient to lower level of care
- O2 sat over 92% RA
- Lab values improving
- Lactate below 2 and not rising
- BP consistently above 90/50 or MAP above 65 x 2 hours
- Temperature below 100.4 and above 96.8
- Heart rate below 110
- Respiratory rate below 24
- Urine output above 120ml/4hr
- No changes in LOC

November 4, 2023



Shift: N D E			Shift: N D E			Shift: N D E		
Date/Time	IN	OUT	Date/Time	IN	OUT	Date/Time	IN	OUT
SHIFT TOTAL			SHIFT TOTAL			SHIFT TOTAL		

24 HOUR TOTALS IN: _____ OUT: _____

Shift: N D E			Shift: N D E			Shift: N D E		
Date/Time	IN	OUT	Date/Time	IN	OUT	Date/Time	IN	OUT
SHIFT TOTAL			SHIFT TOTAL			SHIFT TOTAL		

Sepsis Surveillance Frequency

	Undelivered: Sepsis Evaluation/DX	Recovery: 1st 2 hours	Recovery: after 2 hours until Sepsis	Postpartum
Vital Signs	Q 30 min	Q 30 min x 4	Q 1 hour	Q 2 hours x 4 then Q 4
Temperature	Q 1 hour	Q 1 hour	Q 1 hour	Q 2 hours x 4 then Q 4
O2 Sat	Continuous	Continuous	Continuous	Q 2 hours x 4 then Q 4
LOC	Q 2 hours unless altered			

24 HOUR TOTALS IN: _____ OUT: _____

DATE/ TIME	LACTIC ACID	NOTES

San Jose Badge Buddy

MATERNAL SEPSIS PROTOCOLS

4 TREATMENT

- ❑ **FLUIDS**: Target = 30mL/Kg fluid bolus* (subtract any boluses in last 6 hrs). Rate of 1L /30 min. -or per orders. Caution with patients at risk for fluid overload, ie PEC. Use ideal body weight if BMI >30
- ❑ **ANTIBIOTICS**: Source directed antibiotics, if not already done or broad spectrum if source unknown
- ❑ **LABS**:
  - ❑ PT/INR/PTT (Coags)
  - ❑ Blood cultures x2,
  - ❑ Lactate q2 hrs until < 2 mmol/L,
  - ❑ UA and urine culture,
  - ❑ Possible chest X Ray?
- ❑ **MONITOR**:
  - ❑ Monitor u/o q1 hr
  - ❑ See "Sepsis Surveillance Guidelines"
- ❑ **CONSULTS**: Consider consult with MFM or HBS or RRT- Help with POC, bouts intermittent hypotension, fluid resuscitation consultation, antibiotic choice per suspected sources, decision to transfer.

SEPSIS SURVEILLANCE GUIDELINES

	Prior to Delivery	PP 0-2 hrs	PP > 2 hr & NOT stable	PP >2 hr & stable
VS	q30 min	q30 min x4	q30 min	q2 hr x 4 then q4
Temp	q1 hr	q1 hr	q1 hr	q2 hr x 4 then q4
O2	cont.	cont.	cont.	q2 hr x 4 then q4
LOC	Q 2 hrs unless altered			

Transfer to LOWER level of care ("Sepsis Stable"):

- **BP** consistently > 90/50
- **MAP** > 65 x 2 hrs
- **HR** < 110
- **RR** < 24
- **O2** > 92% RA
- **LOC** no changes
- **Lab values** improving
- **Lactate** < 4 and not rising
- **Temp** < 100.4 and > 96.8
- **U/O** >120 ml / 4 hr

Transfer to HIGHER level of care (ICU):

- **SBP** consistently < 85
- **MAP** < 65 (After fluid)
- Need for vasopressors
- **O2** < 92% RA
- **LOC**: confused, combative, disoriented

MATERNAL SEPSIS PROTOCOLS

1 SCREEN

If ≥ 2 SIRS & Suspected Infection ⇨ Do further evaluation & notify ANM & Provider

Temp	HR	RR	WBC	Bands
≥ 100.4 or ≤ 96.8	> 110 (for 15 min)	> 24	> 15k or < 4k	> 10%

* Last CBC > 24 hrs? → **send** repeat CBC → consider adding other sepsis evaluation labs.

2 EVALUATE for serious infection/sepsis

Interventions

- ❑ Bedside Evaluation
- ❑ 1-liter LR bolus over 60 min. or per orders
- ❑ Suspected Infection → start antibiotics per orders

Monitor

- ❑ O2: continuous
- ❑ VS (& temp): q30 min
- ❑ Assess mental status
- ❑ Urinary Output: q2 hrs

Labs *(Call x7227- request "**stat sepsis**" labs)*

- ❑ CBC w/diff
- ❑ Chem 7
- ❑ Bili Total
- ❑ Lactic acid:
  - **NO DRAW** from 2nd stage to 1hr PP
  - **DRAW** after 1hr+ PP

3 DIAGNOSE

If ≥ 1 Organ Dysfunction → may dx sepsis

Bili	> 2 mg/dl
Creat	≥ 1.2 mg/dL
Oliguria	<60ml/2hrs
HoTN	< 85 mmHg or down 40 mmHg from base or MAP < 65 mmHg
Hypoxia	Ventilation (ex: CPAP, biPAP)
CNS	Toxic, agitated, confused or unresponsive
Coags	Plts < 100,000 or INR >1.5 or aPTT >60sec

Sepsis Severity Level

Lactic Acid	- NO labor: > 2 mmol/L - Labor: >4 mmol/L* *(not during 2nd stage to 1hr PP)*

* *Elevated only w/o organ dysfunction - repeat lactate q3-4 hrs until improving*

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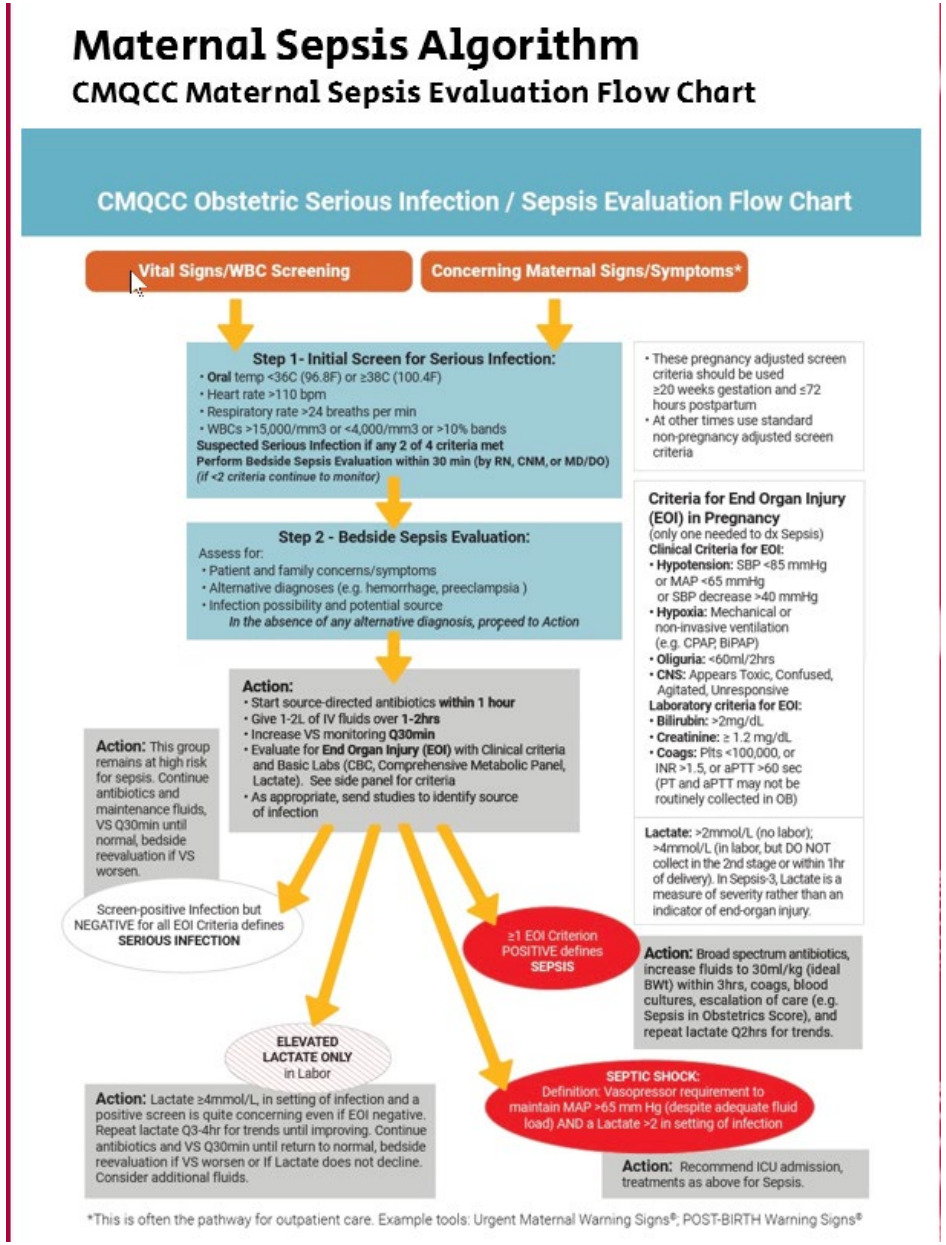
Last edited 03/24/26

CMQCC Job aid

Algorithm laminated and in LD rooms and PP



Maternal Sepsis Algorithm

CMQCC Maternal Sepsis Evaluation Flow Chart

CMQCC Obstetric Serious Infection / Sepsis Evaluation Flow Chart

Vital Signs/WBC Screening | **Concerning Maternal Signs/Symptoms***

Step 1- Initial Screen for Serious Infection:
- **Oral** temp <36C (96.8F) or ≥38C (100.4F)
- Heart rate >110 bpm
- Respiratory rate >24 breaths per min
- WBCs >15,000/mm3 or <4,000/mm3 or >10% bands

Suspected Serious Infection if any 2 of 4 criteria met
Perform Bedside Sepsis Evaluation within 30 min (by RN, CNM, or MD/DO)
(if <2 criteria continue to monitor)

- These pregnancy adjusted screen criteria should be used ≥20 weeks gestation and ≤72 hours postpartum
- At other times use standard non-pregnancy adjusted screen criteria

Step 2 - Bedside Sepsis Evaluation:
Assess for:
- Patient and family concerns/symptoms
- Alternative diagnoses (e.g. hemorrhage, preeclampsia)
- Infection possibility and potential source

In the absence of any alternative diagnosis, proceed to Action

Criteria for End Organ Injury (EOI) in Pregnancy
(only one needed to dx Sepsis)
Clinical Criteria for EOI:
- **Hypotension:** SBP <85 mmHg or MAP <65 mmHg or SBP decrease >40 mmHg
- **Hypoxia:** Mechanical or non-invasive ventilation (e.g. CPAP, BiPAP)
- **Oliguria:** <60ml/2hrs
- **CNS:** Appears Toxic, Confused, Agitated, Unresponsive

Laboratory criteria for EOI:
- **Bilirubin:** >2mg/dL
- **Creatinine:** ≥ 1.2 mg/dL
- **Coags:** Plts <100,000, or INR >1.5, or aPTT >60 sec (PT and aPTT may not be routinely collected in OB)

Lactate: >2mmol/L (no labor); >4mmol/L (in labor, but DO NOT collect in the 2nd stage or within 1hr of delivery). In Sepsis-3, Lactate is a measure of severity rather than an indicator of end-organ injury.

Action:
- Start source-directed antibiotics **within 1 hour**
- Give 1-2L of IV fluids over **1-2hrs**
- Increase VS monitoring **Q30min**
- Evaluate for **End Organ Injury (EOI)** with Clinical criteria and Basic Labs (CBC, Comprehensive Metabolic Panel, Lactate). See side panel for criteria
- As appropriate, send studies to identify source of infection

Action: This group remains at high risk for sepsis. Continue antibiotics and maintenance fluids, VS Q30min until normal, bedside reevaluation if VS worsen.

Screen-positive Infection but NEGATIVE for all EOI Criteria defines **SERIOUS INFECTION**

≥1 EOI Criterion POSITIVE defines **SEPSIS**

Action: Broad spectrum antibiotics, increase fluids to 30ml/kg (ideal BWt) within 3hrs, coags, blood cultures, escalation of care (e.g. Sepsis in Obstetrics Score), and repeat lactate Q2hrs for trends.

ELEVATED LACTATE ONLY in Labor

Action: Lactate ≥4mmol/L, in setting of infection and a positive screen is quite concerning even if EOI negative. Repeat lactate Q3-4hr for trends until improving. Continue antibiotics and VS Q30min until return to normal, bedside reevaluation if VS worsen or If Lactate does not decline. Consider additional fluids.

SEPTIC SHOCK:
Definition: Vasopressor requirement to maintain MAP >65 mm Hg (despite adequate fluid load) AND a Lactate >2 in setting of infection

Action: Recommend ICU admission, treatments as above for Sepsis.

*This is often the pathway for outpatient care. Example tools: Urgent Maternal Warning Signs®, POST-BIRTH Warning Signs®

Go-live

- Tracking-80% or more staff attended/completed training
- Signage and huddles prior to go-live
- Badge buddies distributed
- Reminders about job aids
- Champions as resources for go-live/during shifts
- Maternal Sepsis clipboard on unit for questions/concerns
- Clipboard for patient stickers for 2(+) SIRS to monitor
- Post go-live reminders in staff meetings, huddles, shared learnings, FAQs

Sustainability

- Maternal Sepsis committee
  - RNs, providers, quality: Staff RN co-chair of committee
  - Review cases with sepsis diagnosis. Suggest opportunities and communicate to staff/providers
  - Review dashboard compliance-reminders to individuals
- Occasional review of key points and opportunities at staff meetings
- Once a year provider case conference of real case at SJ
- Maternal Sepsis-escape room at skills days

Successes

- Communicate the why
  - Low volume, high impact if not recognized/treated early, use real life examples
- Plan the work then work the plan
  - Plan includes clear roles, responsibilities and timelines
- Team approach-Involve the staff and all stakeholder
  - The more people you have involved on the front end the better
  - Kick-off celebration
- Easy access to information/resources
  - Job aids, signs, QR codes
- Repetition deepens the impression
  - Have planned re-socialization of key points and opportunities for staff to clarify knowledge

Challenges(and suggestions)

- Scheduling staff/providers to attend in person education/tracking pre-work
  - Leadership knowledge and approval ahead of time
  - Partner with management/scheduler well ahead of class dates
  - Track registration and attendance and follow up. Have a plan for the % that cannot/do not attend
- Competing priorities and maintaining enthusiasm
  - Staff ownership of the sustainability and messaging important
  - Share successes and opportunities with the staff/provider regularly
  - Respond to staff questions
- Staff/Providers using job aids and/or consulting unit resources
  - Planned reminders/re-socialization and addition to annual education/skills
- At/After discharge-Information without frightening patients
  - Sepsis cases happen after discharge- emphasize importance of sepsis without worrying patients
  - Ensuring they understand and will act one signs and symptoms
  - More work to be done partnering with our outpatient providers and community resources

Obstetric Sepsis: ED Implementation

A practical ED workflow for identifying and managing obstetric patients, anchored by real-world clinical challenges.

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Why the ED Matters

- Obstetric sepsis remains an important cause of maternal morbidity and mortality.
- Many severe outcomes are preventable with earlier recognition and an immediate clinical response.
- The ED is often where postpartum patients first present, especially when symptoms are vague (as they often are for sepsis and cardiovascular disorders).
- The outcome often depends entirely on whether the ED recognizes postpartum status early and moves the patient quickly into the right pathway.

The Sample Case: Where Delays Begin

Patient Presentation

- **Status:** Postpartum Day 6 after cesarean delivery.
- **Symptoms:** Presents to the ED with abdominal pain, chills, and general malaise (feeling "not right").
- **Vitals at Triage:** Tachycardia (Pulse 115), but no obvious fever (Temp 37.2°C).
- **Result:** No immediately clear diagnosis or disposition.

The Implementation Challenge

This case illustrates the central systemic challenge in obstetric emergency care.

The core issue is **not just knowing what sepsis is** but having an operational system that recognizes an obstetric patient early.

Once identified, the system must seamlessly and quickly move her into the appropriate clinical pathway before rapid deterioration occurs.

What Goes Wrong in the ED

Missed Pregnancy Status: Pregnancy or recent pregnancy is simply not identified early in the triage process

Misattributed Symptoms: Severe symptoms are mistakenly attributed to "normal" postpartum recovery pains.

Underappreciated Vitals: Tachycardia or pain levels may be underappreciated or dismissed without fever.

No Clear Pathway: There may be no clear next step or algorithm established after a clinical concern is raised.

Unclear Roles: ED, OB, ICU, and inter-facility transfer roles may be ambiguous, causing critical delays in handoffs and treatment.

Start with the Front Door: Triage

One Question, One Flag

Ask **every reproductive-age patient** if they are pregnant or were recently pregnant. This must be a universal standard.

Make pregnancy/postpartum status highly visible early in the chart and the physical workflow

In our sample case, this single triage question is what shifts the patient from a slow, general abdominal pain workup to a critical obstetric emergency mindset.

This is the foundational implementation principle: **one question, one flag, one downstream pathway.**

Clinical Core: Screen & Evaluate

1. Initial Screen

Utilize an initial serious infection screen. In our case, the patient's pulse climbs to 120 and WBC is revealed to be 22k.

2. Bedside Eval

A positive screen must trigger a rapid, in-person clinical assessment. The screen should initiate action, not end the process.

3. Actionable Focus

The evaluator must promptly assess for the likely infection source, rule out alternative diagnoses, and check for organ dysfunction.

What the ED Must Be Ready to Do

Rapid Diagnostics

Immediate labs (CBC, Chem panel, and Lactate) and full sepsis evaluation.

Aggressive Treatment

Early administration of broad-spectrum antibiotics, IV fluids, and rapid escalation.

Timely Action

Source-directed thinking from the start. Making timely action the default, without waiting for the picture to worsen.

Define Roles Before the Case Happens

Crucial Questions to Answer

- Who exactly performs the bedside evaluation?
- Who places the initial rapid orders?
- At what specific clinical threshold is OB called?
- When is the ICU team involved?
- For hospitals without onsite OB, when and how is a transfer initiated?

Impact on the Sample Case

In our postpartum abdominal pain case, absolute **role clarity** dictates the outcome.

Defined roles determine whether the patient moves efficiently and safely from triage, to treatment, and finally to disposition, rather than languishing and getting delayed in chaotic handoffs.

Case Study: Next Steps & Scenarios

Clinical Exam Scenario	Primary Suspicion	Key Considerations
Scenario 1: Severe pain near the laparotomy incision	**Necrotizing Fasciitis**	Immediate surgical emergency; look for pain out of proportion to exam and end-organ injury (Cr 1.5mg/dL, Lactate 3.6).
Scenario 2: CVA (Costovertebral angle) tenderness	**Pyelonephritis**	Requires IV fluids, but monitor closely as pregnant/postpartum patients are prone to pulmonary leak.
Scenario 3: Incision intact, but moderate uterine tenderness	**Endometritis**	Common post-cesarean, but patient's drowsy affect and elevated lactate suggest severe systemic worsening.

Build the System

Partner with OB: Ensure the OB department has a designated member with a focus on infections (an infection champion).

EHR Innovations: Implement EHR tools that immediately flag pregnancy or recent pregnancy across all departments.

Embedded Tools: Utilize embedded screening and documentation tools to standardize the evaluation process.

Standardized Pathways: Create dedicated order sets or quick pathways for rapid sepsis evaluation and treatment.

Empower Nursing: Establish nurse-driven workflows and time-zero support where possible to reduce reliance on memory under pressure.

Education That Changes Behavior

- Implement routine, mandatory ED education specifically focused on obstetric emergencies.
- Conduct role-specific training tailored for nurses, APPs, physicians, and inter-facility transfer teams.
- Prioritize **in situ drills and active debriefs** over passive didactic lectures.
- Use our sample case (Day 6 Postpartum C-Section) as a simulation scenario to practice recognition, escalation, and safe disposition.
- Link these educational efforts to lessons learned from previous successful initiatives, like postpartum hypertension implementation in the ED.

EDUCATION: OB Sepsis Pearls

Fever is Not Required: Many obstetric sepsis patients do not present with a fever, even when they are severely ill.

Altered Lab Thresholds: Pregnancy physiology changes mean End-organ Injury is indicated at lower thresholds: Creatinine >1.2 mg/dL, sysBP < 85 mmHg.

Pyelonephritis Risks: Pregnant patients with pyelonephritis require IV fluids, but are uniquely prone to pulmonary leak and pulmonary edema.

High Mortality Threats: Necrotizing fasciitis (NEC) and GAS infections are incredibly dangerous with high mortality rates, requiring immediate surgical attention.

Incision Pain is a Red Flag: Severe pain at or near an incision (including episiotomy or vaginal laceration) requires careful evaluation—classic presentation for NEC.

Measuring Progress

Focus on Process

Focus early on practical process and structure measures rather than just waiting for lagging outcome data.

For cases like our sample, success is defined by whether the system **reliably identifies the patient**, initiates the correct evaluation immediately, and activates the right clinical team without hesitation.

Key Structural Examples

- Triage identification process is actively in place and audited.
- ED algorithm is universally available and understood.
- Order sets and EHR tools are fully built and utilized.
- Multi-disciplinary drills are completed regularly.
- A formal case review process is established for continuous improvement.

Working With the ED

Collaborate

Create an active, inter-disciplinary group with recurring monthly meetings to maintain focus and momentum.

Identify Leaders

Identify Sponsors (Department Heads) and Stakeholder Representatives (Frontline Clinicians, Nurses, Techs). Enlist an OB MD and RN liaison.

Review & Adapt

QA cases to identify improvement opportunities and critically review successful cases to see what works when things go right.

The Diffusion Curve

1. Champions

Create a dedicated group of Champions to confidently lead the initial change effort.

2. Early Adopters

Target early adopters and solicit feedback to rapidly iterate the process after implementation.

3. Hard Wire

Hard Wire workflows into the EHR and standard operating procedures to ensure resilience despite staff turnover.

4. Laggards

Consider strict compliance metrics and accountability ("sticks") for the laggards who are slow to adopt the critical changes.

What Hospitals Can Build Now

- ✓ Add pregnancy/recent pregnancy identification to triage
- ✓ Adopt a simple Serious OB Infection screen + bedside evaluation
- ✓ Clarify ED, OB, ICU, and transfer ownership
- ✓ Build one ED-facing algorithm or order set
- ✓ Run one drill using a postpartum sepsis case and debrief it
- ✓ Track a small set of implementation measures

The goal: Recognize early, treat promptly, and move to the right level of care without delay.

Key Points

- Without implementation science, evidence-based practices often fail to be adopted/sustained. ~ 70% of change efforts do not achieve full implementation.[1]
- Education should be developed that is engaging and multidisciplinary. Additionally, it should be reinforced beyond the end of the active implementation phase and included in onboarding materials.
- Emergency departments must be included in the development of all obstetric emergency education. Methods of education/tool utilization that align with standard ED practices should be considered.

1. Dominique de Waard, Ryan Gainer, Meaghan Sim, Claudia Cote, Philippe Tremblay, Paul Bonnar, Gregory Hirsch, A beginner's guide to implementation science, JTCVS Techniques, Volume 32, 2025, Pages 96-101, ISSN 2666-2507, https://doi.org/10.1016/j.xjtc.2025.05.005.

Action Steps

- Evaluate which formal implementation strategies and frameworks are currently utilized at your facility
  - Is there an opportunity to add methods or strengthen those in use?
- Develop an education curriculum and timeline
  - What resources will you utilize in your baseline education?
  - How can you incorporate this learning into drills?
  - How can the ED participate in co-designing OB education for their service?
    - Will the OB department participate actively in the education roll out to the ED or will a train the trainer model be used?

Sepsis Sprint Sessions 1-3 Summary Action Steps

- Assess your current vital sign screening tool for obstetric sepsis
- Assess serious infection bedside evaluation practices
- Partner with your hospital Antibiotic stewardship team and review the current local antibiogram and discuss special needs of obstetrics
- Review serious infection/sepsis protocol and order sets
- Create a workgroup to establish where to place educational handouts/posters in clinical settings and link with community leaders to explore additional opportunities
- Create an on-going team (minimally inclusive of physician, nurses and social worker) to map out steps to support patients after an adverse maternal event.
- Partner with your hospital-wide Sepsis (SEP-1) team to review the differences for obstetric patients and their unique needs

Direct Links to Sessions 1-3

- **March 17, 2026:** Session 3 **Recorded Webinar(link is external)** and **Slide Set**
  Presented by: Elliott Main, MD; Christa Walczak, MSN RN; Melissa Bauer, DO; Vernice Anthony, BSN, MPH; Stephanie Ingram, BSN, RN, C-EFM; Kayleigh Summers, LCSW; Jodee Lejnieks, MSN, RN, CCRN
  Material(s) available for download, descriptions for use are included in the webinar and slide set above.

- **February 17, 2026:** Session 2 **Recorded Webinar and Slide Set**
  Presented by: Elliott Main, MD; Christa Walczak, MSN RN; Melissa Bauer, DO; Katie Andonian, PharmD; Lauren Puckett, PharmD, BCIDP; Casey Smiley, MD; Natali Aziz, MD, MS; Deirdre Lyell, MD
  Material(s) available for download, descriptions for use are included in the webinar and slide set above.

- **January 20, 2026:** Session 1 **Recorded Webinar and Slide Set**
  Presented by: Elliott Main, MD; Lori Olvera, DNP RNC; Christa Walczak, MSN RN; Jenna Ogborn, BSN RNC-OB; Courtney Martin, DO; Daisy Ramos, MSN RNC-OB PHN
  Materials available for download, descriptions for use are included in the webinar and slide set above.

Bundle Implementation Sustainability Considerations

Sustainability is:

When processes or improved outcomes last within an organization after an implementation has occurred

An improvement that has become part of the organizational culture and has been maintained regardless of workforce turnover

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AHRQ. (March 2017). Module 6. Sustainability: Facilitator notes. Retrieved on April 15, 2026, from https://www.ahrq.gov/hai/quality/tools/cauti-ltc/modules/implementation/long-term-modules/module6/mod6-facguide.html

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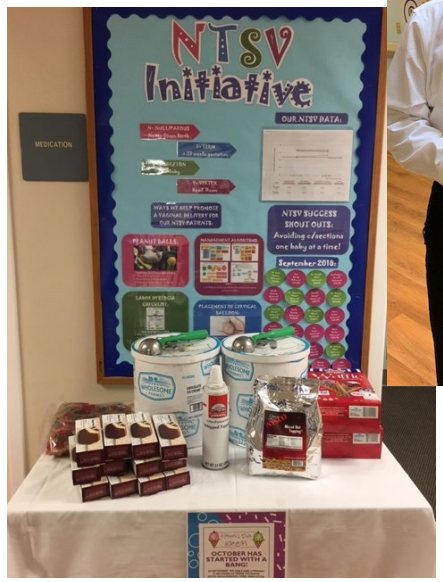
Celebrate!

- Acknowledge the work of individuals
- Acknowledge the work of the team



Sustainability Plan Development

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Keys to Sustaining Improvement

- Focus on explicitly organized frontline management
  - Create standardized workflow which reduces unintended variation
- Create coordinated practices at higher levels of management
  - Enable quality planning which reinforces, supports, and improves work at the front line
- Facilitate the shift from quality improvement to quality control
  - Monitor for stability, detect emerging process problems, take steps to address the gaps identified

Scoville, R., Little, K., Rakover, J., Luther, K., & Mate, K. (2016). *Sustaining improvement* [White paper]. Institute for Healthcare Improvement. https://www.ihi.org/resources/white-papers/sustaining-improvement

Structure Measures

Structure Measure data can be overlooked

- Assessment of structure measures can address a break in the system before a reflection in rates
  - Hemorrhage carts, Patient education materials, etc.

Electronic Health Record (EHR)

- Often updating the EHR during the active phase of implementation is a challenge
- What can be added to reinforce changes made or processes created during implementation?
  - Order sets
  - Documentation
  - Patient Education
  - Chart review/audit capabilities – replace paper forms or manual spreadsheets

Process Measures

- Chart Audits
  - Consider random reviews every quarter
    - The number of charts should take delivery volume into consideration
  - If issues are discovered in random audits, consider expanding the review to look for improvement opportunities
- Education
  - Maintain consistency of education by tracking staff continuing education
  - Provider/staff education on bundle implementation should be provided during onboarding to reinforce unit culture

Most Challenging Structure Measures

These Structure Measures have the lowest completion rates

- **(46%) 1. Patient Event Debriefs** – *Has your department established a standardized process to conduct debriefs with patients after a severe event?*
- **(32%) 8. Identification of Post-Obstetric Sepsis Resources and Referral Pathways** – *Has your facility created a comprehensive list of resources and referral pathways tailored to people who experienced obstetric sepsis?*
- **(51%) 9. Emergency Department (ED) Education Program on Recognition of Obstetric Emergencies** – *Has your facility developed a process and/or program for educating ED staff on signs and symptoms of potential obstetric emergencies?*

QI Sustainability Requires Constant Gardening

Please look out for a 6-month post-survey!