Unit Based Standard: Sepsis and chorioamnionitis: Maternal Early Identification and Treatment Protocol in Obstetrics

Purpose

Standardize early recognition and management of intrapartum intraamniotic infection (chorioamnionitis) and maternal perinatal sepsis.

Supportive Information

Intraamniotic infection also known as chorioamnionitis is an infection with inflammation of any combination of the amniotic fluid, placenta, fetus, or decidua. Intramniotic infection can be associated with neonatal and maternal morbidity. Chorioamnionitis may be the most common infection in the obstetric population, but is not the only source. Therefore, it is important to consider other sources e.g. pneumonia, urinary tract infection, pyelonephritis, skin/soft tissue infection. Timely maternal management together with notification of the neonatal team can facilitate appropriate evaluation and empiric antibiotic treatment when indicated. Perinatal sepsis is one of the leading causes of preventable maternal mortality and severe morbidity. Sepsis bundles when used significantly improve outcomes. Due to the physiology of pregnancy, labor, and postpartum screening criteria for perinatal patients has been adjusted to account for the normal biologic variation in the OB population.

Definitions:

Intraamniotic (CHORIO) Infection: Infection with inflammation of any combination of the amniotic fluid, placenta, fetus, or decidua.

SIRS (Systemic Inflammatory Response): A clinical manifestation resulting from an insult, infection, or trauma that includes a body-wide activation of immune and inflammatory cascades

OB SIRS Criteria:

- Temperature: Less than 36 ^{o} C **OR** Greater than or equal to 39.0^{o} C OR when temperature is 38.0- 38.9^{0}C and one additional clinical risk factor is present
- White Blood Cell Count: Greater than 14,000 **OR** Less than 4,000
- Heart Rate- greater than 110
- Fetal Tachycardia greater or equal160
- Respiratory Rate-greater than 20

- Systemic Blood Pressure-less than 90
- MAP less than 65 **OR** Systolic more than 40mmHg drop from baseline

SEPSIS: Any patient with a documented or suspected infection AND 2 or more SIRS criteria.

SEVERE SEPSIS: Any patient who has a documented or suspected infection, 2 or more SIRS criteria AND evidence of a new signs of organ dysfunction. A risk for severe sepsis is suspected when any patient has a documented or suspected infection, 2 or more SIRS criteria AND one or more signs of acute organ dysfunction:

- BP <90 systolic or <65 MAP or drop of >40 systolic from baseline
- Cr > 2.0 or UO < 0.5 mL/kg/h for 2 hours
- Lactate > 2mmol/L
- Bili > 2.0
- Platelets < 100
- INR > 1.5 or a PTT > 60 sec
- New altered LOC
- Acute respiratory failure

SEPTIC SHOCK: Any patient with severe sepsis associated with refractory hypotension despite adequate fluid resuscitation and/or a lactate level greater than or equal to 4 mmol/L.

TIME ZERO: Any 2 signs (SIRS) AND attending provider confirms suspicion for infection

STEPS→Key Points

1. **Intramniotic (Chorio) Infection or suspected perinatal Sepsis:**

    1. Criteria for suspected Chorio or Perinatal Sepsis:
        - Maternal Temp greater than or equal to 39.0^{o} C **or** when Temp is 38.0- 38.9^{0}C and one additional clinical risk factor is present:
            - Maternal Tachycardia (greater than 110)
            - Fetal Tachycardia (greater than 160)
            - WBC Greater than 14,000
            - Foul smelling amniotic fluid
            - Abdominal tenderness

Key Point → Intraamniotic infection (chorio) alone is rarely if ever an indication for cesarean delivery

II. **INITIATE 1 Hour Bundle from Bright Orange OB sepsis Checklist (GOAL completed by 1 hour form TIME ZERO)**
    a. Keep Checklist with chart. *Although not part of the permanent record the checklist is used to improve bundle compliance, and for quality improvement. Turn completed checklist into manager.* ***See Appendix A***

b. Call Rapid Response Team (RRT) unless MD or OB Hospitalist is available for immediate assessment to initiates sepsis orders
   - RRT initiates Sepsis Nurse Initiated Orders (NIO), **or** an immediately available MD Orders:
   - Obtain Order for antibiotics if indicated **(start by 1 hour of time Zero)**
   - Lab Panel: Nursing Sepsis Panel ***See Appendix B***
     - Lactate (Initial lactate and repeat within 4 hours if elevated (greater than 2.0)
     - Blood Cultures x2 *(Before antibiotic, but do not delay antibiotics if unsuccessful with blood draw)*
     - Blood Culture & Lactate are pre-checked. *There is ONE STAT lactate that repeats in 4H. Cancel 2nd lactate order if initial lactate is 2.0 or less*
     - Order IV Fluid Bolus 500cc (Wide open) LR or NS Bolus

c. **Notify Provider**
   - Lactate result
   - Lactate critical value is greater than 4.0

d. **Administration of intrapartum antibiotics** is recommended whenever intraamniotic (chorio) is suspected ***See Appendix C***
   - Consider antibiotics in the setting of isolated fever unless source other than infection is identified and documented

Key Point → Intraamniotic infection (chorio) alone is rarely if ever an indication for cesarean delivery

e. Assess Vital Signs every 15 minutes x2 from completion of bolus
   - If Vital signs are stable
   - Repeat Full Set of Vital every 1 hour x 2

f. Notify Provider if patient remains hypotensive (SBP less than 90 or MAP less than 65 OR systolic pressure is 40mmHg or more drop from baseline)
   - Prepare for potential CCU admission AND
   - Fluid bolus of 30ml/kg.

g. Call RRT and provider if patients condition deteriorates

h. Assess neonatal risk of sepsis using early onset sepsis calculator (EOSC) one hour after birth.
   - Document sepsis calculator results in progress note in newborn record

III. **3 HOUR BUNDLE: Sepsis Standard Work Flow (Completed by HOUR 3 from TIME ZERO)**

a. IF Septic Shock Present
   - IV LR or NS mL/kg fluid Bolus

IV. 4 HOUR BUNDLE: Standard Work Flow (Completed by HOUR 4 from TIME ZERO)

a. Repeat Lactate 4 hours after the first IF first lactate is greater than 2.0
b. Consider vasopressors is patient remains hypotensive after mL/Kg bolus
c. Notify MD for fluid status reassessment after completion of mL/kg fluid bolus OR 4 hours of TIME ZERO
d. MD completes required (Focus 5) fluid volume reassessment documentation

References

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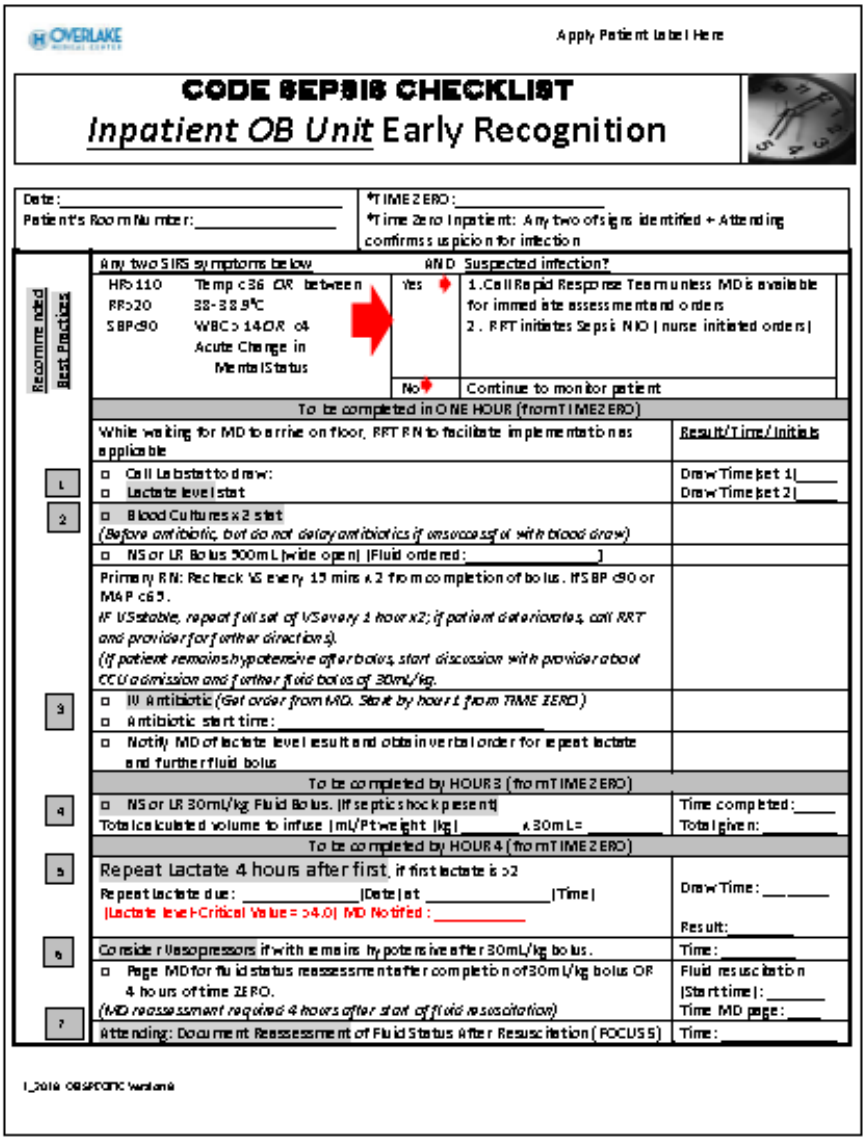
Appendix A



OVERLAKE

Apply Patient Label Here

CODE SEPSIS CHECKLIST

Inpatient OB Unit Early Recognition

Date: _____
Patient's Room Number: _____

*TIME ZERO: _____
*Time Zero Inpatient: Any two of signs identified + Attending confirms suspicion for infection

Recommended Best Practices

Any two SIRS symptoms below AND Suspected infection?

HR>110 Temp <36 OR between
RR>20 38-38.9°C
SBP<90 WBC> 14 OR <4
Acute Change in Mental Status

Yes → 1. Call Rapid Response Team unless MD is available for immediate assessment and orders
2. RRT initiates Sepsis MD / nurse initiated orders

No → Continue to monitor patient

To be completed in ONE HOUR (from TIME ZERO)

While waiting for MD to arrive on floor, RRT RN to facilitate implementation as applicable — Result/Time/Initials

1
- ☐ Call Lab stat to draw:
- ☐ Lactate level stat

Draw Time/set 1/____
Draw Time/set 2/____

2
- ☐ Blood Cultures x 2 stat

(Before antibiotic, but do not delay antibiotics if unsuccessful with blood draw)

- ☐ NS or LR Bolus 500mL (wide open) (Fluid ordered: _____)

Primary RN: Recheck VS every 15 mins x 2 from completion of bolus. If SBP <90 or MAP <65.
IF VS stable, repeat full set of VS every 1 hour x2; if patient deteriorates, call RRT and provider for further directions).
(If patient remains hypotensive after bolus, start discussion with provider about CCU admission and further fluid bolus of 30mL/kg.

3
- ☐ IV Antibiotic *(Get order from MD. Start by hour 1 from TIME ZERO)*
- ☐ Antibiotic start time: _____
- ☐ Notify MD of lactate level result and obtain verbal order for repeat lactate and further fluid bolus

To be completed by HOUR 3 (from TIME ZERO)

4
- ☐ NS or LR 30mL/kg Fluid Bolus. (If septic shock present)

Total calculated volume to infuse (mL/Pt weight (kg) _____ x 30mL = _____

Time completed: ____
Total given: _____

To be completed by HOUR 4 (from TIME ZERO)

5
Repeat Lactate 4 hours after first, if first lactate is >2

Repeat lactate due: _____ (Date) at _____ (Time)
(Lactate level-Critical Value = >4.0) MD Notified: _____

Draw Time: _____
Result: _____

6
Consider Vasopressors if with remains hypotensive after 30mL/kg bolus. — Time: _____

7
- ☐ Page MD for fluid status reassessment after completion of 30mL/kg bolus OR 4 hours of time ZERO.

(MD reassessment required 4 hours after start of fluid resuscitation)

Fluid resuscitation (Start time): _____
Time MD page: ____

Attending: Document Reassessment of Fluid Status After Resuscitation (FOCUSS) — Time: _____

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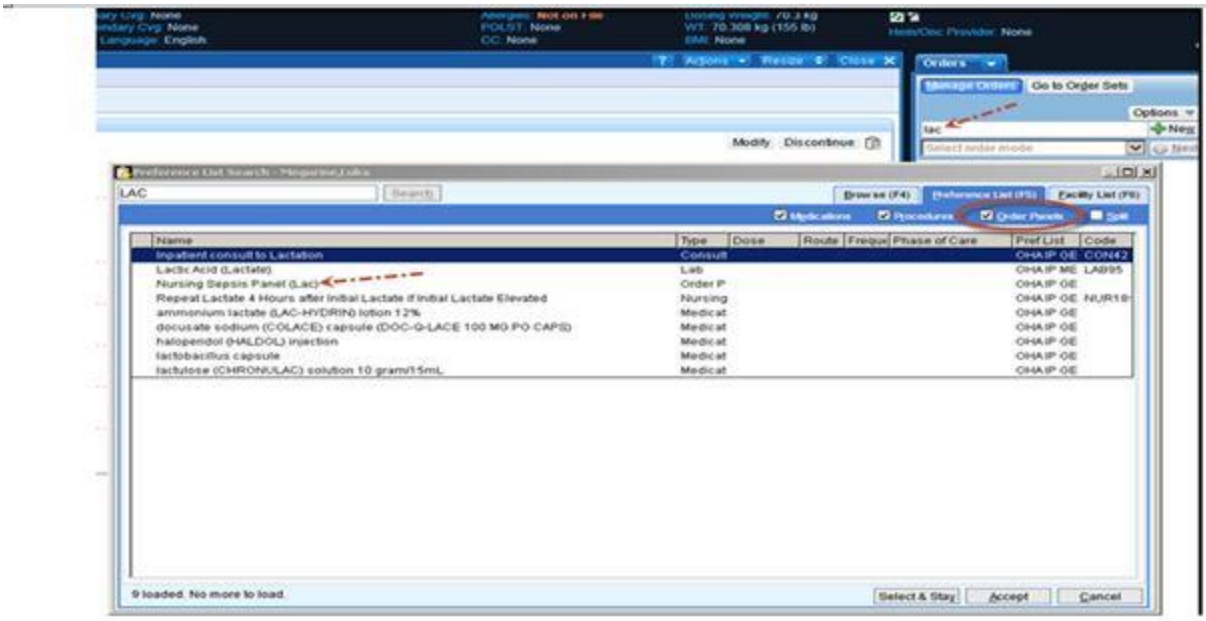
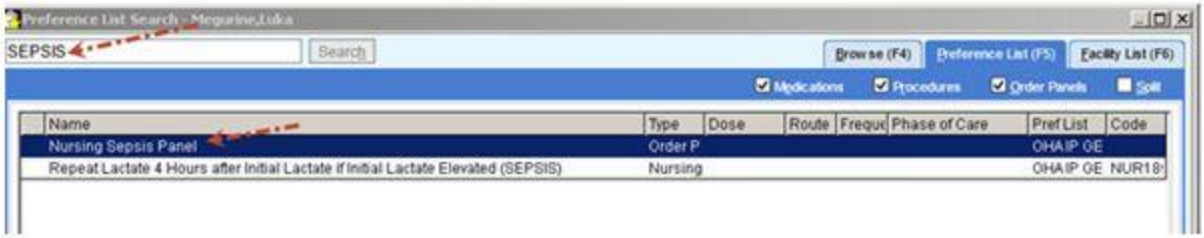
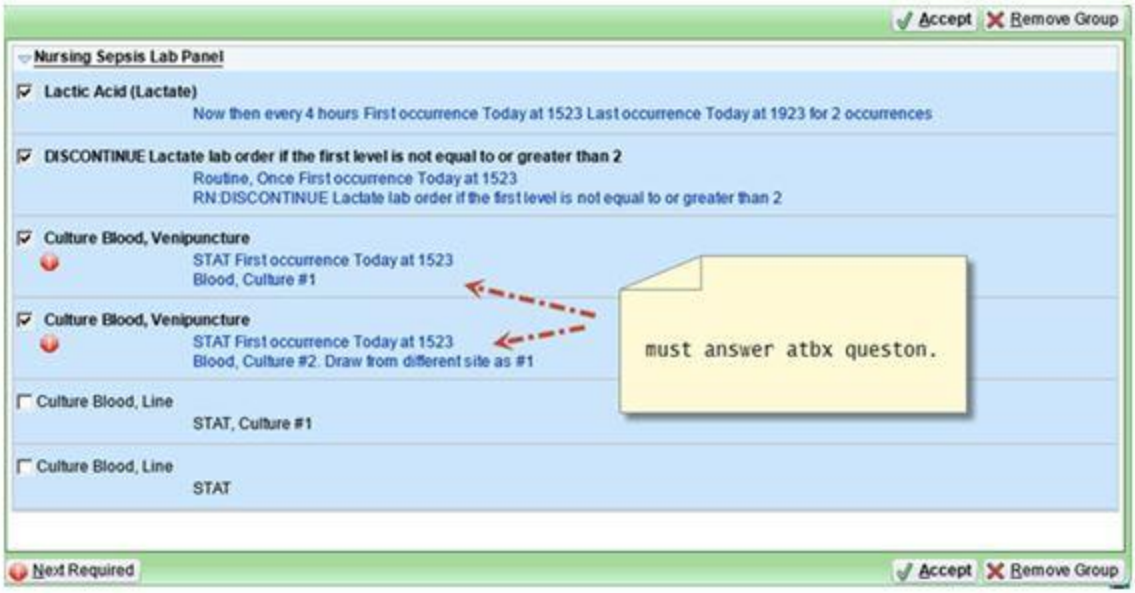
Appendix B





Blood Culture & Lactate are pre-checked. There is ONE STAT lactate that repeats in 4H. Cancel 2nd lactate order if not needed



Appendix C

Recommended antibiotic regime for treatment of intramniotic infection
Treatment: 1. Unasyn 3g IV every 6h **OR** 2. Ceftriaxone 2g IV every 24h
Beta lactam Allergy: 1. Clindaymycin 900mg IV every 8h **PLUS** Aztreonam 2g IV every 8h
Alternative Treatment for primary (non-beta lactam allergy): 1. Zosyn 3.375g IV every 6h
Multiple Allergies (beta lactam and clindamycin): 1. Contact pharmacist or ID

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