BestPractice Advisory: **Early Identification of Severe Sepsis and Septic Shock**

**Type: Active (pop-up, interrupts workflow), hard-stop – required response if no action taken**

**Purpose:** Notify ED nurse that patient should be rescreened for Severe Sepsis or Septic shock.

**BPA Logic:** *(red text indicates to be finalized; latest changes highlighted in yellow)*

* **Who/Audience:** Nurses in Emergency Department (RR and SM)
* **Where:** Open ED Nurses Narrator
* **When:** Criteria to display BPA:
1. Patient Age >= 18

**AND**

1. *Nursing documentation (flowsheet): Severe Sepsis and Septic Shock = NEGATIVE* OR *NULL during the current encounter (3/3/17 – proposed change)*

**AND**

1. **Two or more manifestations of systemic infection** according to the Systemic Inflammatory Response Syndrome (SIRS) criteria (lookback 6 hours):
	1. Temperature >38.3 C **or** <36.0 C
	2. Heart rate (pulse) >90
	3. Respiration >20 per minute
	4. White blood cell count >12,000 **or** <4,000 **or** >10% bands

**AND**

1. **Acute/New signs of organ dysfunction**, evidenced by any one of the following:
	1. Systolic blood pressure (SBP) < 90 (lookback 6 hr), or mean arterial pressure < 65 (lookback 6 hr), (most recent abnormal value in past 6 hours, regardless of more recent normal values)
	2. Creatinine >2.0 (lookback 6 hours)
	3. Total Bilirubin >2 mg/dL (lookback 6 hours)
	4. Platelet count <100,000 (lookback 6 hours)
	5. INR >1.5 or aPTT > 60 sec (lookback 6 hours)
		1. Exclude active medication (in house or home med) warfarin
	6. Lactate > 18.0 mg/dL (lookback 6 hours)
	7. Acute respiratory failure as evidenced by a new need for invasive or non-invasive mechanical ventilation (RN documentation Assessment - O2 Device: “Bi-PAP”, “ETT”, “Mechanical Ventilator”) (lookback 6 hours)
	8. Altered mental status based on RN documentation: any of following (lookback 6 hours)
		1. Assessment - Glasgow Coma Scale < 15 (Trauma or CPN”
		2. General Assessment – Orientation Level = “Disoriented X4”

 **AND**

1. **Exclude patients currently have sepsis IVF or Sepsis Bundle administered/completed** **or “Code Sepsis Activated” during current encounter**
	1. Patient has sepsis IVF order **Active or Completed or Administered** (from Add-On sepsis orderset, ED physician ADULT SEPSIS ORDER SET) (ERX 502422 and ERX 502447) (lookback 6 hours) (Providers have likely ordered everything necessary off of OS if these orders placed) (Qualifies for exclusion as soon as Active/Ordered)

**OR**

**ALL 4 of the following:**

1. Lactate [LAB95] or [LAB8483]– **Active or Completed Order** (lookback 6 hours) (Qualifies for exclusion as soon as Active/Ordered)

**AND**

1. At least 1 Blood Cultures [LAB462] (Covers Blood culture #1, 2 and 3 peripheral and central lines on orderset)- **Active or Completed Order** (lookback 6 hours) (Qualifies for exclusion as soon as Active/Ordered)

**AND**

1. At least one Broad Spectrum IV Antibiotics order or Combo Antibiotics **Active or Completed or Administered** (lookback 6 hours)– see Appendix A (Qualifies for exclusion as soon as Active/Ordered)

**AND**

1. At least one IVF (NS or Lactate Ringer – not able to ascertain rate of infusion) **Active or Completed or Administered** (lookback 6 hours)

(Qualifies for exclusion as soon as Active/Ordered)

**AND**

**OR**

1. *Nursing documentation (flowsheet):* Intervention=“Code Sepsis Activated” during the current encounter (Requested 3/10/17)
* **Display:**
	+ Alert message:

***The patient has met risk factors for severe sepsis/septic shock.***

**Please re-screen patient using Severe Sepsis / Septic Shock Screening Tool**

* **Actions Available: (Acknowledgement reason required if no action taken, inactivate ‘Cancel’ button)**
	+ ~~Sepsis Protocol follow-up order~~
	+ Link to ED Narrator Sepsis Screening
	+ Document Acknowledgment reasons: (**Display buttons**)
		- ~~Defer to 1 hour / (Assessment Pending) (no lock out)~~
		- Will Re-Screen Patient (lock out for 2 hours)
		- ~~Severe Sepsis~~ Bundle In Progress (lock out for 6 hours)
		- Will Notify Primary RN (no lock out)
		- ~~Known Condition (lock out for x hours)~~

~~Consider Adding a note: notify MD if patient’s SBP < 90 or Lactate >= 36, … 30 ml/kg~~

~~Need to figure out lock out times~~



**Project Timeline: Currently in Silent Period Phase**

|  |  |
| --- | --- |
| *10/19/16 – 12/16* | Design |
| *12/12/16 – 1/4/17* | Build |
| *~1/5/17-1/17/17* | Testing & Migrate |
| *~2 months beginning 1/17/17* | Silent BPA period – data evaluation/refine logic iterative review |
|  | Communication & Training |
| 5/8/17 | Roll out  |
| 5/15/17 | Monitor & Optimize |

**Pending Questions:**

* Who else uses the ED Narrator? *Techs, but we restrict display of BPA to nurses only.*
* Investigate feasibility add an indicator of need to rescreen for Sepsis on ED Track board – in progress. *DEFERRED*
* Investigate how to suppress BPA if trauma patient admitted less than 6 hours ago? *DEFERRED*
* ~~If including drop in Systolic criteria, which values to compare (min/max, first/last, last two), how far to look back (6 hours), exclusive only to current encounter or all encounters?~~ *~~NO LONGER NEEDED~~*
* For each of the lab criteria, would we ever want to reference outside labs, or only labs taken/resulted within UCLA? *Only UCLA*
* Do we want the BPA to dynamically display which organ dysfunction criteria failed (similarly to the SIRS criteria that currently displays dynamically)? *DEFERRED until after silent period*

**Meeting Notes:**

**4/14/17:**

1. Will rescreen, bundle, notify RN
2. Asking Rahwa what happens in ED – do super users in ED have access to PLY? How to give access to test out BPA—migrate to MST as extra environment
3. Aiming for May 1st roll out, Stephanie Larson to work on tipsheet 4/17-4/18, two weeks for training/testing – should be May 3rd (payroll cycle in line with inpatient); discuss with workgroup

**4/7/17:**

1. Title = “Organ Dysfunction Data” “SIRS Criteria Data”
2. Separate O2 device, Glasgow and Orientation Level and labs (last value)
3. Multiple lab values; pull last three GCS values if possible (look at range again)
4. Show example of labs with multiple labs on file for each CN
5. RN Reviewed button needs more clarification
6. Make this a Hard Stop BPA – problem with clicking link (this doesn’t count as acknowledge reason?), any way to make re-screening satisfy hard stop? Button that goes to screening?
7. Any way for HTML link to screening in text body?
8. May 1st roll-out, lock down build for 4/14/17, tipsheet designed by 4/14/17

**3/24/17:**

1. **Updates on Reported Bugs and Build Changes**
	1. **Build changes previously requested are now reflected in CareConnect as of 1:04PM on 3/24/2017**
	2. Modified Sepsis Screen criteria to look both at patients who were either screened Negative, or who had no Sepsis Screening completed
	3. Modified Sepsis Bundle lab criteria to capture any sepsis bundle labs that were ordered (no longer restricted to resulted labs)
	4. \*\*\*Due to an issue with build migration, please discard silent BPA data between 1PM 3/23 – 1:04PM 3/24
	5. Defect reported to us on non-numeric lab values (e.g. “<5”, “>10”) does not appear to affect the data and firing of ED Sepsis BPA
2. **Sepsis BPA Display**
	1. If we can display the triggering BPA data with timestamp, this is preferred (for both SIRS and Organ Dysfunction) (e.g. Temp = 101.3 C)
		1. Ashley is working with Epic to discern if it is possible to display triggering data on BPA
	2. If we cannot display actual data, then display the list of criteria met for both SIRS and Organ Dysfunction (e.g. Temperature > 100.9 C)
	3. Remove display of last vitals values
	4. BPA display will contain the following message:

**“This patient is at risk for SEVERE SEPSIS/SEPTIC SHOCK for the following reasons:**

**SIRS RISK FACTORS MET WITHIN THE LAST 6 HOURS:**

**-List pt’s qualifying SIRS factors (preferred to display actual triggering data with timestamp)**

**ORGAN DYSFUNCTION CRITERIA MET WITHIN THE LAST 6 HOURS:**

**-List pt’s qualifying Organ dysfunction/failure criteria (preferred to display actual triggering data with timestamp)**

**Please re-screen patient using Severe Sepsis / Septic Shock Screening Tool”**

* 1. The following two acknowledgement reasons will be displayed as buttons:
		1. Severe Sepsis Bundle In Progress (lock out for 6 hours)
		2. Will notify Primary RN (no lock out)

**3/17/17:** Reviewed BPA Spec again and started going over display:

* Group agreed with Dr. Cheng’s recommendation to not postpone BPA till entire Negative testing is done since we should not be too concerned since at least positive testing confirms that we are catching patients that we need to catch, and can be concerned about the under firing post go live. Next week to discuss the timeline and progress to next steps.
* Display:
	+ Reword SEVERE SEPSIS CRITERIA MET to “RISK FACTORS MET:”
	+ Temp: In C
	+ Asal and Summer to look at the literature to confirm the temperature. Apparently should be 101
	+ Which lab results display

**3/10/17:** workgroup confirmed BPA spec:

* Discussed with workgroup how we cannot capture “collected” Labs. Currently our build excludes patients with sepsis bundle elements of “completed.”
	+ Completed- refers to labs that have been resulted
* Workgroup wants for us to also exclude any patients that have “Active” labs on their record meaning the labs have been ordered and not yet resulted. Now logic to contain “Active” OR “Completed” sepsis elements

Next steps:

* Completed build and testing, aim for roll out of changes in 2 week (ETA 3/24).
* Review 24 cases of Sepsis Bundle before time of alert – (likely related to lab collected but not resulted/order completed within 6 hours of alert).

**3/3/2017:** workflow changing where Sepsis may not be screened immediately (additional steps to triage process, may be ~30min-60 delay in sepsis screen, initial documentation handed off to other nurse). How often do patients not get screened?

Change Sepsis Bundle criteria per above specifications.

Remove NICU order

Investigating if signed order can be used instead of collected order for sepsis bundle labs.

**2/24/17:** consider changing logic for Sepsis Screen NEG; chart needs to be closed for bpa to evaluate newly documented data. File flowsheet trigger if needed\*\*

2/17/2017:

Asal provided some initial cases for review via e-mail.

Discussed design of OHIA report to catch instances where BPA should have fired earlier than it did.

Correcting display error with BP criteria.

2/2/2017:

• Criteria for mechanical ventilation documented will now only return true if (BiPap, ETT, Mechanical Ventilator) documented for the patient in the past 6 hours. (Was previously looking back indefinitely)

• Criteria for orientation status documented will now only return true if (Glasgow Scale < 15 or Orientation Level = Disoriented X4) documented for the patient in the past 6 hours (Was previously looking back indefinitely)

• General IVF bolus orders now only include: LACTATED RINGERS IV BOLUS [400296] or SODIUM CHLORIDE 0.9 % IV BOLUS [400291] (previously included order for NICU and replacements)

1/27/2017:

General IVF Orders:

LACTATED RINGERS IV BOLUS [400296]

SODIUM CHLORIDE 0.9 % IV BOLUS [400291]

~~SODIUM CHLORIDE 0.9% IV BOLUS (NICU) [430147]~~

~~LACTATED RINGERS IV BOLUS (REPLACEMENT) [122523]~~

~~SODIUM CHLORIDE 0.9% IV BOLUS FOR REPLACEMENT [120933]~~

Adding 6 hour lookback to Mechanical Ventilation and Orientation flowsheets –In CareConnect 2/2/2017

Asal will be handing out 10-14 patients per validator per week for review to assess if patient meets SS/SSh criteria per SEP-1 Guideline. At end of week, will compile any issues/questions and will communicate information to Ashley with Esther cc’d.

Currently have 101 positive cases -- assess how long to review one case; then establish a certain percentage to review over a set timeframe (5 or 10% over defined time period?)

~2 hours allotted per validator per week – will continue to proceed through March 14th. Fires <~20 times per day per hospital.

Lauren Jones – sent patients that came through ED, but no BPA fire – tedious

How to define negative patients? Those excluded by bundle and those not eligible at all.

Initially defining as patients who came through ED who did not screen positive for sepsis.

Wait until patient is coded negative and compare patients that the BPA fired for and those for which it didn’t.

Esther – there is a sepsis report that can be used to pull all patients that screened negative. Will help develop means to validate negative patients.

Summer demoing validation of Positive BPA fires – Library Reports -> BPA Sepsis Early Identification Log -> Run -> Export and assign each case to Validator – will populate values for each criteria. Reference time of alert

Needs a way to determine if patient had sepsis – Ashley to send sepsis IVF ERX IDs to Asal/Summer

Not all antibiotics store indication for use

1/20/17-- - determine who will validate what and when per summer -- not much data yet, has spot checked and nothing looks outlandish, numbers look reasonable 1st report shows all the times the BPA fired; 2nd report shows all the patients in the ED with triggers; export does not pull LRP

Need clinical users who know what sep guidelines are for assess false/true negatives

Summer listing out what is needed for review and sharing with clinical users

Ohia says they will have dataset for 1/27 When patient gets admitted to floor, will nurses still be logging into RR/SM ED? May need to open DEP restriction (will be addressed in IP version)

If patient is border and is admitted (but no room on the floor), inpatient from float pool comes to take care of pt – are they logging into ED/using ED Narrator?

* Inpatient nurses are not using ED Nurse Narrator
* Will be addressed in Inpatient BPA design (different population definition)

30 ml/kg, 2000 ml/hr – sepsis orderset has these components. Any bolus outside of orderset falls outside of these volumes/rate; ED prefers to place single 1,000 ml etc. and replenish/order in increments until total met. Suggestion for new fluid bolus order for sepsis pts with correct volume and rate outside of sepsis orderset

1/13/17-- SM ED fluids- SM ED has own order panel, RR own order set; fluids fail because provider wants to use bolus in increments, right now orders are 30 ml/kg; if they want increments, need to use “a la carte” orders for IVF; additional option for fluids proposed for SM ED panel, if other option is used, can’t guarantee it meets 30 ml/kg requirement.

Verbiage in order set re: 30 ml/kg requirement; Possible for Orders team David Mui to create order that does not have adjustable volume; yes, it is possible for 30 ml/kg – may have new ERX to reference in CER rule

Workgroup working with OHIA on other report? Ashley to send Asal list of fields BPA report will be capturing

Quality team (QIA) working with wg to pull time of presentation for patients, won’t run real time; goal is person runs report in morning for previous day; will pull patients based off defined set of criteria (bp and lactate for org dys) – could be a couple of months for development

135-140 charts per day in SM screened Negative for Severe Sepsis, then narrow by Org Dysfunction

Per Summer, roll out as is and refine as we go; will talk with Physician champions about infusion volume/orders considerations

Will run RWB report daily to assess volume and support needs

1/12/17 – Confirmed with Summer that Sepsis bundle exclusion criteria should only exclude patients who have had a sepsis ivf bolus or sepsis bundle **administered** in the past 6 hours with no subsequent discontinuation of pertinent medications. Modified testing scripts and specification to reflect this requirement

12/9/16 – DESIGN SESSION #5, Sepsis SS/SSh BPA Core Working Group Meeting

* Review BPA criteria (above)
	+ Asal to collect additional requirements for systolic BP drop and exclude patient who has sepsis bundle implemented
	+ Ashley to start build

12/2/16 – DESIGN SESSION #4, Sepsis SS/SSh BPA Core Working Group Meeting

* Review BPA criteria (above)
	+ Asal to coordinate with workgroup members to gather diagnosis codes for exclusions and documentation items
	+ Build team Ashley to investigate build for confirmed items

11/4/16 – DESIGN SESSION #3, Sepsis SS/SSh BPA Core Working Group Meetings

* Asal to review BPA criteria approach with IT workgroup, provide draft of logic to be discussed next time
* No need to exclude trauma patient
* Acknowledge Reasons discussion:
	+ Will further refine when BPA criteria logic (patient condition) is defined
	+ Can also change during optimization after roll out (change control protocol)
	+ Button can provide “customized” verbiage mapped to generic reasons; decision to display button.
	+ Specify “Severe Sepsis Bundle In Progress”
	+ No need for “Defer” option; rescreening for severe sepsis/septic shock is priority.
	+ No need for “Known Conditions” – similar to “Severe Sepsis Bundle In Process”

11/3/16 – notes

* Dr.Kerbel to discuss BPA criteria with group 11/4
* ED RN proposed acknowledge reasons:

Assessment Pending/Defer (wording TBD) - PREFER TO REMOVE; The ED RNs would prefer not to have this option as they feel strongly that the nurses will abuse it. They are hoping that the silent period will help tweak the BPA enough so as to reduce false positives. (Would it be possible to add this option later if needed?)

Sepsis Protocol in Progress; 12 hour lock out period for this option.

Not RN: Notify RN/MD: Whether this option is included or not should be discussed with the group. If we do end up included this option, there should be NO lock out period.

Known Conditions

* If trauma and cardiac arrest patients can be “excluded,” then this option will be eliminated.
* Trauma patients only relevant to RR, not SM.
* A 6 hour lock out is requested.
* Waiting on Karla (RR nurse) to respond with specifications.

10/28/16 – DESIGN SESSION #2, Sepsis SS/SSh BPA Core Working Group Meetings

* Defined BPA alert display
	+ Confirmed verbiage
	+ Would like to see last set of vitals and relevant labs (align with logic to display BPA) – highlight in red if data is above/below threshold for SS/SSh
	+ Action Required, inactivate ‘Cancel’ button
	+ Do not display acknowledge quick buttons
* Do not display BPA for trauma patients - Kim & Rahwa to investigate feasibility
	+ ED event / ADT documentation? TBD
	+ Suppress BPA for 6 hours
	+ ED nurses to think about timing and suggest specifics for this exclusion.
* Defer BPA logic discussion until next workgroup meeting; need to ensure all workgroup members are in participation
* Defer BPA acknowledge reason decision

10/21/16 – DESIGN SESSION #1, Sepsis SS/SSh BPA Core Working Group Meetings

* Defined **goal of BPA**: Notify ED nurse that patient should be rescreened for Severe Sepsis or Septic shock.
	+ There may be a fall-outs related to incomplete/inaccurate screening at Triage; this BPA will not address this issue. We will address this issue at a later time, as there are more fall outs related to patients who need to be rescreened.
* Discussed **BPA trigger event**: Open ED Narrator for nurses
	+ Check BPA logic each time nurses open the ED Narrator
* ED Nursing workflow –
	+ Initial Documentation: Patient is screened for sepsis during Triage; nurse do not typically go back to this navigator again during the patient’s stay
	+ ED Narrator: nurses usually “live” in the ED Narrator; opens chart quite frequently
		- BPA will evaluate every time ED Narrator is opened and interrupt workflow if BPA logic is true. (BPA logic to be discussed at future meetings)
	+ If patient’s chart is not opened, then BPA logic is not evaluated. Request to add an indicator on ED Track board – need to investigate feasibility.
* Next steps:
	+ kim and Rahwa to investigate feasibility add an indicator of need to rescreen for Sepsis on ED Track board
	+ Ashley to update BPA build for next workgroup meeting
	+ ED Nurses to draft BPA message and action available

**References**

**“Severe Sepsis Present” –** extracted from Summer’s email 10/13/16

**Notes for Abstraction:** In order to establish the presence of severe sepsis, there are three criteria, all three of which must **be met within 6 hours of each other.**

1. **Documentation of a suspected source of clinical infection**. There may be reference to “possible infection from xx,” “suspect infection from xx,” or similar reference in progress notes, consult notes, or similar physician/APN/PA documentation. Nursing documentation referencing an infection, suspected infection, or current treatment of an infection is acceptable. Exclude documentation of viral or fungal infections.
2. **Two or more SIRS criteria** (Systemic Inflammatory Response Syndrome, manifestations of systemic infection):
	1. Temperature >38.3 C or <36.0 C
	2. Heart rate (pulse) >90
	3. Respiration >20 per minute
	4. White blood cell count >12,000 or <4,000 or >10% bands
3. **Organ dysfunction**, evidenced by any one of the following:
	1. Systolic blood pressure (SBP) <90, or mean arterial pressure <65, or a systolic blood pressure decrease of more than 40 mmHg. *Physician/APN/PA documentation must be present in the medical record indicating a >40 mmHg decrease in SBP has occurred and is related to infection, severe sepsis or septic shock and not other causes*.
	2. Acute respiratory failure as evidenced by a new need for invasive or non-invasive mechanical ventilation. Invasive mechanical ventilation requires an endotracheal or tracheostomy tube. Non-invasive mechanical ventilation (may be referred to as BiPAP) uses a mask.
	3. Creatinine >2.0, or urine output <0.5 mL/kg/hour for 2 hours
	4. Bilirubin >2 mg/dL (34.2 mmol/L)
	5. Platelet count <100,000
	6. INR >1.5 or aPTT >60 sec
	7. Lactate >2 mmol/L (18.0 mg/dL)
4. **Exclude organ dysfunction chronic condition or medication**: Do not include evidence of organ dysfunction that is considered to be due to a chronic condition or medication (e.g., Creatinine >2 for a patient with end stage renal disease, INR >1.5 for a patient on Warfarin, decrease in SBP associated with administration of a blood pressure medication).

**“Septic Shock Present”**

**Notes for Abstraction:** The criteria for determining that Septic Shock is present are as follows:

1. There must be documentation of severe sepsis present.

AND

1. Hypotension persists in the hour after the conclusion of the 30 mL/kg *Crystalloid Fluid Administration*, evidenced by
	1. systolic blood pressure (SBP) <90, or
	2. mean arterial pressure <65 or
	3. a decrease in systolic blood pressure by >40 mmHg. Physician/APN/PA documentation must be present in the medical record indicating a >40 mmHg decrease in SBP has occurred and is related to infection, severe sepsis or septic shock and not other causes.

OR

* 1. Tissue hypoperfusion is present evidenced

**Chief complaints for Sepsis:**



**Appendix A:**

|  |  |
| --- | --- |
| **Table 5.0: Antibiotic Monotherapy, SepsisAntibiotic Selection Options** **(includes trade & generic name)**  | **Generic Name Crosswalk**  |
| Doribax  | Doripenem  |
| Doripenem  | Doripenem  |
| Eratepenem  | Eratepenem  |
| Invanz  | Eratepenem  |
| Imipenem/Cilastatin  | Imipenem/Cilastatin  |
| Meropenem  | Meropenem  |
| Merrem  | Meropenem  |
| Primaxin  | Imipenem/Cilastatin  |
| Cefotaxime  | Cefotaxime  |
| Claforan  | Cefotaxime  |
| Ceftazidime  | Ceftazidime  |
| Ceftriaxone  | Ceftriaxone  |
| Fortaz  | Ceftazidime  |
| Rocephin  | Ceftriaxone  |
| Cefepime  | Cefepime  |
| Maxipime  | Cefepime  |
| Ceftaroline fosamil  | Ceftaroline fosamil  |
| Teflaro  | Ceftaroline fosamil  |
| Avelox  | Moxifloxacin  |
| Levaquin  | Levofloxacin  |
| Levofloxacin  | Levofloxacin  |
| Moxifloxacin  | Moxifloxacin  |
| Ampicillin/sulbactam  | Ampicillin/sulbactam  |
| Piperacillin/tazobactam  | Piperacillin/tazobactam  |
| Ticarcillin/clavulanate  | Ticarcillin/clavulanate  |
| Timentin  | Ticarcillin/clavulanate  |
| Unasyn  | Ampicillin/sulbactam  |
| Zosyn    If the pt does not receive one of the above listed approved monotherapy choices, then they must receive a combination as listed here -  | Piperacillin/tazobactam     |

|  |  |
| --- | --- |
| **Column A**  | **Column B**  |
| Aminoglycosides OR Aztreonam OR Ciprofloxacin  | +  | Cephalosporins (1st and 2nd Generation) OR Clindamycin IV OR Daptomycin OR Glycopeptides OR Linezolid OR Macrolides OR Penicillins  |
|  |  |  |  |

|  |  |
| --- | --- |
| **Table 5.1: Antibiotic Generic/Trade Name Crosswalk, Sepsis Antibiotic Selection Options** **(includes trade & generic name)**   | **Generic Name Crosswalk**  |
| **Aminoglycosides**  |
| Amikacin  | Amikacin  |
| Garamycin  | Gentamicin  |
| Gentamicin  | Gentamicin  |
| Kanamycin  | Kanamycin  |
| Kantrex  | Kanamycin  |
| Nebcin  | Tobramycin  |
| Tobramycin    | Tobramycin  |
| **Aztreonam**  |
| Azactam  | Aztreonam  |
| Aztreonam    | Aztreonam  |
| **Cephalosporins** **(1st and 2nd Generation)**  |
| Ancef  | Cefazolin  |
| Cefazolin  | Cefazolin  |
| Cefotan  | Cefotetan  |
| Cefotetan  | Cefotetan  |
| Cefoxitin  | Cefoxitin  |
| Ceftin  | Cefuroxime  |
| Cefuroxime  | Cefuroxime  |
| Mefoxin   | Cefoxitin  |
| **Ciprofloxacin**  |
| Cipro  | Ciprofloxacin  |
| Ciprobay  | Ciprofloxacin  |
| Ciprofloxacin  | Ciprofloxacin  |
| Ciproxin    | Ciprofloxacin  |
| **Clindamycin IV**  |
| Cleocin  | Clindamycin  |
| Clindamycin   | Clindamycin  |
| **Daptomycin**  |
| Cubicin  | Daptomycin  |
| Daptomycin    | Daptomycin  |
| **Glycopeptides**  |
| Targocid  | Teicoplanin  |
| Teicoplanin  | Teicoplanin  |
| Telavancin  | Telavancin  |
| Vancocin  | Vancomycin  |
| Vancomycin  | Vancomycin  |
| Vibativ    | Telavancin  |
| **Linezolid**  |
| Linezolid  | Linezolid  |
| Zyvox  | Linezolid  |

**Technical Design**

|  |  |
| --- | --- |
| **Description /Purpose of alert** | **Advise the nurses in the Emergency Department to re-screen ED/Border patients if a patient becomes at risk for SS/SSh. Patients will be defined as ≥ 18 years old who were initially screened negative for sepsis in triage. The specific clinical objective of the alert is to reduce sepsis mortality rates by assisting in the identification of patients at risk for SS/SSh.**  |
| **Display text (what end-users will actually see):** | **No visual display during silent period (duration TBD)** |
| **Triggering area/s(i.e. navigator, order entry, etc.):** | **Open Nursing Narrator Activity [67]** |
| **Behavior - Active or Passive?** | **Active** |
| **Inclusion Criteria (include ‘lookback limit days’ for procedure and/or lab component):** | Patient Age > 18 Years**AND**ED Sepsis Risk Assessment Flowsheet = Negative**AND AT LEAST 2 of following SIRS Criteria:**(Temp > 38.3C **OR** Temp <36.0C in Past 6 hours)(Heart Rate > 90 in Past 6 hours)(Respirations > 20 BPM in Past 6 hours)(WBC > 12,000 **OR** WBC < 4,000 **OR** Bands > 10%)**AND AT LEAST 1 of following Organ Dysfunction Criteria:**(Systolic BP < 90 **OR** MAP < 65 in Past 6 hours)(Creatinine > 2.0 in Past 6 hours)(Bilirubin > 2 mg/dL in Past 6 hours)(Platelet Count < 100,000 in Past 6 hours)(INR > 1.5 **OR** APTT > 60 in Past 6 hours)(Lactate > 18.0 mg/dL in Past 6 hours)(Documented Bi-PAP, ETT **OR** Mechanical Ventilator Ventilation)(Documented Altered Mental Status: Glasgow <15 **OR** Orientation Level = Disoriented X4)**AND DOES NOT HAVE EITHER OF FOLLOWING:**(Sepsis IVF Bolus admin in past 6 hours (ERX 502447; ERX 502422)(Sepsis Bundle admin/completed in past 6 hours (Lactate **AND** Bacterial Blood Culture **AND** General IVF bolus **AND** (Monotherapy Antibiotics **OR** (Combination 1 Antibiotics **AND** Combination 2 Antibiotics) |
| **Exclusion Criteria (include ‘lookback limit days’ for procedure and/or lab component):** | Exclusion field is used within the Sepsis Bundle 6 hour lookback criteria (in conjunction with NOT logic) to look for orders that were placed within that timeframe.INR > 1.5 or APTT > 60 criteria also uses exclude Medication field = Warfarin Sodium, in order to exclude any patients currently prescribed this medication. |
| **Restrictions (i.e. location, specialty, department, provider type, encounter type, age, gender):** | Restricted to Registered Nurses, Licensed Nurses and Nursing Students within departments RR ED and SM ED. |
| **Display any lab component or other clinical data within the alert.**  | **No visual display during silent period (duration TBD)** |
| **Include a link to a SmartSet or suggest orders** | **No visual display during silent period (duration TBD)** |
| **Add link(s) to the display text or links to other specific activities** | **No visual display during silent period (duration TBD)** |
| **Acknowledge Reasons options:** | **No visual display during silent period (duration TBD)** |
| **Other rules or programming points:** |  |

**Work Notes:**

Test patient set-up:

1. Arrive new patient (Anonymous for quick set up)
2. Initial Documentation (Triage)
	1. Document Arrival Info – click ‘Arrived’
	2. Document Assessment – Sepsis screening
	3. Document Triage Complete
3. Go to ED Manager, room patient (drag & drop)
4. Place orders
5. Result labs

|  |  |  |
| --- | --- | --- |
| **MRN: 4489365** | **MRN: 4489366** | **MRN: 4489367** |
| Name: Test, Sepsis 5 | Name: Test, Sepsis 6 | Name: Test, Sepsis 7 |
| Sepsis Screening: **Negative** @ triage | Sepsis Screening: **Positive** @ triage | Sepsis Screening: **Negative** @ triage |
| **Chief Complaint: Blood Infection** | Chief Complaint: None | Chief Complaint: None |
| BP: 120/80 | BP: 89/70 | BP: 89/70 |
| Resp: 18 | Resp: 19 | Resp: 19 |
| Temp: 39 | Temp: 39 | Temp: 39 |
| Pulse: 101 | Pulse: 91 | Pulse: 91 |
| Lactate: 20 mg/dL | Lactate: 20 mg/dL | Lactate: 20 mg/dL |
| WBC: 13.00 x 10E/uL | WBC: 13.00 x 10E/uL | WBC: 13.00 x 10E/uL |
| BILIRUBIN: 2.5 mg/dL | BILIRUBIN: 2.5 mg/dL | BILIRUBIN: 2.5 mg/dL |
| Creatinine: 2.1 mg/dL | Creatinine: 2.1 mg/dL | Creatinine: 2.1 mg/dL |

ED RN workflows –

* ED Narrator: list on **Event Log** –
	+ Quite busy, may not see lab resulted, especially if not flagged red.
	+ Assessment: Sepsis Screening or Flowsheet: Screening tab, Sepsis Screening (bottom)
		- Some nurses do use Flowsheet activity; to be cleaned up
* Track Board: on *My list* of patients, can see **Lab Stat** column
* Follow-up

**Misc notes**

Research on BPA trigger: Open Nursing Narrator Activity [67], only impact ED Narrator

**Open Nursing Narrator Activity -** [**Galaxy**](https://galaxy.epic.com/#Browse/page=8100!68!90!280769,2784890,2784922)

Checked when a nurse opens the ED Narrator for the first time. After an advisory with this triggering action first appears, it won't appear again until a nurse closes and reopens the patient's ED chart. This triggering action initially checks all advisory criteria.

Lactate – how to result in ED, reference ranges for displaying “red”. Reference range is 5 - 25