

CCHMC Sepsis Algorithm



Algorithms guide care but are not intended to replace clinical judgement, nor capture all nuances of critical care.

CONCERN FOR SEPSIS
Clinical Concern Positive Screen (ED, PICU, CICU) SA Huddle Discussion

SITUATION AWARENESS HUDDLE or ED SEPSIS HUDDLE

Evaluate for Signs of Shock: Altered Perfusion

- Cool extremities
- Delayed capillary refill (> 2 sec); diminished pulses; mottling
- Flushed; warm extremities; bounding pulses; flash capillary refill (< 1 sec)
- Altered mental status (confusion, sleepiness, fussiness)
- Hypotension (**late finding**)

Yes, concern for shock No, but concern for and/or at risk of sepsis

Altered Perfusion?

SEPTIC SHOCK RED PATHWAY

GOALS: Reverse shock, antibiotics within 60 minutes

- Utilize CCHMC or Unit-Specific Septic Shock Order Set*
- Initiate monitors (Q15 minute vital signs)
 - Rapid IV access; IO if PIV cannot be obtained quickly
 - Oxygen as needed
 - Rapid bolus of NS or LR 10-20 mL/kg** (Push pull bolus or rapid infuser)
 - STAT CBC, blood culture, BMP, blood gas, lactic acid. Other labs as indicated to assess for organ dysfunction (see back)
 - Order antibiotics STAT
 - Designate Watcher status/MRT criteria; Activate MRT if indicated
- **Smaller volumes if clinically indicated

- Reassess**
- Vital signs q15 minutes
 - Response to fluid & for signs of fluid overload (rales, new/worse hypoxemia)
 - Signs of persistent shock
 - Consider additional fluid boluses, up to 40-60 mL/kg total over the 1st hour (10-20 mL/kg per bolus) until shock resolves or signs of fluid overload develop

Continued signs of shock? No → Monitor closely, ongoing care

- Ongoing Resuscitation**
- Administer antibiotics within 60 min** of shock recognition
 - Reassess response to fluid & for signs of fluid overload (rales, new/worse hypoxemia)

Continued signs of shock? No → Monitor closely, ongoing care

- Ongoing Resuscitation & Sepsis Care***
- Initiate epinephrine or norepinephrine if shock persists after 40-60mL/kg (sooner if signs of fluid overload develop)
 - When available, assess cardiac function; consider epinephrine if there is myocardial dysfunction
 - Airway management: consider trial of noninvasive ventilation if ARDS & responding to resuscitation; consider intubation for resistant shock, avoid etomidate; utilize high PEEP
 - Early infectious source control (including surgical)
 - Avoid hypoglycemia / address electrolyte abnormalities
 - Repeat lactic acid if abnormal

Other considerations: Invasive hemodynamic monitoring; Hydrocortisone for refractory shock (risk/benefit unclear); ECLS for refractory shock or oxygenation / ventilation failure (after addressing other causes of shock & respiratory failure)

SUSPECTED SEPSIS YELLOW PATHWAY

GOALS: Expedite diagnostic evaluation, recognize developing shock

- Utilize CCHMC or Unit-Specific Septic Shock Order Set*
- Initiate monitors (Q15 minute vital signs)
 - IV access
 - Consider rapid bolus of NS or LR 10-20 mL/kg** (Push pull bolus or rapid infuser)
 - STAT CBC, blood culture, BMP, blood gas, lactic acid. Other labs as indicated to assess for organ dysfunction (see back)
 - Consider additional labs & imaging to identify source of infection
 - Consider Watcher status, Specify MRT criteria
 - Evaluate for developing shock
- *Populations with protocols for antibiotics for fever (GI, CBDI, CVL, etc.) should have antibiotics initiated within those timeframes
**Smaller volumes if clinically indicated

Signs of shock? Yes → Move to RED Pathway

- Reassess**
- Vital signs
 - Response to fluid & for signs of fluids overload (rales, new/worse hypoxemia)
 - When indicated, antibiotics should be ordered STAT & administered ASAP
 - Consider need for additional fluid boluses (10-20 mL/kg per bolus)
 - Evaluate for developing shock

Signs of shock? Yes → Move to RED Pathway

- Ongoing care, Monitor closely**
- Administered antibiotics as soon as indicated & within 3 hours of initial suspicion of sepsis*** (if indicated)
 - Ongoing monitoring & reassessments for clinical deterioration

*Septic Shock Order Sets

Ensures comprehensive sepsis management, including indicated labs, & that antibiotics are ordered STAT

- Septic Shock Algorithm (used on **acute care units**)
- **ED** Septic Shock Algorithm
- **PICU** Septic Shock Admission (or Abbreviated)
- Septic Shock Algorithm for **GI**
- **BMT** Sepsis Order Set
- Sepsis **Hem/Onc**
- **CICU** Septic Shock Abbreviated

See next page for antibiotic & lab recommendations

30 min

1 hr

1 hr

3 hrs

SEPTIC SHOCK CLOCK



(use for patient on **RED** pathway)

Sepsis or Septic Shock? → Yes/Unsure → **CALL A SITUATION AWARENESS (SA) HUDDLE or MRT**

Start Time: _____

60 Minute Re-Assessment

Time: _____

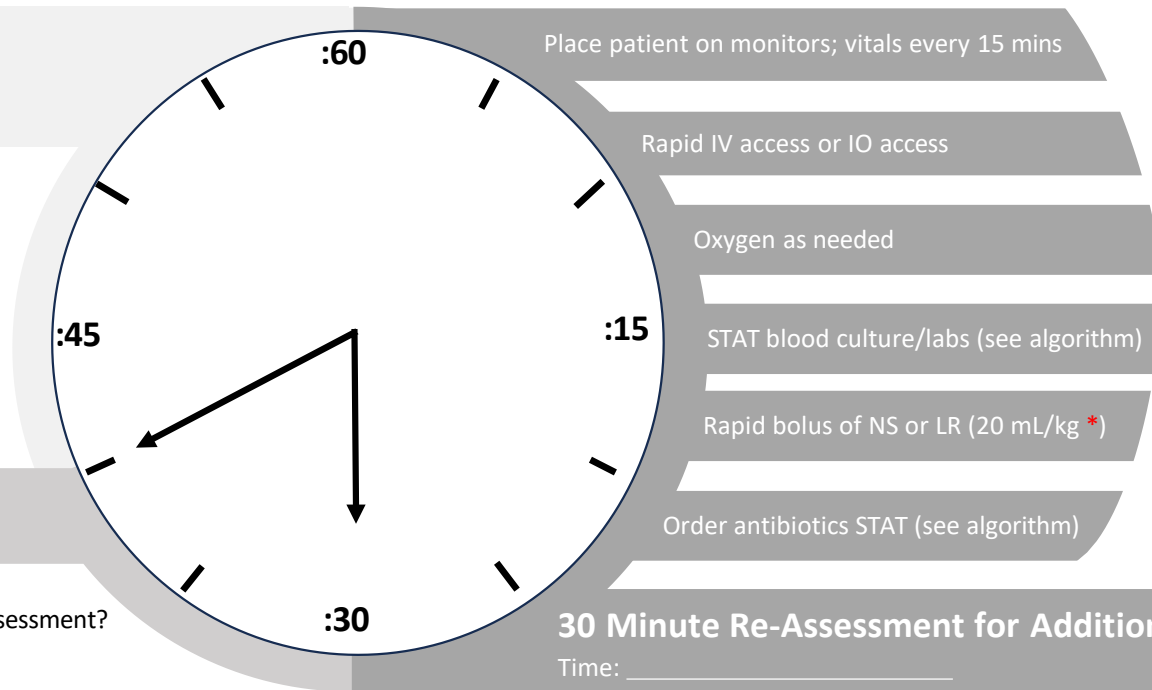
Antibiotics given? YES NO

- Shared mental model performed?**
 - Is there altered perfusion?
 - If yes, call MRT**
 - Are there signs of fluid overload?
 - If yes, call MRT**
 - Is a higher level of care needed for vasopressor/inotropic initiation?
 - If yes, call MRT**

40 Minute Re-Assessment

Time: _____

- Did a shared mental model take place on re-assessment?
- Is there altered perfusion?
 - Are there signs of fluid overload?



Place patient on monitors; vitals every 15 mins

Rapid IV access or IO access

Oxygen as needed

STAT blood culture/labs (see algorithm)

Rapid bolus of NS or LR (20 mL/kg *)

Order antibiotics STAT (see algorithm)

30 Minute Re-Assessment for Additional Bolus

Time: _____

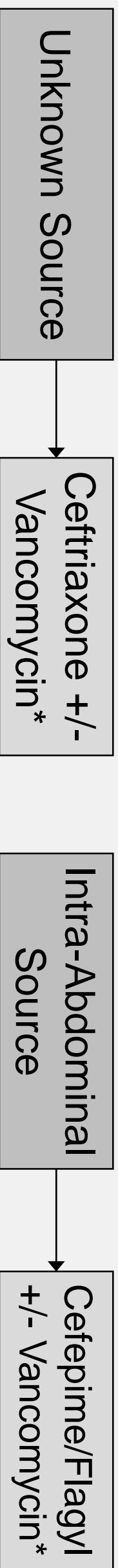
***Goal = restore/maintain adequate perfusion and avoid fluid overload**

- Reassess perfusion/clinical status after each bolus

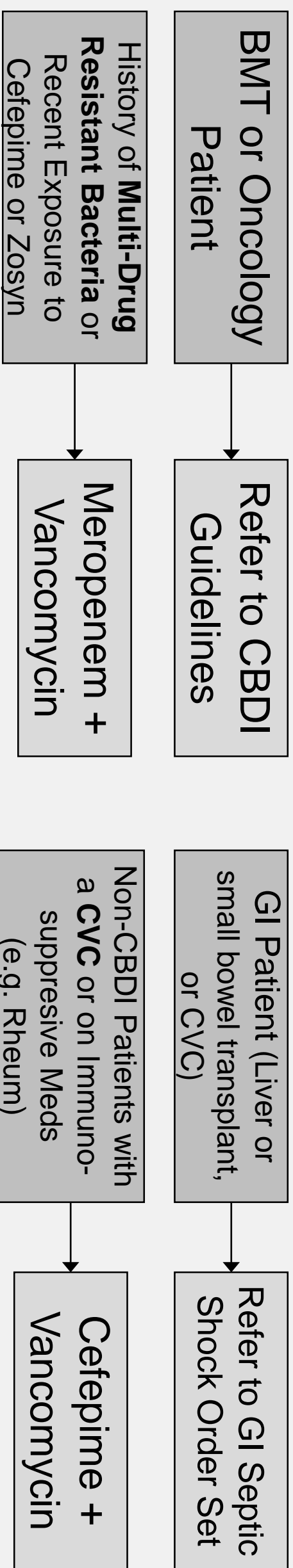
Should this patient be made a watcher / MRT called?

Antibiotic Recommendations

Previously Healthy Patient



Medically Complex Patient



*Vancomycin is indicated for children with **MRSA risk factors** or **highly-resistant S. pneumoniae** & when it is ordered, it should be administered after the 1st antibiotic listed above.

- **MRSA risk factors:** bone/joint/deep tissue infection; personal history or family history of MRSA infection of recurrent boils
- **Highly-resistant S. pneumoniae risk factors:** recent B-lactam exposure, daycare attendance, unvaccinated

Additional Lab Recommendations

All patients: CBC, blood culture, BMP, blood gas, lactic acid

As needed to identify source/based on underlying conditions: UA/Urine culture, LFTs, HCG, CXR, and/or

CSF, viral, wound, trach studies

If signs of coagulopathy: PT/PTT, INR, Fibrinogen, type/screen

If concerned for osteomyelitis or septic joint: ESR, CRP

Advanced care as needed: Procalcitonin, additional or advanced imaging