

Evidence-Based Clinical Care: Surviving Sepsis



Eduardo Martinez-DuBouchet, M.D.

Medical Director of Telehealth,
eICU, Transfer Center

Disclosures



Narrators

Eduardo Martinez-DuBouchet, M.D., indicated that neither he nor his spouse/partner has relevant financial relationships with commercial interest companies, and he will not include off-label or unapproved product usage in his presentation or discussion.

Katia Jimenez, M.D., CCDS, indicated that neither she nor her spouse/partner has relevant financial relationships with commercial interest companies, and she will not include off-label or unapproved product usage in her presentation or discussion

Design Team

All content contributors, including all sepsis and design team members, have indicated that neither they nor their spouses/partners have relevant financial relationships with commercial interest companies, and they will not include off-label or unapproved product usage in their presentations or discussions.

All other team members and those involved in the narration, planning, development and editing/review of the content have no relevant financial relationships to disclose.

Objectives



- Discuss factors used to identify patients presenting with sepsis.
- Review evidence-based best-practice management of sepsis.
- Describe our team role in time-sensitive sepsis management.

Sepsis Stone Age



- Life-threatening organ dysfunction caused by a dysregulated host response to infection
- Yet no individualized treatment to date for that host response (Treatment is similar across all phenotypes)
- Current management is infection control and organ support

Case



62 y.o. female brought by family to the ED with history of syncope at home. She states she has felt a dull full feeling in her left lower abdomen for 4 days, and this morning had 3 bloody bowel movements, leaving her feeling weak and dizzy. She has taken nothing by mouth except sips of tea today.



- PMHX- hypertension managed with metoprolol, diet controlled DM with a hgba1c 7.1 three months ago and a BMI of 36, breast cancer this year post-mastectomy and last chemotherapy 4 weeks ago
- Allergy- penicillin (rash after taking it for a few days 30 years ago for a dental procedure)



- VS – BP 100/60, HR 98, R 22, and O2 sat 100% on room air, T 99.4 F (standing BP 90/51, HR 110)
- Pale conjunctiva
- Abdomen- palpable discomfort left lower quadrant, no rebound or guarding
- Rectal normal exam except noted blood on glove
- Extremities warm with easily palpable pulses



- Chest X-ray – normal findings with chemo port in good position
- EKG- sinus tachycardia, nonspecific lateral ST changes and high lateral R waves in AVL, V5, V6 consistent with LVH
- Troponin 2.1
- Lab calls with a critical hemoglobin 6.2



- Labs- glucose 195, creatinine 1.5, BUN 47, hgb 6.5, WBC 3.5
- Despite IVF and blood transfusion, her BP deteriorates to 88/50, repeat hgb 8.5 after 2 units PRBC.
- Her urine output remains low at 30ml/hr.
- Bedside echocardiogram reports EF 30% globally depressed with LVH



- Rapid micro results with positive gene expression for MRSA in blood cultures done in triage and E. coli 2/2
- CT abdomen and pelvis- some thickening of the sigmoid colon wall, with possible small adjacent collection



SIRS

Signs of systemic inflammatory response syndrome (SIRS)

SIRS—defined by presence of two or more criteria of following

Heart rate	>90 beats/min
Core temperature	<36°C or >38°C
White blood count	<4000 or >12000/mm ³
Respirations	>20/min or PCO ₂ <32 mm Hg

How Do We Screen for Sepsis?



Table 2. Definitions of Sepsis, Severe Sepsis, and Septic Shock

Sepsis Category	Sepsis-3	2001 Sepsis	CMS SEP-1
Sepsis	SOFA score ≥ 2 + suspected infection	2 of 4 SIRS criteria + suspected infection	2 of 4 SIRS criteria + suspected infection
Severe sepsis	Not applicable	Sepsis + organ dysfunction, hypoperfusion, or hypotension	Sepsis + sepsis-induced organ dysfunction*
Septic shock	Vasopressor requirement to maintain MAP ≥ 65 mm Hg + serum lactate level > 2 mmol/L in the absence of hypovolemia	Sepsis-induced hypotension persisting after adequate IV fluid resuscitation + presence of perfusion abnormalities or organ dysfunction	<ul style="list-style-type: none"> Lactate > 4 mmol/L SBP < 90 mm Hg, not responsive to IV fluids or <ul style="list-style-type: none"> MAP < 70 mm Hg, not responsive to IV fluids

*Organ dysfunction variables according to CMS SEP-1 include: SBP < 90 mm Hg or MAP < 70 mm Hg, or a SBP decrease > 40 mm Hg or < 2 SD below normal for age or known baseline; creatinine > 2.0 mg/dL (176.8 mmol/L) or urine output < 0.5 mL/kg/hr for > 2 hr; bilirubin > 2 mg/dL (34.2 mmol/L); platelet count $< 100,000$; coagulopathy (INR > 1.5 or aPTT > 60 sec); lactate > 2 mmol/L (18.0 mg/dL).

Abbreviations: aPTT, activated partial thromboplastin time; CMS, Centers for Medicare and Medicaid Services; INR, international normalized ratio; MAP, mean arterial pressure; SBP, systolic blood pressure; SD, standard deviation; SIRS, systemic inflammatory response syndrome; SOFA, sequential organ failure assessment.

qSOFA Vs. SIRS



- 46.7% sensitive in ED
- Pooled specificity 72%
- 2/3 of AMS, $RR \geq 22$,
 $SBP \leq 100$
- Identifies patients at high risk of death

Encephalopathy = High Risk

- 83.6% sensitive in ED
- Specificity 25.8%
- Superior screening

Fernando SM, Tran A, Taljaard M, et al. Prognostic accuracy of the Quick Sequential Organ Failure Assessment for mortality in patients with suspected infection: A systematic review and meta-analysis. *Ann Intern Med* 2018;168:266-275.

Severe Sepsis = Organ Dysfunction



- 1. Lactate > 2 mmol/L
- 2. INR > 1.5 or aPTT > 60 seconds
- 3. Platelet count $< 100,000$
- 4. Bilirubin > 2 mg/dL
- 5. Creatinine > 2 , or urine output < 0.5 mL/kg/hour for 2 hours
- 6. Systolic blood pressure (SBP) < 90 mmHg, or mean arterial pressure (MAP) < 65 mmHg, or decrease in SBP more than 40 mmHg from last previously recorded SBP “normal” for patient

Or



- Numeric criteria for severe sepsis are not met; however, there is physician/ARNP/PA documentation of sepsis, severe sepsis or septic shock.

CMS Requirement



Two initiatives for improvement in sepsis management come from the Surviving Sepsis Campaign and the Centers for Medicare & Medicaid (CMS).

In 2002, the Surviving Sepsis Campaign began with a goal to reduce mortality from severe sepsis and septic shock worldwide. It was a joint collaboration of the Society of Critical Care Medicine and the European Society of Intensive Care Medicine. The campaign focused on using bundles (a selected set of elements used together within a specified time frame) to improve the treatment and survival of patients diagnosed with sepsis. Here are the current recommendations.

To be completed within 3 hours of presentation*:

- 1** Measure lactic acid level.
- 2** Obtain blood cultures before administering antibiotics.
- 3** Administer broad-spectrum antibiotics.
- 4** Administer 30 mL/kg crystalloid for hypotension or lactic acid ≥ 4 mmol/L.

To be completed within 6 hours of presentation:

- 5** Apply vasopressors (for hypotension that does not respond to initial fluid resuscitation) to maintain a mean arterial pressure (MAP) ≥ 65 mmHg.

- 6** In the event of persistent hypotension after initial fluid administration (MAP < 65 mmHg) or if initial lactic acid was ≥ 4 mmol/L, reassess volume status and tissue perfusion and document findings.

- 7** Remeasure lactic acid if initial level elevated.

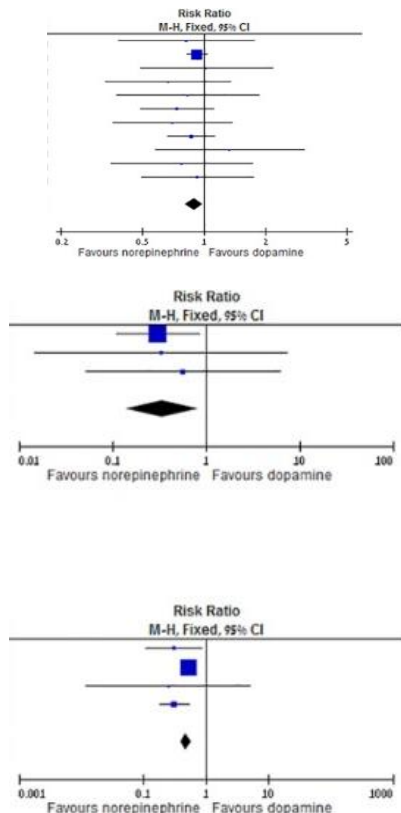
*Time of presentation is the time of triage in the emergency department or, if presenting from another care venue, from the earliest chart annotation consistent with all elements of severe sepsis or septic shock ascertained through chart review.

The CMS Severe Sepsis/Septic Shock Early Management Bundle (SEP-1) took effect in 2015. The bundle consists of core measures that must be completed within 3- and 6-hour time frames. Hospitals are required to achieve 100% compliance with all the bundle elements. The CMS bundle has been criticized by clinicians; Aaronson and colleagues note its “ambiguous definition of severe sepsis and septic shock, prescriptive fluid volume requirements, rigid reassessment, and complex abstraction logic.”

Sources: Surviving Sepsis Campaign. Updated bundles in response to new evidence. April 2015. survivingsepsis.org/SiteCollectionDocuments/SSC_Bundle.pdf; Aaronson EL, Filbin MR, Brown DF, Tobin K, Mort EA. New mandated Centers for Medicare and Medicaid Services requirements for sepsis reporting: Caution from the field. *J Emerg Med*. 2017;52(1):109-116.



Norepinephrine vs. Dopamine

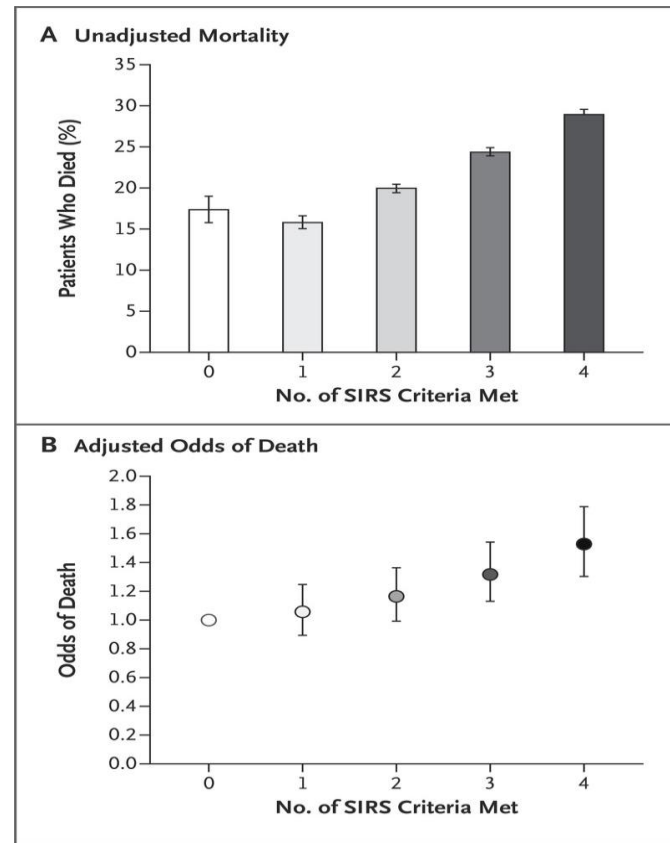
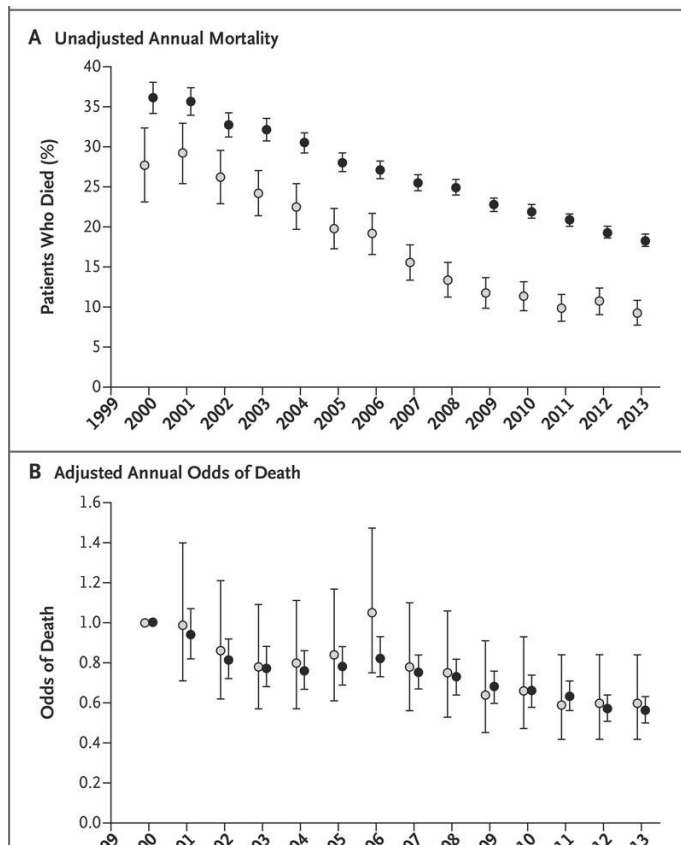


- All Cause Mortality
- Adverse Events
- Cardiac Arrhythmias

Vasopressors for the Treatment of Septic Shock: Systematic Review and Meta-Analysis Avni T, Lador A, Lev S, Leibovici L, Paul M, Grossman A. PLoS One. 2015 Aug 3;10(8)



Kaukonen KM et al. Systemic Inflammatory Response Syndrome Criteria in Defining Severe Sepsis. NEJM 2015. [PMID: 25776936](https://pubmed.ncbi.nlm.nih.gov/25776936/)

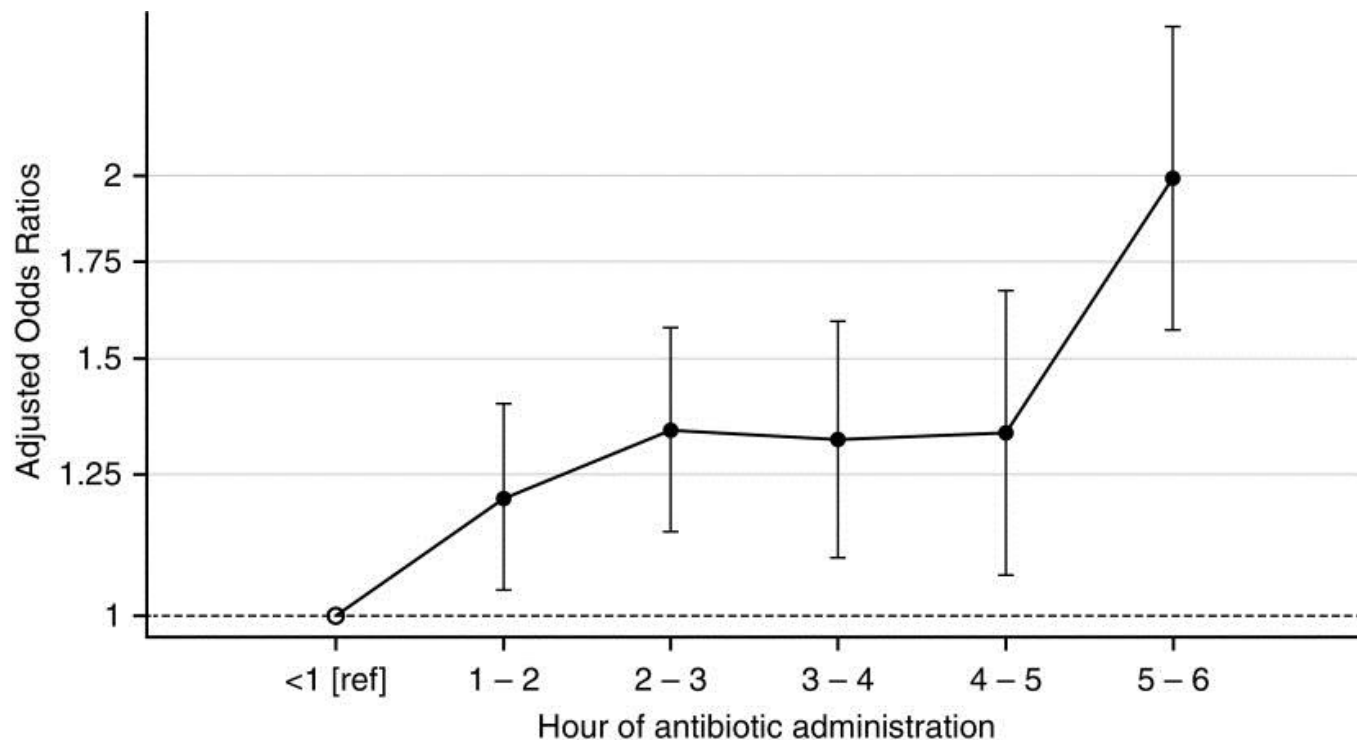


Blood Culture Results Before and After Antimicrobial Administration in Patients With Severe Manifestations of Sepsis: A Diagnostic Study

Ann Intern Med. 17 September 2019 Matthew P. Cheng et al.



- Severe sepsis with SBP < 90 or lactate ≥ 4 mmol/L
- Pre-antibiotic blood cultures 31.4% positive
- Post-antibiotic blood cultures 19.4% positive
- Absolute difference 12.0% (95% CI, 5.4% to 18.6%; $P < 0.001$)



Adjusted odds ratios for hospital mortality comparing patients within each hourly antibiotic administration group with the reference group of patients given antibiotics in <1 hour. The *y-axis* is on logarithmic scale and the *error bars* represent 95% confidence intervals.

Vincent X. Liu et al. Am J Respir Crit Care Med. 2017 Oct 1;196(7):856-863. The Timing of Early Antibiotics and Hospital Mortality in Sepsis.



Severe Sepsis and Septic Shock Trials Rivers EGDT 2001 vs. (ProCESS, ARISE, ProMISe) 2014-2015: What Is Optimal Resuscitation?

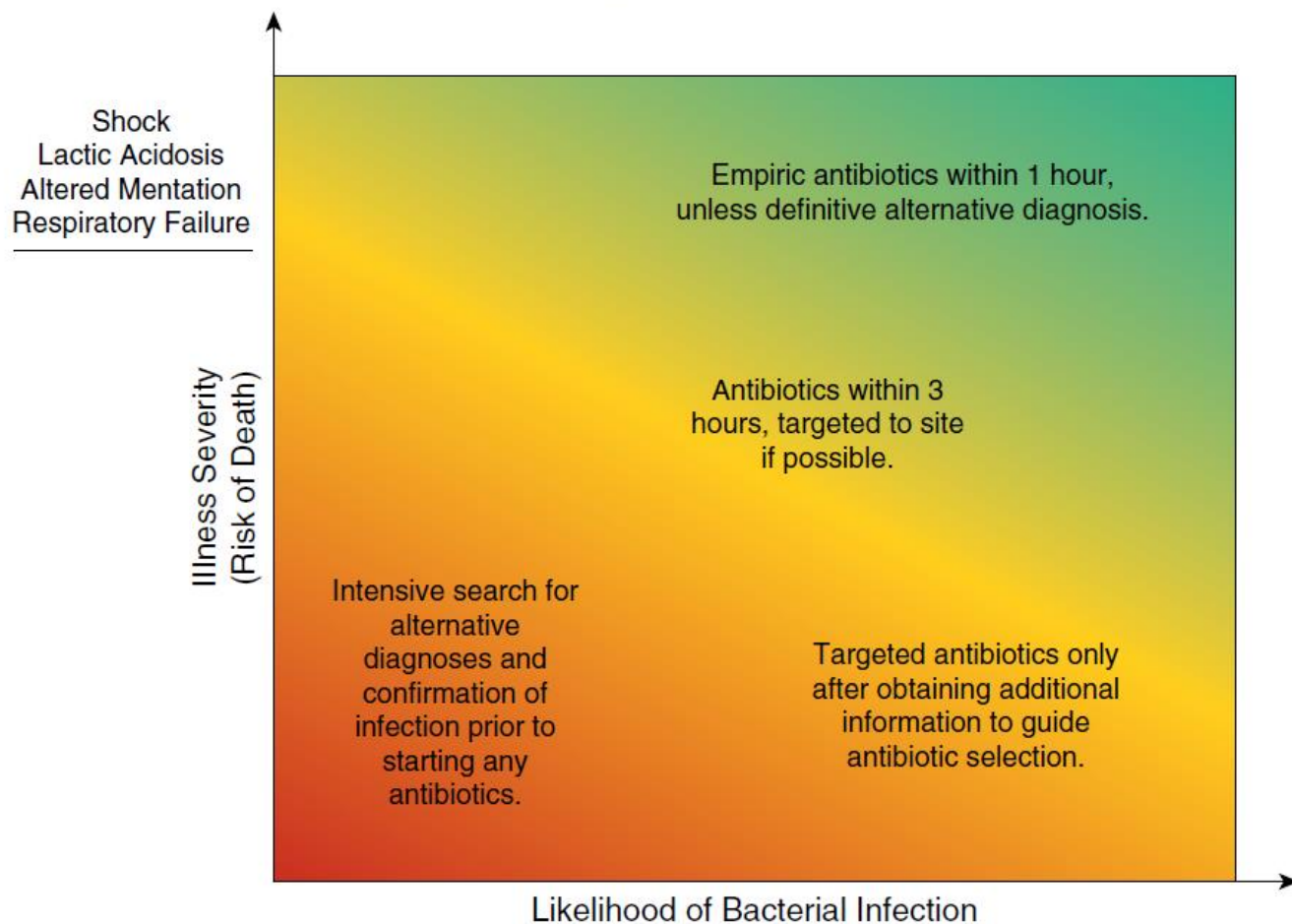
Improving Sepsis Treatment by Embracing Diagnostic Uncertainty



- Surviving Sepsis Campaign released a new 1-hour treatment bundle, strengthening the recommendation that antibiotics be delivered within 60 minutes
- ???Indiscriminate use of broad-spectrum antibiotics
- Decision to administer antibiotics must often be made when the diagnosis is still uncertain



Framework for Timing and Broadness of Initial Antimicrobials



30-Day Mortality (%) Sepsis and Intermediate Lactic Acid



- Prebundle 2012
- Hx CHF 18.8%
- Hx CKD 15.9%
- Postbundle 2013
- 17.8%
- 13.3%

Liu VX, Morehouse JW, Marelich GP, Soule J, Russell T, Skeath M, Adams C, Escobar GJ, Whippy A. Multicenter implementation of a treatment bundle for patients with sepsis and intermediate lactate values. **Am J Respir Crit Care Med** 2016;193: 1264 – 1270



The NEW ENGLAND JOURNAL *of* MEDICINE

Time to Treatment and Mortality During Mandated Emergency Care for Sepsis

Christopher W. Seymour, M.D., Foster Gesten, M.D., Hallie C. Prescott, M.D.,
Marcus E. Friedrich, M.D., Theodore J. Iwashyna, M.D., Ph.D.,
Gary S. Phillips, M.A.S., Stanley Lemeshow, Ph.D., Tiffany Osborn, M.D., M.P.H.,
Kathleen M. Terry, Ph.D., and Mitchell M. Levy, M.D.

June 8, 2017
N Engl J Med 2017; 376:2235-2244

Rate of Fluid Bolus



- There is less evidence that the rate of bolus or completion within the time frame changes mortality
- Found no association between the time to completion of the initial bolus of intravenous fluids and outcome



0.9% Saline

- Increased volume expansion +++
- Diuresis ++
- Hyperchloremia
- Metabolic acidosis
- Chloride causes tubuloglomerular feedback with constrictive adenosine and worse GFR

Balanced solutions

- Volume expansion ++
- Diuresis +++
- Renal artery flow velocity
- Renal cortical perfusion

SMART



- Semler MW et al. Balanced Crystalloids Versus Saline in Critically Ill Adults. N Engl J Med 2018; 378:829-839
- Critically ill adults
- (Balanced crystalloids vs. saline)
- Lower rate composite outcome death, new RRT, or persistent renal dysfunction than the use of saline.

Fluid Responsiveness



- The ability to increase cardiac output after fluid administration
- Requires functional hemodynamic monitoring

Fluid Creep

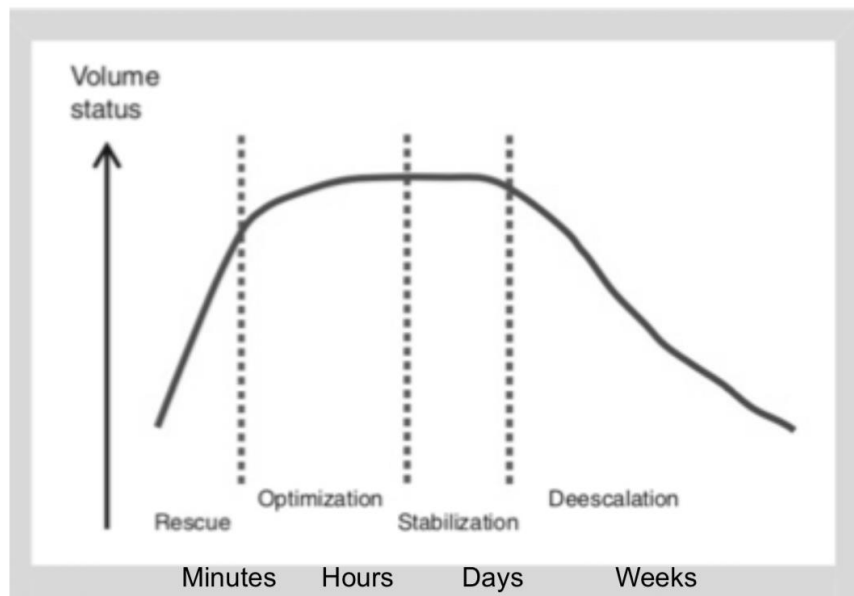


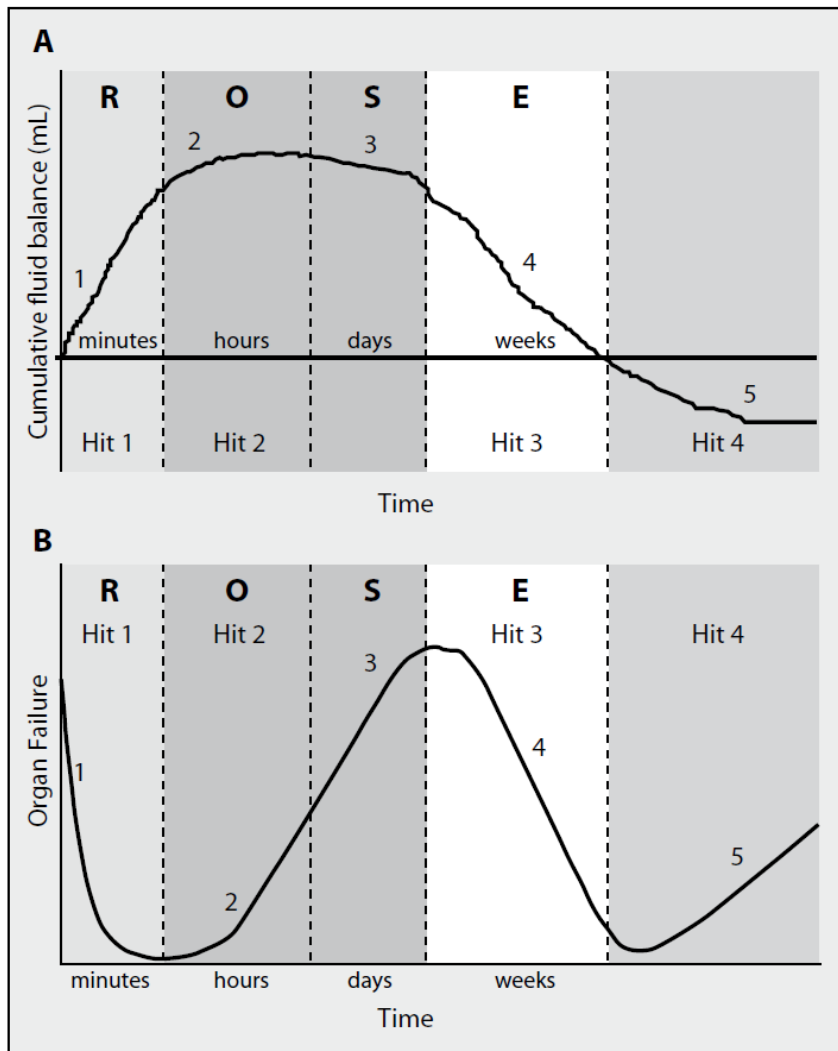


SPECIAL ARTICLES

Four phases of intravenous fluid therapy: a conceptual model[†]

E. A. Hoste^{1,2}, K. Maitland^{3,4}, C. S. Brudney⁵, R. Mehta⁶, J.-L. Vincent⁷, D. Yates⁸, J. A. Kellum⁹, M. G. Mythen¹⁰ and A. D. Shaw¹¹ for the ADQI XII Investigators Group





Fluid overload, de-resuscitation, and outcomes in critically ill or injured patients: a systematic review with suggestions for clinical practice

Manu L.N.G. Malbrain, Paul E. Marik, Ine Witters, Colin Cordemans, Andrew W. Kirkpatrick, Derek J. Roberts, Niels Van Regenmortel Anaesthesiology Intensive Therapy 2014, vol. 46, no 5, 361–380

After Hemodynamic Stabilization



- Conserve fluids
- Diurese
- May need RRT

Deresuscitation



In ARDS, sepsis or SIRS, a conservative or deresuscitative fluid strategy results in an increased number of ventilator-free days and a decreased length of ICU stay compared with a liberal strategy or standard care

Intensive Care Med. 2017 Feb;43(2):155-170

Conservative fluid management or deresuscitation for patients with sepsis or acute respiratory distress syndrome following the resuscitation phase of critical illness: a systematic review and meta-analysis.

Silversides JA, Major E, Ferguson AJ, Mann EE, McAuley DF, Marshall JC, Blackwood B, Fan E.

XXCPOBHM, TestPatient - 10000142 Opened by Martinez-DuBouchet, Eduardo M MD

Task Edit View Patient Chart Links Notifications Options Current Add Help

Message Center Physician Handoff Patient List MyExperience eCoach Quality Measures Summary

E-FORCSE Physician On-Call Schedules ISS Injury Severity Score Secure Messaging

Sign: 0

UpToDate Non Opioid Alternatives FL Exit Communicate Patient Education iAware Patient Pharmacy New Sticky Note View Sticky Notes Tear Off Suspend Charges Calculator AdHoc PM Conversation Add Discern Reporting Portal Specimen Collection

XXCPOBHM, TestPatient

XXCPOBHM, TestPatient

CMRN: 100383402

Allergies: penicillin, Ativan

DOB:01/01/80

Age:39 years

Dose Wt:40.000 kg (08/29/2019)

Sex:Female

MRN:10000142

Attending:Baigorri, Francisco Javier MD

Same Day Surgery FIN: 900364148 [Visit Dt: 11/01/2016 11:16:00 EDT] Visit Reason: Test encou...Loc:BH_PREO

Patient Portal: No

No XDCos

Menu

Intensivist View

Interactive View and I&O

Clinical Notes + Add

Lines/Tubes/Drains

Results Review

Allergies + Add

Problems/Dx/PMH

Histories

Orders + Add

Medication List + Add

MAR Summary

Documentation + Add

Outside Records

Patient Information

Clinical Images + Add

Form Browser

Provider Face Sheet

eCoach

Orders

Document Medication by Hx Reconciliation * Check Interactions External Rx History Rx Plans (0): No Benefit Found

Reconciliation Status

Meds History Admission Discharge

Orders Medication List

View

Orders for Signature

Plans

Medical

EBCC MED Sepsis Quick Orders for Adults_B (Planned Pen

Suggested Plans (0)

Orders

Admit/Transfer/Discharge/Status

Patient Care

Activity

Diet/Nutrition

Continuous Infusions

Medications

Laboratory

Diagnostic Tests

Card/Vasc/Neuro

Respiratory

Therapies

Consults/Referrals

Communication Orders

Supplies

Procedures

Special

Non Categorized

Medication History

Medication History Snapshot

Reconciliation History

Component

Status

Dose ...

Details

ADD metronidazole (Flagyl) if anaerobes are suspected.

metronIDAZOLE (Flagyl)

500 mg. IV Piggyback, Soln-IV, Every 8 hrs, Sepsis no clear source - Empiric, A...

ADD metronidazole (Flagyl) if anaerobes are suspected. First dose STAT.

For patients with prior ESBL infections:

meropenem (Merrem)

1,000 mg. IV Piggyback, Soln-IV, Once, Sepsis no clear source - Empiric, Admi...

Obtain blood cultures before antibiotic administered. For patients with prior E...

For patients with prior ESBL infections. Give Meropenem (Merrem) 1 gm IV x ...

Communication Order

Consult to Infectious Diseases Specialist

ADD vancomycin IV if patient has any of the following:

Sepsis of unknown source, prior MRSA infection, HIV, antibiotic use or surgery or hospitalization within 30 days, residence in a long term care facility, hemodialysis, indwelling IV catheter.

vancomycin

Select an order sentence

vancomycin

Select an order sentence

Septic Shock

If Lactic acid level greater than or equal to 4 and/or persistent hypotension defined as Systolic Blood Pressure (SBP) less than 90, or Mean Arterial Pressure (MAP) less than 65, give:

Sodium Chloride 0.9% intravenous solution (sodium c...

Select an order sentence

OR

Lactated Ringers Injection intravenous solution (lactated ringer's bolus)

30 mL/kg/dose, IV Bolus, Soln-IV, Once, Administer over: 60 minutes, Star...

If Lactic acid level greater than or equal to 4 and/or persistent hypotensio...

If IV fluid bolus given. Check MAP and SBP every 30 minutes until SBP greater ...

Communication Order

Laboratory

Lactic Acid with Reflex

Blood, ST, T;N

Order and Draw

a repeat lactic acid should be obtained within 3 hours of time zero if initial lac...

CBC with Diff (BHSF) (CBC with Diff)

Blood, Stat, T;N

Urinalysis with Reflex Culture

collect Stat, T;N

Culture, Blood-Peripheral

Blood, Blood,Peripheral, for 2 times, Obtain blood cultures before antibiotic a...

Communication Orders

Notify Treating Provider (Vital Signs)

SBP greater than 180 mmHg, SBP less than 100 mmHg, Mean AP less than 65 ...

Notify Provider

for vasopressor orders if patient remains hypotensive after 30mL/kg bolus given

Sepsis Quality Measures

Details for Lactated Ringers Injection intravenous solution (lactated ringer's bolus)

Dx Table Orders For Cosignature Save as My Favorite

Plan for Later Initiate Now

Alerts

Patient is pending discussion about non-opioid alternatives. Click here to document.

P574 EDUARDOMD September 20, 2019 12:02 EDT

lactated ringer's bolus

Dose Values

- 1) Target dose: 30 mL/kg/dose
- 2) Calculated dose: 1,299.81 mL
- 3) Dose Adjustment: 1,299.81 mL 100 %
- 4) Final dose: 1,299.81 mL 30 mL/kg/dose
- 5) Standard dose: mL mL/kg/dose
- 6) Rounding rule: No rounding
- 7) Adjust Reason:
- 8) Route: IV Bolus

Dose Forms Order Comments

If Lactic acid level greater than or equal to 4 and/or persistent hypotension defined as Systolic Blood Pressure (SBP) less than 90, or Mean Arterial Pressure (MAP) less than 65, give Lactated Ringers 30 mL/kg IV bolus x 1 STAT

- Check MAP and SBP every 30 minutes until SBP greater than 90 and/or MAP greater than 65.
- Notify provider for vasopressor order if patient remains hypotensive.
- Focused Reassessment to be done immediately upon completion of the 30 mL/kg fluid bolus.

Reference Data

Date of birth: 01/01/1980 (39 Years)

Sex: Female

Ethnicity: Non Hispanic

Height: 150 cm

Source: Manually entered

Actual weight: 85 kg

Source: Manually entered

Adjusted weight: 43.327 kg

Adjustment: Ideal body weight

Serum creatinine: mg/dL

Source: Manually entered

CrCl (est.): mL/min

Algorithm: Manually entered

Body surface area: 1.35 m2

Weight Used for CrCl: Manually entered

Last Dose Calculation

Formulae... Standard Dose Reference

Apply Standard Dose

Apply Dose

Cancel

Orders Medication List Document In Plan

- View
- Orders for Signature
 - Plans
 - Document In Plan
 - Medical
 - EBCC ED Suspected Sepsis and/or Neutropenic Fever (Initiated Pending)
 - EBCC MED ENDO Sus Insulin (Diabetes/Hypertension) (Initiated)
 - MED General Admission_B (Initiated)
 - PSO Patient Status (Initiated)
 - MED Adult Tel (Initiated)
 - MED Adult Int (Initiated)
 - EBCC ED Chest Angina/NSTEMI_B (Discontinued)
 - EBCC ED Chest Angina/NSTEMI_B (Discontinued)
 - Interdisciplinary
 - Suggested Plans (0)
 - Orders
 - Admit/Transfer Status
 - Patient Care
 - Activity
 - Diet/Nutrition
 - Continuous Infusions
 - Medications
 - Laboratory
 - Diagnostic Tests
 - Card/Vasc/Neuro
 - Respiratory
 - Therapies
 - Consults/Referrals
 - Communication Orders
 - Supplies
 - Procedures
 - Special
 - Non Categorized

- Right Click
- Evidence
 - Remove
 - Plan for later
 - Check Alerts
 - Add Comment
 - Save as My Favorite

Component	Status	Dose ...	Details
EBCC ED Suspected Sepsis and/or Neutropenic Fever_B (Initiated Pending)			
Patient Care			
<input type="checkbox"/> NPO			Except for Medications
<input type="checkbox"/> ED Cardiac Telemetry			Reason: Sepsis
<input type="checkbox"/> Pulse Oximetry Continuous			STAT
<input type="checkbox"/> POCT Glucose-Monitor			STAT
<input type="checkbox"/> Intake and Output			Strict.If urine output is less than 240 mL over 8 hours and no indwelling urinary catheter is present, perform b...
<input type="checkbox"/> Notify Treating Provider			If urine output is less than 240 mL over 8 hours and no indwelling urinary catheter is present, perform b...
<input type="checkbox"/> Notify Provider			If urine retention is still greater than 400 mL after second straight cath
<input type="checkbox"/> Saline lock with routine flush			If no urination within 4 hours
<input type="checkbox"/> Saline lock with routine flush			# 1 -18 gauge or larger
<input type="checkbox"/> EKG Standard			# 2
<input type="checkbox"/> Oxygen Therapy			Stat, Sepsis
<input type="checkbox"/> Sepsis Quality Measures			Nasal Cannula, Flow Rate (L/min): 2, SpO2 goal 94% or greater
Continuous Infusions			
<input type="checkbox"/> Sodium Chloride 0.9% intravenous solution			IV Continuous, 1,000 mL Order Rate: 150 mL/hr, Soln-IV
<input type="checkbox"/> Lactated Ringers Injection intravenous solution			IV Continuous, 1,000 mL Order Rate: 150 mL/hr, Soln-IV
Medications			
<input type="checkbox"/> sodium chloride (sodium chloride 0.9% flush)			5 mL, Flush, Soln-IV, As Directed, PRN other (see comment), Order Duration: 2 doses Peripheral line flush.
<input type="checkbox"/> Suspected Sepsis-STAT Antibiotics			
<input type="checkbox"/> Neutropenic Fever-STAT Antibiotics			
Septic Shock			
<input type="checkbox"/> If Lactic acid level greater than or equal to 4 and/or persistent hypotension defined as Systolic Blood Pressure (SBP) less than 90, or Mean Arterial Pressure (MAP) less than 65, give:			
<input type="checkbox"/> Sodium Chloride 0.9% intravenous solution (sodium c...			Select an order sentence
<input type="checkbox"/> OR			
<input type="checkbox"/> Lactated Ringers Injection intravenous solution (lactat...			Select an order sentence
<input type="checkbox"/> Communication Order			If IV fluid bolus given. Check MAP and SBP every 30 minutes until SBP greater than 90 and/or MAP great...
Vasopressors			
<input type="checkbox"/> If unable to maintain SBP greater than 90 or MAP greater than 65 after fluid resuscitation:			
<input type="checkbox"/> norEPINEPHrine (Levophed) 16 mg/D5W 250 mL			IV Continuous, 250 mL Starting Rate: 5 mcg/min Max Rate: 200 mcg/min Titrate Instructions: Start at 5 ...

Menu

- ED Workflow
- ED Summary
- Results Review
- Problems/Dx/PMH
- Quick Orders**
- Orders **+** Add
- Documentation **+** Add
- Interactive View and I/O
- Flowsheet
- Allergies **+** Add
- Demographics
- Growth Chart
- Problems/Dx/PMH
- Histories
- Immunization Schedule
- MAR Summary
- Medication List **+** Add
- Notes **+** Add
- Form Browser
- Sepsis Advisor
- Clinical Research
- Clinical Images **+** Add
- Provider Face Sheet
- eCoach
- PDMP Report

Quick Orders

Emergency Orders | Pediatric Orders | UC Quick Orders | Trauma Orders | PED Trauma

Input | Prescriptions | All

Emergency Orders

- EBCC ED COPO and Asthma_B EBCC ED COPO and Asthma_B_EXM
- EBCC ED Cystitis/Pyelonephritis/Prostatitis/UTI Adult_B EBCC ED Cystitis/Pyelonephritis/Prostatitis/UTI Adult_B_EXM
- EBCC ED DVT_B EBCC ED DVT_B_EXM
- EBCC ED GI Bleeding_B EBCC ED GI Bleeding_B_EXM
- EBCC ED Heart Failure Enhanced Diuresis_B EBCC ED Heart Failure Enhanced Diuresis_B_EXM
- EBCC ED Hip Fracture_B EBCC ED Hip Fracture_B_EXM
- EBCC ED Insulin (Diabetes/Hyperglycemia) Management_B EBCC ED Insulin (Diabetes/Hyperglycemia) Management_B_EXM
- EBCC ED Ibuprofen (Convert) Chemical Cardioversion Protocol: Atrial Fibrillation-Flutter_B EBCC ED Ibuprofen (Convert) Chemical Cardioversion Protocol: Atrial Fibrillation-Flutter_B_EXM
- EBCC ED Pulmonary Embolism_B EBCC ED Pulmonary Embolism_B_EXM
- EBCC ED Seizure_B EBCC ED Seizure_B_EXM
- EBCC ED Skin Abscess and Cellulitis_B EBCC ED Skin Abscess and Cellulitis_B_EXM
- EBCC ED Skin and Soft Tissue Infection Diabetic Infections of the Lower Extremities Adults_B EBCC ED Skin and Soft Tissue Infection Diabetic Infections of the Lower Extremities Adults_B_EXM
- EBCC ED Skin and Soft Tissue Infection-Acute Animal and Human Bites Adults_B EBCC ED Skin and Soft Tissue Infection-Acute Animal and Human Bites Adults_B_EXM
- EBCC ED Suspected DVT_B EBCC ED Suspected DVT_B_EXM
- EBCC ED Suspected Extremity Fracture_B EBCC ED Suspected Extremity Fracture_B_EXM
- EBCC ED Suspected Sepsis and/or Neutropenic Fever_B EBCC ED Suspected Sepsis and/or Neutropenic Fever_B_EXM
- EBCC ED Vomiting and Diarrhea_B EBCC ED Vomiting and Diarrhea_B_EXM

Cough/Dyspnea

- DKA
- Flank Pain
- GI Bleed
- Heart Failure
- Headache
- Hyperkalemia
- Hip Fracture Age 65 or Greater
- Laceration
- Neuro / Stroke / TIA
- Sepsis
- Skin / Soft Tissue Infection
- Trauma
- Vaginal Bleed/Pelvic Pain

Critical Care

- Code / ACLS
- Cardiac
- Shock / Pressors
- RSI
- Setup
- Sedation - Procedural
- Sedation - Infusion
- Transfusion

BUN

- Creatinine (Blood)
- Calcium (Total)
- Magnesium Level
- Phosphorus Level
- Chlamydia trachomatis by PCR
- Hepatic Function Panel
- Ammonia Level
- Lipase Level
- LDH (LD)
- Beta-Hydroxybutyrate
- Uric Acid Blood
- PT-INR (Prothrombin Time)
- PTT (Partial Thromb Time)
- SED Rate
- CRP (C-Reactive Protein)
- CK (Total)
- POCT Troponin I (ED ONLY)
- Troponin-I
- Pro-BNP Baseline
- D-Dimer (Quant)
- Lithium Level
- ABG With CO-ox
- ABG Lifesaver Panel RP
- ABO and Rh
- Type and Screen
- Urinalysis with Reflex Culture Urine, Clean Catch, collect Stat, T/R
- Pregnancy Test-Blood(Qual)
- on Blood (Quant)
- / Test-Urine (Qual)
- Blood Pregnancy Test
- Urine Pregnancy Test
- let Prep
- i/QC Amplification PCR
- Culture & Gram-Genital
- Rotavirus Antigen
- WBC in Feces
- Urea N Stool/Gel

EKG Standard

- Sodium Chloride 0.9% intravenous solution
- sodium chloride 0.9% bolus
- sodium chloride 0.9% irrigation solution
- Saline Lock Insert
- Debridement (AM/TC)
- Insert Foley
- Muscle trigger point injection 20552 (PM)

Problems/Dx/PMH

All Visits

Classification: All

Add new as: This Visit

Priority Problem

This Visit (3)

- 1 Arm injury, upper - Minor
- 1 Back pain
- 1 Fall

Active (6)

- Diabetes
- Diabetes
- HT - Hypertension
- Hypertension
- OCD - Obsessive-compulsive disorder
- OCD (obsessive compulsive disorder)

Resolved (1) **Show Previous Visits**

Abx - Sepsis - Other

- Anti-emetics / GI
- Cardiovascular
- Corticosteroids
- Hemorrhage / Reversal
- IV Fluids
- Metabolic
- Neuro/Psych
- Respiratory
- ENT / Ophth / Dental

Admit/Discharge/Transfer

- Discharge
- Discharge Patient
- Admit
- Plan to Hospitalize
- Request for Surgery/Endoscopy
- Transfer
- Transfer Patient
- Observation
- PSO Patient Status Order_B PSO Patient Status Order_B

Outstanding Orders (13)

Add to Phase
 Check Alerts
 Comments
 Start:
 Duration:

	Component	Status	Dose ...	Details
EBCC ED ANI-Suspected Sepsis_B (Initiated Pending)				
Patient Care				
	Complete RN Sepsis Screening Tool			
	If fever >100.4F or <96.0F, Tachycardia >90 BMP, Tachypnea RR>20.			
	Chills/Rigors. Place patient in room and consult EDP			
	Please proceed with:			
<input checked="" type="checkbox"/>	Peripheral IV			Maintain IV access
<input checked="" type="checkbox"/>	ED Cardiac Telemetry			
Medications				
<input checked="" type="checkbox"/>	Sodium Chloride 0.9% intravenous solution (sodium c...			IV Continuous, 1,000 mL Order Rate: 126 mL/hr, Soln-IV
Laboratory				
<input checked="" type="checkbox"/>	Basic Metabolic Panel - BMP			
<input checked="" type="checkbox"/>	CBC with Diff (BH5F) (CBC with Diff)			Blood, Stat, T;N, Once
<input checked="" type="checkbox"/>	PT-INR (Prothrombin Time) (PT (with INR))			Blood, Stat, T;N, Once
<input checked="" type="checkbox"/>	PTT (Partial Thromb Time)			Blood, Stat, T;N, Once
<input checked="" type="checkbox"/>	Lactic Acid with Reflex			Blood, Stat, T;N, Once
<input checked="" type="checkbox"/>	Culture, Blood-Peripheral			Blood, Blood,Peripheral, Stat collect, ST - Stat, T;N, Every 15 minutes for 2 times
<input checked="" type="checkbox"/>	Urinalysis with Reflex Culture			collect Stat, T;N
<input type="checkbox"/>	Pregnancy Test-Blood(Qual)			Blood, Stat, T;N, If Female less than 50 years old without history of hysterectomy
<input checked="" type="checkbox"/>	Hepatic Function Panel			
Diagnostic Tests				
<input type="checkbox"/>	Chest Single View XR			Stat, Reason: Other (please specify), suspected sepsis
<input checked="" type="checkbox"/>	Chest 2 Views XR			Stat, Reason: Other (please specify), suspected sepsis
Card/Vasc/Neuro				
<input type="checkbox"/>	EKG Standard			Stat, Sepsis, If 50 years old or older
Respiratory				
<input checked="" type="checkbox"/>	Oxygen Therapy			Nasal Cannula, Flow Rate (L/min): 2, SpO2 goal 92% or greater, Stat, if pulse ox less than 92%
Communication Orders				
<input checked="" type="checkbox"/>	Discontinue Power Plan prior to transferring patient t...			
<input checked="" type="checkbox"/>	Sepsis Quality Measures			

Summary of “Pearls”



- Call the VSU x79802 on new sepsis cases or when in doubt.
- There are criteria to be excluded from the 6-hour bundle that require documentation. (ex. Palliative)
- Always think “Could this be sepsis?” (cultures, lactate, antibiotics)
- Use IBW to calculate fluids in BMI>30 for shock.
- Manage hypoperfusion in timely fashion. (Pressors if not responding to fluids)
- Assess fluid responsiveness if continuing fluids past bolus.
- Beware of the fluid CREEP. Think deresuscitation.
- Get reperfusion exam done in time.
- Beware of transition points of care “handoff tool”

VSU Team



Thank you to the Sepsis Steering Committee and EBCC Group for all their efforts toward improving sepsis outcomes at Baptist Health South Florida!

Sepsis Documentation



- Coders are not clinical, they are ***translators***.
- The data that is ***coded*** is the data that is ***reported***.
- Data impact: financial, quality, public reporting.
- Documentation is not showing how “sick” our patients are; no justification for the amount of resources geared toward their care.

Sepsis Documentation



- If you think it, **document!** Terminology such as “suspected,” “possible,” “probable,” “likely,” “questionable,” or other similar terms is accepted.
- If condition is ***ruled out***, please document in the medical record and remove diagnosis from problem list.
- DO NOT USE “sepsis syndrome,” “urosepsis” or “SIRS.”
- Always document POA status.
- Link the sepsis with the source of infection, and if microorganism known, also document.
- Link the organ dysfunctions to the sepsis.

Sepsis Documentation



- Stay away from signs, symptoms, and lab values. **Document diagnoses!**
- Instead of hypoxia...is this a respiratory failure?
- Instead of confusion, altered mental status...is this a metabolic or septic encephalopathy?
- Instead of bedridden...is this a functional quadriplegia?
- Instead of frailty, debility, cachexia...does this patient have malnutrition? What degree?
- Instead of hypotension...is this patient in shock? What type?



Questions?

Thank You!