ONGOING INNOVATIONS TO IMPROVE SEPSIS CARE AND REDUCE SEPSIS MORTALITY
BAYLOR SCOTT & WHITE HEALTH - NORTH TEXAS DIVISION

Publication Year: 2014

SUMMARY:
Standardized processes, protocols, tools, and reports that improved sepsis care and reduce sepsis mortality across the health system.

SUBMISSION CATEGORY:
- Safety & Quality
- Care Coordination

HOSPITAL: The Baylor Scott & White Health -
LOCATION: Dallas, TX

CONTACT: Kristine Powell MSN RN CEN NEA-BC
Director of Emergency Services, Baylor Scott & White-North Texas, KrisP@baylorhealth.edu

CATEGORY:
- A: Arrival
- C: Clinician Initial Evaluation

KEY WORDS:
- Communication
- Door-to-Doc
- Information Systems
- Care Protocols
- Reporting Consistency/Frequency
- Vulnerable Population

HOSPITAL METRICS:
- Annual ED Volume: ~450,000
- Hospital Beds: Total of 10 Hospitals
- Ownership: Baylor Scott & White Health
- Trauma Level: 1 Level 1 Trauma Ctr, 1 Level 3 Trauma Center
- Teaching Status: 1 Academic Teaching Hospital

TOOLS PROVIDED:
- Sepsis screening tool (Paper form and EDIS instructions)
- Difficult IV workflow
- Code Sepsis Protocol
- Poster presentation

CLINICAL AREAS AFFECTED:
- Ancillary Departments
- Emergency Department
- EMS
- Radiology
- Registration
- Triage
- Pharmacy

STAFF INVOLVED:
- Administrators
- Ancillary Departments
- Clerks
- ED Staff
- IT Staff
- Nurses
- Pharmacists
- Physicians
- Registration Staff
- Technicians
Innovation Problem Statement:
The Hospital Standardized Mortality Ratio (HSMR) at Baylor Health Care System (now Baylor Scott & White Health - North Texas) demonstrated a higher number of actual deaths over expected deaths for severe sepsis/septic shock in FY07 and FY08.

New innovations and processes
The Emergency Department Practice Council developed tools, expectations, and a reporting process that resulted in improved care processes and a markedly reduced mortality rate (HSMR). New processes included mandated sepsis screening at triage, expedited lactate testing for positive sepsis screens, Code Sepsis protocol for positive lactate results and positive sepsis screen to include rapid administration of antibiotics and intravenous fluid boluses, difficult IV start protocol to expedite IV access, and standardized inpatient admission orders to ensure consistent continuity of care upon admission. New tools developed included an online sepsis screening tool in the ED information system, difficult IV algorithm, daily huddle boards to engage frontline clinicians, and standardized transparent compliance reporting for expected processes.

Background
The innovation works because (1) Nursing and physician frontline clinicians supported and helped develop the initiatives, (2) a multidisciplinary approach engaged clinicians, ancillary services, and administration, (3) compliance and mortality reports were transparent and shared at all levels of the organization (4) compliance reports are not self-reported. The system Health Care Improvement department audits all charts and develops the reports for dissemination, (5) sepsis process and mortality targets were built into performance goals at all levels of the organization from frontline clinicians to department managers and executive administration to align priorities and activities.

The organization chose these approaches to align priorities to meet a system goal of reducing sepsis mortality. It was understand that widespread buy-in would be required to hardwire improved processes and that objective and transparent reporting would drive ongoing engagement, awareness, and accountability.

Tactics Implemented
- Targeted initiative by Emergency Department Council of Baylor Scott & White – North Texas.
- Multidisciplinary Sepsis Committees established with engagement by ED leaders, Executive leaders, quality improvement, and ancillary support staff.
- Education of physicians, nursing, and other emergency department staff
- Developed screening tool and mandated screening at triage for all patients >16 years old
- Developed nurse-driven protocol for lactate testing with positive sepsis screen
- Code Sepsis algorithm developed and resources for Code Sepsis response identified.
- Difficult IV protocol developed to facilitate IV fluid bolus completion.
- Set process targets for 3-hour care bundle and tied performance to annual merit raises
- Set outcome targets for reduction in sepsis mortality for ED and hospital leadership tied to annual merit raises
- 100% chart audits and monthly reports generated and disseminated
- Visual cues programmed into ED Information & Tracking System for patients with positive sepsis screening
- Daily huddles at change of shift bring timely data to staff and opportunities for celebration and discussion
Resources Used for Implementation
Primarily time for education of clinicians and reporting infrastructure at start up. Ongoing education and support of reporting infrastructure to sustain.

Implementation Team
The Team consisted of all ED Medical and Nursing leadership, CEO/CNO/COO executive teams at each hospital, the Multidisciplinary Sepsis Steering Teams and the system level and at each hospital, Ancillary Support Services leadership in the Lab, Radiology, and Pharmacy, and Health Care Improvement staff.

Timeline
Jan 2009
- Planning started. Surviving sepsis campaign materials reviewed. Emanual Rivers brought in to speak to Critical Care and ED Council at Baylor.

Apr 2009
- Sepsis Care Steering Team implemented.

Aug 2009
- Sepsis screening tool developed and implemented across all ED's. Screening tool built into EDIS for the hospitals using electronic charting.

Nov 2009
- Chart audit tool developed for review of screening and care processes in ED

Jan 2010
- Expectations for compliance with ABX and IVF bolus within 3 hours. Audit tools completed on all Code Sepsis patients for monitoring of compliance. Emphasis on screening of patients at triage. Ongoing education in all ED's.

Sep 2010
- System report comparing ED performance across all ED's for screening, lactates, ABX administration, and IVF bolus. Initial reports were self-reported by each ED. Reports reviewed each month in ED Council and executive sponsors. Formal "Next Steps" plan developed based on data review. ED protocols developed and placed into algorithm.

Mar 2011
- Resource person designated from Health Care Improvement dept to do objective chart audits and compile reports. Reports escalated to Senior Executive leadership each month.

April 2011
- Focus on improving documentation of IV stop times to improve reporting of IV fluid boluses for sepsis patients. Alerts built into EDIS so staff were triggered to document IV stop time prior to patient disposition. This improvement spread across the system as each ED went live with the EDIS (MedHost)

Aug 2011
- 1st system report generated to look at overall compliance of system ED's for expected care processes for random selection of patients.

Sep 2011 (& Ongoing)
- Reports and best practice discussions occurred monthly at ED Council meetings so high performing ED's could share strategies with the other ED's. Became a standing agenda item on ED Council meeting to maintain high awareness. Shared screening tool with local EMS.

Mar 2012
- 100% chart audits now occurring for all severe sepsis/septic shock patients. Mortality reports reviewed monthly.

Apr 2012 (to Jan 2013)
- focus changed from working towards average time of 180 minutes from triage to ABX and IVF fluids to 120 minutes target to drive further improvement. Also started tracking and reporting % compliance with goal of 80% to improve care for more patients. Incremental improvements noted throughout the year for ABX within
180 minutes but improvement leveled off at 75% for ABX within 180 min and 60% for IVF bolus completion within 180 minutes.

Jan 2013
- Process changes developed to further improve process including nurse-driven lactate testing based on sepsis screen done by nurse at triage, daily reporting at staff change-of-shift huddles on previous days compliance with sepsis processes, developed difficult IV start decision algorithm to expedite IVF boluses in ED in one ED that was spread to other EDs at Baylor.

Mar 2013
- System compliance with ABX within 180 minutes >80% for 1st time. Staff recognition and celebrations.

May 2013
- System compliance for IVF bolus within 180 minutes >80% for 1st time and >90% compliance for ABX within 180 minutes for 1st time. Staff recognition and celebrations.

Jun-Dec 2013
- Ongoing tracking and reporting. Remainder of 2013 showed sustained improvement with both ABX and IVF bolus completion occurring within 180 minutes >80%.

Jan-Jun 2014
- Improvements sustained. Care process and mortality reports showed marked improvement.

**Results**

<table>
<thead>
<tr>
<th></th>
<th>March 2012</th>
<th>Jun 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time to ABX in ED - % cases within 180 min</td>
<td>66%</td>
<td>94%</td>
</tr>
<tr>
<td>Time to ABX in ED - Avg minutes</td>
<td>120 min</td>
<td>66 min</td>
</tr>
<tr>
<td>Time to IVF bolus completion - % cases within 180 min</td>
<td>66%</td>
<td>83%</td>
</tr>
<tr>
<td>Time to IVF bolus completion - Avg minutes</td>
<td>135 min</td>
<td>90 min</td>
</tr>
<tr>
<td>HSMR (Mortality rate) (Target &lt;1.0)</td>
<td>FY2007 1.205</td>
<td>FY2008 1.128</td>
</tr>
</tbody>
</table>

Estimated 589 lives saved from FY2009 to FY2013.
Improvements in sepsis care processes in the ED have resulted in decreased sepsis mortality.

Mean time (in minutes) to ABX and IVF Fluids in Sepsis

Improving Performance

- ED Arr to ABX - Mean time to ABX
- ED Arr to ABX - Mean time to IVF Bolus
Cost/Benefit Analysis

Costs included the following:

- Education time for direct care staff and physician/nursing leaders
- IT time to make configuration changes in EDIS
- Time for planning/development/implementation of new workflows and protocols
- Time of one fulltime staff nurse to do 100% chart audits of severe sepsis/septic shock patients and compile reports
Cost savings:
Improvements resulted in decreased mortality rates for this vulnerable population. Cost savings are not analyzed.

Advice and Lessons Learned

- Nursing and physician direct care clinicians must support and participate in development of the initiatives. Direct care staff are most familiar with barriers and resource needs and should be included from the start.

- A multidisciplinary approach will engage clinicians, ancillary and support services, and administration. Care of the sepsis patient requirements multiple resources and disciplines. Involvement of administration assists with acquiring resources when a validated need exists. Involvement of EMS can expedite care started prior to patient arrival to ED.

- Determine a baseline and a target. Measure and report with transparency and share the reports at all levels of the organization. An objective audit process is necessary as compliance reports that are self-generated have a higher likelihood of internal bias.

- Build sepsis process measures (compliance with care timelines and expectations) and outcome measures (mortality) into performance goals at all levels of the organization including direct care clinicians, department managers, and executive administration to align priorities and activities.

- Make your IT systems work for you. Build tools (such as a sepsis screening tool) and prompts to drive to best practice. Develop reports that can be run easily from the EDIS to measure compliance with use of the tools and resources (sepsis screening tool, sepsis admission order sets, Code Sepsis care protocols, lactate testing, etc.)

- Provide staff with the needed education, tools, and resources to meet the expected targets.

- Celebrate and recognize direct care and support staff as often as possible. At minimum, celebrate upon reaching a goal and intermittently through the implementation. When celebrating - make direct correlations between how staff changed their practice and the resulting improvements in measured processes and patient outcomes.

- Daily and direct feedback to frontline staff can accelerate the improvement process or push you past a point of plateau.
• Set performance goals that will drive individuals to align their performance with expectations. When performance goals drive annual merit raises, people are more likely to align their personal performance to meet goals.

• Set performance goals at all levels of the organization to drive improvement to meet targets. An administrator that has a sepsis mortality goal will align their activities with direct care clinicians who have process goals specified.

Sustainability
Results are sustained through (1) ongoing tracking and transparent reporting to maintain high levels of awareness and (2) frequent recognition and celebrations for sustained and ongoing improvements.

The next steps are to:
(1) focus on improving bundle compliance of Arrival to ABX administration and IVF bolus completion with the intent that more patients will receive total best care with all bundle components met.
(2) Implement sepsis screening into inpatient shift assessments with Rapid response Team activation for positive screens with elevated lactate levels.

Tools to Download
1. Innovation Award SUBMISSION FORM_KP_Sepsis Mortality.pdf
4. Sepsis Screening Form_Paper tool rev 7.30.2010
5. Sepsis screening tool in EDIS_Staff Education
6. BHCS Sepsis Protocol algorithm
7. Sepsis Adult 24-hour Admission order set
9. Daily Huddle Board for change of shift
Urgent Matters Innovation Award
2014

Process and Outcome Measures
Sepsis Care

Baylor Scott & White Health – North Texas
Improvements in sepsis care processes in the ED have resulted in decreased sepsis mortality.
Mean time (in minutes) to ABX and IVF Fluids in Sepsis

Improving Performance

- **ED Arr to ABX - Mean time to ABX**
- **ED Arr to ABX - Mean time to IVF Bolus**
% Compliance with ED Arr to ABX and IVF w/in 180 min in Sepsis

Improving Performance

ED Arr to ABX - % w/in 180 min
ED Arr to IVF Bolus - % w/in 180 min
6-Year HSMR Sepsis Performance

Improving Performance

Total 589 lives saved FY09-FY13
<table>
<thead>
<tr>
<th></th>
<th>Mar-12</th>
<th>Apr-12</th>
<th>May-12</th>
<th>Jun-12</th>
<th>Jul-12</th>
<th>Aug-12</th>
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<tbody>
<tr>
<td>ED Arr to ABX - % w/in 180 min</td>
<td>66%</td>
<td>72%</td>
<td>68%</td>
<td>70%</td>
<td>63%</td>
<td>71%</td>
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<tr>
<td>ED Arr to IVF Bolus - % w/in 180 min</td>
<td>66%</td>
<td>43%</td>
<td>46%</td>
<td>53%</td>
<td>55%</td>
<td>63%</td>
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<tr>
<td>ED Arr to ABX - Mean time to ABX</td>
<td>124</td>
<td>115</td>
<td>126</td>
<td>104</td>
<td>113</td>
<td>108</td>
</tr>
<tr>
<td>ED Arr to ABX - Mean time to IVF Bolus</td>
<td>133</td>
<td>112</td>
<td>149</td>
<td>115</td>
<td>108</td>
<td>117</td>
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<td></td>
<td>Sep-12</td>
<td>Oct-12</td>
<td>Nov-12</td>
<td>Dec-12</td>
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<tr>
<td>Percent</td>
<td>76%</td>
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<td>70%</td>
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<td>119</td>
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<td>124</td>
<td>130</td>
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<td>62%</td>
<td>59%</td>
<td>65%</td>
<td>61%</td>
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<tr>
<td>Value</td>
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<td>92%</td>
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<td>94</td>
<td>93</td>
<td>81</td>
<td>87</td>
<td>92</td>
<td>90</td>
<td>88</td>
</tr>
</tbody>
</table>
% Compliance with Care Process within 180 min

- ED Arr to ABX - % w/in 180 min
- ED Arr to IVF Bolus - % w/in 180 min

Mean time in minutes to Care Process

- ED Arr to ABX - Mean time to ABX
- ED Arr to ABX - Mean time to IVF Bolus
1. Complete Sepsis Screening AFTER you have charted Vital Signs

2. Click on Infection Suspected then click on the suspected source. If you cannot identify a suspected source click SOURCE UNKNOWN.

3. Click on SIRS Criteria and select the criteria the patient meets (may be 1 or multiple). If the patient meets no SIRS criteria, click NONE.

4. If your patient meets BOTH of the following conditions:
   1) Has an identifiable, potential source of infection
   2) Has 2 or more SIRS criteria
   The screen is POSITIVE. Click YES and go to step 5.
   If the patient meets only 1 of or none of the above conditions, the screen is NEGATIVE. Click NO. Continue to monitor and Re-screen with condition changes.

5. Initiate Sepsis Protocol (SDMO for Labs).
   You no longer have to notify the provider for a positive screen. Changes to MH will occur after 4/25 to remove the provider notification step. Now your Sepsis Screening documentation is complete!
**Sepsis Screen:**
- Suspected infection
  - Pneumonia
  - Skin infection
  - UTI
  - Meningitis
  - Abdominal infection
  - Bone or Joint
  - Indwelling device/line
  - Flu/Viral/fungal illness
- 2 or more SIRS criteria:
  - TIR > 0.5
  - SBP < 90
  - MAP < 65
  - Temp < 90.8°F or > 100.8°F
  - Temp < 96°C or > 103°C
  - RR > 20

**Send Labs:**
- CBC
- CMP
- Lactate
- Draw & Hold:
  - Blood Culture x1
  - Blue Top
- Mark Special Handling
- In MedHost
- Sepsis Sr +

**Unstable?**
- Is there:
  - SBP < 90
  - MAP < 65
  - Osat < 90%
  - AMS

**Potential Severe Sepsis**
1. Move to a room ASAP
2. Notify Physician for immediate evaluation
3. Provider: initiate Sepsis Alert Order Set, including:
   - Blood CX x2
   - NS 30 mL/kg bolus
4. Administer Broad Spectrum Abx
   - Obtain order from Provider
5. Potential Code Sepsis patient
   - To be determined by Physician

**Why This is Important:**
- Sepsis mortality ranges 16-49%
- Early Abx reduces mortality
- Early IVF reduces mortality
  - Even if IF normal
- New measures for 2013 released by Surviving Sepsis Campaign & NQF
  (Crit Care Med. 2010 Feb;38(2):367-74)
- Time clock starts at “Arrival to ED”
- Metrics are being followed by BHCS to drive quality care for patients.

**MedHost Sepsis Order Sets**
- Sepsis Screen Positive
  - CBC
  - CMP
  - Lactate
  - Draw Blood CX x1 and hold
  - Draw blue top and hold

**Sepsis ALERT**
- Blood Culture x2
- Blood Culture (x2)
- CBC (Complete Blood Count)
- CMP (Comprehensive Metabolic Panel)
- PO2 - Lactate (Lactic Acid)
- PT (Prothrombin Time with INR)
- PTT (Partial Thromboplastin Time)
- UA (Urineysis)
- Urine Culture
- CXR 1 View XRAY Portable
- NS 30 mL/kg Bolus IV
  - Use pressure bag
  - NS 100 mL IV at 2000 mL/hr administer after fluid bolus complete
  - Sepsis Alert - Please Activate (notify ED supervisor)
  - Draw Blood cultures prior to Antibiotics
  - If no IV access within 15 minutes, notify physician
  - Monitor Pulse Oximeter
  - Monitor: Place patient on cardiac monitor
  - Notify Physician of vital signs after fluid bolus
  - Oxygen - Protocol
  - Saline Lock
  - Saline Lock - Large Bore
  - Use pressure bags for all fluid bolus
  - Weigh Patient

**CODE SEPSIS**
- Arterial Blood Gas
- Venous Blood Gas (Draw from Central line)
- NS 1000 mL Bolus IV at 3000 mL/hr, repeat until CVP > 8
- Norepinephrine (Levophed) 0.5 mcg/kg/min IV
  - at calculated rate, continue, titer to maintain MAP > 60 mmHg
- Central Line Setup
- Monitor Central Venous Pressure and report to Physician
- Ultrasound to bedside

**NOTE:** also order Sepsis Alert Order Set if not already done.
# Baylor Health Care System
## Physician Orders
### Sepsis Adult 24-Hour Bundle / Admission Order Set

**Admit**
Select an order item by placing a mark in the corresponding box.

<table>
<thead>
<tr>
<th>Box</th>
<th>Admit Status</th>
<th>Attending Physician</th>
<th>Physician to Nurse Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑️</td>
<td>Inpatient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☑️</td>
<td>ICU</td>
<td></td>
<td>• These orders take precedence over orders in the <em>Sepsis Adult Emergent 6 Hour Care Bundle Order Set</em> or other orders initiated in the ED</td>
</tr>
</tbody>
</table>

**Location**
Consulting Physician

- **Inpatient**
  (Goal is for bed within 60 min.)

**Diagnosis**
1. Sepsis
2. [ ] Allergies (list below)  [ ] No known allergies

**Code Status**
- [ ] Full Code
- [ ] Do not resuscitate / do not intubate
- [ ] Other:

**Legend**
- ACTH = adrenocorticotropic hormone
- bpm = beats per minute
- CVP = central venous pressure
- dL = deciliter
- ED = Emergency Department
- g = gram
- GI = gastrointestinal
- GT = gastric tube
- ICU = Intensive Care Unit
- IV = intravenous
- kg = kilogram
- MAP = mean arterial pressure
- mcg = microgram
- mg = milligram
- min = minute
- mL = milliliter
- mmHg = millimeters of mercury
- NG = nasogastric
- NPO = nothing by mouth
- OG = orogastric
- PO = by mouth
- PR = per rectum
- PRBC = packed red blood cells
- PRN = as needed
- SBP = systolic blood pressure
- ScvO2 = Central venous oxygen saturation
- SpO2 = oxygen saturation by pulse oximeter
- SDMO = Standing Delegated Medical Order
- SVo2 = venous oxygen saturation

### Hemodynamics and Oxygen Delivery
**Goals:**
- **CVP:** 8-12 mmHg
- **MAP:** 65-90 mmHg
- **ScvO2:** Greater than or equal to 70%

### Resuscitation Fluids – For patients with severe sepsis or septic shock
**Goals:**
- If central line present: CVP greater than or equal to 8 mmHg (greater than or equal to 12 mmHg if mechanically ventilated)
- If no central line present: MAP greater than 65 mmHg AND SBP greater than 90 mmHg

**Infuse a minimum of 40 mL / kg NS and continue additional fluid boluses to meet above goals**

**Maintenance Fluids**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Unit of Measure</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium chloride 0.9% (NS)</td>
<td>500 mL</td>
<td>IV bolus</td>
<td>PRN, per instructions</td>
</tr>
</tbody>
</table>

**Instructions**
Deliver over 15 minutes
Continue boluses until goal is met

**Maintenance Fluids**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Amount</th>
<th>Additive</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium chloride 0.9%</td>
<td>at</td>
<td>mL / hour</td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td>at</td>
<td>mL / hour</td>
<td></td>
</tr>
</tbody>
</table>

**Vasopressors** (Use central access, if available)

- Begin if patient remains hypotensive despite meeting CVP or minimum fluid bolus goals above.
- Pressor titration goal is maintenance of SBP greater than 90 mmHg or MAP greater than 65 mmHg UNLESS otherwise indicated below.
- Place arterial line as soon as practical.

**Medication**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Starting Concentration</th>
<th>Starting Rate</th>
<th>Unit of Measure</th>
<th>Route</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norepinephrine (LEVOPHED)</td>
<td>4 mg / 250 mL</td>
<td>0.1 - 0.3 mcg / kg / min</td>
<td>IV</td>
<td>Preferred agent in severe sepsis / shock</td>
<td></td>
</tr>
</tbody>
</table>

**Maximum dose of norepinephrine is 3 mcg / kg / min. Notify physician if SBP less than 90 mmHg or MAP less than 65 mmHg despite maximum dose. Consider vasopressin for refractory hypotension once at maximum norepinephrine dose.**

**Vasopressin (PITRESSIN)**

- Use as second-line pressor agent

**Medication**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Starting Concentration</th>
<th>Starting Rate</th>
<th>Unit of Measure</th>
<th>Route</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vasopressin</td>
<td>100 units / 100 mL</td>
<td>0.03 units / min</td>
<td>IV</td>
<td>0.03 units per minute is suggested dose. Do not titrate upward further.</td>
<td></td>
</tr>
</tbody>
</table>

**Antibiotics** (See attached *Sepsis Empiric Treatment Antibiotic Order Set*)

<table>
<thead>
<tr>
<th>Provider #:</th>
<th>Date:</th>
<th>Time:</th>
</tr>
</thead>
</table>

**Physician Information**

<table>
<thead>
<tr>
<th>Physician Signature:</th>
<th>Provider #:</th>
<th>Date:</th>
<th>Time:</th>
</tr>
</thead>
</table>

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*BAYLOR HEALTH CARE SYSTEM*

BHCS-49241 (Rev. 11/11/2009)
PHYSICIAN ORDERS
SEPSIS ADULT 24-HOUR BUNDLE / ADMISSION ORDER SET
Page 1 of 4
BAYLOR HEALTH CARE SYSTEM
PHYSICIAN ORDERS
SEPSIS ADULT 24-HOUR BUNDLE / ADMISSION ORDER SET

BLOOD PRODUCTS
☑ Notify physician for possible PRBC transfusion if ScvO\textsubscript{2} is less than 70% AND hemoglobin (Hgb) is less than 7 g / dL (Goal: 7-9 g / dL)

PATIENT CARE ORDERS

<table>
<thead>
<tr>
<th>Description</th>
<th>Frequency</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vital Signs</td>
<td>per ICU Routine</td>
<td>Continuous monitoring preferred</td>
</tr>
<tr>
<td>Monitor Central Venous Pressure</td>
<td>per ICU Routine</td>
<td>Continuous monitoring preferred</td>
</tr>
<tr>
<td>Monitor Mean Arterial Pressure</td>
<td>per ICU Routine</td>
<td>Continuous monitoring if oximetric catheter in use</td>
</tr>
<tr>
<td>Monitor: ☐ ScvO\textsubscript{2} ☐ SvO\textsubscript{2}</td>
<td>per ICU Routine</td>
<td>Call if</td>
</tr>
<tr>
<td>Neuro Status Check</td>
<td>per ICU Routine</td>
<td>Call physician if urine output less than 0.5 mL / kg / hour x 2 hours</td>
</tr>
<tr>
<td>Strict Intake and Output</td>
<td>per ICU Routine</td>
<td>Call physician if urine output less than 0.5 mL / kg / hour x 2 hours</td>
</tr>
<tr>
<td>Continuous pulse oximetry</td>
<td></td>
<td>Initiate Oxygen protocol for SpO\textsubscript{2} value less than 92%</td>
</tr>
<tr>
<td>Weigh patient</td>
<td></td>
<td>On Admission</td>
</tr>
<tr>
<td>Insert Indwelling Urinary Catheter</td>
<td></td>
<td>To gravity</td>
</tr>
<tr>
<td>Insert: ☐ Nasogastric tube ☐ Orogastric tube</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

VENTILATOR STATUS *Best Practice
☐ Patient is on a ventilator - Implement BHCS Adult Ventilator Order Set

VENOUS THROMBOEMBOLISM (VTE) PROPHYLAXIS *Best Practice

VTE Adult Prophylaxis Risk Screening and Order Set

NOTIFY PHYSICIAN IF:
☐ Temperature greater than 101 degrees Fahrenheit
☐ Temperature less than 96 degrees Fahrenheit
☐ Heart rate greater than 130 bpm or less than 50 bpm
☐ Respiratory Rate greater than 30 breaths per min or less than 8 breaths per min
☐ Systolic blood pressure greater than 180 mmHg or less than 90 mmHg
☐ Mean Arterial Pressure (MAP) greater than 115 mmHg or less than 65 mmHg

NUTRITION
☐ NPO
☐ NPO except medications
☐ If NG / OG tube in place, give PO meds per tube, if not contraindicated
☐ Initiate Enteral Tube Feeding per Nutrition Management Protocol
☐ Consult for Total Parenteral Nutrition
☐ Other:

ACTIVITY
☐ Bed rest
☐ Other:

GLUCOSE CONTROL *Best Practice
☐ Check Dextrose Fingerstick (DFS) every 4 hours for an initial 24 hour period unless specified otherwise
☐ If during the initial 24 hour period, no two consecutive results are greater than 180 mg / dL, discontinue DFS glucose checks
☐ If during the initial 24 hour period, two consecutive results are greater than 180 mg / dL, then begin Adult Subcutaneous Sliding Scale Insulin Order Set and notify physician

INSULIN
☐ BHCS Adult Insulin IV Infusion Order Set (NON-Diabetic Ketoacidosis)
☐ BHCS Adult Subcutaneous Sliding Scale Insulin Order Set
☐ Other:

Physician Signature: Provider #: Date: Time:

Legend: ACTH=adrenocorticotropic hormone blood, bpm=beats per minute, CVP=central venous pressure dL=deciliter, ED=Emergency Department, g=gram, GI=gastrointestinal, GT=gastric tube, ICU=Intensive Care Unit, IV=intravenous, kg=kilogram, MAP=mean arterial pressure, mcg=microgram, mL=milliliter, min=minute, mmHg=millimeters of mercury, NG=nasogastric, NPO=nothing by mouth, OG=orogastric, PO=by mouth, PR=per rectum, PRBC=packed red blood cells, PRN=as needed, SBP=systolic blood pressure, ScvO\textsubscript{2}=Central venous oxygen saturation, SpO\textsubscript{2}=oxygen saturation by pulse oximeter, SDMO=Standing Delegated Medical Order, SvO\textsubscript{2}=venous oxygen saturation

BAYLOR HEALTH CARE SYSTEM
*49241*
BHCS-49241 (Rev. 11/11/2009)
PHYSICIAN ORDERS
SEPSIS ADULT 24-HOUR BUNDLE / ADMISSION ORDER SET
Page 2 of 4
**LABORATORY - MICROBIOLOGY**

<table>
<thead>
<tr>
<th>Test</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Cultures times 2 from different sites; draw one set from central line, if in place</td>
<td>STAT, before antibiotics administered</td>
</tr>
<tr>
<td>Urine Culture (catheterized)</td>
<td>STAT AM</td>
</tr>
<tr>
<td>Gram Stain/Culture/Other site: __________</td>
<td>STAT AM</td>
</tr>
<tr>
<td>Other:</td>
<td></td>
</tr>
</tbody>
</table>

**LABORATORY - OTHER**

<table>
<thead>
<tr>
<th>Test</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dextrose Fingerstick DFS</td>
<td>Every 4 hours for initial 24 hours</td>
</tr>
<tr>
<td>Complete blood count (CBC) with differential</td>
<td>STAT AM</td>
</tr>
<tr>
<td>Lactate</td>
<td>STAT AM</td>
</tr>
<tr>
<td>Basic Metabolic Panel (BMP)</td>
<td>STAT AM</td>
</tr>
<tr>
<td>Complete Metabolic Panel (CMP)</td>
<td>STAT AM</td>
</tr>
<tr>
<td>Arterial blood gas (ABG)</td>
<td>STAT AM</td>
</tr>
<tr>
<td>Troponin</td>
<td>Every 8 hours times 3</td>
</tr>
<tr>
<td>Prothrombin Time / Partial Thromboplastin Time (PT/PTT)</td>
<td>STAT AM</td>
</tr>
<tr>
<td>Random Cortisol level</td>
<td>STAT AM</td>
</tr>
<tr>
<td>If oximetric catheter in place: SvO₂ for monitor calibration</td>
<td>Once Daily</td>
</tr>
<tr>
<td>Other:</td>
<td></td>
</tr>
</tbody>
</table>

**DIAGNOSTIC TESTING**

<table>
<thead>
<tr>
<th>Test</th>
<th>Priority/Frequency</th>
<th>Reason for Exam/Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest X-Ray, Posterior Anterior /Lateral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrocardiogram, 12 Lead (ECG)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Recombinant human activated protein C (XIGRIS) screening - for patients with severe sepsis and septic shock*

- Consideration of XIGRIS is recommended for patients with severe sepsis and a high risk of death (sepsis-induced failure in 2 or more organ systems or APACHE II score 25 or more) if no contraindications exist

**STRESS ULCER PROPHYLAXIS**

*(To prescribe a dose other than the pre-printed dose, cross out the pre-printed dose and write alternative dose, i.e. for renal dosing considerations)*

(Recommended for patients with 1 or more GI bleeding risks: mechanical ventilation, coagulopathy, severe sepsis or septic shock, renal failure)

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Unit of Measure</th>
<th>Route</th>
<th>Frequency</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>famotidine (PEPCID)</td>
<td>20 mg</td>
<td>PO / GT</td>
<td>IV</td>
<td>Every 12 hours</td>
<td>Consider daily dosing for Creatinine Clearance less than 50 mL / min</td>
</tr>
<tr>
<td>pantoprazole (PROTONIX)</td>
<td>40 mg</td>
<td>IV</td>
<td>Once Daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**STEROID UTILIZATION**

Consider use in septic shock patients poorly responsive to adequate fluid resuscitation and vasopressors

Do NOT start until after a cortisol level or an ACTH stimulation test has been ordered and resulted

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Unit of Measure</th>
<th>Route</th>
<th>Frequency</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydrocortisone (SOLU-CORTEF)</td>
<td>50 mg</td>
<td>IV</td>
<td>Every 6 hours</td>
<td>Consider weaning once vasopressors are off</td>
<td></td>
</tr>
</tbody>
</table>
### MEDICATIONS -- GI AGENTS / ANTI-PYRETICS – PRN

*(To prescribe a dose other than the pre-printed dose, cross out the pre-printed dose and write alternative dose, i.e. for renal dosing considerations)*

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Unit of Measure</th>
<th>Route</th>
<th>Frequency</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium hydroxide suspension</td>
<td>30 mL</td>
<td>PO</td>
<td>Once Daily, PRN</td>
<td>Constipation</td>
<td></td>
</tr>
<tr>
<td>Bisacodyl (DULCOLAX)</td>
<td>10 mg</td>
<td>PR</td>
<td>Once Daily, PRN</td>
<td>Constipation</td>
<td></td>
</tr>
<tr>
<td>Acetaminophen (TYLENOL)</td>
<td>650 mg</td>
<td>PO / PR</td>
<td>Every 4 hours, PRN</td>
<td>Fever</td>
<td></td>
</tr>
<tr>
<td>Ondanestrone (ZOFRAN)</td>
<td>4 mg</td>
<td>IV</td>
<td>Every 6 hours, PRN</td>
<td>Nausea</td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### MEDICATIONS - SEDATIVES / ANALGESICS – PRN

*Consider respiratory depression risk for polypharmacy with narcotics analgesics and other central nervous system (CNS) depressants*

*Select a single analgesic per pain scale and route*

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Unit of Measure</th>
<th>Route</th>
<th>Frequency</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lorazepam (ATIVAN)</td>
<td>1-2 mg</td>
<td>IV</td>
<td>Every 2 hours, PRN</td>
<td>For sedation / anxiety</td>
<td></td>
</tr>
<tr>
<td>Midazolam (VERSED)</td>
<td>1-2 mg</td>
<td>IV</td>
<td>Every 2 hours, PRN</td>
<td>For sedation / anxiety</td>
<td></td>
</tr>
<tr>
<td>Hydrocodone / acetaminophen (NORCO)</td>
<td>5 / 325 mg</td>
<td>tablet</td>
<td>PO</td>
<td>Every 6 hours, PRN</td>
<td>For pain 1-2 / 10</td>
</tr>
<tr>
<td>Fentanyl (SUBLIMAZE)</td>
<td>25-75 mcg</td>
<td>IV</td>
<td>Every 2 hours, PRN</td>
<td>For pain 3-10 / 10</td>
<td></td>
</tr>
<tr>
<td>Morphine sulfate</td>
<td>2-4 mg</td>
<td>IV</td>
<td>Every 2 hours, PRN</td>
<td>For pain 3-10 / 10</td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### IMMUNIZATIONS / PREVENTIVE

- Pneumovax Vaccine per protocol / SDMO
- Influenza Vaccine per protocol / SDMO

### DEPARTMENTAL REFERRALS

- Physical Therapy Evaluation and Treatment
- Occupational Therapy to evaluate Activities of Daily Living (ADL)
- Speech Therapy
- Nutritional Services
- Pharmacy consult for pharmacokinetics/antibiotic dosing
- Palliative Care Consult
- Other:

### EDUCATION

- Conduct Smoking Cessation counseling for all patients that have smoked during the past 12 months
- Conduct Diabetes Education
- Other:

### ADDITIONAL ORDERS

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**Legend:**

- ACTH = adrenocorticotropic hormone blood
- bpm = beats per minute
- CVP = central venous pressure
- dL = deciliter
- ED = Emergency Department
- g = gram
- GI = gastrointestinal
- GT = gastric tube
- ICU = Intensive Care Unit
- kg = kilogram
- MAP = mean arterial pressure
- mcg = microgram
- mmHg = millimeters of mercury
- NG = nasogastric
- NPO = nothing by mouth
- OG = orogastric
- PO = by mouth
- PR = per rectum
- PRBC = packed red blood cells
- SBP = systolic blood pressure
- ScvO2 = Central venous oxygen saturation
- SpO2 = oxygen saturation by pulse oximeter
- SDMO = Standing Delegated Medical Order
- SvO2 = venous oxygen saturation
DAILY HUDDLE DATA

SEPSIS
- #CodeSepsis
- #Correct Screens
- ABX in 1 hour
- ABX in 2 hours
- IV Bolus in 3 hours

FOLEYS
- Inserted 5
- w/ order 4
- Did Not meet Criteria 1

6 DAYS SINCE THE LAST WRIT