Kentucky Hospital Association Quality Award

Honoring Leadership and Innovation in Patient Care Quality, Safety, and Commitment

Application—2014

The Kentucky Hospital Association Quality Award is presented to honor hospital leadership and innovation in quality, safety, and commitment in patient care. The goals of this award are to:

- Raise awareness of the need for an organization-wide commitment to highly reliable, exceptional quality, patient-centered care
- Reward successful efforts to develop and promote a improvements in quality of care
- Inspire organizations to systematically integrate and align their quality improvement efforts throughout the organization
- Communicate successful programs and strategies to the hospital field
- Facilitate Kentucky hospitals' alignment of quality initiatives with national initiatives

The inaugural 2006 Quality Award was presented at the 2006 KHA Annual Convention.

Eligibility

All **acute hospitals, psychiatric hospitals and programs and post-acute hospitals and programs** in Kentucky are eligible to apply for the award. There are six award categories:

- Critical Access Hospital (≥25 Beds)
- Acute Hospitals Under 100 Beds
- Acute Hospitals Between 101-250 Beds
- Acute Hospitals With Greater than 250 Beds
- Psychiatric Units and Freestanding Psychiatric Hospitals
- Post-Acute Units and Freestanding Hospitals (Including Physical Rehabilitation and Long-Term Acute Care)

Application Materials

This application can also be downloaded directly from http://www.kyha.com/home/quality-pricing-information/. If you have questions about the award, please contact Elizabeth Cobb at 502-426-6220 or by e-mail at ecobb@kyha.com

Each application should have three parts:

1) A cover page signed by the CEO
2) Completed demographics section
3) Responses to specific questions on your hospital's systems to improve and ensure overall quality

All applications become the property of the Kentucky Hospital Association and may be used in KHA's efforts to promote quality improvement in the hospital field and to provide

"best practices" and examples of different approaches to achieving the quality goals.

Submission of Applications

Applications are due by April 1, 2014. Please do not submit attachments or any supplemental materials in binders or special folders or video/audio materials. Completed applications may be either e-mailed (preferred) or mailed. Completed applications may be e-mailed to ecobb@kyha.com. When e-mailing, we strongly encourage you to convert your application to a pdf file to minimize possible distortion in graphs, charts, and lay out. Applications may be mailed to the Kentucky Hospital Association, c/o Elizabeth Cobb, P.O. Box 436629, Louisville, Kentucky 40253. The awards will be presented at the 2014 KHA Annual Convention Awards Luncheon on the May 9.

Application Fee: The application fee for the KHA Quality Award is $1 for each licensed hospital bed. In the case of a psychiatric or physical rehabilitation unit applying, the fee should be $1 per each licensed bed for that service. ***Fees must be received by the April 1 deadline in order to qualify for the Quality Award.*** Checks should be made payable to the Kentucky Hospital Research and Education Foundation (KHREF).

Kentucky Hospital Association Quality Award
2012 Application

Hospital Name: _Saint Joseph Hospital_____

Application Contact: _Russ Judd_____

Title of Contact: _Antimicrobial Stewardship Program Coordinator_____

Street Address: _1 Saint Joseph Drive_____

City, State, Zip Code: _Lexington, KY 40504_____

E-Mail Address: _juddwr@sjhlex.org_____

Phone Number: _859-351-7135_____Fax :_859-313-2304_____

The following should be read and signed by the hospital CEO.

This award seeks to increase understanding of the value of organizational focus and commitment to achieving optimal outcomes. Hospitals are urged to consider participation in the awards process both as recognition of their quality improvement and patient safety efforts and to assess their progress in creating an environment focused on safety and effectiveness.

All applications for the award become the property of the Kentucky Hospital Association. Descriptions of winning programs may be published by the Kentucky Hospital Association in an aim to increase awareness of the need for an organization-wide commitment to quality improvement and patient safety. Program contacts may be asked to provide additional information.

I certify that the information in this application is accurate and consent to the use of submitted information by KHA in publications or for the purposes of promoting exceptional quality in the delivery of care by Kentucky hospitals.

Signature _____Date_____

Title_____

A Few Helpful Tips for Completing this Application:

- Please note that the word limits in Part II are **maximums**; reviewers appreciate concise and direct responses; bulleted responses rather than narrative text are acceptable and encouraged where appropriate.

- Given that reviewers may read many applications, make your application easy to read by using 12-point type, letting some white space show on the page, and making sure it has been proofread.

- If a system or mechanism that you have already described as a response to one question is also relevant to another answer, please feel free to refer to the original description and explanation rather than repeat it.

- When possible, cite specific examples that demonstrate progress or illustrate processes that have resulted in improved outcomes.

Part I: ORGANIZATIONAL Demographic Information

1) Quality Award category:

- [ ] Critical Access Hospital
- [ ] < 100 Acute Beds
- [ ] 100 to 250 Acute Beds
- [X] > 250 Acute Beds
- [ ] Psychiatric
- [ ] Physical Rehabilitation or Long-Term Acute Care

2) Medicare designation:

- [X] Urban
- [ ] Rural

SERVICE DEMOGRAPHIC INFORMATION: Please provide an ***estimation***

1) Population Demographics of the Community Served

_____20____% <21 years of age

_____30____% ≥ 21 years of age but less than age 40

_____30____% ≥ 40 years of age, but less than age 65

_____20____% ≥ 65 years of age

2) Population Diversity Demographics of the Community Served

A. __50__% Caucasian ___25__% Latino/Hispanic __15_% African-American

___10__% Asian _____% Other (please list major groups)

B. __70__% English as primary language

__25__% Non-native English speaker

___5__% Little or no English (requiring interpreter)

3) Patient Insurance Demographics of the Community Served

__15___% With private insurance

__30___% With Medicare

__20___% With Medicare and supplemental insurance

__20___% Medicaid or other public assistance

__15___% No coverage

Part II: Quality Issues

The following sections list certain issues that the application **should** address; however, applicants are encouraged to address additional issues where appropriate.

A. What role does organizational leadership (governance, clinical leadership, administration) play in defining and promoting quality health care in your organization? Be sure to address:

1) The specific definition of "quality" used by your organization
2) How leadership works together and uses the organization's definition of quality in conjunction with the organization's mission and vision to set quality goals
3) How organizational leadership engages the organization's employees, clinical/medical staff, and patients and families in setting goals, evaluating progress, and implementing changes to achieve the defined goals

(max. 500 words)

B. How does your organization support staff and employee efforts to achieve quality goals? Be sure to address:

1) How employees and clinical/medical staff are trained in principles and practice of effective teamwork, communication, relationship management, and how the organization continually evaluates the effectiveness of such training
2) How personal accountability for job performance is balanced with understanding the causes of harm and errors based on an analytical systems approach
3) How and with what frequency your organization assesses employee and clinical/medical staff perceptions of the quality and safety culture within your organization
4) How and with what frequency your organization assesses employee and medical staff satisfaction with the hospital work environment and the care provided to patients.

(max. 500 words)

C. Describe one clinical or non-clinical hospital process improvement, patient care initiative, or innovative change project. Be sure to address:

1) A description of the project
2) A description of the operation/process problems, patient care challenge or other factors that drove the improvement project
3) The implementation of the project/process including how long did the project take and when was it completed
4) What makes the project innovative and significant
5) What benefits were realized

*attach any relevant photos, diagrams, or other information (not included in word count)

(max. 1000 words)

PART A: What role does organizational leadership (governance, clinical leadership, administration) play in defining and promoting quality health care in your organization? Be sure to address:

3) The specific definition of "quality" used by your organization
4) How leadership works together and uses the organization's definition of quality in conjunction with the organization's mission and vision to set quality goals
4) How organizational leadership engages the organization's employees, clinical/medical staff, and patients and families in setting goals, evaluating progress, and implementing changes to achieve the defined goals
(max. 500 words)

The vision of Saint Joseph Hospital and KentuckyOne Health is to be the premier, integrated, comprehensive health system in the Commonwealth providing high-quality care, reducing the incidence of disease, and eliminating inequities in access to care. Core values of the organization are integrated into the quality of care received. They include the following:

- Reverence
- Integrity
- Compassion
- Excellence

Organizational leadership engages the organization's employees, clinical/medical staff, and patients and families in setting goals, evaluating progress, and implementing changes to achieve the defined goals through a number of different mechanisms, including orientation and education of all newly hired employees and clinical staff members during the hospital orientation process and periodically thereafter. Competency evaluations as well as online training and educational modules are also used to enhance quality of care.

Patient safety is also a critical component of quality health care. Organizational leadership has been actively involved in the "SafetyFirst" program to enhance patient safety. The role of the administrative team in this process is to reinforce a safety-first attitude, demonstrate personal involvement in safe practices, and rapidly respond to safety issues. Administrative team members are actively involved in each of the following "SafetyFirst" activities:

- Annual goal setting for department leaders related to patient safety
- Participation in "Safety and Quality Council" meetings
- Executive oversight for root cause analysis
- Daily check-ins to review current safety issues
- Reward and recognize safety success stories

Although resources were limited during the early stages of program development, the Antimicrobial Stewardship Program recently received administrative support to operate in a full-time capacity. Activities performed under the direction of the ASP team, Sepsis Committee, and hospital administration have allowed us to meet our stated goals and objectives.

PART B: How does your organization support staff and employee efforts to achieve quality goals? Be sure to address:

5) How employees and clinical/medical staff are trained in principles and practice of effective teamwork, communication, relationship management, and how the organization continually evaluates the effectiveness of such training
6) How personal accountability for job performance is balanced with understanding the causes of harm and errors based on an analytical systems approach
7) How and with what frequency your organization assesses employee and clinical/medical staff perceptions of the quality and safety culture within your organization
8) How and with what frequency your organization assesses employee and medical staff satisfaction with the hospital work environment and the care provided to patients.
(max. 500 words)

The Educational Services and Organizational Development Department of Saint Joseph Hospital strives to provide enrichment opportunities for all interested persons through personal, professional, clinical, and community offerings. These enrichment opportunities are designed to augment the knowledge, skills, attitudes, and well-being of all participants for the enhancement of life skills, professional practice, leadership, and continuous quality improvement. Hospital employees complete mandatory competency training using an online education and assessment tool known as LEARN. Educational modules are designed to enhance teamwork, communication, and knowledge of core competencies.

The "SafetyFirst" program (described in Part A) was designed to promote clear and complete communication using specific error prevention techniques. A "SafetyFirst" attitude was adopted by hospital administration and employees which supports open, personal, and team commitment to safety. Department leaders meet with staff on a daily basis to review serious safety events and "good catches" or other safe practices. The "Rounding to Influence" program also allows department leaders to engage hospital employees and to identify problems that may negatively impact operations. Weekly rounds are conducted to help establish and maintain open and clear communication. The leadership team participates in the following activities:

- Observes first-hand the work performance of staff and leaders
- Provides real-time feedback and performance coaching
- Understands employee knowledge and reinforces performance expectations
- Identifies problems impacting operations

The Quality Management Department also provides services to the organization, which consists of two arms. The first arm includes that of data abstraction, collation, and analysis. Data are analyzed and evaluated at the patient level, physician level, and outcomes level. Reports are generated and taken to Medical Staff, Departmental and Leadership committees and meetings for review and discussion. The second arm of the department includes actions in relation to data critique and analysis to focus performance improvement efforts. Quality performance feedback is provided to physicians, clinicians and staff as opportunities for improvement are identified. Through the Plan, Do, Check, Act (PDCA) process, process improvements are then put into place. Results of process improvement initiatives are reported to the Performance Improvement Council, Leadership and the Board of Directors.

The Antimicrobial Stewardship Program is one example of a quality-based initiative whose primary goals and objectives include the following: to ensure the appropriate use of antimicrobial agents, to reduce or prevent the emergence of antimicrobial resistance, and to reduce antimicrobial expenditures. The ASP coordinator reports directly to Dr. Reynolds who serves as a medical director for the hospital, overseeing physician practices and other quality improvement initiatives. Dr. Reynolds meets with the ASP team at least once a month to identify opportunities to improve patient care related to antimicrobial stewardship. Open and clear communication with the administrative team is essential to the success of the program.

PART C: Describe one clinical or non-clinical hospital process improvement, patient care initiative, or innovative change project. Be sure to address:

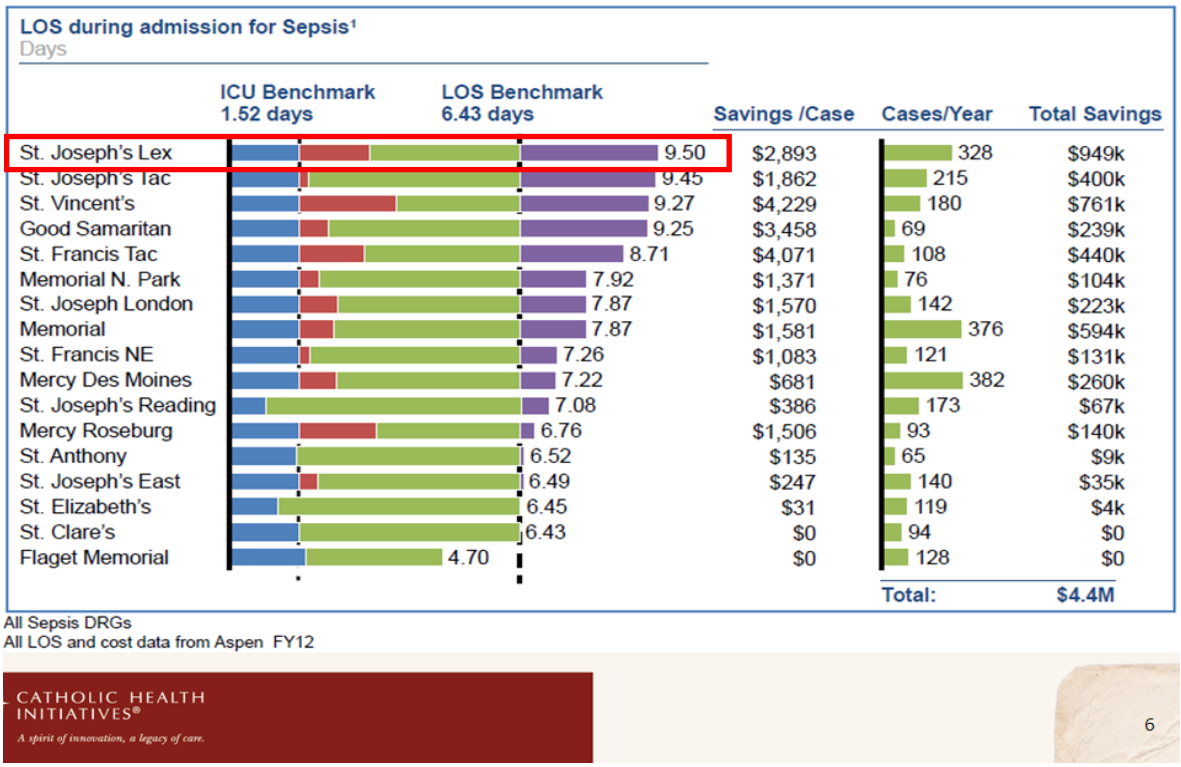
6) A description of the project
7) A description of the operation/process problems, patient care challenge or other factors that drove the improvement project
8) The implementation of the project/process including how long did the project take and when was it completed
9) What makes the project innovative and significant
10) What benefits were realized

*attach any relevant photos, diagrams, or other information (not included in word count)
(max. 1000 words)

Management of severe sepsis and septic shock is multifaceted and requires a coordinated effort among healthcare providers. The Saint Joseph Hospital Sepsis Initiative was designed to improve upon quality metrics related to severe sepsis and septic shock, including hospital and ICU length-of-stay, mortality, and re-admission within 30 days. The sepsis initiative was supported through grant funding from the Kentucky Hospital Engagement Network (KHEN). Phase one of this two-phase initiative focused on early identification and treatment of patients with sepsis using principles derived from the Surviving Sepsis Campaign guidelines.

To accomplish our stated objectives, a multidisciplinary team, known as the Sepsis Committee, operated under the direction of the Antimicrobial Stewardship Program (ASP). The committee was supported by organizational leadership, and key stakeholders were identified from each of the following departments: ED, pulmonary, ID, infection control, pharmacy, nursing, and hospitalist groups. Baseline quality metrics data including length-of-stay (LOS), ICU-LOS, mortality, and markers of early, goal-directed resuscitation were collected for patients with sepsis-related DRGs. Time to effective antimicrobial therapy was also identified as a key contributor to sepsis-related mortality and LOS. Before implementing this initiative, the ASP team identified ‘management of severe sepsis and septic shock’ as a target area for improvement. Baseline data among CHI hospitals revealed a higher than expected rate of morbidity and mortality along with wide protocol variability (See figure 1 below).

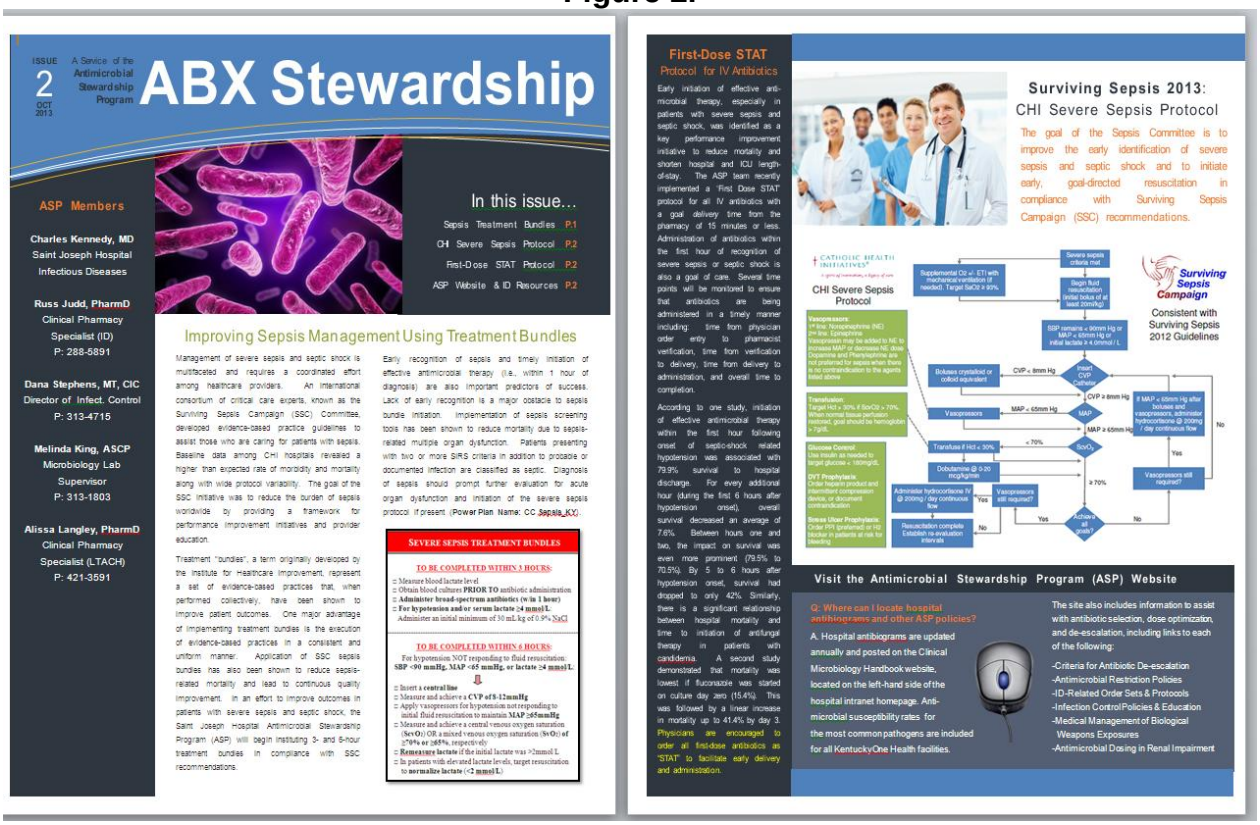
Figure 1.



Early recognition of sepsis and timely initiation of effective antimicrobial therapy (i.e., within 1 hour of diagnosis) were also recognized as important predictors of success. Lack of early recognition is a major obstacle to sepsis bundle initiation. Implementation of sepsis screening tools was shown in previous trials to reduce sepsis-related mortality due to multiple organ dysfunction.

A 'Sepsis Screening Tool' was integrated into the new electronic medical record. The screening tool was incorporated into daily documentation requirements for all nursing staff, and all patients were screened for signs of sepsis at least once per shift. Patients presenting with two or more SIRS criteria in addition to documented or suspected infection were classified as septic. Nurses were instructed to notify the primary care provider or rapid response team for patients meeting those criteria. Diagnosis of sepsis would then prompt further evaluation for acute organ dysfunction and initiation of the severe sepsis protocol if present. A portion of the funds provided by K-HEN were also used to print and distribute 'Severe Sepsis Cards' and other forms of education (See figures 2 and 3 below). All educational materials shown below were prepared by the Saint Joseph Hospital ASP team in preparation for the Severe Sepsis Initiative.

Figure 2.



ISSUE 2 OCT 2013

A Service of the Antimicrobial Stewardship Program

ABX Stewardship

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In this issue...

Improving Sepsis Management Using Treatment Bundles

Management of severe sepsis and septic shock is multifaceted and requires a coordinated effort among healthcare providers. An international consortium of critical care experts, known as the Surviving Sepsis Campaign (SSC) Committee, developed evidence-based practice guidelines to assist those who are caring for patients with sepsis. Baseline data among CHI hospitals revealed a higher than expected rate of morbidity and mortality along with wide protocol variability. The goal of the SSC Initiative was to reduce the burden of sepsis worldwide by providing a framework for performance improvement initiatives and provider education.

Treatment "bundles", a term originally developed by the Institute for Healthcare Improvement, represent a set of evidence-based practices that, when performed collectively, have been shown to improve patient outcomes. One major advantage of implementing treatment bundles is the execution of evidence-based practices in a consistent and uniform manner. Application of SSC sepsis bundles has also been shown to reduce sepsis-related mortality and lead to continuous quality improvement. In an effort to improve outcomes in patients with severe sepsis and septic shock, the Saint Joseph Hospital Antimicrobial Stewardship Program (ASP) will begin instituting 3- and 6-hour treatment bundles in compliance with SSC recommendations.

Early recognition of sepsis and timely initiation of effective antimicrobial therapy (i.e., within 1 hour of diagnosis) are also important predictors of success. Lack of early recognition is a major obstacle to sepsis bundle initiation. Implementation of sepsis screening tools has been shown to reduce mortality due to sepsis-related multiple organ dysfunction. Patients presenting with two or more SIRS criteria in addition to probable or documented infection are classified as septic. Diagnosis of sepsis should prompt further evaluation for acute organ dysfunction and initiation of the severe sepsis protocol if present (Power Plan Name: CC Sepsis_KY).

SEVERE SEPSIS TREATMENT BUNDLES

TO BE COMPLETED WITHIN 3 HOURS:

- ☐ Measure blood lactate level
- ☐ Obtain blood cultures **PRIOR TO** antibiotic administration
- ☐ **Administer broad-spectrum antibiotics (w/in 1 hour)**
- ☐ **For hypotension and/or serum lactate ≥4 mmol/L**
  Administer an initial minimum of 30 mL/kg of 0.9% NaCl

TO BE COMPLETED WITHIN 6 HOURS:

For hypotension NOT responding to fluid resuscitation:
SBP <90 mmHg, MAP <65 mmHg, or lactate ≥4 mmol/L

⇩

- ☐ Insert a **central line**
- ☐ Measure and achieve a **CVP of 8-12mmHg**
- ☐ Apply vasopressors for hypotension not responding to initial fluid resuscitation to maintain **MAP ≥65mmHg**
- ☐ Measure and achieve a central venous oxygen saturation (**ScvO2**) OR a mixed venous oxygen saturation (**SvO2**) of **≥70% or ≥65%**, respectively
- ☐ **Remeasure lactate** if the initial lactate was >2mmol/L
- ☐ In patients with elevated lactate levels, target resuscitation to **normalize lactate** (<2 mmol/L)

First-Dose STAT Protocol for IV Antibiotics

Early initiation of effective antimicrobial therapy, especially in patients with severe sepsis and septic shock, was identified as a key performance improvement initiative to reduce mortality and shorten hospital and ICU length-of-stay. The ASP team recently implemented a First Dose STAT protocol for all IV antibiotics with a goal delivery time from the pharmacy of 15 minutes or less. Administration of antibiotics within the first hour of recognition of severe sepsis or septic shock is also a goal of care. Several time points will be monitored to ensure that antibiotics are being administered in a timely manner including: time from physician order entry to pharmacist verification, time from verification to delivery, time from delivery to administration, and overall time to completion.

According to one study, initiation of effective antimicrobial therapy within the first hour following onset of septic-shock related hypotension was associated with 79.9% survival to hospital discharge. For every additional hour (during the first 6 hours after hypotension onset), overall survival decreased an average of 7.6%. Between hours one and two, the impact on survival was even more prominent (79.5% to 70.5%). By 5 to 6 hours after hypotension onset, survival had dropped to only 42%. Similarly, there is a significant relationship between hospital mortality and time to initiation of antifungal therapy in patients with candidemia. A second study demonstrated that mortality was lowest if fluconazole was started on culture day zero (15.4%). This was followed by a linear increase in mortality up to 41.4% by day 3. Physicians are encouraged to order all first-dose antibiotics as "STAT" to facilitate early delivery and administration.

Surviving Sepsis 2013: CHI Severe Sepsis Protocol

The goal of the Sepsis Committee is to improve the early identification of severe sepsis and septic shock and to initiate early, goal-directed resuscitation in compliance with Surviving Sepsis Campaign (SSC) recommendations.

CHI Severe Sepsis Protocol

Surviving Sepsis Campaign

Consistent with Surviving Sepsis 2012 Guidelines

Visit the Antimicrobial Stewardship Program (ASP) Website

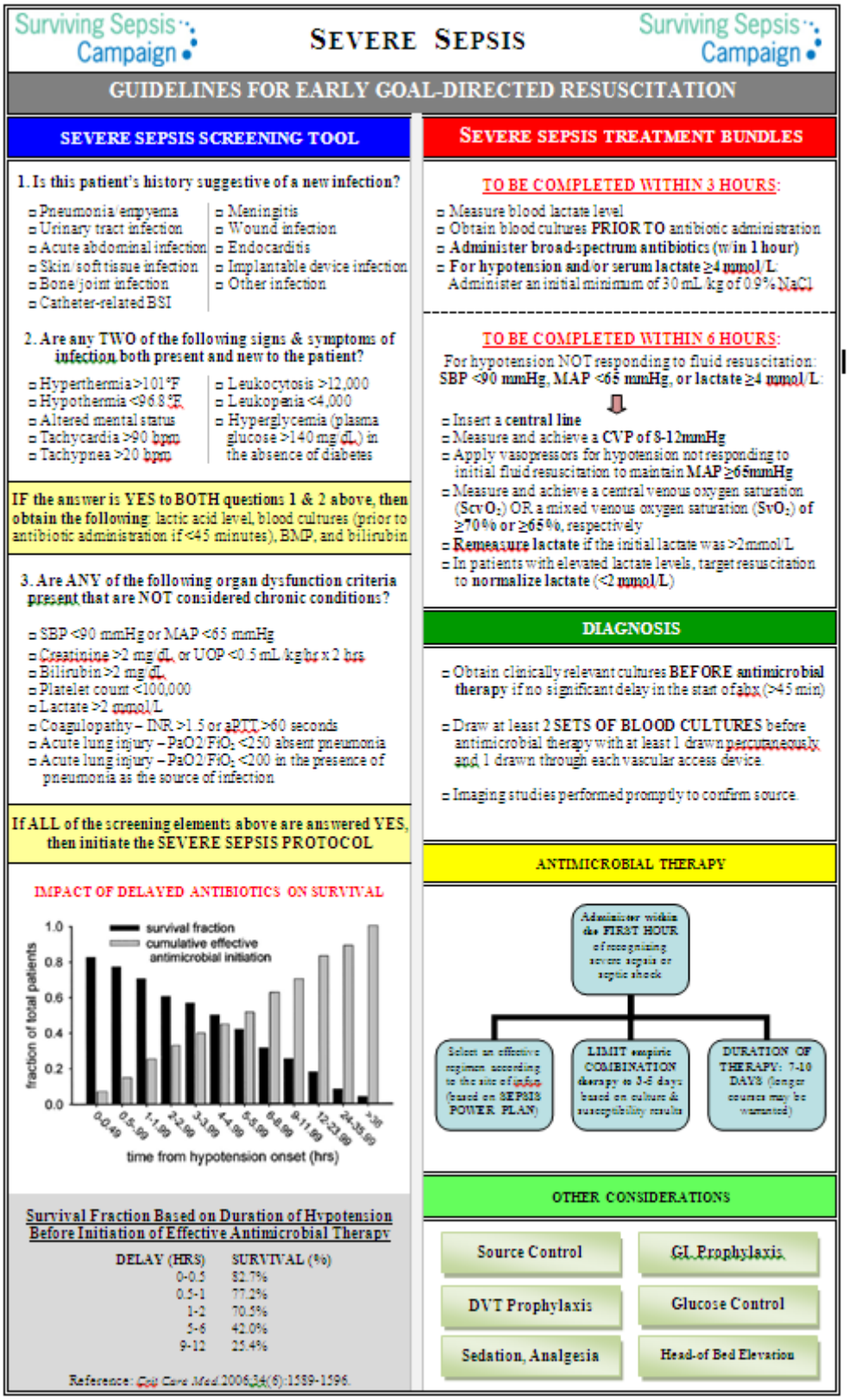
Q: Where can I locate hospital antibiograms and other ASP policies?

A. Hospital antibiograms are updated annually and posted on the Clinical Microbiology Handbook website, located on the left-hand side of the hospital intranet homepage. Antimicrobial susceptibility rates for the most common pathogens are included for all KentuckyOne Health facilities.

The site also includes information to assist with antibiotic selection, dose optimization, and de-escalation, including links to each of the following:

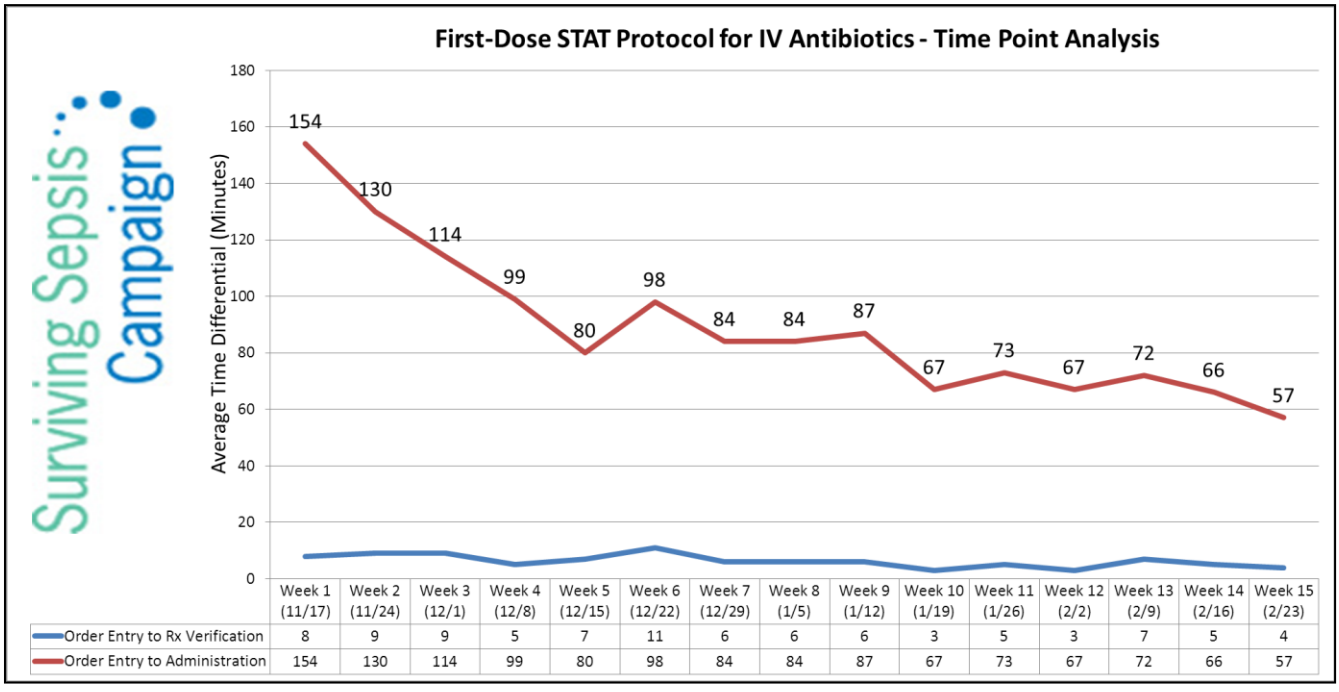
- -Criteria for Antibiotic De-escalation
- -Antimicrobial Restriction Policies
- -ID-Related Order Sets & Protocols
- -Infection Control Policies & Education
- -Medical Management of Biological Weapons Exposures
- -Antimicrobial Dosing in Renal Impairment

Figure 3.


Surviving Sepsis Campaign
SEVERE SEPSIS
Surviving Sepsis Campaign
GUIDELINES FOR EARLY GOAL-DIRECTED RESUSCITATION
SEVERE SEPSIS SCREENING TOOL
1. Is this patient's history suggestive of a new infection?
Pneumonia/empyema
Urinary tract infection
Acute abdominal infection
Skin/soft tissue infection
Bone/joint infection
Catheter-related BSI
Meningitis
Wound infection
Endocarditis
Implantable device infection
Other infection
2. Are any TWO of the following signs & symptoms of infection both present and new to the patient?
Hyperthermia >101°F
Hypothermia <96.8°F
Altered mental status
Tachycardia >90 bpm
Tachypnea >20 bpm
Leukocytosis >12,000
Leukopenia <4,000
Hyperglycemia (plasma glucose >140 mg/dL) in the absence of diabetes
IF the answer is YES to BOTH questions 1 & 2 above, then obtain the following: lactic acid level, blood cultures (prior to antibiotic administration if <45 minutes), BMP, and bilirubin
3. Are ANY of the following organ dysfunction criteria present that are NOT considered chronic conditions?
SBP <90 mmHg or MAP <65 mmHg
Creatinine >2 mg/dL or UOP <0.5 mL/kg/hr x 2 hrs
Bilirubin >2 mg/dL
Platelet count <100,000
Lactate >2 mmol/L
Coagulopathy – INR >1.5 or aPTT >60 seconds
Acute lung injury – PaO2/FiO2 <250 absent pneumonia
Acute lung injury – PaO2/FiO2 <200 in the presence of pneumonia as the source of infection
If ALL of the screening elements above are answered YES, then initiate the SEVERE SEPSIS PROTOCOL
IMPACT OF DELAYED ANTIBIOTICS ON SURVIVAL
survival fraction
cumulative effective antimicrobial initiation
fraction of total patients
1.0
0.8
0.6
0.4
0.2
0.0
0-0.49
0.5-0.99
1-1.99
2-2.99
3-3.99
4-4.99
5-5.99
6-8.99
9-11.99
12-23.99
24-35.99
>36
time from hypotension onset (hrs)
Survival Fraction Based on Duration of Hypotension Before Initiation of Effective Antimicrobial Therapy
DELAY (HRS) SURVIVAL (%)
0-0.5 82.7%
0.5-1 77.2%
1-2 70.5%
5-6 42.0%
9-12 25.4%
Reference: Crit Care Med 2006;34(6):1589-1596.
SEVERE SEPSIS TREATMENT BUNDLES
TO BE COMPLETED WITHIN 3 HOURS:
Measure blood lactate level
Obtain blood cultures PRIOR TO antibiotic administration
Administer broad-spectrum antibiotics (within 1 hour)
For hypotension and/or serum lactate ≥4 mmol/L: Administer an initial minimum of 30 mL/kg of 0.9% NaCl
TO BE COMPLETED WITHIN 6 HOURS:
For hypotension NOT responding to fluid resuscitation: SBP <90 mmHg, MAP <65 mmHg, or lactate ≥4 mmol/L:
Insert a central line
Measure and achieve a CVP of 8-12mmHg
Apply vasopressors for hypotension not responding to initial fluid resuscitation to maintain MAP ≥65mmHg
Measure and achieve a central venous oxygen saturation ($ScvO_2$) OR a mixed venous oxygen saturation (SvO_2) of ≥70% or ≥65%, respectively
Remeasure lactate if the initial lactate was >2mmol/L
In patients with elevated lactate levels, target resuscitation to normalize lactate (<2 mmol/L)
DIAGNOSIS
Obtain clinically relevant cultures BEFORE antimicrobial therapy if no significant delay in the start of abx (>45 min)
Draw at least 2 SETS OF BLOOD CULTURES before antimicrobial therapy with at least 1 drawn percutaneously and 1 drawn through each vascular access device.
Imaging studies performed promptly to confirm source.
ANTIMICROBIAL THERAPY
Administer within the FIRST HOUR of recognizing severe sepsis or septic shock
Select an effective regimen according to the site of infxn (based on SEPSIS POWER PLAN)
LIMIT empiric COMBINATION therapy to 3-5 days based on culture & susceptibility results
DURATION OF THERAPY: 7-10 DAYS (longer courses may be warranted)
OTHER CONSIDERATIONS
Source Control
GI Prophylaxis
DVT Prophylaxis
Glucose Control
Sedation, Analgesia
Head-of Bed Elevation

Early initiation of effective antimicrobial therapy, especially in patients with severe sepsis and septic shock, was identified as a key performance improvement initiative to reduce sepsis-related mortality and shorten hospital and ICU length-of-stay. The 'First-Dose STAT Policy for IV Antibiotics' was designed to achieve a target *delivery* time of less than 15 minutes from order entry and a target *administration* time of less than one hour from diagnosis or order entry. A designated STAT pharmacy printer containing visually distinct medication labels was purchased to help facilitate this goal. Bright yellow labels served as a visual cue to pharmacy and nursing to administer STAT medications within 60 minutes of order entry. Results of the First-Dose STAT Protocol are shown in Figure 4 below. Pharmacy and nursing in-services were also developed to highlight the benefits of early antimicrobial administration. During the 15-week study period, the average time from order entry to administration declined significantly from 154 minutes to 57 minutes for all units combined. The average time from antibiotic order entry to administration was reduced by 63% by the end of the phase one intervention period. When combined with an electronic sepsis screening tool to enhance early recognition, this study demonstrated an immediate impact on both clinical and economic outcome measures.

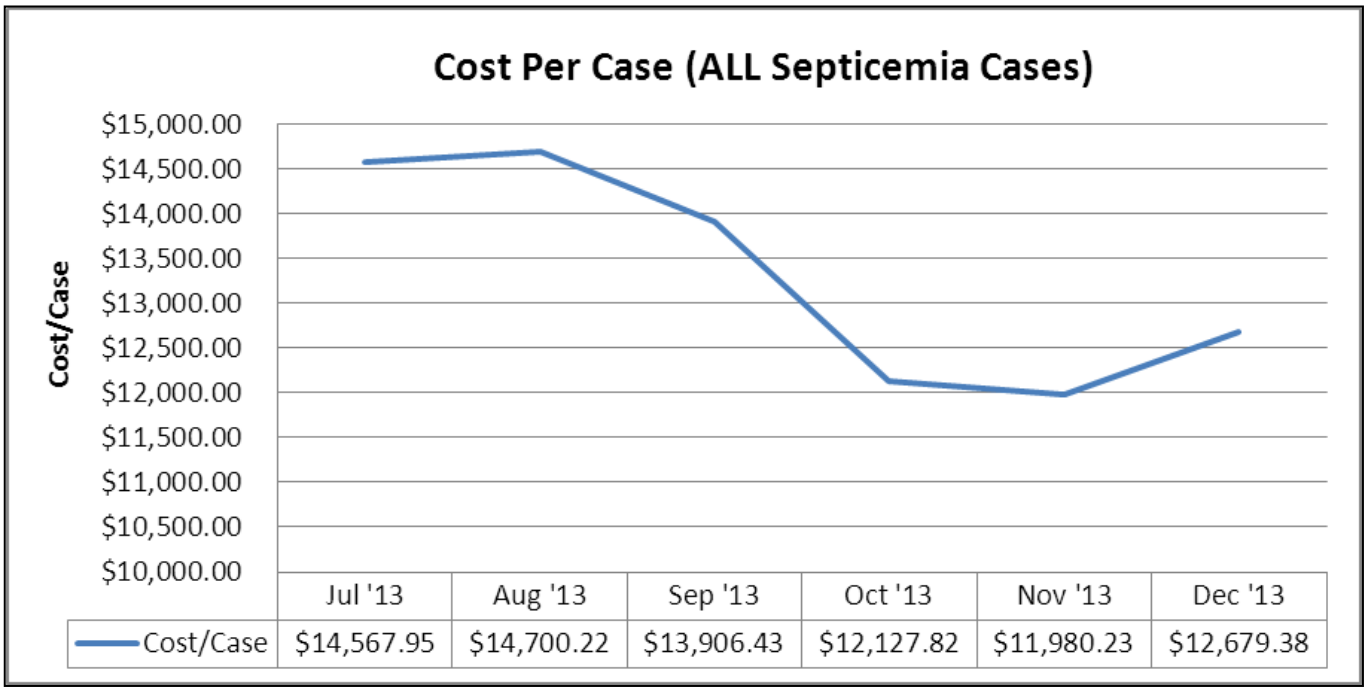
Figure 4.

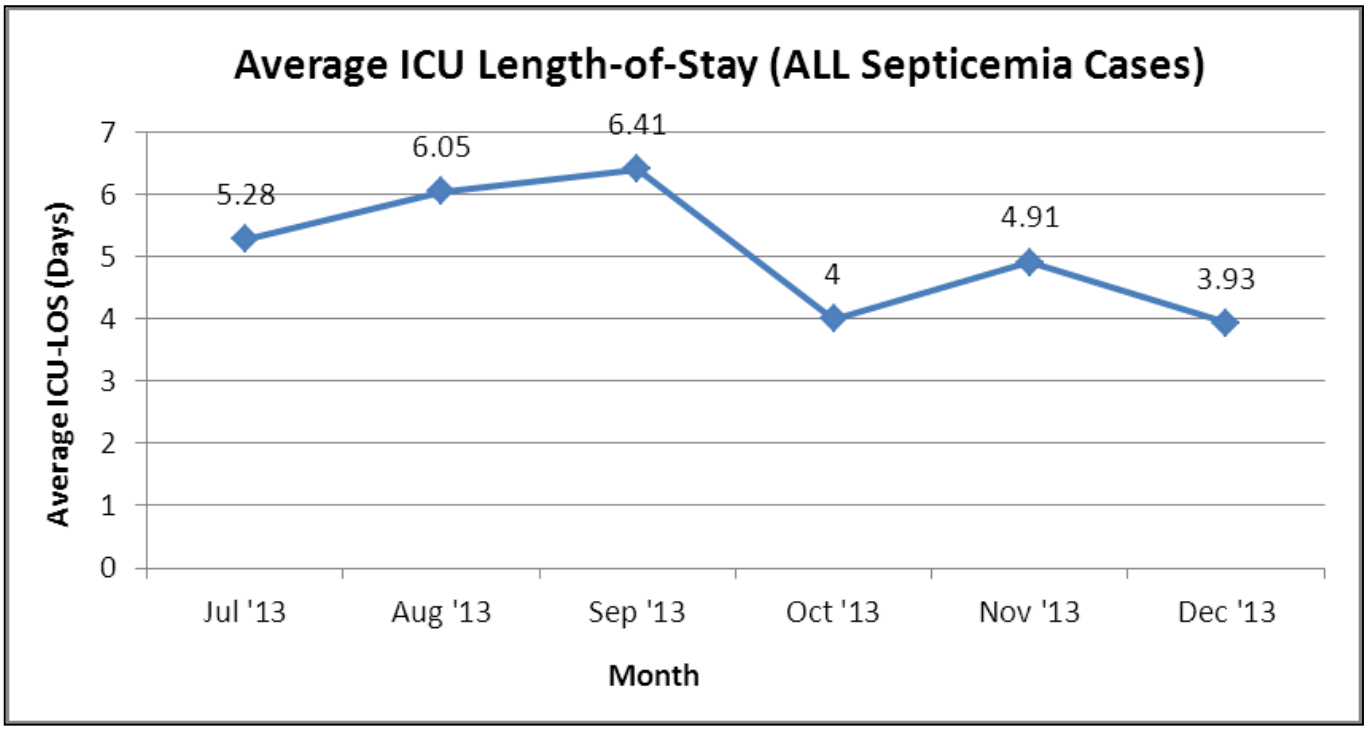


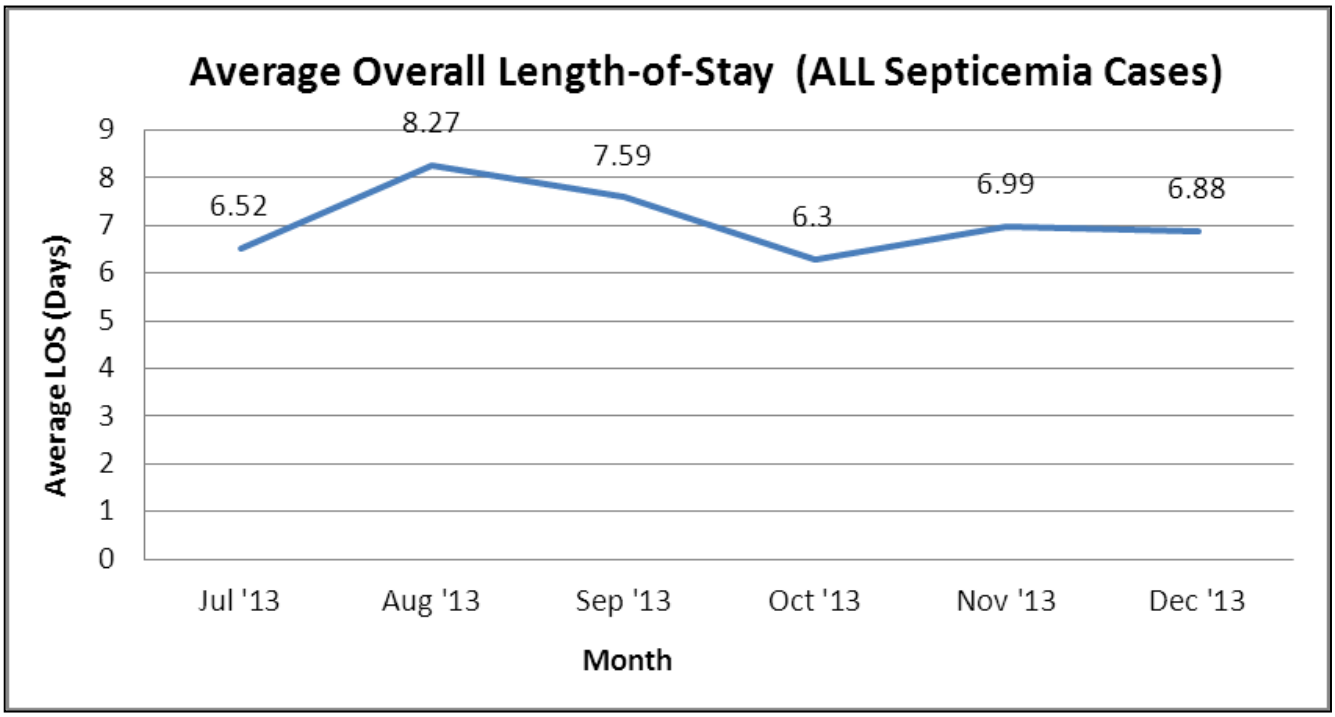
	Week 1 (11/17)	Week 2 (11/24)	Week 3 (12/1)	Week 4 (12/8)	Week 5 (12/15)	Week 6 (12/22)	Week 7 (12/29)	Week 8 (1/5)	Week 9 (1/12)	Week 10 (1/19)	Week 11 (1/26)	Week 12 (2/2)	Week 13 (2/9)	Week 14 (2/16)	Week 15 (2/23)
Order Entry to Rx Verification	8	9	9	5	7	11	6	6	6	3	5	3	7	5	4
Order Entry to Administration	154	130	114	99	80	98	84	84	87	67	73	67	72	66	57

Sepsis-related quality metrics (i.e., ICU-LOS, overall LOS, and cost per case) were monitored on a monthly basis to determine if performance improvement initiatives were leading to their desired effects. Quality metrics were provided by the hospital analytics department by extracting patient outcomes from sepsis-related DRGs. Retrospective chart reviews were also performed to determine the average time to initiation of antimicrobial therapy (i.e. time from order entry to administration). Results of the 'First-Dose STAT' policy were distributed to nurse unit managers on a weekly basis and posted in the pharmacy.

Phase-one results from the three-month intervention period (October-December 2013) are shown below. Cost per case, ICU and overall length-of-stay (LOS), and mortality were compared to baseline LOS data in Figure 1 above. The three months immediately preceding the intervention period are also shown below. Significant improvements in all quality metrics were noted after implementing the program.






Average Overall Length-of-Stay (ALL Septicemia Cases)
Average LOS (Days)
9
8
7
6
5
4
3
2
1
0
6.52
8.27
7.59
6.3
6.99
6.88
Jul '13
Aug '13
Sep '13
Oct '13
Nov '13
Dec '13
Month

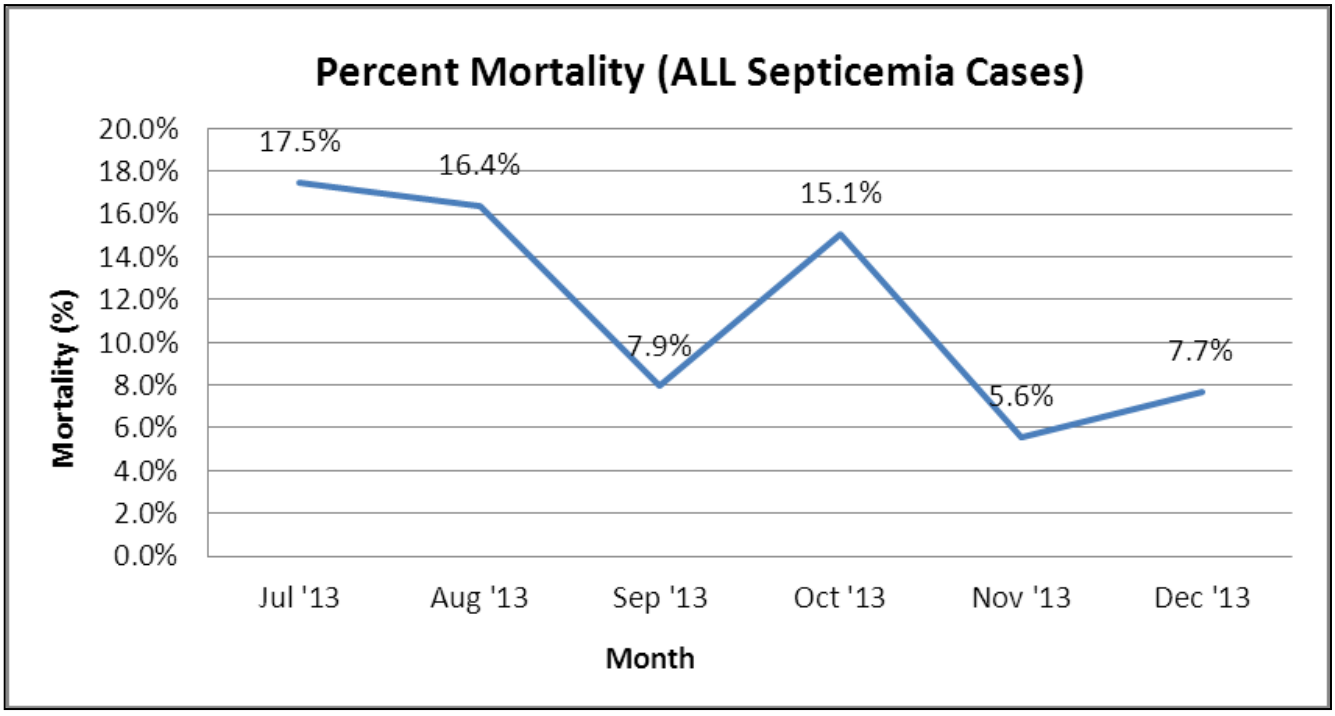
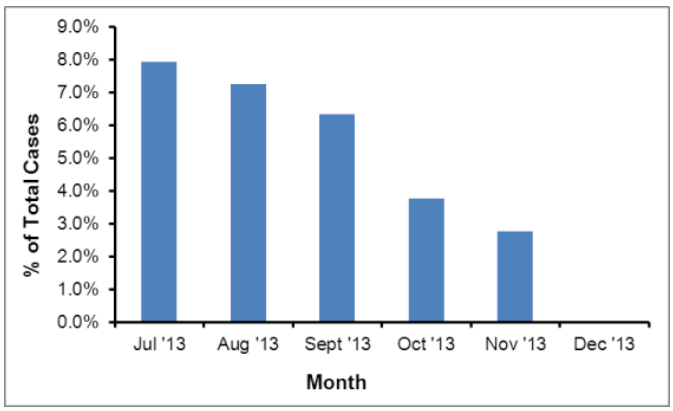
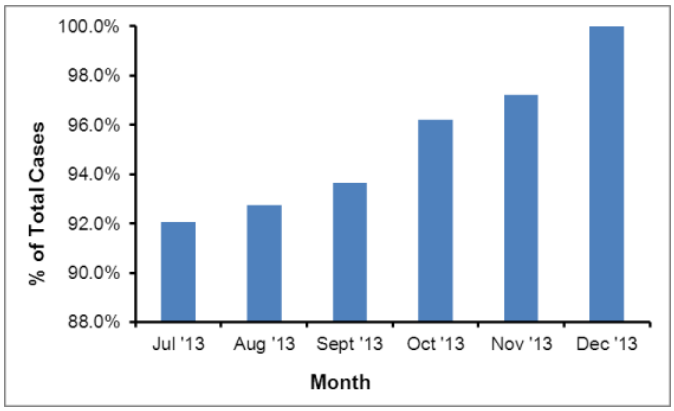

Percent Mortality (ALL Septicemia Cases)
Mortality (%)
20.0%
18.0%
16.0%
14.0%
12.0%
10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
17.5%
16.4%
7.9%
15.1%
5.6%
7.7%
Jul '13
Aug '13
Sep '13
Oct '13
Nov '13
Dec '13
Month

Table 1. Clinical and Economic Outcomes After Program Implementation			
	Historical Group, n = 181	**Intervention Group, n = 216**	**p-value**
Clinical outcome measures			
In-hospital mortality, n (%)	25 (13.8)	19 (8.8)	0.113
Overall LOS, days	7.43 ± 5.68	6.77 ± 5	0.115
ICU LOS (ICU-admitted patients only), days	5.85 ± 4.38	4.21 ± 3.64	0.006
ICU LOS (All septicemia cases), days	2.33 ± 3.98	1.66 ± 3.07	0.033
Economic outcome measures			
Variable indirect cost per case	$1,275.52	$1,119.40	0.06
Fixed indirect cost per case	$5,499.15	$4,727.96	0.033
Variable direct cost per case	$6,406.42	$5,465.26	0.038
Fixed direct cost per case	$1,099.69	$725.83	<0.001
TOTAL cost per case	**$14,377.89**	**$12,310.99**	0.033

Sepsis diagnosis-related group (DRG) codes included 870, 871, and 872. Historical data indicated that risk for mortality, LOS, and overall severity-of-illness were highest for DRG code 870 versus other coding assignments. Scheduled completion of an electronic sepsis screening tool aided in converting the sepsis population to a lower severity of illness based on the change in sepsis-related DRG codes over the six-month study period. By the end of the study period, the percentage of patients presenting with DRG code 870 decreased from 7.9% to 0%. The mortality rate in patients with 870 codes ranged from 25-50% versus 5.6-22.5% in the 871 group and 0% in the 872 group.





Strategies to improve early recognition and treatment of sepsis including routine use of an electronic sepsis screening tool, increased provider awareness of sepsis, and implementation of a First-Dose STAT policy resulted in lower rates of in-hospital mortality and overall LOS as well as significant reductions in ICU-LOS and total cost per case.