



Taking Better Care of Sepsis Patients

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Sepsis by the Numbers

1.7 Million

- More than 1.7 Million people get sepsis each year in the US
- About 84,000 admissions in PA annually

270,000

- At least 270,000 Americans die from sepsis each year (that's one every two minutes!)
- About 7,000 deaths in PA annually

1 in 3 Patients

- About 1 in 3 patients who die in the hospital have sepsis

1 in 15

- 1 in 15 severe sepsis discharges will be readmitted within 7 days
- 1 in 5 are readmitted within 30 days

55%

- Just over half of all Americans know the signs and what sepsis is

1/3rd

- Only about one third of sepsis patients nationwide receive the best care
- Late and missed diagnoses are common

\$24 Billion

- Total annual US hospital costs for treating sepsis

www.cdc.gov
www.sepsis.org

HAP Raising the Bar for Sepsis Care in Pennsylvania, September 6, 2017, Harrisburg, PA



Our Sepsis Story

- Our sepsis journey began in 2012
 - PI project with a private payer
- Higher volume diagnosis
- Higher associated cost
- Higher associated mortality rate
- CMS publically reported measure
 - CMS mandated reporting beginning with Oct 2015 discharges
 - First posted on Hospital Compare July 2018





Quality/PI Structure

- Network Sepsis PI Team
 - Report out to Network PI Council
 - Executive sponsor
 - Various disciplines represented
 - Representation from every campus
- Monthly meetings
- Data reviewed and discussed
 - Premier
 - CMS Sep-1 Core Measure compliance
- Trends and opportunities are identified
- Seek feedback and recommendations





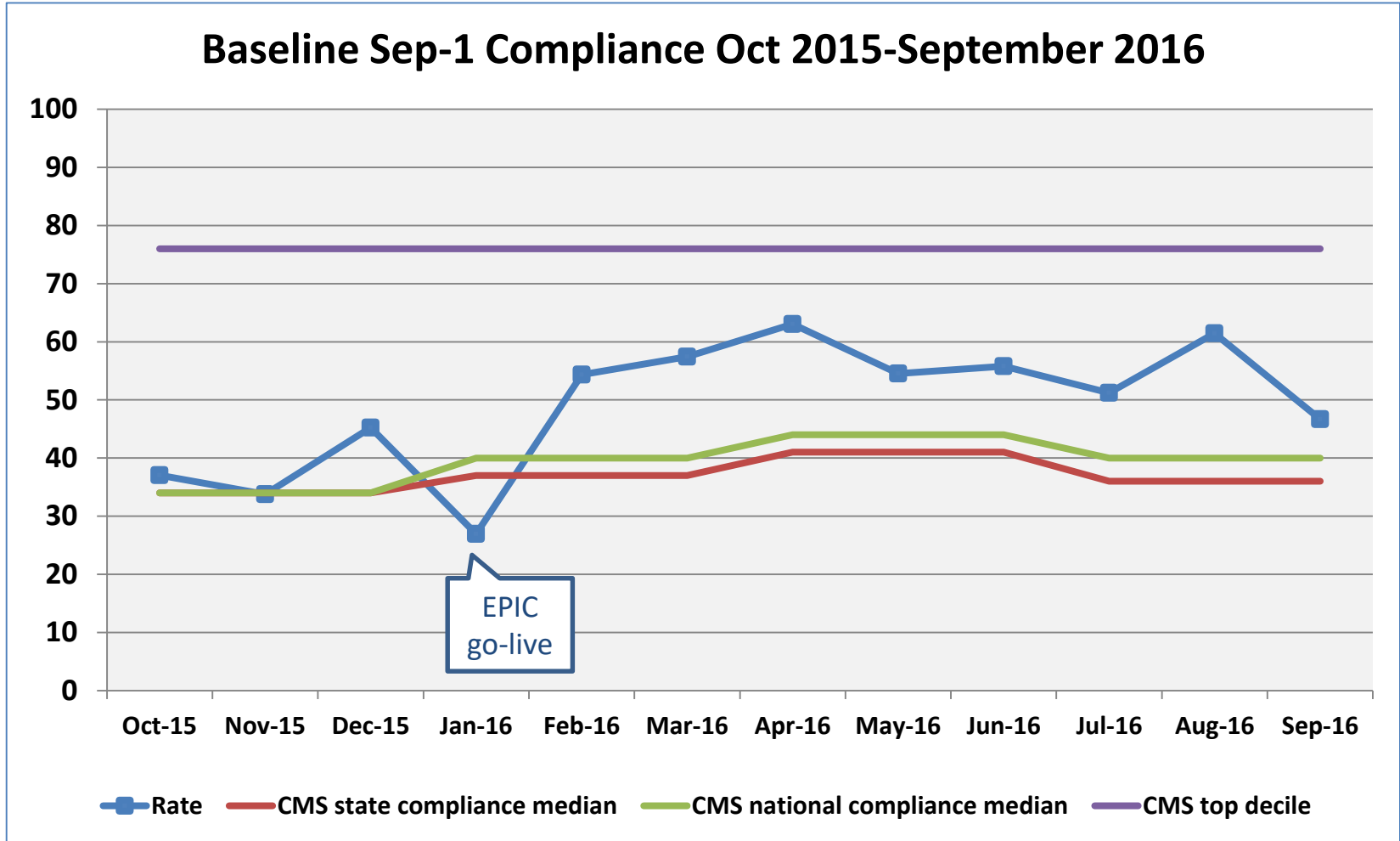
Opportunities For Improvement

- Feedback on measure failure is provided
- Each measure failure is reviewed for opportunities and feedback is solicited
- Measure failures are viewed as learning opportunities
- Opportunity letters



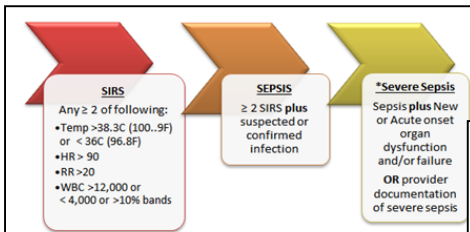


Baseline Network Sepsis Compliance





CMS Sepsis-1 Core Measure



*Severe Sepsis Bundle

Within 3 hours of time of presentation:

- Draw Initial Lactate
- Draw Blood Cultures x2 before Antibiotics
- Administer Broad Spectrum Antibiotics

If patient exhibits initial hypotension:

Two low BP readings 6 hrs prior/after time of severe sepsis presentation [SBP< 90 or MAP< 65 or ↓SBP by >40 points]

- administer 30ml/kg IV crystalloid fluid bolus
- Use actual body weight
- May use IBW if BMI >30. Provider must clearly document based on IBW

Within 6 hours of time of presentation:

- If initial Lactate is > 2, repeat Lactate in 2 hours

**Septic Shock Bundle

Initiate all elements required for Severe Sepsis

Within 3 hours of time of presentation:

- Administer 30ml/kg IV crystalloid fluid bolus. Use actual
- May use IBW if BMI >30. Provider must clearly document based on IBW

Within 6 hours of time of presentation:

- Only if hypotension persists. Two consecutive measurements [MAP< 65 or ↓SBP by >40 points] after fluid resuscitation
- Administer vasopressors
- Focused Reassessment of Volume Status and Tissue Perfusion

Focused Reassessment:

Provider documentation of (all):

- Vital Signs
- Cardiopulmonary Exam
- Capillary Refill evaluation
- Peripheral Pulse Evaluation
- Skin Examination
- Arterial oxygen saturation or pulse oximetry
- Urine output
- Shock Index

OR... Any 1 of the following

- CVP measurement
- ScVO2 measurement
- Bedside Cardiovascular US
- Passive Leg Raise or Fluid Challenge

End Organ Dysfunction Criteria:

Any of the following

- SBP <90 or MAP < 65 or ↓SBP by > 40 points
- Acute respiratory failure (new need for invasive/noninvasive mechanical ventilation)
- Creatinine >2.0 or > 0.5 increase from baseline
- Urine output < 0.5ml/kg/hr for 2 hrs
- Bilirubin > 2mg/dL (34.2 mmol/L)
- Platelet count < 100,000
- INR > 1.5 or aPTT > 60 seconds
- Lactate > 2mmol/L (18.0 mg/dl)

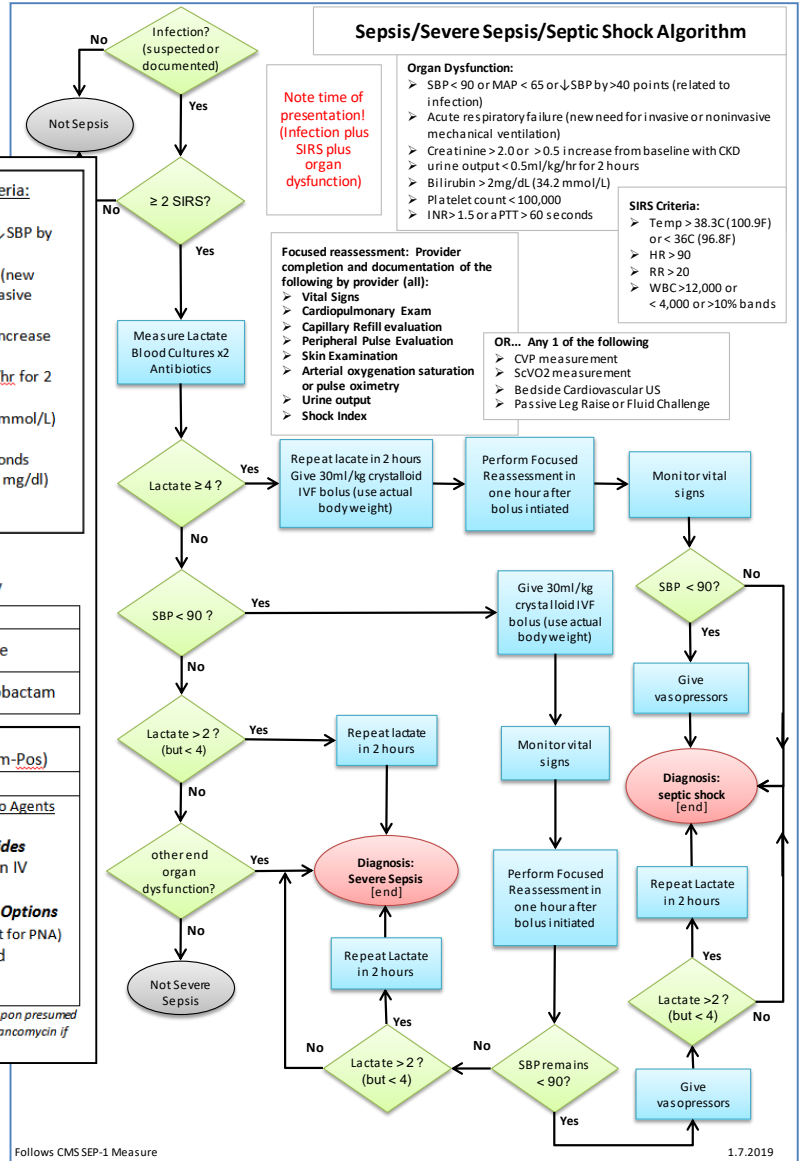
Antibiotic Selection for CMS Sepsis Measure

You may select either Monotherapy or Combination Therapy

Monotherapy		
Ampicillin-Sulbactam <i>(if Pseudomonas unlikely)</i>	Ceftriaxone <i>(if Pseudomonas unlikely)</i>	Cefepime
Levofloxacin	Meropenem <i>(if h/o ESBL)</i>	Piperacillin-Tazobactam

Combination Therapy		
Select one from Column A (Gram-Neg) and one from Column B (Gram-Pos)		
Column A (Gram-Neg)	Column B (Gram-Pos)	
Aminoglycosides Gentamycin Tobramycin	MSSA/Beta-Strep Agents 1 st /2 nd gen Ceph Cefazolin Cefoxitin Cefuroxime	MRSA/S. pneumo Agents Glycopeptides Vancomycin IV
Fluoroquinolones Ciprofloxacin	Anti-Staph Pens Nafcillin Oxacillin	Vanco-Allergic Options Daptomycin (not for PNA) Linezolid
Monobactams Aztreonam		

* Note: patient may need additional antibiotics with combo/monotherapy above, dependent upon presumed source (e.g., Metronidazole for anaerobic coverage) or concern for resistant pathogens (e.g., Vancomycin if MRSA concern).



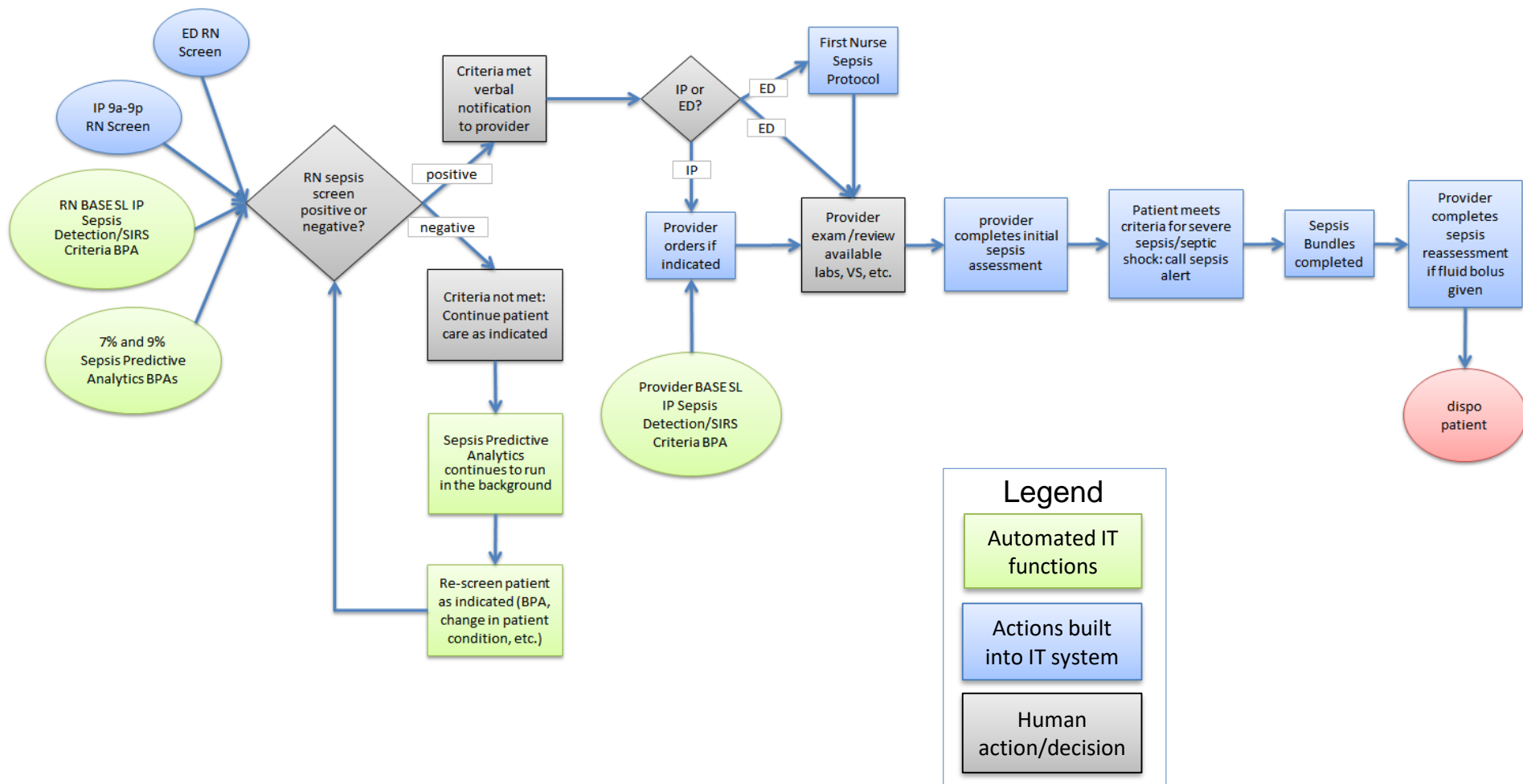
Follows CMS SEP-1 Measure

1.7.2019



Basic Workflow

Basic Workflow





The “Purple Sepsis Checklist”

- Process prior to EPIC
- Limitations of legacy product
- Numerous paper processes
- “The purple sepsis checklist”

Sepsis Checklist Patient Sticker

Date: _____
 Primary RN: _____
 Provider/Resident/AP: _____ Patient's Weight: _____

TIME	ITEM TO BE COMPLETED	TIME REQUIREMENT
	SEPSIS SCREENING upon arrival to bed or if warrants in triage	IMMEDIATELY
	2 or more SIRS criteria (see back of form) AND suspected infection AND organ dysfunction (see back of form)- Document the time internal sepsis alert was initiated	IMMEDIATELY
	Begin first nurse sepsis order set if screening is positive or you suspect sepsis AND notify provider OR Ensure that the sepsis order set is being utilized by the provider so that no order/measure is missed	IMMEDIATELY
1st _____ 2nd _____	INITIAL LACTATE WITH REPEAT LACTATE (>2) within 2 hours- this is preselected in order sets. Two lab stickers will print in ED/Normal lab printing process for in-patient. The second lactate is to be sent WITHIN 2 hours of the first lactate	IMMEDIATELY AND PRIOR TO 2 hours
	BLOOD CULTURES prior to antibiotics - Enter the actual DRAW time in EPIC and make sure it precedes the antibiotic start infusion time **Be careful not to scan blood cultures after antibiotic is hung --- must be re-timed in EPIC**	IMMEDIATELY
	ANTIBIOTICS - NEED to be INITIATED within 1 hour of presentation time. Use appropriate mono- or combo therapy from the CMS antibiotic list. *Start and Stop times MUST be documented in EPIC* *Run FASTEST antibiotics first*	WITHIN 1 hour
	ANTIBIOTICS - If a second antibiotic is ordered, it has to be INITIATED before 3 hours after presentation time	START PRIOR TO 3 HOURS
Initiation time _____ Completion time _____	IV FLUIDS - 30cc/kg fluid resuscitation INFUSED within 3 hours of presentation of initial hypotension or lactate ≥ 4 . **Must document accurate start/stop times in EPIC **MUST HAVE DOCUMENTED WEIGHT OF PATIENT in EPIC Patients weight _____ kg x 30= _____ ml of fluid **May use ideal body weight if BMI is GREATER THAN 30 **Provider must document that ideal body weight is being used to calculate fluids	WITHIN 3 HOURS
	VASOPRESSORS - if persistently hypotensive after fluids	
	REASSESSMENT BY PHYSICIAN - provider needs to document a reassessment one hour after fluid resuscitation initiated. **Use the Sepsis Navigator/Sepsis Reassessment to meet all criteria	1 hour after fluids initiated

Send original copy with patient. Provide copy of checklist to manager or other designee.

10/2016; 3/2019 (Not a part of the permanent medical record)



The "Purple Sepsis Checklist"

- Built the sepsis checklist into EPIC

Flowsheets

File Selected | Add Rows | LDAAvatar | Cascade | Add Col | Insert Col | Data Validate | Hide Device Data | Last Filed | Reg Doc | Graph | Go to Date | Values By | Refresh | Legend | Chart Correction

Complex Vitals | Complex Assessment | I/O | IV Assessment | Cares/Safety | Screenings | ****Quality Measure Che...**

Search (Alt+Comma) | Hide All Show All

UNIVERSAL MEASURES

QUALITY MEASURES

SEPSIS SCREENING

SEPSIS

Sepsis Quality Measures - complete ...

Accordion Expanded View All

1m 5m 10m 15m 30m 1h 2h 4h 8h 24h Based On: 0700 | Reset | Now

8/19/19
1200

Quality Measures

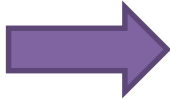
Quality Measure Patient?

Sepsis Screening (Must be performed on all patients over 18 years of age) **Use most recent VS and lab values available within previous 24 hours for your screen**

Indicate SIRS criteria	Hyperthermia >...	
Two (2) or more SIRS criteria present?	! Yes (Proceed)	
Suspected/known infection and/or ABX therapy (not prophylaxis)?	! Yes (Proceed)	
S/S of Organ Dysfunction (change from baseline)?	Lactic Acid > 2...	
Nursing suspects a new/acute/worsening infection?	! Yes	
Date Sepsis Alert Called:		
Time Sepsis Alert Called:		

Sepsis Quality Measures - complete if current/suspected hospital diagnosis

Screening upon arrival or in triage if warranted?		
Comfort Care within 3 hours of presentation of severe sepsis		
Comfort Care within 6 hours of presentation of septic shock		
Initial lactic acid measured?		
Blood cultures obtained prior to antibiotics?		
Broad spectrum antibiotics?		
Crystalloid (30ml/kg) for initial hypotension OR lactic acid ≥ 4 mmol/L?		
Vasopressors initiated if indicated?		
Required reassessment documentation complete following fluid resuscitation?		
Repeat lactic acid obtained if initial level ≥ 2		





Inpatient and ED RN Screening Process

SIRS Criteria Options

Selection Form

- Hyperthermia > 38.3C (100.9F)
- Hypothermia < 36C (96.8F)
- Tachycardia > 90 bpm
- Tachypnea > 20 resp per min
- Leukocytosis (WBC > 12000 IJL)
- Leukopenia (WBC < 4000 IJL)

Accept Cancel

Flowsheets

Summary | File | Add Rows | LDA Avatar | Cascade | Add Col | Insert Col | Data Validate | Hide Device Data | Last F

Complex Vitals | Complex Assessment | I/O | IV Assessment | Cares/Safety | **Screenings** | **Quality Measure Che...

Search (Alt+Comma) | Accordion | Expanded | View All | 1m 5m 10m 15m 30m 1h 2h 4h 8h 24h Based On: 0700 | Reset | Now

8/19/19
1200

Sepsis Screening (Must be performed on all patients over 18 years of age) **Use most recent VS and lab values available within previous 24 hours for your screen**

Indicate SIRS criteria	Hyperthermia > 38.3C (100.9F); Tachycardia > 90 bpm	
Two (2) or more SIRS criteria present?	Yes (Proceed)	
Suspected/known infection and/or ABX therapy (not prophylaxis)?	Yes (Proceed)	
S/S of Organ Dysfunction (change from baseline)?	Lactic Acid > 2 mmol/L	
Nursing suspects a new/acute/worsening infection?	Yes	
Physician Notified?		
Sepsis Protocol Initiated?		
Date Sepsis Alert Called:		
Time Sepsis Alert Called:		

Selection Form

- SBP decrease > 40mmHg from baseline
- SBP < 90 or MAP < 65
- Creatinine > 2.0 mg/dl (176.8 mmol/L)
- Urine Output < 0.5ml/kg/hour for > 2 hrs
- Bilirubin > 2 mg/dl (34.2 mmol/L)
- Platelet count < 100,000
- Coagulopathy (INR > 1.5 or aPTT > 60 secs)
- Lactic Acid > 2 mmol/L

Accept Cancel

Organ Dysfunction Options



ED First Nurse Sepsis Protocol

FIRST NURSE SEPSIS

Insert and maintain peripheral IV

Insert and maintain peripheral IV x 2 (18 gauge or >)
STAT, Once, First occurrence today at 0920

Vital Signs

Continuous cardiac monitoring
STAT, Once, First occurrence today at 0920

Oxygen Therapy Orders

Nasal cannula oxygen
STAT, Give 2 L/min oxygen, to keep sats > 92%

Labs - Blood

APTT (\$\$\$)
Once, First occurrence today at 0920
Blood

Protime-INR (\$)
Once, First occurrence today at 0920
Blood

⚠ Blood culture #1 (\$\$\$\$)
Once, First occurrence today at 0920

⚠ Blood culture #2 (\$\$\$\$)
Once, First occurrence today at 0920

CBC and differential (\$\$\$)

Comprehensive metabolic panel (\$\$\$)
Once, First occurrence today at 0920
Blood

Lactic acid x2 (\$\$\$\$)
Now then every 2 hours, First occurrence today at 0920, Last occurrence today at 1120, for 2 occurrences
Blood

Troponin I (\$\$\$)
Once

Gold top on hold
Once, Blood

Green / Black tube on hold
Once, Blood

Green / Yellow tube on hold
Once, Blood

Lavender Top 7ml on hold
Once, Blood

Red top on hold
Once, Blood

Bladder Catheter and Labs - Urine

Insert, non-dwelling bladder catheter
STAT, Once, if patient does not urinate within 1 hour

POCT urinalysis dipstick (\$)
STAT, Once

Urine dip analyzer
STAT, Once

Cardiac Tests - ECG

⚠ ECG 12 lead
STAT, Once, First occurrence today at 0920

Imaging

XR chest 1 view portable (\$\$)
STAT, 1 time imaging

XR chest 2 views (\$\$)
STAT, 1 time imaging

Nursing Orders

Notify physician if BP < 90
STAT, Until discontinued, starting today at 0920, Until Specified
Systolic blood pressure less than: 90

NS Bolus

sodium chloride 0.9 % bolus (\$\$)
1,000 mL, Intravenous, Once

Fever Medications

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Provider Initial Sepsis Assessment

Sepsis Initial Assessment - Initial Sepsis Screening

Time taken: 1429 8/16/2019

Show: Row Info Last Filed Details All Choices

Values By

qSOFA (Quick SOFA) Score for Sepsis

Altered mental status GCS < 15

Respiratory Rate > / =22

Systolic BP < / =100

Q Sofa Score



qSOFA

Initial Sepsis Screening

Is the patient's history suggestive of a new or worsening infection? Yes (Proceed) No

Suspected source of infection

<input type="checkbox"/> pneumonia	<input type="checkbox"/> empyema	<input type="checkbox"/> urinary tract infection	<input type="checkbox"/> acute abdominal infection	<input type="checkbox"/> meningitis
<input type="checkbox"/> soft tissue	<input type="checkbox"/> infected joint	<input type="checkbox"/> wound infection	<input type="checkbox"/> bloodstream catheter infection	<input type="checkbox"/> endocarditis
<input type="checkbox"/> implant or prosthesis infection	<input type="checkbox"/> suspect infection, source unknown			



Infection

Are two or more of the following signs & symptoms of infection both present and new to the patient? Yes (Proceed) No

Indicate SIRS criteria

<input type="checkbox"/> Hyperthermia > 38.3C (100.9F)	<input type="checkbox"/> Hypothermia < 36C (96.8F)	<input type="checkbox"/> Altered mental status	<input type="checkbox"/> Tachycardia > 90 bpm	<input type="checkbox"/> Tachypnea > 20 resp per min
<input type="checkbox"/> Leukocytosis (WBC > 12000 I/L)	<input type="checkbox"/> Leukopenia (WBC < 4000 I/L)	<input type="checkbox"/> WBC > 10% bands		



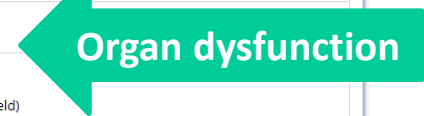
SIRS

If the answer is yes to both questions, suspicion of sepsis is present

Are any of the following organ dysfunction criteria present within 6 hours of suspected infection and SIRS criteria that are NOT considered to be chronic conditions? Yes No

Organ dysfunction

<input type="checkbox"/> Bilirubin > 2.0 mg/dL	<input type="checkbox"/> INR > 1.5 or aPTT > 60 secs	<input type="checkbox"/> Creatinine > 2.0 mg/dL	<input type="checkbox"/> Creatinine > 0.5 mg/dl ABOVE BASELINE	<input type="checkbox"/> Lactate > 2.0 mmol/L	<input type="checkbox"/> Lactate >=equal 4.0 mmol/L	<input type="checkbox"/> Platelet count < 100,000/mcl
<input type="checkbox"/> SBP decrease > 40 mmHg from baseline	<input type="checkbox"/> SBP < 90 mmHg	<input type="checkbox"/> MAP < 65 mmHg	<input type="checkbox"/> Urine output < 0.5 mL/kg/hour for 2 hours	<input type="checkbox"/> Acute respiratory failure (new need for invasive or non-invasive mechanical ventilati...		



Organ dysfunction

Date of presentation of severe sepsis

Time of presentation of severe sepsis

Tissue hypoperfusion persists in the hour after crystalloid fluid administration, evidenced, by either:

<input type="checkbox"/> SBP < 90 mm/Hg (__ mm/Hg in comment field)	<input type="checkbox"/> Mean arterial pressure < 65 mm/Hg (__ mm Hg in comment field)
<input type="checkbox"/> Decrease in SBP by > 40 points mm/Hg	<input type="checkbox"/> * OR * Lactate level is greater to or equal 4 mmol/dL (__ mmol/dL in comment field)

Was hypotension present within one hour of the conclusion of crystalloid fluid administration? Yes No



Shock

If severe sepsis is present AND tissue hypoperfusion persists in the hour after fluid resuscitation or lactate >= 4, the patient meets criteria for SEPTIC SHOCK

Date of presentation of septic shock

Time of presentation of septic shock

Restore Close Cancel



Patient Banner

Hyperspace - AL ED - Playground Training Env - CHRIS B.

Epic ED Chart In Basket ED Manager ED Track Board ED Map My Dashboards Personalize Pennsylvania PMED

Asparagus, Frank

Asparagus, Frank
Preferred Name: None
DOB: 08/16/1963, 56 y.o.
Sex: Male
MRN: 129000010

ED Bed TRN ORD...

CC: Fatigue; Unable to speak
Encounter Date: 08/16/2019
PCP: **None**
LOS: 0 (H:0 E:1 M:0)

Critical Event
None

Allergies
No Known Allergies
Med List Status: **None**

2 : Chart Completion 0

New Jersey PMED PA Death Certificate NJ Death Certificate Homecare WebChart ServicePortal Print Log Out

PLAYGROUND TRAINING CHRIS B. Search

Temp: **101.3**
BP: **149/87**
HR: **84**
Resp: **18**
SpO2: **97**

Weight (kg): **79.8**
Height: 5' 8" (1.727 m)
Pain Score: No/denies...

Infection: **None**
Isolation: **None**
Code: **Not on file**
Adv Dir Filed?: None
POLST: None

Pref Lang, Need Interp: None, None

MyChart: Inactive
Disposition: None
Dx: None
Note Status: Signed
First Provider Eval: None

- Providers can add weights to the banner
- Impacts functionality of order sets



Sepsis Order Sets/Panels

Orders ↑

Order Sets Clear All Orders

Adult Sepsis Focused Personalize

General Orders

General

- ▶ Vital Signs Click for more
- ▶ Notify Physician Click for more
- ▶ Isolation Click for more
- ▶ Activity Click for more
- ▼ Diet / Nutrition
 - Diet
- ▶ Nursing Assessments Click for more
- ▶ Nursing Interventions Click for more
- ▶ Respiratory Interventions Click for more
- ▼ Physician Consults
 - Inpatient consult to Infectious Diseases

Labs

Labs

▼ Initial Labs

- Procalcitonin Serial Testing
 - Procalcitonin Guidance / Algorithms
 - Procalcitonin
 - Once, First occurrence today at 1435
 - Blood
 - Procalcitonin AM Draw
 - Morning draw, First occurrence tomorrow at 0600
 - Blood
- ▼ Chemistry - other
 - Lactic Acid STAT and in 2 hours if first result greater than 2
 - Now then every 2 hours, First occurrence today at 1435, Last occurrence today at 1635, for 2 occurrences
 - Lactic Acid STAT and in 2 hours if first result greater than 2
 - Blood
 - Lactic acid every 2 hours prn
 - Every 2 hours prn if greater than 2 mmol/dL

←



Sepsis Order Sets/Panels - Fluids

Microbiology

- Blood Culture X2 - Separate Sites - NOW
- Blood Culture X2 - FUTURE

Micro & Imaging

Daily

Click for more

Imaging

Chest

Click for more

IV Fluids

IV Fluid Infusions

Click for more

IV Fluid Boluses

Studies suggest use of a balanced crystalloid (LR or Isolyte) for patients at risk for AKI.

IVF Bolus 133.4 KG - 166.6 KG

- LR Bolus + Vital Signs
- NS Bolus + Vital Signs
- Isolyte Bolus + Vital Signs

IV Fluid Boluses for BMI > 30

Patient's Body mass index is 55.03 kg/m². Consider using Ideal body weight: 61.5 kg (135 lb 9.3 oz) to calculate IV fluid bolus.

IVF Bolus for Ideal Body Weight 33.4 kg - 66.6 kg

LR Bolus + Vital Signs

LR Bolus

lactated ringers bolus 1,000 mL
1,000 mL, Intravenous, Administer over 30 Minutes, Once, today at 1615, For 1 dose
Bag #1 of 2 Based on Ideal body weight: 61.5 kg (135 lb 9.3 oz)

Followed by

lactated ringers bolus 1,000 mL
1,000 mL, Intravenous, Administer over 30 Minutes, Once, today at 1645, For 1 dose
Bag #2 of 2 RN to Stop at 1845mL Total Volume Final Bag Volume to infuse = 845mL Based on Ideal body weight: 61.5 kg (135 lb 9.3 oz)

Vital signs

Vital signs every 15 minutes x 4 after fluid bolus
Routine, Every 15 min, First occurrence today at 1716, for 4 occurrences

NS Bolus + Vital Signs

Isolyte Bolus + Vital signs

Fluids



Sepsis Order Sets/Panels - Antibiotics

▼ Other Medications

▼ Antibiotics

Monotherapy

- ampicillin-sulbactam (UNASYN) IV
3,000 mg, Intravenous, Every 6 hours, If septic, administer first
- cefepime (MAXIPIME) IV
2,000 mg, Intravenous, Every 12 hours, If septic, administer first
- ceftRIAXone (ROCEPHIN) IV
2,000 mg, Intravenous, Every 24 hours, If septic, administer first
- piperacillin-tazobactam (ZOSYN) IV
4,500 mg of piperacillin, Intravenous, Every 6 hours, If septic, administer first
- levofloxacin (LEVAQUIN) IV
If septic administer first

Monotherapy

Navigator

Combination Therapy

Combination Therapy - Column A - Select One

- aztreonam (AZACTAM) IV
2,000 mg, Intravenous, Every 8 hours, If septic, administer first
- ciprofloxacin (CIPRO) IV
Every 8 hours, If septic, administer first
- gentamicin (GARAMYCIN) IV
5 mg/kg, Intravenous, Every 24 hours, If septic, administer first
- tobramycin (NEBCIN) IV
5 mg/kg, Intravenous, Every 24 hours, If septic, administer first

Combo Therapy

Combination Therapy - Column B - Select One

- vancomycin (VANCOGIN) IV
15 mg/kg, Intravenous, Every 12 hours, If septic, administer second
- cefazolin (ANCEF) IV
2,000 mg, Intravenous, Every 8 hours, If septic, administer second
- cefuroxime (ZINACEF) IV
1,500 mg, Intravenous, Every 8 hours, If septic, administer second
- nafcillin (NALLPEN) IV
2,000 mg, Intravenous, Every 4 hours, If septic, administer second
- oxacillin (BACTOCILL) IV
2,000 mg, Intravenous, Every 4 hours, If septic, administer second



Sepsis Order Sets/Panels

▼ Vasopressors

- norepinephrine (LEVOPHED) in dextrose 5 % 250 mL iv infusion
- EPINEPHrine (ADRENALIN) in sodium chloride 0.9 % infusion
- vasopressin (PITRESSIN) 0.2 Units/mL in sodium chloride 0.9 % 100 mL infusion
- DOPamine (INTROPIN) 400 mg in 250 mL infusion (premix)
Intravenous, Once

Vasopressors

▼ Additional SmartSet Orders

🔍 Search

You can search for an order by typing in the header of this section.

✓ Close

↑ Previous

↓ Next



Provider Sepsis Reassessment

Sepsis Reassessment - Sepsis Reassess ↑ ↓

Time taken: 1450 8/16/2019 Show: Row Info Last Filed Details All Choices

Values By

▼ Repeat Volume Status and Tissue Perfusion Assessment Performed

Repeat Volume Status and Tissue Perfusion Assessment Performed

▼ Volume Status and Tissue Perfusion Post Fluid Resuscitation * Must Document All *

Vital Signs Reviewed (HR, RR, BP, T)

Shock Index Reviewed

Arterial Oxygen Saturation Reviewed (POx, SaO2 or SpO2)

Cardio Normal S1/S2 Regular rate and rhythm No murmur No rub or gallop Tachycardia Irregular rhythm
 Bradycardia Other (comment)

Pulmonary Normal effort Clear to auscultation Wheezes Rales Tachypnea Respiratory distress Rhonchi
 Other (comment)

Capillary Refill Brisk Sluggish Other (comment)

Peripheral Pulses Radial Dorsalis Pedis Posterior Tibialis

Skin Warm Cool Dry Diaphoretic Flushed Pale Mottled Normal
 Other/Abnormal (Comment)

Urine output assessed



Provider Sepsis Reassessment

Urine output assessed Adequate Decreased None Other (comment)

▼ *OR* Intensive Monitoring- Must Document One of the Following Four *:

Vital Signs Reviewed Yes

* Central Venous Pressure (CVP or RAP)

* Central Venous Oxygen (SVO₂, ScvO₂ or Oxygen saturation via central catheter)

* Bedside Cardiovascular US in IVC diameter and % collapse CO EF IVC Diameter % Collapse


* Passive Leg Raise OR Crystalloid Challenge Passive leg exam Crystalloid fluid challenge completed

Restore Close Cancel Previous Next

Sepsis Note

Create Note See All Notes Refresh

You have no filed Sepsis Note for this patient within the last 24 hours.





Sepsis Notes

Sepsis Note

Frank Asparagus 56 y.o. male MRN: 129000010

Unit/Bed#: TRN ORDERS ED Pool 02 Encounter: 1013089905

Default Flowsheet Data (last 720 hours)

Sepsis Reassess

Row Name	08/16/19 1450				
Repeat Volume Status and Tissue Perfusion Assessment Performed					
Repeat Volume Status and Tissue Perfusion Assessment Performed	Yes -CB				
Volume Status and Tissue Perfusion Post Fluid Resuscitation * Must Document All *					
Vital Signs Reviewed (HR, RR, BP, T)	Yes -CB				
Shock Index Reviewed	Yes -CB				
Arterial Oxygen Saturation Reviewed (POx, SaO2 or SpO2)	Yes (comment %) -CB				
Cardio	(!) Regular rate and rhythm;Tachycardia -CB				
Pulmonary	(!) Normal effort;Wh -CB				
Capillary Refill	Brisk -CB				
Peripheral Pulses	—				
Skin	Warm;Flushed -CB				
Urine output assessed	—				

OR Intensive Monitoring- Must Document One of the Following Four *:

Vital Signs Reviewed	—
* Central Venous Pressure (CVP or RAP)	—
* Central Venous Oxygen (SVO2, ScvO2 or Oxygen saturation via central catheter)	—
* Bedside Cardiovascular US in IVC diameter and % collapse	—
* Passive Leg Raise OR Crystalloid Challenge	—

User Key (r) = Recorded By, (t) = Taken By, (c) = Cosigned By

Initials	Name	Provider Type
CB	Chris Babypeas, DO	Physician

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Sepsis Navigator

Emergency Department

Risk Strat

3 patients have a name similar to this.

Sepsis Initial Assessment - Initial Sepsis Screening

Time taken: 1537 8/16/2019

Values By

qSOFA (Quick SOFA) Score for Sepsis

Altered mental status GCS < 15

Systolic BP < / =100

Initial Sepsis Screening

Is the patient's history suggestive of a new or worsening infection? Yes (Proceed)

Suspected source of infection

pneumonia

soft tissue

implant or prosthetic

Are two or more of the following signs & symptoms of infection both present and new to the patient? Yes (Proceed)

Indicate SIRS criteria

Hyperthermia > 38.3C (100.9F)

Leukocytosis (WBC > 12,000 or < 4,000)

If the answer is yes to both questions, suspicion of sepsis is

Are any of the following organ dysfunction criteria present within 6 hours of suspected infection and SIRS criteria that are NOT considered to be chronic conditions? Yes No

Inpatient

Sepsis

Summary

Chart Review

Results Review

Synopsis

Problem List

History

Notes

Orders

Infections

PORCH

Admission

Transfer

Discharge

Procedure

Sepsis

Daily Rounding

Charge Capture

Advance Care ...

Order Sets

More

Sepsis Initial Assessment - Initial Sepsis Screening

Time taken: 1614 8/16/2019

Values By + Create Note

qSOFA (Quick SOFA) Score for Sepsis

Altered mental status GCS < 15

Systolic BP < / =100

Initial Sepsis Screening

Is the patient's history suggestive of a new or worsening infection? Yes (Proceed) No

Suspected source of infection

pneumonia

acute abdominal infection

infected joint

endocarditis

Are two or more of the following signs & symptoms of infection both present and new to the patient? Yes (Proceed) No

Indicate SIRS criteria

Hyperthermia > 38.3C (100.9F)

Tachycardia > 90 bpm

Leukopenia (WBC < 4000 I/L)

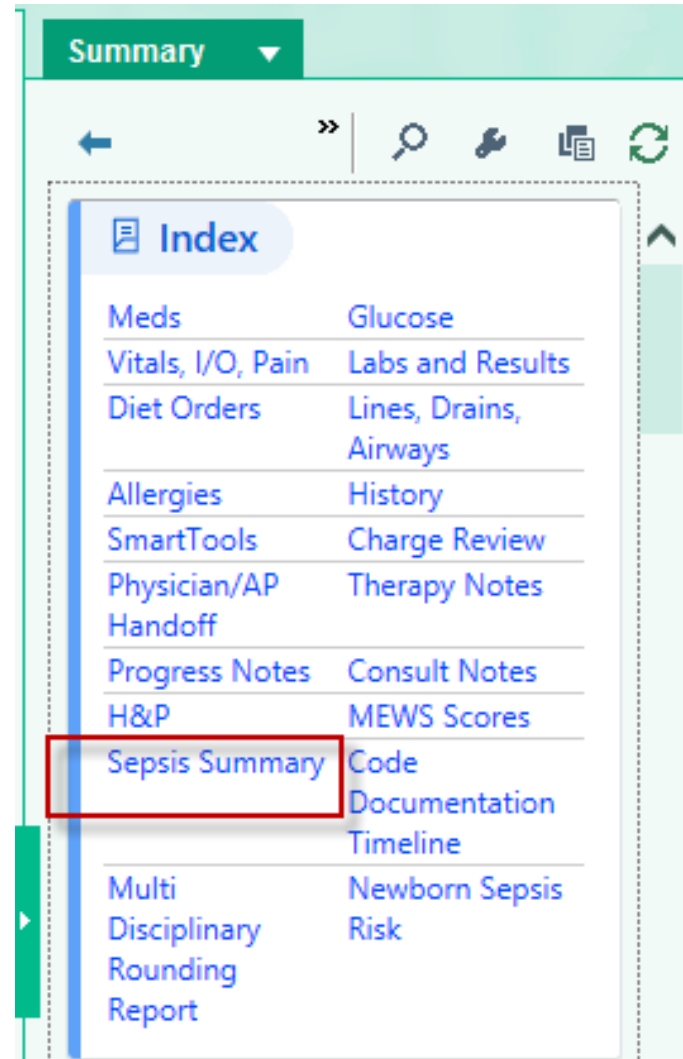
If the answer is yes to both questions, suspicion of sepsis is

Are any of the following organ dysfunction criteria present within 6 hours of suspected infection and SIRS criteria that are NOT considered to be chronic conditions? Yes No



Sepsis Report/Summary – EPIC SideBar

- Link from Sepsis Navigator
- Includes:
 - RN Sepsis Screening
 - qSOFA
 - Initial Sepsis Screen (provider)
 - Sepsis Checklist
 - Lactic Acid
 - Other Labs
 - Microbiology results
 - Vital Signs and shock index



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Best Practice Alert for RN

Patient Safety (1)

⚠ Sepsis Advisory - Please notify provider. Evaluation needed.

This patient meets SIRS Criteria and may be septic.
SIRS = Systemic Inflammatory Response Syndrome

Do not assume that these criteria are the result of a condition that is already identified. Assess this patient as soon as possible. If the patient has changed clinically, **notify the provider** and follow protocol to call the rapid response team if indicated.

Also do the following:
Click "Treating Associated Infection" if the patient is being treated for an infection that is a known cause of these abnormalities
OR
Click "Treating Burn or Trauma" if the patient is being treated for a severe burn or trauma that is a known cause of these abnormalities

The recent clinical data is shown below.

Vitals:

	08/18/19 0742	08/18/19 1621	08/18/19 1720	08/19/19 1333
BP:	110/56	148/69	140/58	
BP Location:	Right arm	Right arm	Right arm	
Pulse:	96	91		(!) 130
Resp:				22
Temp:		97.6 °F (36.4 °C)		(!) 96.6 °F (35.9 °C)
TempSrc:		Oral		
SpO2:		96%		
Weight:				
Last WBC, Collected: 8/18/2019 6:14 AM = 22.15 Thousand/uL				
Prev WBC, Collected: 8/17/2019 8:07 PM = 13.53 Thousand/uL				
Prev WBC, Collected: 7/16/2019 10:08 AM = 7.84 Thousand/uL				
Last BANDSPCT, Collected: 8/17/2019 8:07 PM = 9 %				
Prev BANDSPCT, Collected: 6/30/2019 12:31 AM = 7 %				
Prev BANDSPCT, Collected: 4/16/2019 11:30 PM = 11 %				
Last PCO2ART: Not on file				
Last IMMGRANS, Collected: 8/18/2019 6:14 AM = 2 %				
Prev IMMGRANS, Collected: 7/12/2019 3:48 AM = 6 %				
Prev IMMGRANS, Collected: 6/30/2019 6:09 AM = 6 %				
Last IMMGRANSABS, Collected: 8/18/2019 6:14 AM = 0.36 Thousand/uL				
Prev IMMGRANSABS, Collected: 7/12/2019 3:48 AM = >0.50 Thousand/uL				
Prev IMMGRANSABS, Collected: 6/30/2019 6:09 AM = 0.26 Thousand/uL				
Last LACTATE: Not on file				

[Please complete the Sepsis Screening Tool.](#)

⚠ Acknowledge Reason

Treating Associated Infection Treating Burn or Trauma Provider Notified Access for Chart Query

Accept

Direction

SIRS

Action

- Indicates SIRS criteria is met and sepsis should be considered
- Screen patient
- Notify provider as appropriate
- Lactate has not been completed

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Best Practice Alert for Provider

- Indicates SIRS criteria is met and sepsis should be considered
- Lactate has not been completed

Patient Safety (1)

Sepsis Advisory

This patient meets SIRS Criteria and may be septic.
SIRS = Systemic Inflammatory Response Syndrome

Order a lactic acid level if needed AND/OR Initiate the sepsis protocol with the attached order set
OR
Click "SIRS Not Due to Infection" if the clinical data is not due to SIRS/Sepsis
OR
Click "Treating Associated Illness" if the patient is being treated for another illness that is a known cause of these abnormalities

The recent clinical data is shown below.

Vitals:

	08/18/19 1513	08/18/19 1757	08/18/19 1913	08/19/19 1347
BP:	115/57	116/58	127/60	
BP Location:	Right arm	Right arm	Right arm	
Pulse:	69	83	78	(!) 140
Resp:	16	18	16	22
Temp:	98.1 °F (36.7 °C)	98 °F (36.7 °C)	98.6 °F (37 °C)	(!) 96 °F (35.6 °C)
TempSrc:	Oral	Oral	Oral	
SpO2:	99%	98%	94%	

Weight:

Last WBC, Collected: 8/18/2019 5:24 AM = 12.23 Thousand/uL
Prev WBC, Collected: 8/17/2019 5:21 AM = 10.45 Thousand/uL
Prev WBC, Collected: 8/17/2019 1:25 AM = 15.94 Thousand/uL
Last BANDSPCT: Not on file
Last PCO2ART: Not on file
Last IMMGRANS, Collected: 8/18/2019 5:24 AM = 1 %
Prev IMMGRANS, Collected: 8/17/2019 5:21 AM = 0 %
Prev IMMGRANS, Collected: 8/17/2019 1:25 AM = 0 %
Last IMMGRANSABS, Collected: 8/18/2019 5:24 AM = 0.07 Thousand/uL
Prev IMMGRANSABS, Collected: 8/17/2019 5:21 AM = 0.04 Thousand/uL
Prev IMMGRANSABS, Collected: 8/17/2019 1:25 AM = 0.05 Thousand/uL
Last LACTATE: Not on file

[Orders Activity](#)

Acknowledge Reason

Direction

SIRS

Action



Sepsis Predictive Model



AL Sepsis PA - All Units 134 Patients					
Patient Identification	Deterioration Score Column	Early Detetction of Sepsis Score ▲	MEWS	Bed/ Location	Problem
...	46	22		E4 MS 455-01	Persistent atrial fibrillation (HCC) (Principal Hospital Problem)
...	34	15			Respiratory failure (HCC), SOB (shortness of breath), COPD with acute exacerbati...
...	28	8			Pyelonephritis, acute (Principal Hospital Problem)
...	37	7			Acute on chronic respiratory failure with hypoxia (HCC) (Principal Hospital...)
...	23	7			Urinary tract infection (Principal Hospital Problem)
...	N/A	6	● Never reviewed	ED 14 — AL XRAY	Chest pain (Admission Diagnosis)
...	25	6	● 4 hrs 58 mins	E4 MS 446-01 — E4 MS 446-01	ESRD (end stage renal disease) on dialysis (HCC) (Principal Hospital...)
...	34	5	● 8 hrs 18 mins	E4 MS 434-01 — E4 MS 434-01	Paroxysmal atrial fibrillation (HCC) (Principal Hospital Problem)

Early Detection of Sepsis
Repash, Robert J — Score calculated: 9/13/2019 10:05

8
At Risk

Factors Contributing to Score

- 17% Age is 83
- 16% Number of active cephalosporin orders is 2
- 10% Diagnosis of hypertension is present
- 9% Lymphocytes is low (0.57 Thousands/ μ L)
- 9% Neutrophils is high (86 %)
- 7% Diagnosis of diabetes mellitus is present
- 6% Diagnosis of chronic kidney disease is present
- 6% MCHC is low (30.7 g/dL)
- 4% Diagnosis of chronic liver disease is present

15 more factors not shown



7% and 9% Best Practice Alerts

Important (1)

7% or Higher Warning: This patient's Early Detection of Sepsis score indicates a high risk. Complete a sepsis screening at this time. If screening is positive, notify the physician. If negative, continue to monitor and screen every 2 hours until screening is positive and Sepsis treatment has been initiated OR score is below 7%.

Complete Sepsis Screening

Screen

Acknowledge Reason

Screen patient

Patient being treated for other conditio...

Patient being treated for Sepsis

Leadership Rounding Chart Review

Acknowledge

Accept

Direction

Important (2)

9% or Higher Warning: This patient's Early Detection of Sepsis score indicates a high risk. Perform sepsis screening at this time AND notify the physician.

Complete Sepsis Screening

Screen

Acknowledge Reason

Screen & Notify

Patient being treated for other conditio...

Patient already being treated for Sepsis

Leadership Rounding Chart Review

Acknowledge

Direction

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Accept



ED Sepsis Patient List

SL ED Sepsis Suspected [6466035] as of Mon 8/19/2019 1:09 PM

Filters Options ED Map ED Manager ED Chart

Detail	Grouped Summary	Bar Graph	Summary Table	Department Level Summary						
Arrival Dep ¹	Arr Date/Time	Patient Name ³	MRN	Suspect New Infection	Provider Notified	Provider Initial Assess	Lactic Acid?	Blood Cultures ²	Antibiotics Given?	Repeat Lactic Acid?
BE ED	08/19/2019 1006	[REDACTED]	[REDACTED]	(I) Yes8/19/2019 1022Charles A Curtis, RN						
BE ED	08/18/2019 1412	[REDACTED]	[REDACTED]	No8/18/2019 2100Kimberley Poley, RN	Yes (enter name in comments) (aware of on admission)8/18/2100Kimberley Poley, RN					
BE ED	08/18/2019 1337	[REDACTED]	[REDACTED]	No8/18/2019 1342Tiwana Nestor, RN	No (Already aware.)8/18/2019 2100Jennifer L	(I) Yes8/18/2019 1407Jarrett M Shugars, MD	✓	✓		📄
BE ED	08/18/2019 1312	[REDACTED]	[REDACTED]			(I) Yes8/18/2019 1529Joshua A Campbell, MD	✓	✓	✓	📄

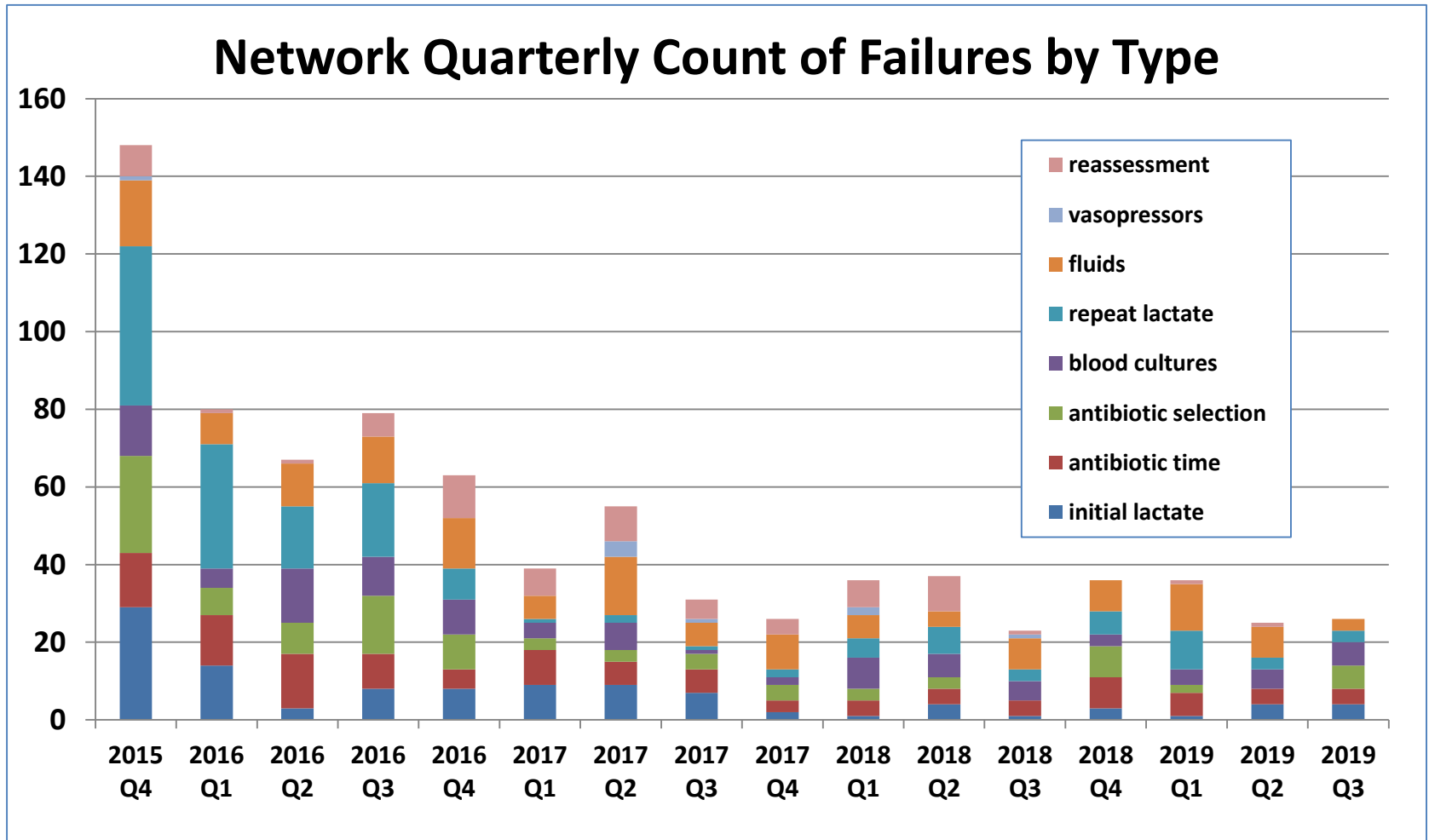
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LOS (mins)	First ED Provider	ED Disposition	Admitting Provider	Admission Diagnosis	ED Destir ^
	COLOMBO, A	Discharge - Lisa Vett*		Abdominal pain	
152	RAMMOHAN, G	Admit - Case was *	Hippen, John T	Diarrhea Dehydration Hyponatremia SOB (shortness of breath) Nausea & vomiting COPD exacerbation (HCC)	BE PPHP
188	RAMMOHAN, G	Admit - Case was *	Daoud, George	Fever Sepsis (HCC)	BE PPHP
193	RAMMOHAN, G	Admit - Case was *	Bhagatwala, Kunal D	Throat pain Bronchitis with tracheitis	BE PPHP

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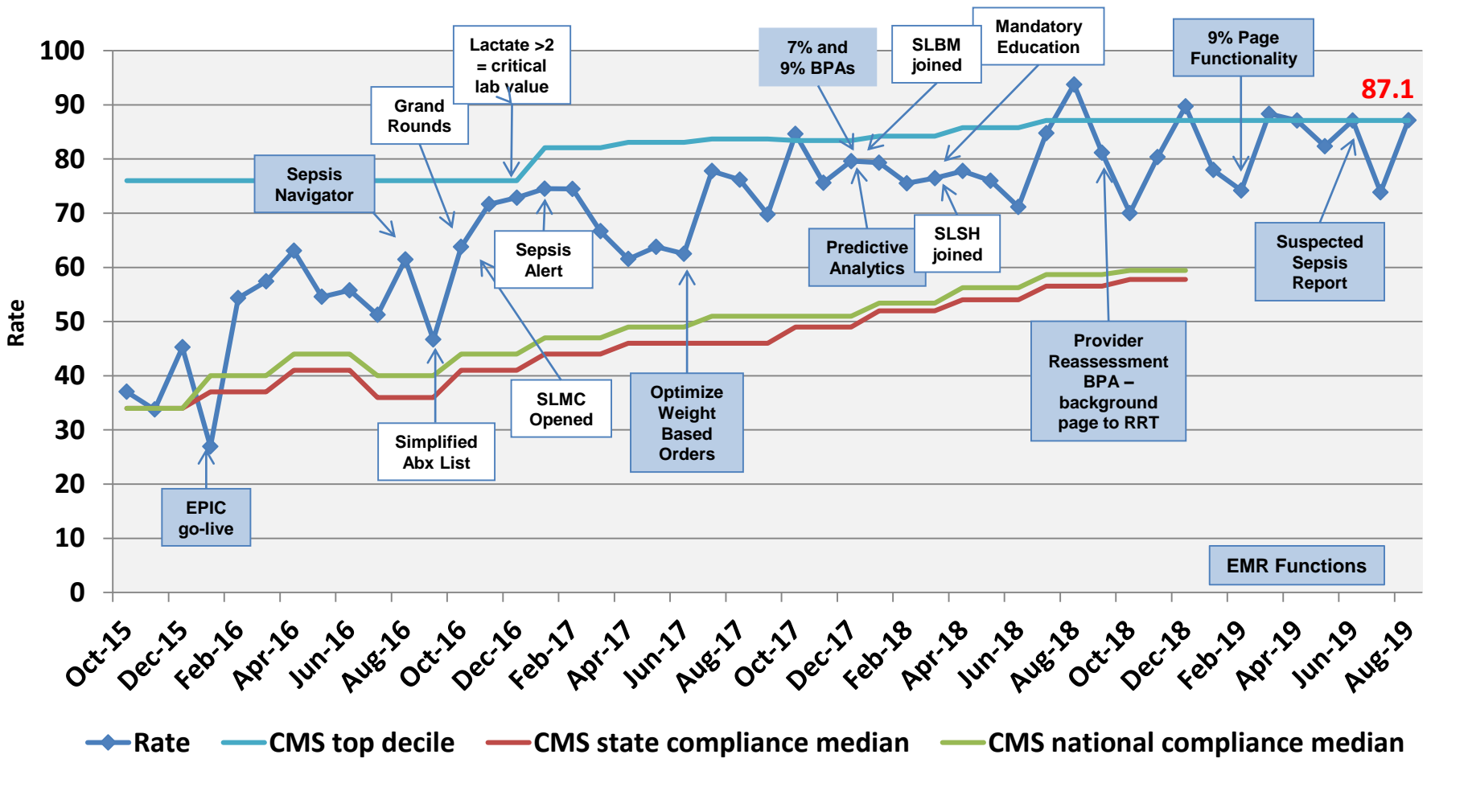
Failure Types





Performance Data

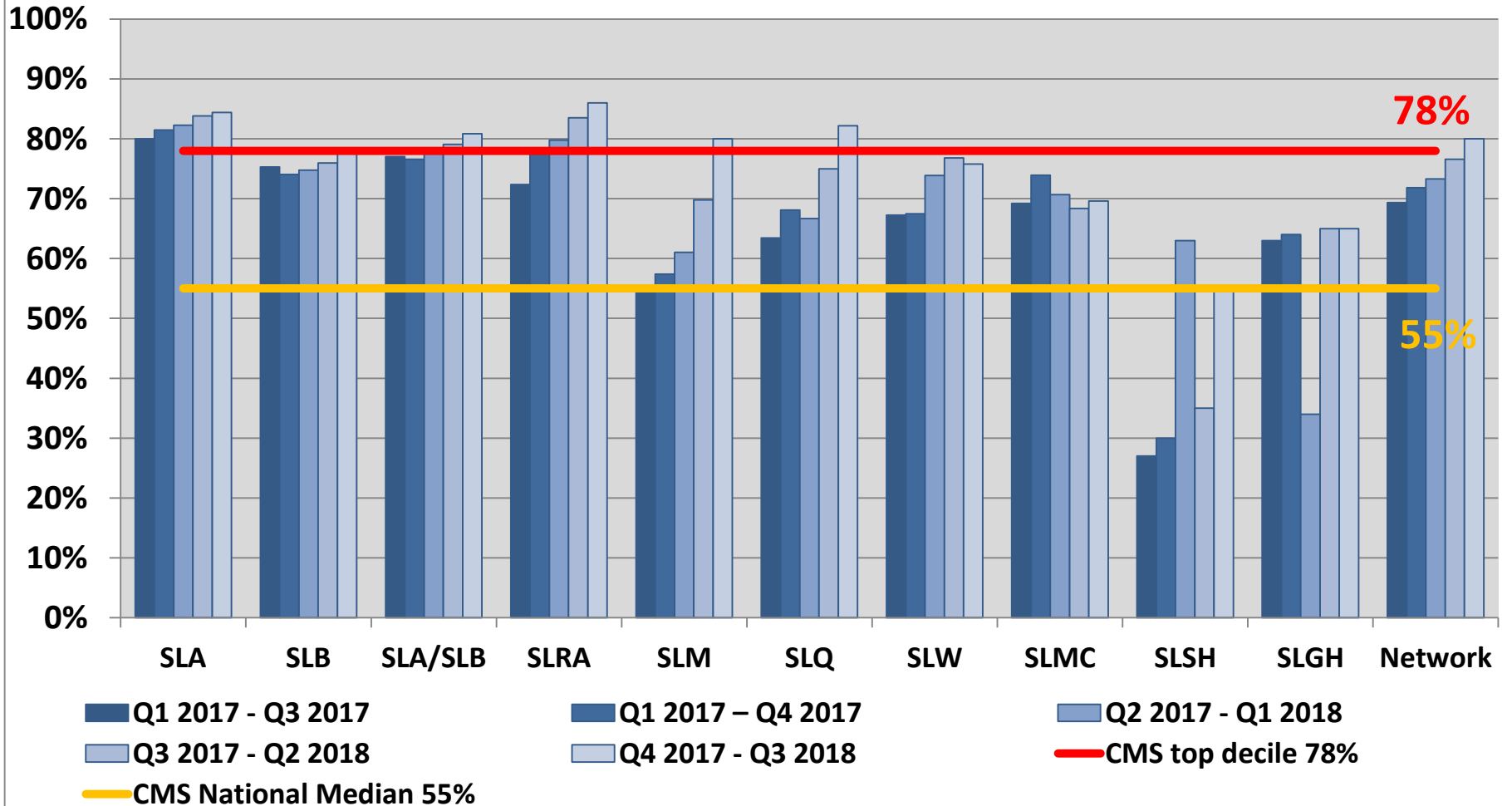
Network CMS Sep-1 Bundle Compliance





St. Luke's Hospital Compare Performance

CMS Hospital Compare Q4 2017 - Q3 2018 Sep-1 Measure Compliance July 2019 Update





Hospital Compare – Regional

Sep-1 Measure Compliance Comparison

Benchmarks	Jul18	Oct18	Feb19	Jul19
Top decile	76%	76%	76%	78%
PA Average	45%	46%	48%	53%
NJ Average	56%	57%	58%	61%
National Average	49%	50%	51%	55%

Hospital	Jul18	Oct18	Feb19	Jul19
SL Allentown/ Bethlehem	77%	77%	78%	81%
SL Anderson	72%	78%	80%	86%
SL Miner's	55%	57%	61%	80%
SL Quakertown	63%	68%	67%	82%
SL Warren	67%	68%	74%	76%
SL Monroe	69%	74%	71%	70%
SL Sacred Heart	27%	30%	34%	55%
SL Blue Mt. (SLGH)	63%	64%	63%	65%
Geisinger Danville	30%	31%	32%	41%
Grandview	44%	44%	47%	49%
Thomas Jefferson Univ.	51%	51%	50%	55%
HUP	75%	75%	74%	84%

Hospital	Jul18	Oct18	Feb19	Jul19
LVH-CC	42%	42%	43%	45%
LVH-M	35%	39%	38%	-
LVH-Pocono	40%	41%	43%	44%
LVH-Hazleton	62%	62%	63%	67%
Easton	45%	48%	59%	63%
Reading	45%	46%	53%	58%
Hershey	40%	44%	50%	51%
Hunterdon	33%	36%	35%	46%
Hackettstown	42%	49%	56%	58%
Cooper	67%	66%	68%	67%
Temple	58%	62%	61%	70%
Hahnemann	41%	38%	42%	47%

Data accessed: 8/2/2019

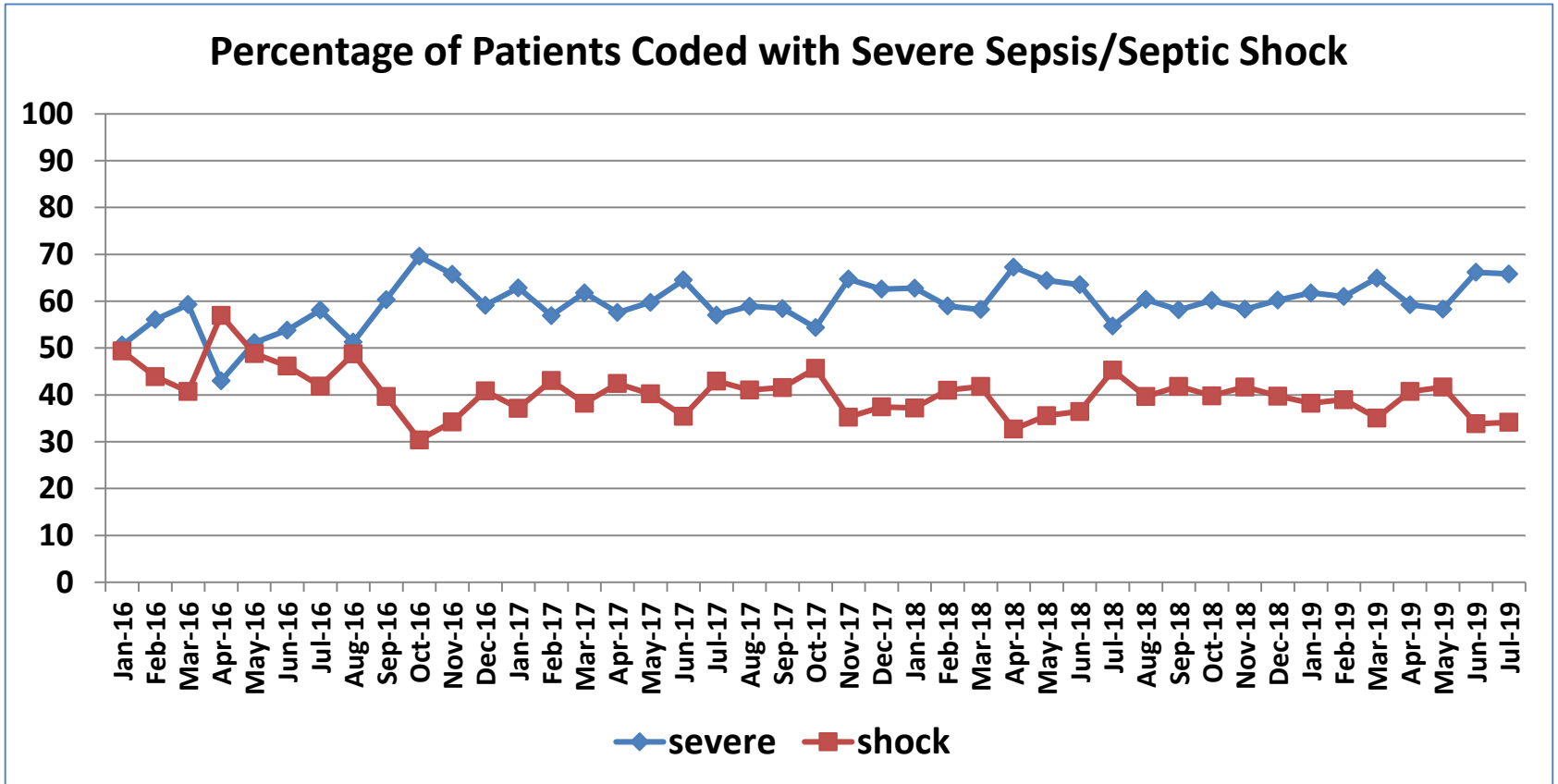
Timeframes:

Jul 2018: Jan- Sep 2017
 Oct 2018: Jan-Dec 2017
 Feb 2019: Apr 2017-Mar 2018
 Jul 2019: Oct 2017-Sep 2018

Oct 2019: next update will drop
 oldest quarter and add newest
 quarter

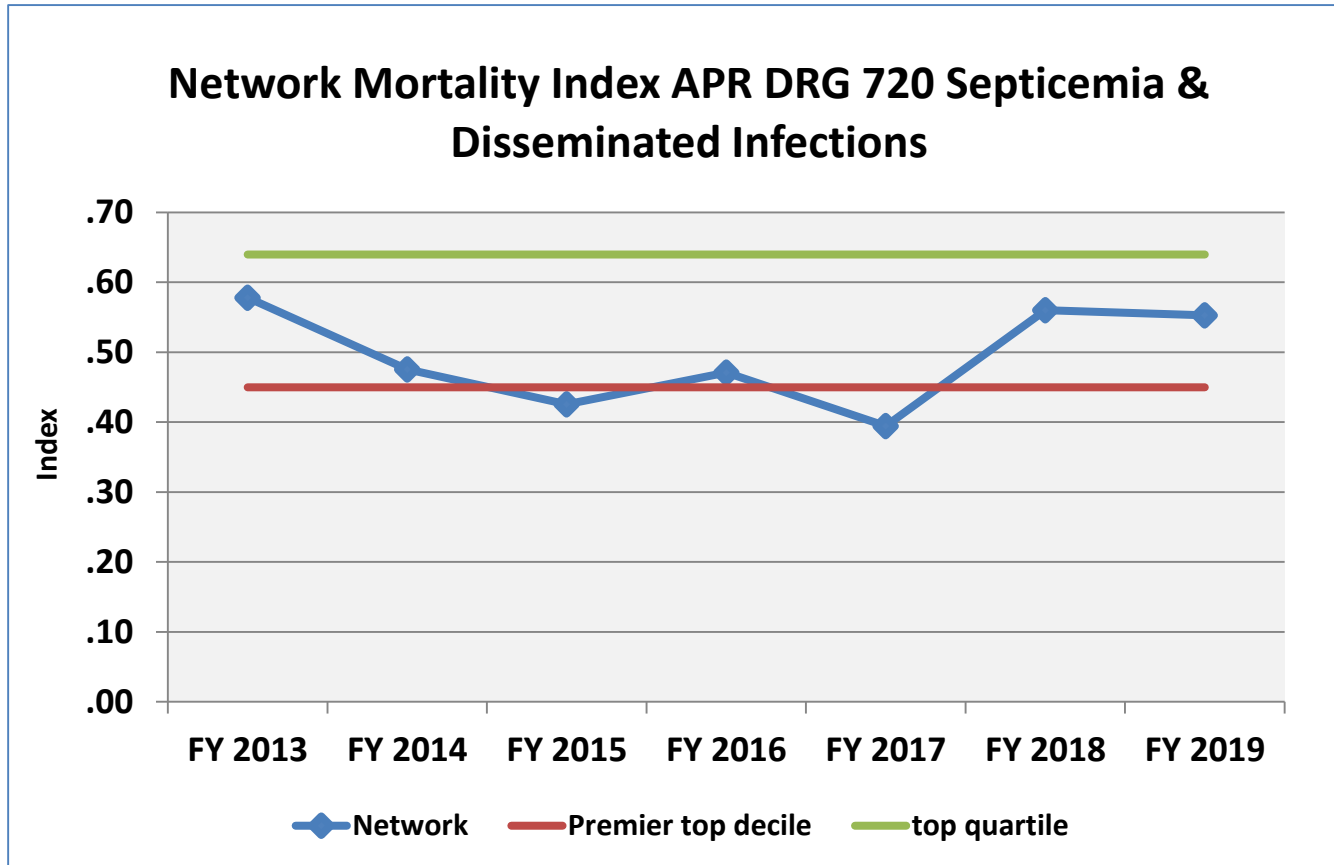


Fewer patients Progress to Septic Shock



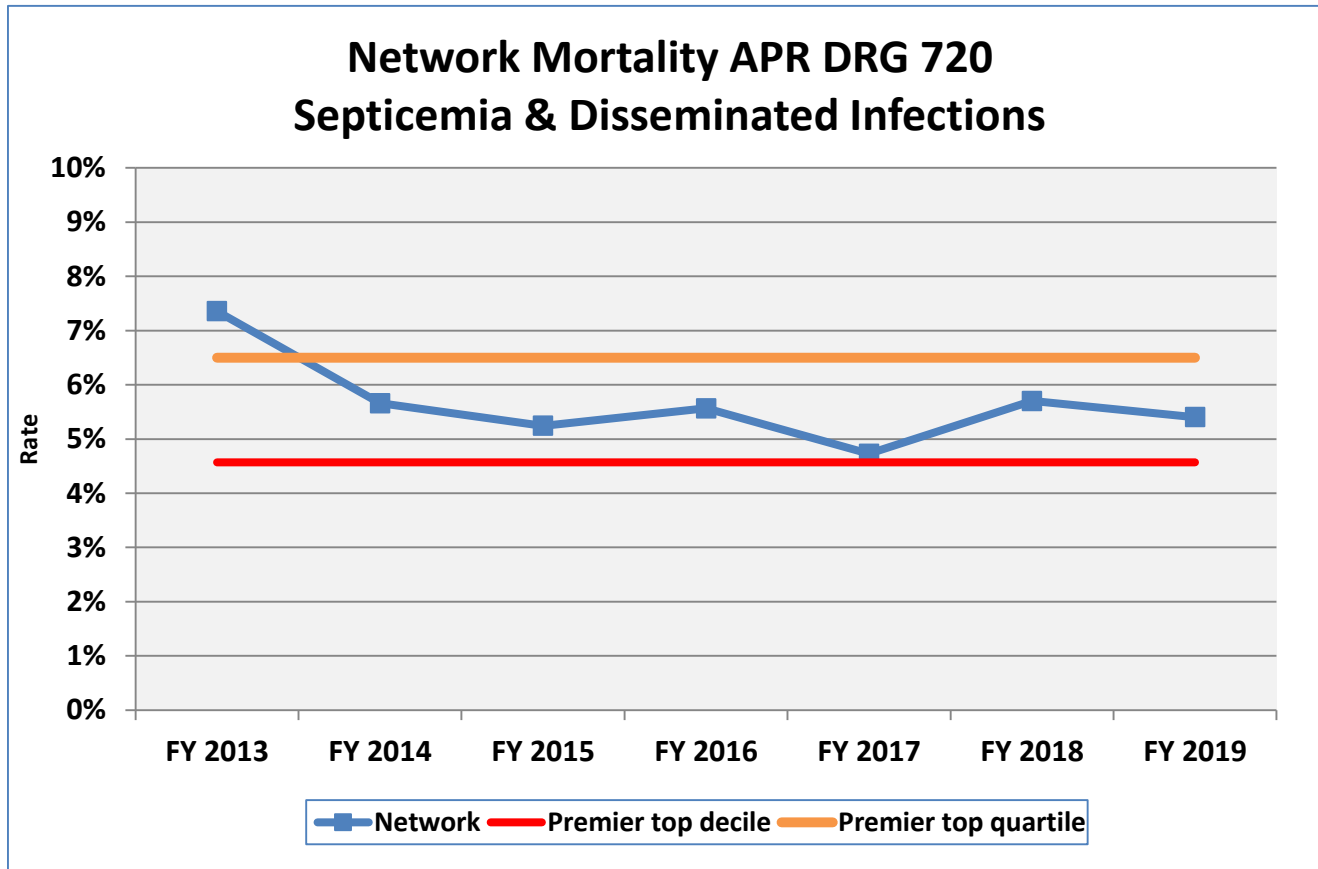


Network Sepsis Mortality Index APR DRG 720





Actual Mortality Rates





Return on Investment and Case Mix Index

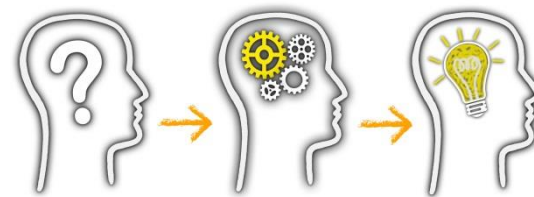
Campus	Year	Cases	Case Mix Index	Average LOS	Operating Margin Per Case
SLA	2018	573	1.71	6.59	\$2,371
	2017	410	1.57	6.65	\$1,584
	2016	336	1.67	6.41	\$1,819
SLB	2018	764	1.97	7.59	\$2,231
	2017	1005	1.74	6.72	\$1,286
	2016	799	1.79	7.19	\$917
SLRA	2018	803	1.65	5.35	\$951
	2017	683	1.62	5.76	\$414
	2016	542	1.65	5.96	\$184
Combined	2018	2140	1.78	6.48	\$1,788
	2017	2098	1.67	6.39	\$1,060
	2016	1677	1.72	6.63	\$861





Lessons Learned

- Leadership support is vital
- Physician buy-in and input
 - We had physicians involved in process development and the EPIC builds prior to go-live
- Empower your nursing staff
- Set clear expectations up front
- Feedback is essential



LESSONS LEARNED



Clinical Governance Technology





Next Steps

- Post Sepsis Syndrome
- Readmissions
 - Predictive model for readmissions
- Length of Stay
- Episode of care
- Current Deterioration Index Pilot and Implementation
 - Will augment our sepsis process
- Exploring potential use of TigerConnect
- Continued optimization of the EMR and our process





Questions

