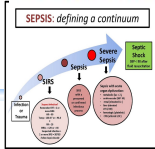


## Multidisciplinary Collaboration for Sepsis Care Leads to Significant Mortality Reduction

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## INTRODUCTION

- Septic patients have a hospital mortality rate of 10.4% compared to a rate of 1.1% percent in patients who did not have sepsis. An estimated 28-50% of patients with severe sepsis die.
- Sepsis hospitalizations contribute to 21.2% of all hospital charges, with 750,000 patients hospitalized for sepsis in the U.S. annually, according to the CDC.
- Sepsis mortality research done at Kaiser Permanente Northern California found:
  - Most patients already had sepsis at the time of hospital admission.
  - There are a large number of patients with less severe sepsis, a group for whom treatment guidelines are less well-defined.
  - The study suggests that improving care for sepsis patients at all severity levels and in all hospital settings could result in many future lives saved [1].
- Kaiser Permanente Southern California Region has eight Hospital Clinical Improvement Team (HCIT)'s active initiatives for quality improvement, with sepsis being one of them. HCITs are comprised of practicing clinicians from multiple specialties and administrators who select and oversee regional hospital clinical improvement priorities.
- The creation of HCIT supports KPCs leaders' vision of becoming the best health care/hospital system in all countries and better positions us to continue to provide quality care to all patients. The team makes improvements that consider the patient perspective and provide the best information available to physicians and other health care professionals who directly care for our members.
- In the first 3 quarters of 2015, the HCIT noted that the sepsis metrics at KP's Moreno Valley Medical Center (MVMC) were underperforming and strategies for improvement were developed.
- At the same time, in an effort to improve patient care in sepsis and for all ED patients, Kaiser Permanente elected to partner with CEP America whose physicians began staffing the E.D. in September 2015 and began collaborating in all E.D. operations. There were immediate changes made to expedite all patient care and strategies were developed between the nurses, E.D. physicians and House staff to hit the sepsis targets below for every patient. The new ED provider team joined in the HCIT initiatives and this was also seen as an optimal time to conduct a Rapid Improvement Event as described below.

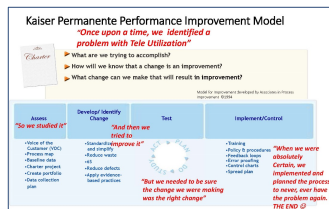
### HCIT Sepsis Target Metrics:

1. Lactate drawn within 1 hr. of ERT
2. Abx given within 3 hrs of ERT – 80% goal
3. Repeat Lactate 2-6 hrs
4. Lactate clearance 2-6 hrs – 60% goal
5. Fluid 30 ml/kg in 3 hrs. of EHT – 80% goal

## RAPID IMPROVEMENT EVENT

An RIE is an accelerated application of the Performance Improvement methodology executed by the team focused on improving a process or solving a problem identified within a specific area over a brief time period (30-60 days). An RIE starts with a problem statement. The Sepsis Team spent an extensive amount of time redefining the problem statement to assure we could achieve success in this brief amount of time.

**Problem Identified:** *How may we improve the process for Sepsis care (evidenced by meeting HCIT targets) from ED triage to inpatient bedding?*

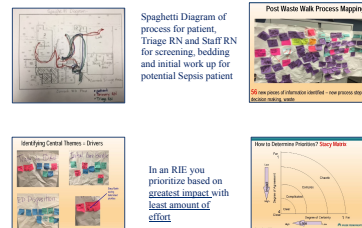


## IMPLEMENTATION

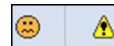
### Key Dates:

- October 2<sup>nd</sup> – Sepsis Team determined it was necessary
- October 15<sup>th</sup> - RIE Stakeholder's Meeting- soliciting Sponsor support
- November 6<sup>th</sup> - November 12<sup>th</sup> – Team Identified the problem planning, planning, planning, observations
- December 14<sup>th</sup> RIE Kickoff Day
- December 22 – Feb 16<sup>th</sup> Weekly Huddles: case reviews, action planning, evaluation
- **RIE Kickoff Agenda:**
  - Opening, introductions
  - What are we trying to accomplish?
  - How will we know that change is an accomplishment?
  - What changes can we make that will result in improvement?
  - Ground Rules
  - Process Mapping
  - Identifying Waste
  - Chart Review
  - Waste Walk based on potential opportunities
  - Current State Process Map
  - Brainstorming Session
  - Grouping Central Themes- Identifying Drivers
  - Prioritizing- Stacy Matrix
  - Planning Next Steps

Waste Walk – led to many “AHA” moments



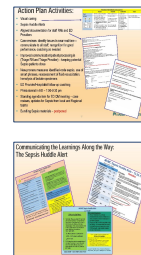
SIRS icon fires in EM  
with two or more  
criteria present: Visual  
awareness to  
THINK SEPSIS



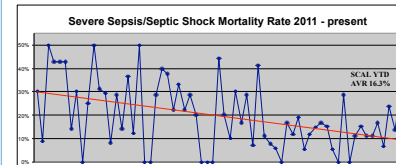
Severe Sepsis Alert fires at  
ED Triage: predictability  
model indicates at high risk  
for Severe Sepsis: Draw  
Sepsis Bundle Labs

**Tests of Change:**

- Increasing SIRS recognition: Triage and electronic medical record icon
- Communication: RN to Provider in Triage, primary RN and ED Provider, Primary RN and Hospitalist
- Standardization of clinical practice: Code Sepsis
- Standardization of documentation: Provider Sepsis note, Nurses Sepsis note
- Patient flow issues to improve initial lab collection



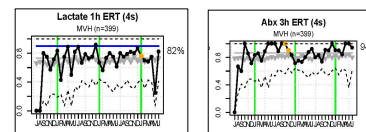
## RESULTS



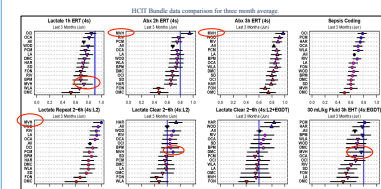
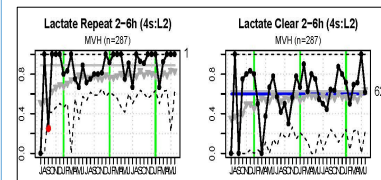
Year – YTD Performance	Severe Sepsis/Septic Shock Mortality Rate
2011	31.6% (n=98)
2012	24.7%
2013	21.7%
2014	15.1%
2015	11.4% (n=246)
2016 (Jan.- July)	8.7% (n=322) 74 more lives saved so far this year

What if MVMC still had the same mortality rate as 2011?  
How many lives have we saved this year with current Sepsis standardized procedures? Substantially larger population with Severe Sepsis/Septic Shock identified and treated with early goal directed therapy. (2)

BCTT trended data over time for lactate collection and initial antibiotic timeliness. With exception of one data point outlier, MVMC sustainable performance above SCAL Regional average.



HCIT trended data over time for repeat lactate collection and lactate clearance by  $\geq 10\%$ . With exception of one data point, MFM/MC maintained the significance almost 50% of the time. Fractional increase for last 31 months



## CONCLUSIONS

Severe Spikes / Septic Shock Trended Report		Moore's Vitals Trended Report	
June 2019 Period		How do we know that <b>changes</b> are <b>improvements</b> ? <small>See trended report for details</small>	
Age	Metric	2018	2019
Children under 18 yrs of age	Septic shock	100%	100%
	Septic shock	100%	100%
18-24 yrs	Septic shock	100%	100%
	Septic shock	100%	100%
25-44 yrs	Septic shock	100%	100%
	Septic shock	100%	100%
45-64 yrs	Septic shock	100%	100%
	Septic shock	100%	100%
65-74 yrs	Septic shock	100%	100%
	Septic shock	100%	100%
75-84 yrs	Septic shock	100%	100%
	Septic shock	100%	100%
85+ yrs	Septic shock	100%	100%
	Septic shock	100%	100%
All ages	Septic shock	100%	100%
	Septic shock	100%	100%

MVMC has been able to demonstrate sustained performance improvement with the three HCIT clinical metrics which impact mortality.

MVMC has successfully reduced mortality rate for patients with Severe Sepsis/Septic Shock. There is a 23 percent reduction in mortality and an estimated 74 lives saved from 2011 to 2016.

We have sustained a rate below the Regional and National average. MVMC Sepsis Team goals include sustaining process measure performance to assure we continued success with this mortality reduction.

Early identification of potential Sepsis allows for timeliness to clinical treatment such as antibiotics and fluid resuscitation. Initial lactate collection with 1 hour of ERT indicates there is suspicion for Sepsis. We were able to demonstrate identification, however staffing a Phlebotomist in the ED has been a barrier. With limited physical space in the Triage area, the ED Triage RN's ability to collect the Sepsis lab bundle is dependent on Triage demand. With the Triage remodel, we anticipate this issue will resolve.

## REFERENCES

1. University of Michigan Health System, May 19, 2014
2. Source: SCAL Dept. of Clinical Analysis
3. SCAL Sepsis Clinical Practice Guidelines
4. MVMC Policy and Procedure for Code Sepsis

## **ACKNOWLEDGEMENTS**

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