Sepsis Care in the ED

Graduate EBP Capstone Project

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University of Mary EBP Graduate Capstone Project Members

- Alicia Vermeulen- Operations Manager, Avera McKennan Hospital
- Wendy Moore, RN- Ambulatory Nurse Manager, Mayo Center for Sleep Medicine, Assistant Professor of Nursing, Mayo College of Medicine
- Rachelle Taylor, RN- Clinical Team Leader, Methodist Hospital for Surgery, Dallas, TX
- David Kihara, RN- Clinical Team Leader, Truman Medical Center Rehabilitation Unit
- Erick Wahome, RN- Clinical Team Manager, Truman Medical Center Rehabilitation Unit

Acknowledgements

- Claudia Dietrich, MS, RN- University of Mary Professor
- Lori Popkes, BAN, MBA, RN- Avera McKennan Chief Nursing Officer
- Lee Bollock, MSN, RN- Director of Emergency Services, Avera McKennan
- Dr. Jared Friedman, Medical Director, Avera McKennan Emergency Services
- Dawn Tomac, RN, CIC- Director of Quality Initiatives, Avera Health

Background

- Patients who present to the emergency department with sepsis are at increased risk for morbidity and mortality
- Mortality rates are as high as 72%
- The incidence of sepsis accounts for 750,000 patients annually
- Sepsis is the third leading cause of death in the US
- Identification of sepsis and aggressive management within the first 6 hours reduces mortality

(Keegan & Wira, 2014)

Background

- Because of the clinical significance and reimbursement issues surrounding sepsis, Avera McKennan is partnering with the University of Mary for an EBP project
- U Mary graduate student team members include: Alicia Vermeulen, Wendy Moore, Rachelle Taylor, David Kihara and Erick Wahome

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Problem Statement

- In October 2015, the CMS announced that they would require reporting on sepsis quality measures beginning in the fall of 2016.

Significance Clinical Problem

- Sepsis is a life threatening clinical syndrome that causes physiologic, biologic and biochemical abnormalities in dysregulated response to infection
- Incidence is rising *
- Mortality rates are high 25-50%**
- Estimates suggest earlier sepsis identification and evidenced based treatment would decrease annual mortality by 92,000, save 1.25 million hospital days and reduce hospital expenditures by 1.5 billion***

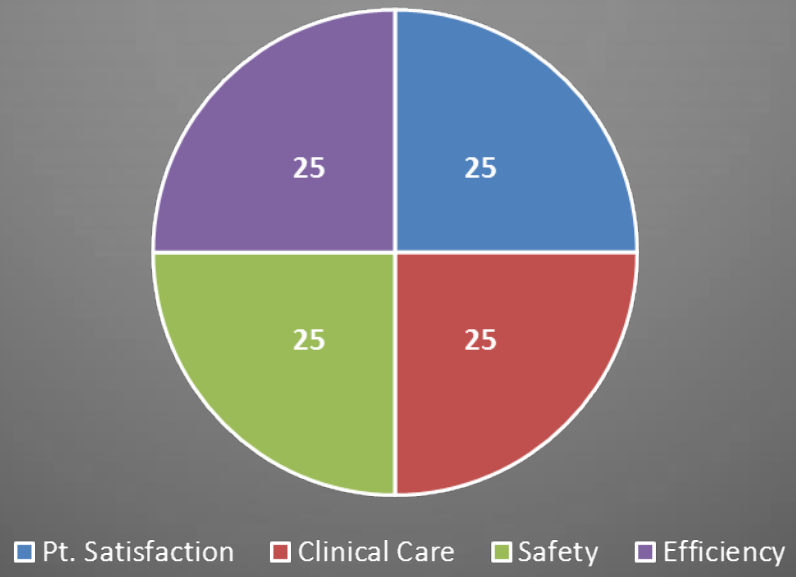
*Elixhauser, Friedman & Stranges, 2009

**Dellenger et al, 2013

***Center for Disease Control (CDC), 2015

Significance of Clinical Problem

- Health care reform has significantly affected reimbursements
- Value-Based Purchasing has the potential to significantly affect financial outcomes



Sepsis in the ED

- Please click on link to view video on sepsis in the ED
- https://www.youtube.com/watch?v=DnsQ4RlXsZY
-

Incidence of Mortality

Severe Sepsis vs Other Care Priorities

Quality Projects	US Incidence	# of Deaths	Mortality Rate
AMI[1]	895,000	171,000	19%
Stroke[1]	700,000	157,800	23%
Pneumonia[2]	1,300,000	61,800	4.8%
Severe Sepsis[3]	751,000	215,000	29%

1. American Heart Association. Heart Disease and Stroke Statistics 2006 Update. 2. National Center for Health Statistics. Available at: www.cdc.gov/nchs/fastats/pneumonia.htm. Accessed 2/04/05. 3. Angus DC et al. *Crit Care Med* 2001;29(7):1303-1310.

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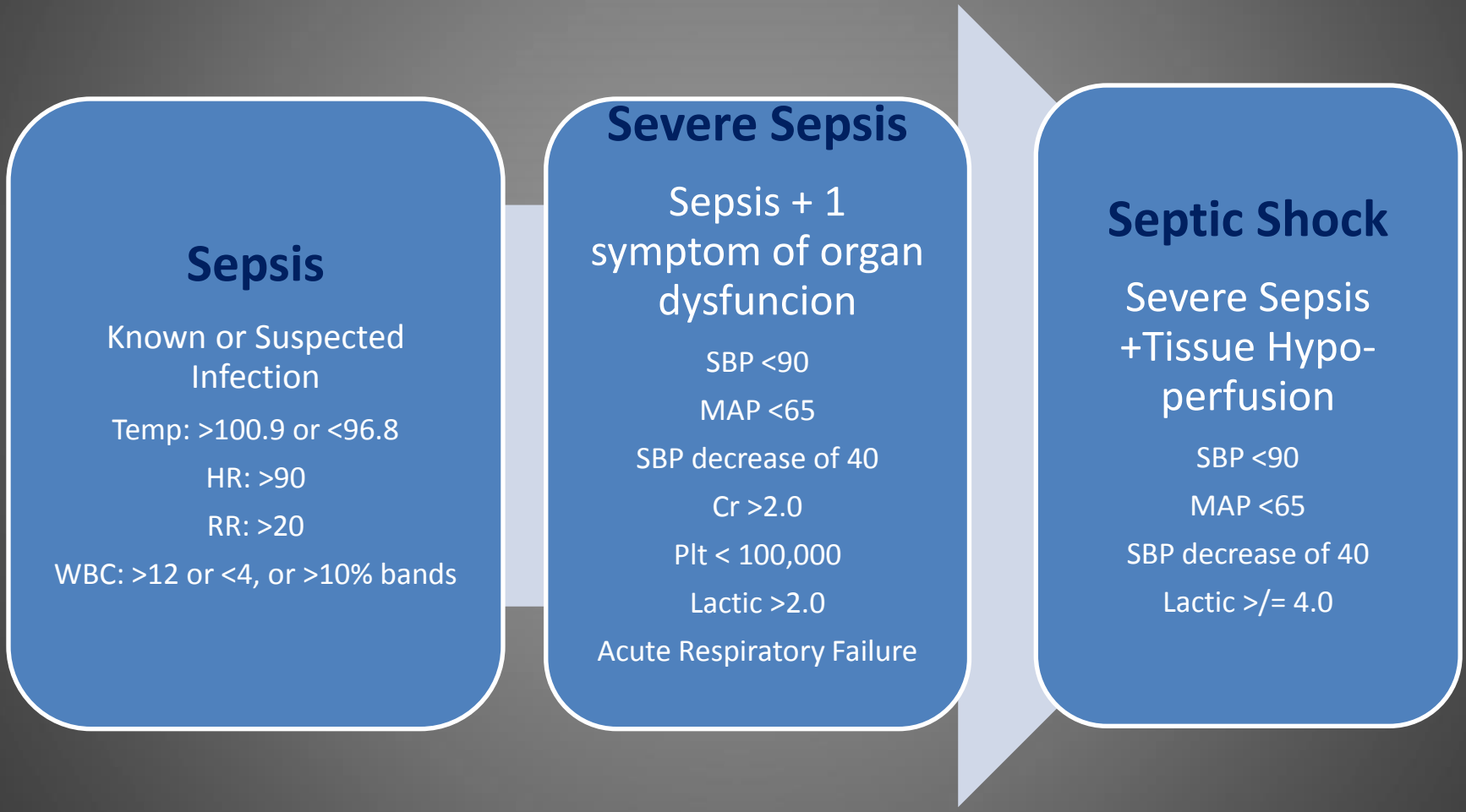
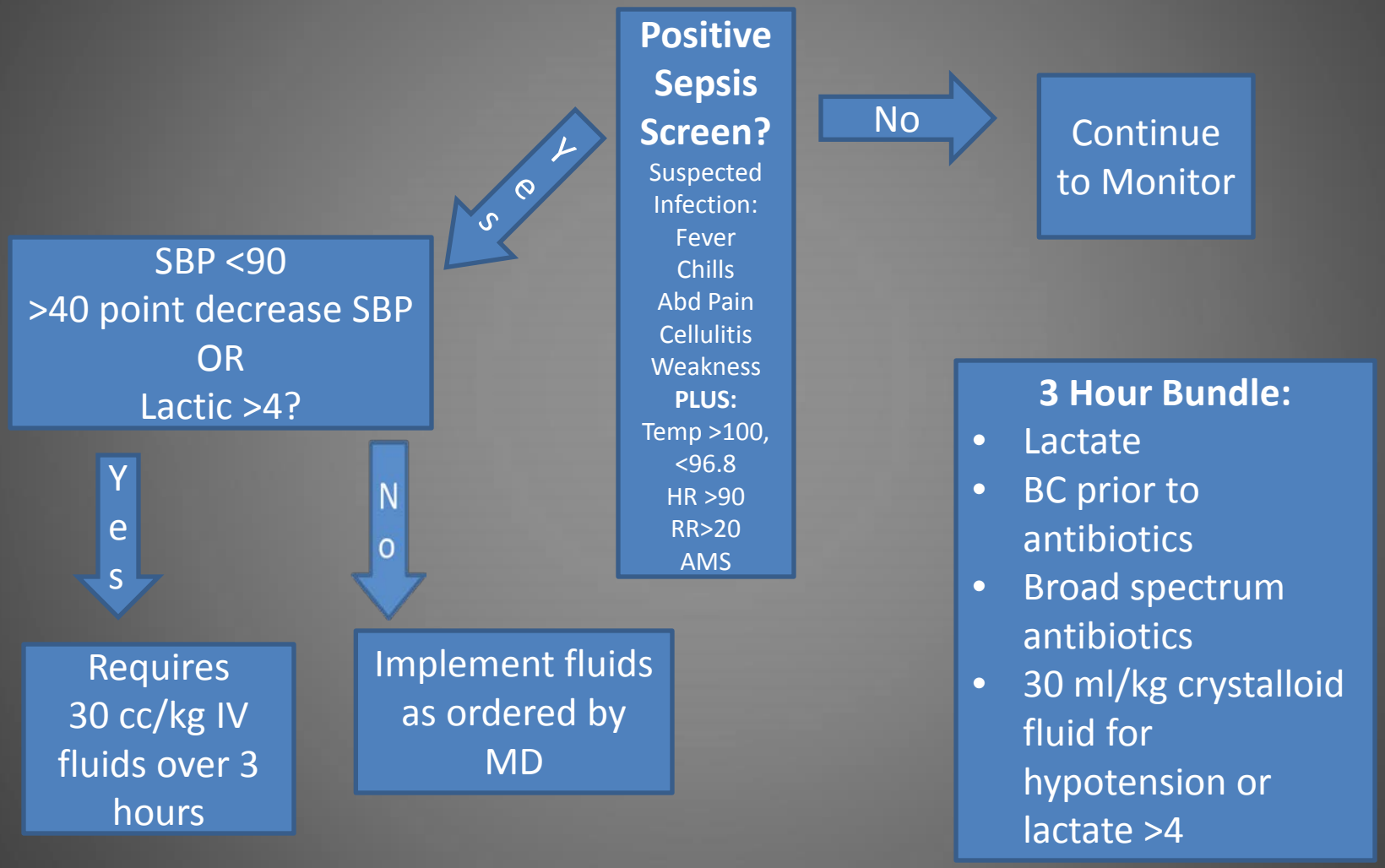
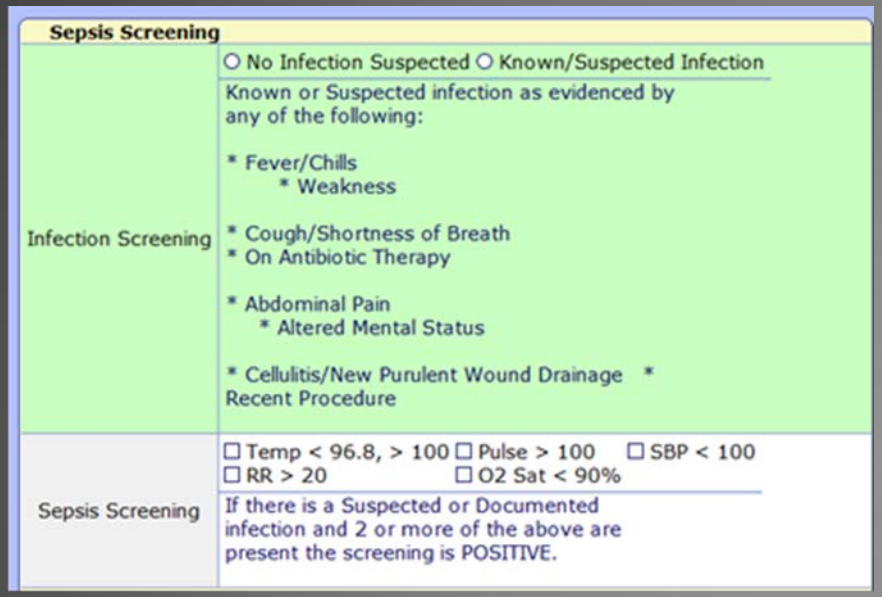
Classifications of Sepsis



Are Fluids Needed?

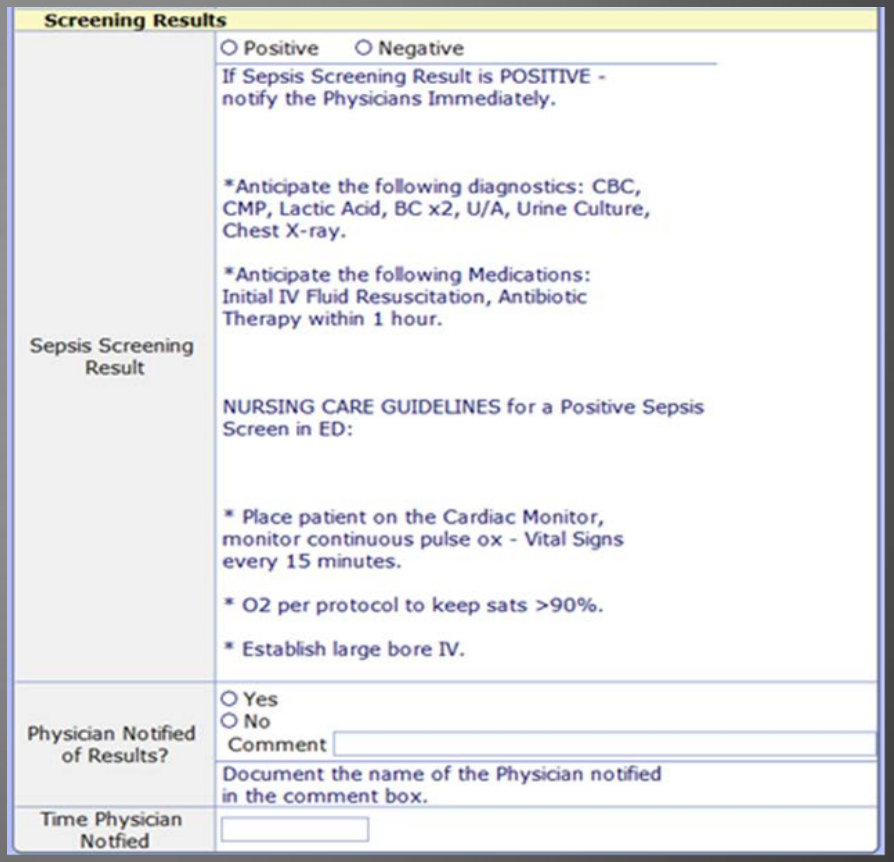


Severe Sepsis Screen



Sepsis Screening

Infection Screening	○ No Infection Suspected ○ Known/Suspected Infection Known or Suspected infection as evidenced by any of the following: * Fever/Chills * Weakness * Cough/Shortness of Breath * On Antibiotic Therapy * Abdominal Pain * Altered Mental Status * Cellulitis/New Purulent Wound Drainage * Recent Procedure
Sepsis Screening	☐ Temp < 96.8, > 100 ☐ Pulse > 100 ☐ SBP < 100 ☐ RR > 20 ☐ O2 Sat < 90% If there is a Suspected or Documented infection and 2 or more of the above are present the screening is POSITIVE.



Screening Results

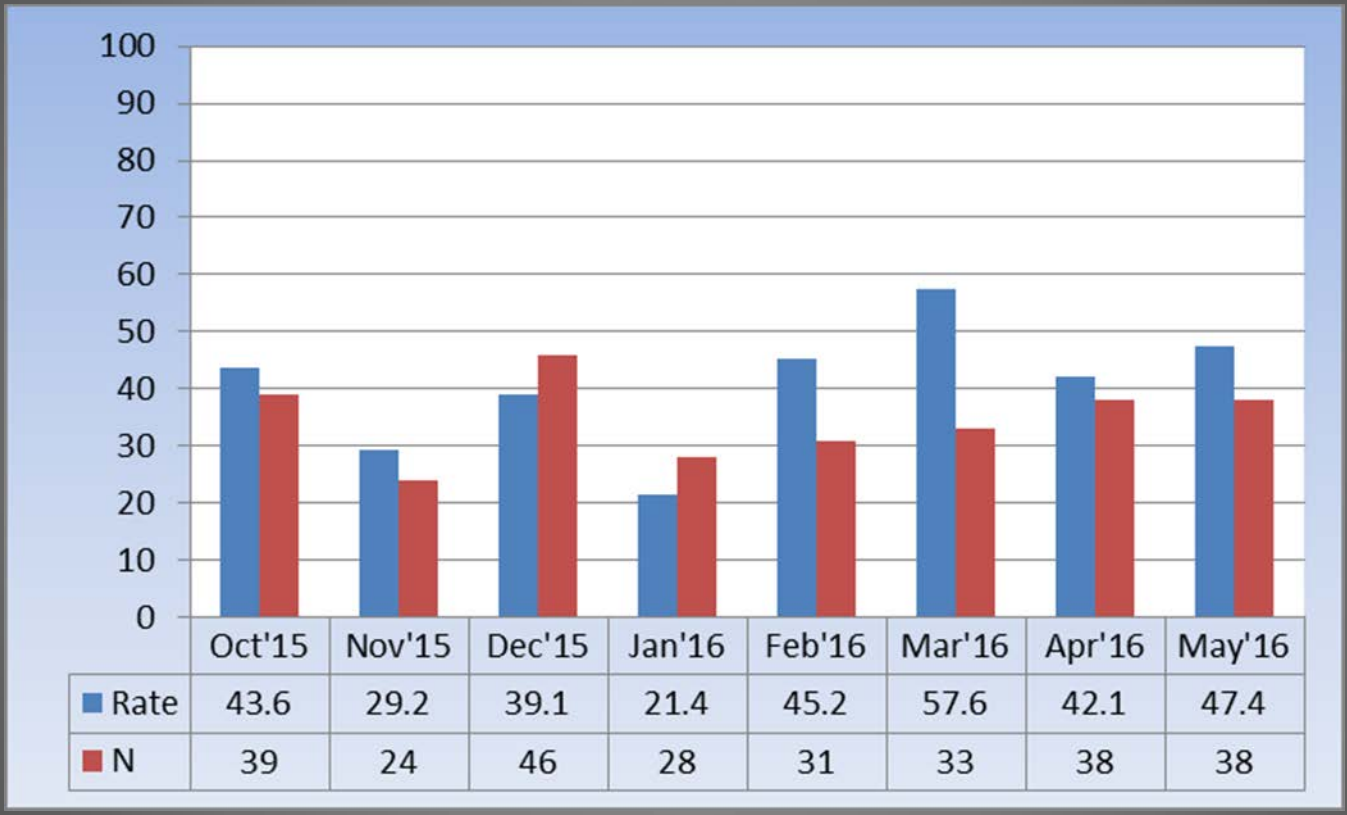
Sepsis Screening Result	○ Positive ○ Negative If Sepsis Screening Result is POSITIVE - notify the Physicians Immediately. *Anticipate the following diagnostics: CBC, CMP, Lactic Acid, BC x2, U/A, Urine Culture, Chest X-ray. *Anticipate the following Medications: Initial IV Fluid Resuscitation, Antibiotic Therapy within 1 hour. NURSING CARE GUIDELINES for a Positive Sepsis Screen in ED: * Place patient on the Cardiac Monitor, monitor continuous pulse ox - Vital Signs every 15 minutes. * O2 per protocol to keep sats >90%. * Establish large bore IV.
Physician Notified of Results?	○ Yes ○ No Comment Document the name of the Physician notified in the comment box.
Time Physician Notfied	

Current State: Avera McKennan

- Internal data shows significant room for improvement in meeting three and six hour bundle outcomes
- Data shows that the majority of patient diagnosed with severe sepsis present through the ED

Current State: Avera McKennan

Organizational Compliance with Sepsis Bundle



	Oct'15	Nov'15	Dec'15	Jan'16	Feb'16	Mar'16	Apr'16	May'16
Rate	43.6	29.2	39.1	21.4	45.2	57.6	42.1	47.4
N	39	24	46	28	31	33	38	38

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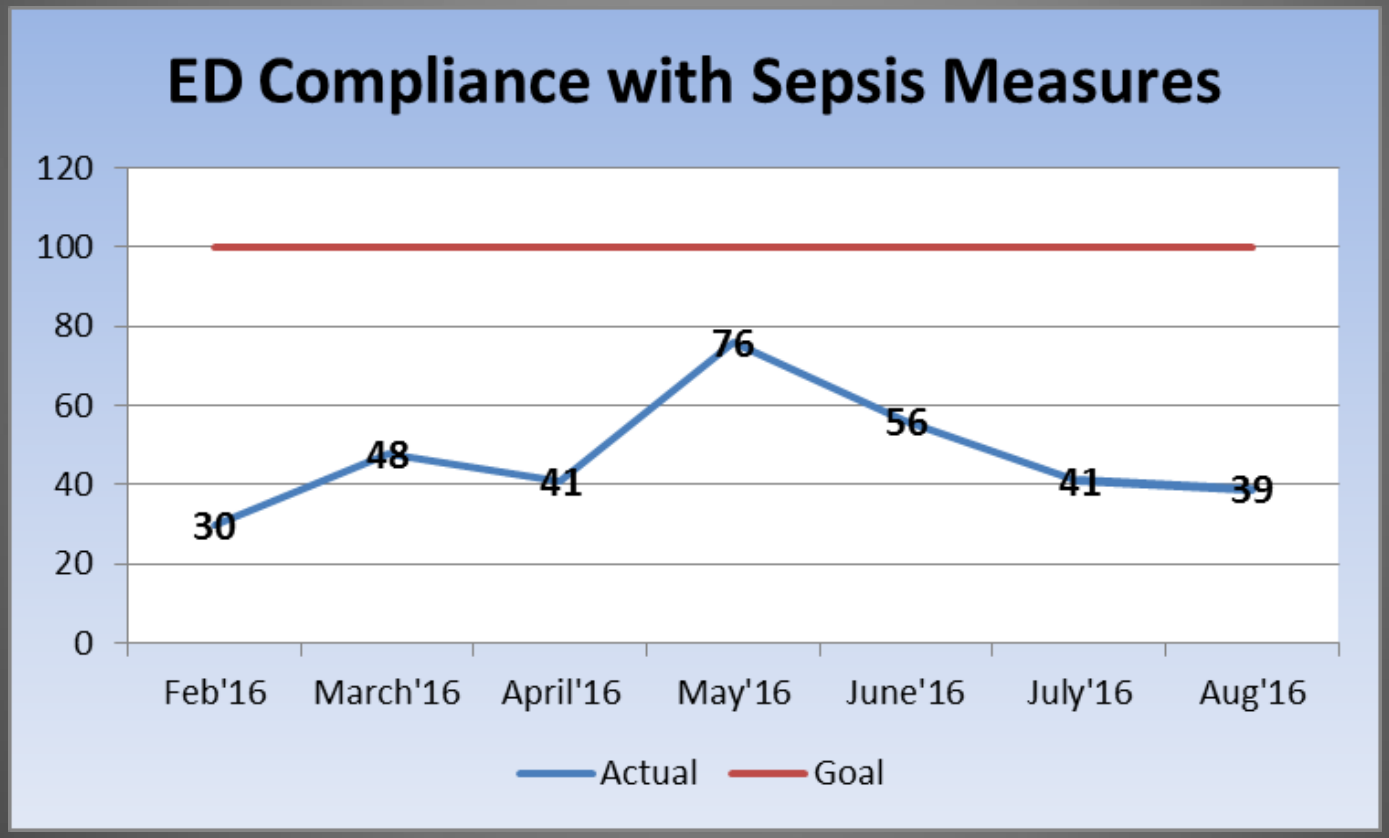
Current State: Avera McKennan ED Compliance with Sepsis Bundle



University of Mary EBP Project

- Explore the impact of a nurse-driven DART protocol on the compliance of sepsis bundled care interventions
- Enhance the patient handoff process between the ED to the Critical Care Unit to facilitate improvement with the established 6 hour bundle metrics

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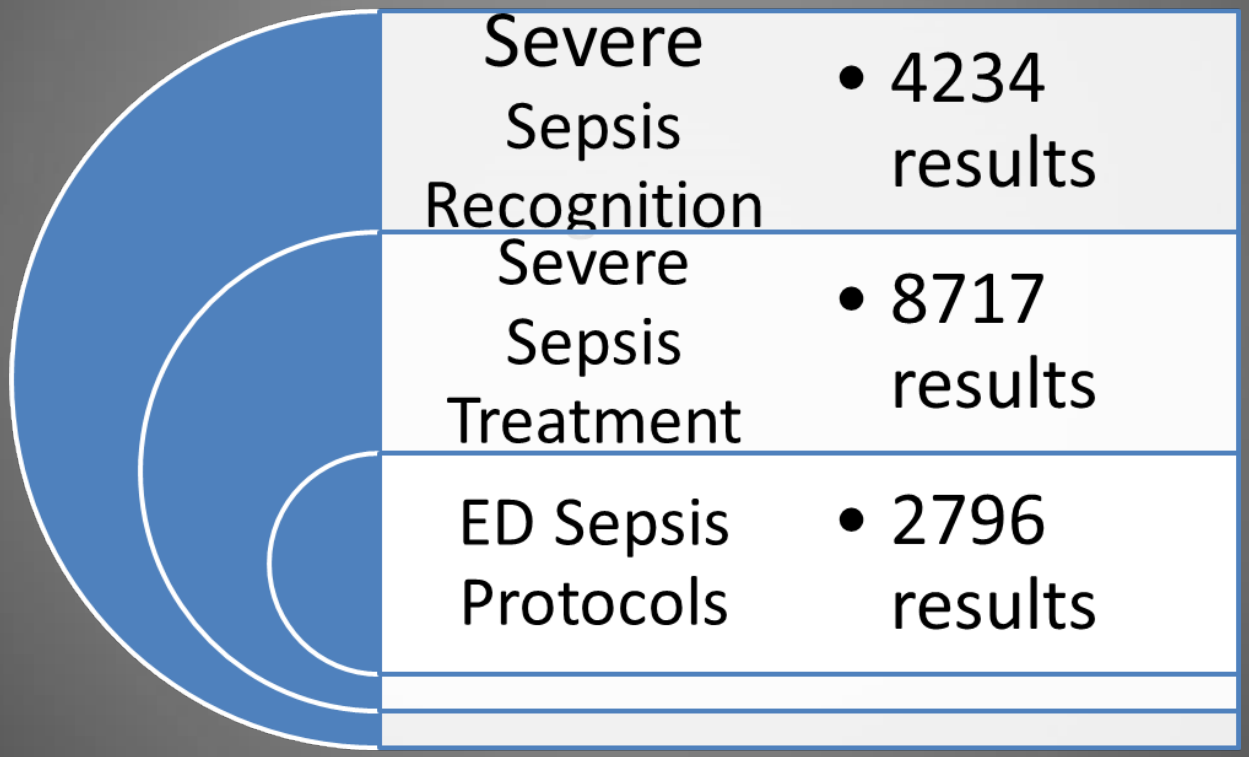
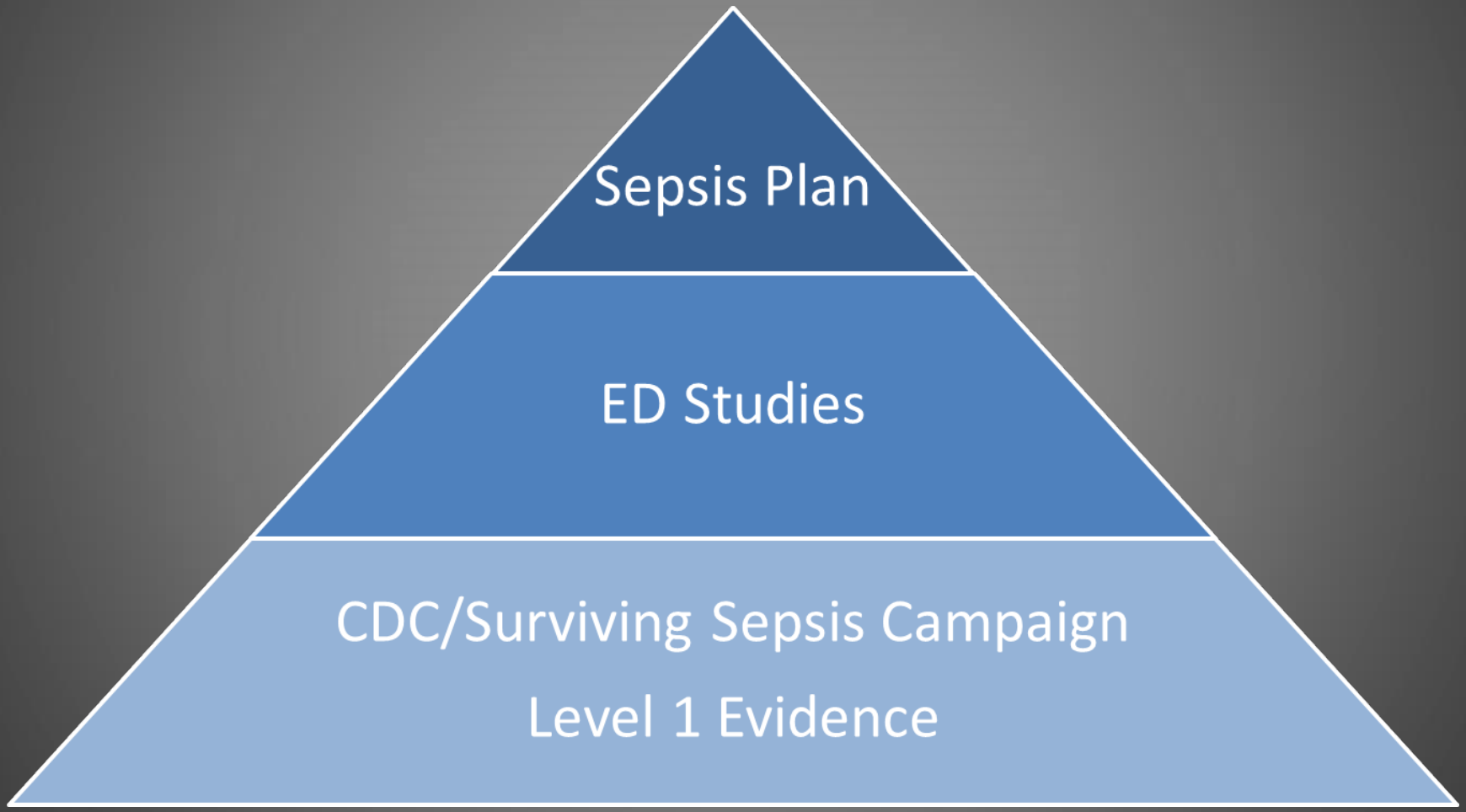
Review of Literature

- Literature review search engines used:
- CINAHL
- Medline
- Cochrane Library
- 2010-2016

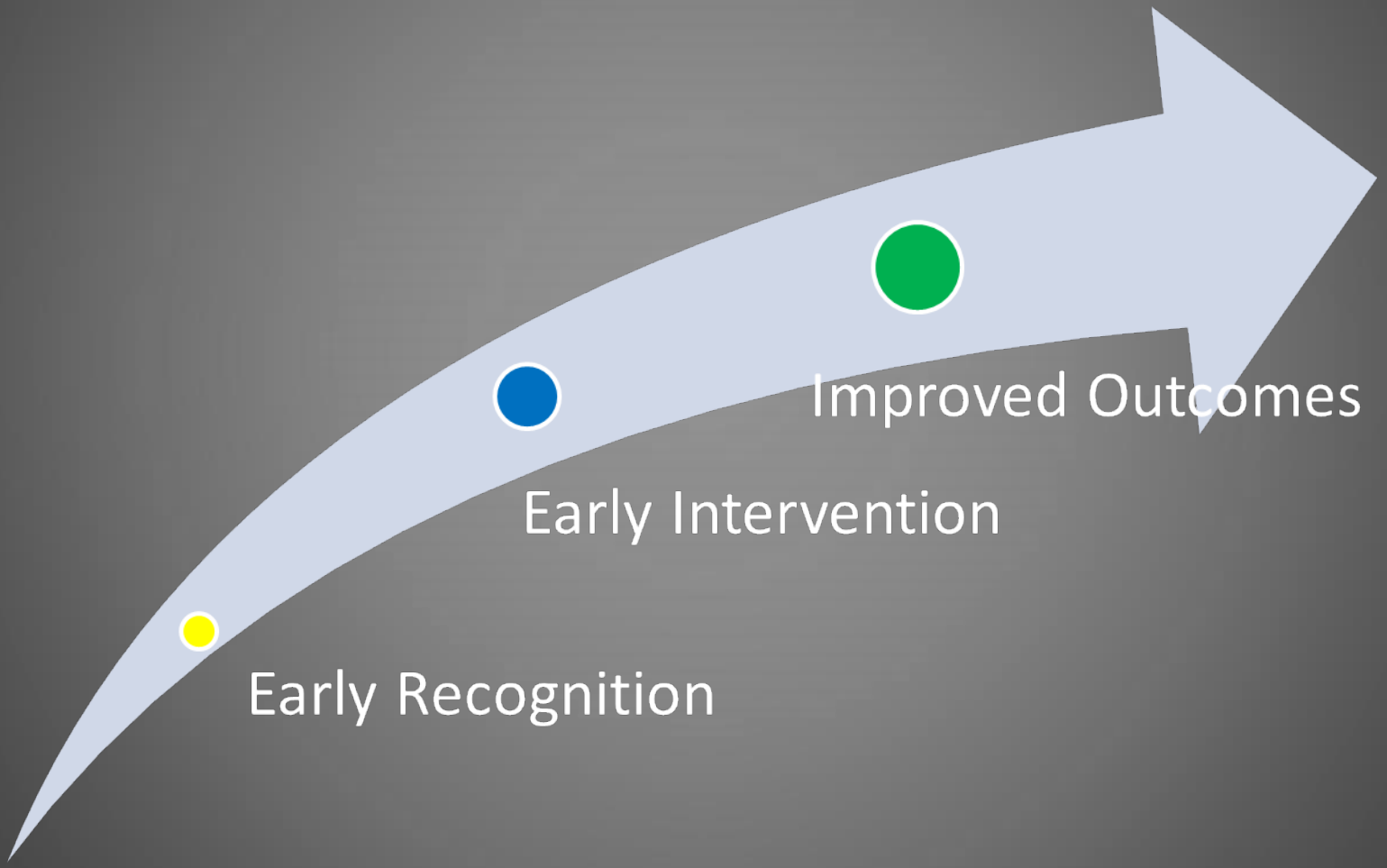
Review of Literature



Literature Review Findings



Literature Review Themes



Project Design

- This is an evidence based practice project measuring the impact of nurse protocol and SBAR communication
- This project uses an evidenced based practice quality improvement model called enhancing reliability
- Project Population is Registered Nurses and Physicians

Nurse-Driven Sepsis Algorithm

Detect
• Identify Sepsis Early (Complete Sepsis Screening Tool at time of triage) • Broadcast 'Code Sepsis' • Obtain Lactate and Blood Cultures, Obtain order from MD
Act
• Give 500 cc Cystalloid Bolus • Anticipate order for antibiotics, administer ASAP
Reassess
• Re-measure Lactate (within 6 hours of initial lactate) • Reassess volume status after fluid boluses
Titrate
• Frequently monitor patient response (HR, BP)

Severe Sepsis Checklist

Patient Sticker

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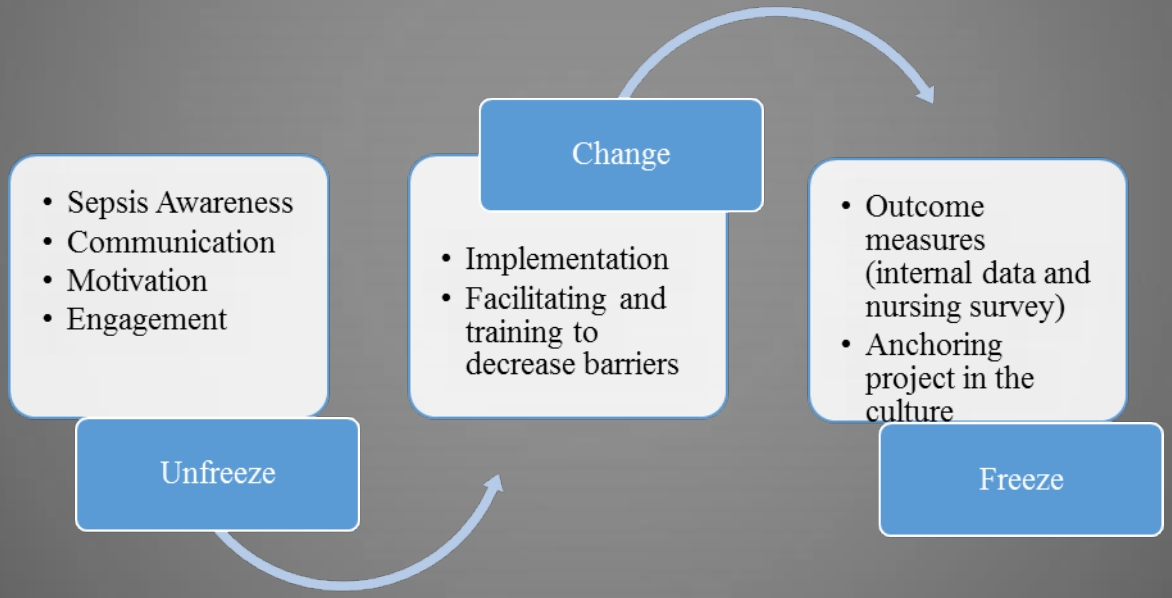
Severe Sepsis/Septic Shock Checklist	Time
Positive Sepsis Screening. Severe sepsis screening completed with triage assessment Severe Sepsis Criteria: Sepsis plus evidence of organ dysfunction (any **ONE** of the following): ☐SBP <90 ☐ MAP <65 ☐ SBP decrease of 40 points ☐ Lactic >2.0 ☐ Acute respiratory failure with need for invasive or non-invasive ventilation	Time ZERO: ED arrival time _____
Blood Cultures x2 drawn with IV start and sent to lab	
Initial Lactate Lactate level_____	
IV fluids: 30 ml iv fluid/kg to be administered if patient exhibits signs of **septic shock**. Septic Shock: Severe Sepsis PLUS signs of tissue hypo-perfusion: ☐ SBP <90 ☐ MAP <65 ☐ SBP decrease of 40 points ☐ **Lactic >4.0** ☐ Acute respiratory failure with need for invasive or non-invasive ventilation Pt wt in kg_____ x 30 ml= _____ Total IV fluids given in ED= _____ (goal is to give ivf within 3 hours of positive sepsis screening time) Repeat B/P within 1 hour of fluid bolus completion.	
Vasopressors: Norepinephrine (Levophed) preferred if not responsive to initial 30 ml/kg fluid bolus, or with profound hypotension while concurrently administering fluids.	
Antibiotics: Goal is to administer in less than 1 hour. Name of antibiotic:	
Repeat Lactic Acid: If initial lactic is >2, repeat within 3 hours. Repeat Lactic due at:	

NOT A PERMANENT PART OF THE MEDICAL RECORD

Fax form to eICU at 605-322-1950

Upon completion of form, please send to Alicia Vermeulen, ED Operations Manager via Interoffice Mail

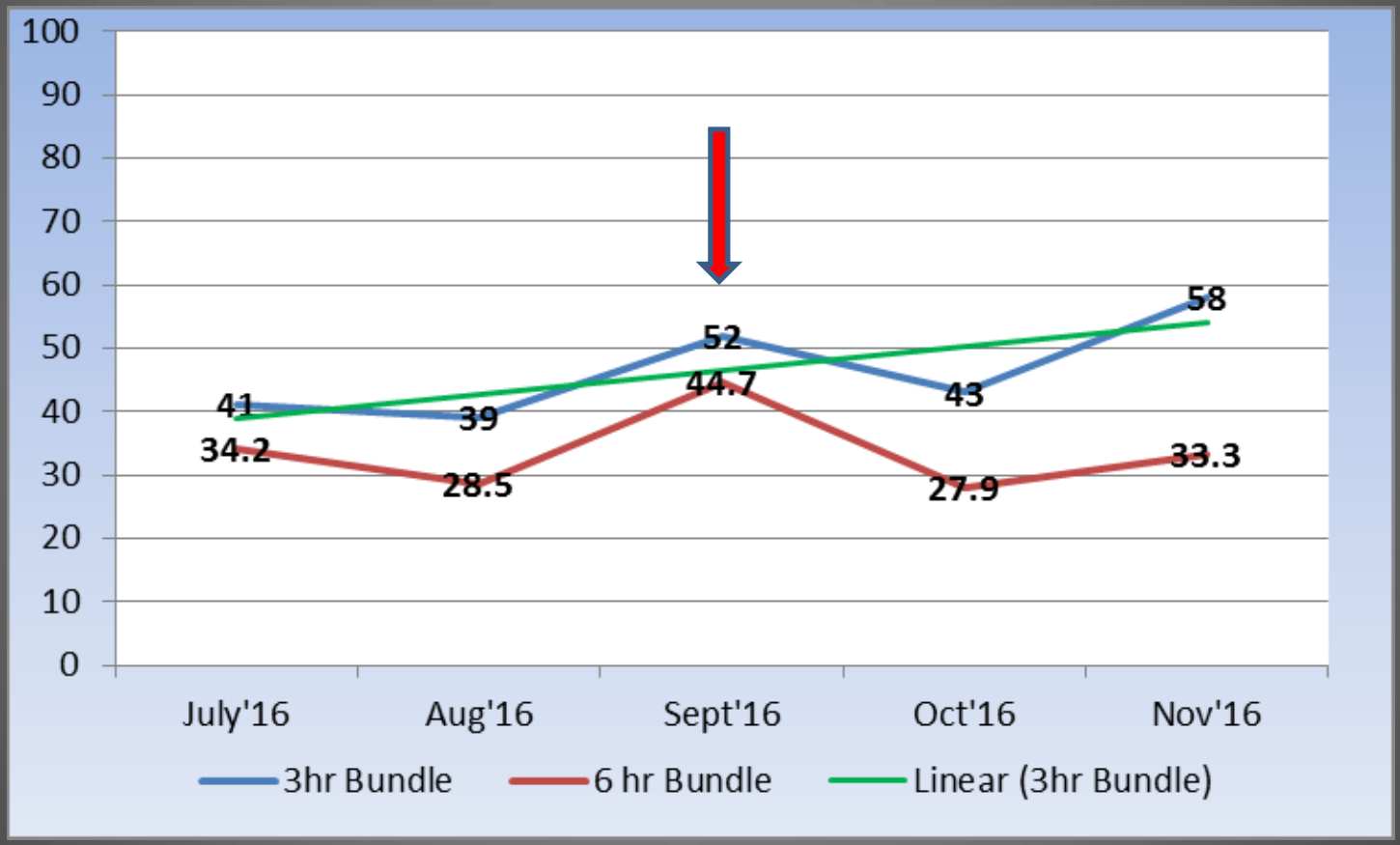
Project Implementation Lewin's Change Model



Project Implementation

- U Mary EBP project will be implemented on Wednesday, Sept. 14th
- Goals of the project include: decreased time to interventions, improved 3 and 6 hour bundled care metrics, and improved communication
- Data from the EBP project will be analyzed and reported December 2016

Project Measurement



Case Study

- 1428: 68 yr. old male presents via ambulance with c/o SOB x 1 day. Received 2 nebs enroute.
- Triage vitals: T- 101.3, HR-140, RR-36, O2 Sat 91% on room air, B/P- 144/75
- Sepsis? Sepsis screen completed at 1444

Case Study, con't

- 1444- Code Sepsis initiated.
- BC x 2, Lactic, IV x2, 500 cc NS IV bolus.
- Lactic resulted at 5.2. HR- multiple PVC's (bigeminy).
- B/P trending down to 91 systolic.
- Labs: WBC 11.8, Positive UA
- Admit Diagnosis: Septic shock, bacterial prostatitis. Admitted to the ICU

Case Study, con't

- Patient received fluid bolus in the ED, short of 30 ml/kg by 100 cc on arrival to ICU. Severe sepsis checklist utilized- pt received additional fluid within 3 hour window.
- Levaquin 750 mg iv given in ED

Conculsion

- Sepsis is a time-critical emergency, that is linked to high morbidity and mortality rates. The literature suggests that sepsis should be treated with the same level of urgency as that of a myocardial infarction or stroke.

Questions?

References

- Centers for Disease Control and Prevention. (2012). Data Reports. Retrieved from http://www.cdc.gov/nchs/data
- Delinger, R. P., Levy, M., Rhodes, A., Annane, D., Gerlach, H., Opal, S., . . . a, D. A. (2013). Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock, 2012. Intensive Care Medicine, 39, 165-228
- Elixhauser A, Friedman B, Stranges E. Septicemia in U.S. Hospitals, 2009. Agency for Healthcare Research and Quality, Rockville, MD http://www.hcup-us.ahrq.gov/reports/statbriefs/sb122.pdf (Accessed on June 6, 2016).