

# Methodist Mansfield Medical Center Sepsis Checklist decreases Sepsis Mortality

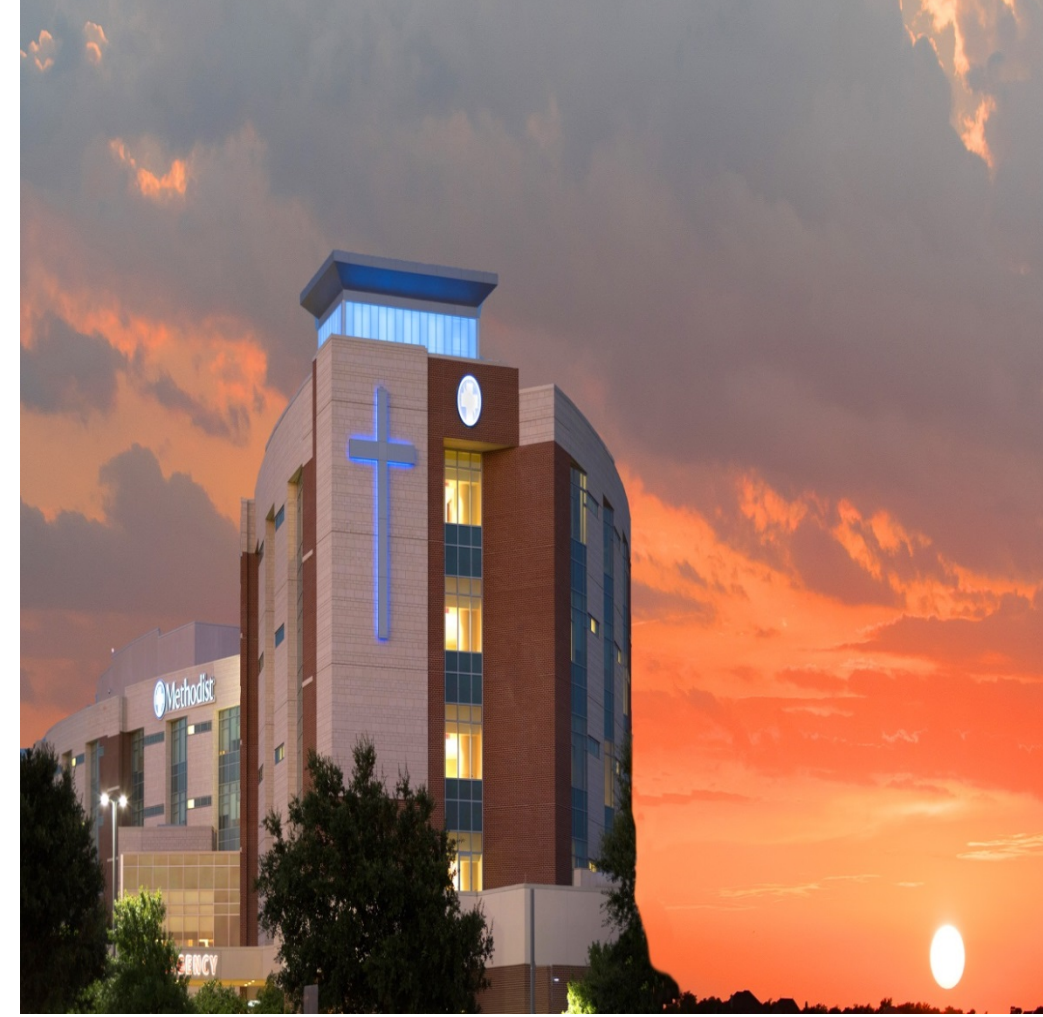
## Lean Six Sigma Yellow Belt Project

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### Introduction

Methodist Mansfield Medical Center (MMMC) is a 254 bed community-based hospital located in Mansfield, Texas. The medical center provides inpatient services primarily to adults and newborns. Inpatient care includes intensive care, surgery, medicine, women's services and special care nursery. Annually, there are over 11,000 inpatient admissions. Approximately 1007 employees support these services



#### Problem Statement

Since September of 2015, there has been 0% compliance with initiation of the Sepsis Checklist in the Emergency Department for positive severe sepsis patients. Early recognition and implementation of the sepsis bundle increases patient survival rate. MMMC Sepsis O/E Mortality for Oct was 1.06 and Nov 1.35, above our goal of 1.14.

#### Why is this a problem?

Every 2.5 minutes someone dies of sepsis  
↑mortality rate  
↑ LOS  
Early recognition = ↑ survival rate  
Early treatment = ↑ survival rate

### Goal Statement

#### AIM-Goal

**Primary:** To increase initiation of Sepsis checklist, by 50%, in ED for Sepsis positive patients by Dec 7, 2015.

**Secondary:** To decrease Sepsis O/E (observed to expected) Mortality to O/E below 1 by March 2016

### Special Thanks

- ED staff-Physicians & Nurses who have adopted the Sepsis Checklist into their culture.
- MMMC Sepsis Steering Team who embraced the Sepsis Lean Team work.
- Stephen Griffin-Mentor Lean Sensei
- MMMC C-Suite allowing the staff the time to learn, absorb and make a difference!

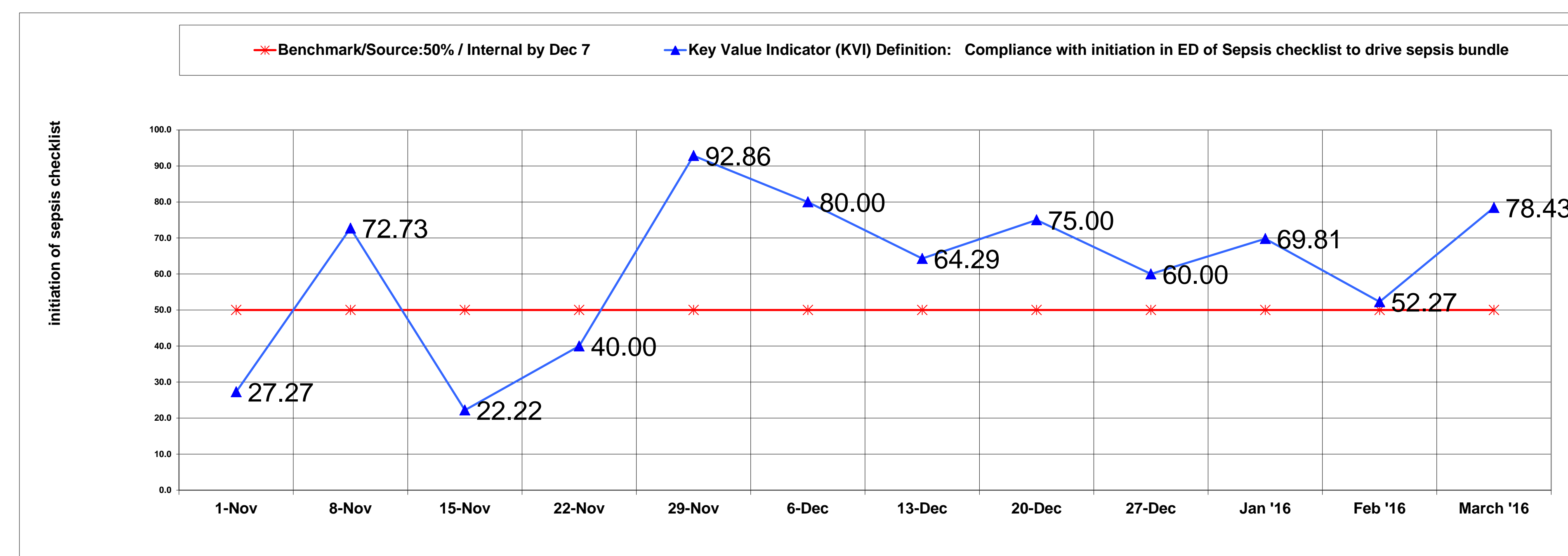
*Alone we can do so little;  
together we can do so much." Helen Keller*

### Results

#### Primary and Secondary Goals MET:

- First 3 weeks of project - **Checklist: 41.94%**
- Project Goal Date: **Checklist-↑58%; Sepsis O/E Mortality ↓ 0.43!**
- March 2016-3 months post project: **Checklist: ↑65.11%; Sepsis O/E Mortality: ↓ 0.70**
- MMMC has sustained the results

**Sepsis Checklist continues to serve as our roadmap and allows us to focus on early recognition and early treatment which has improved Patient Lives**

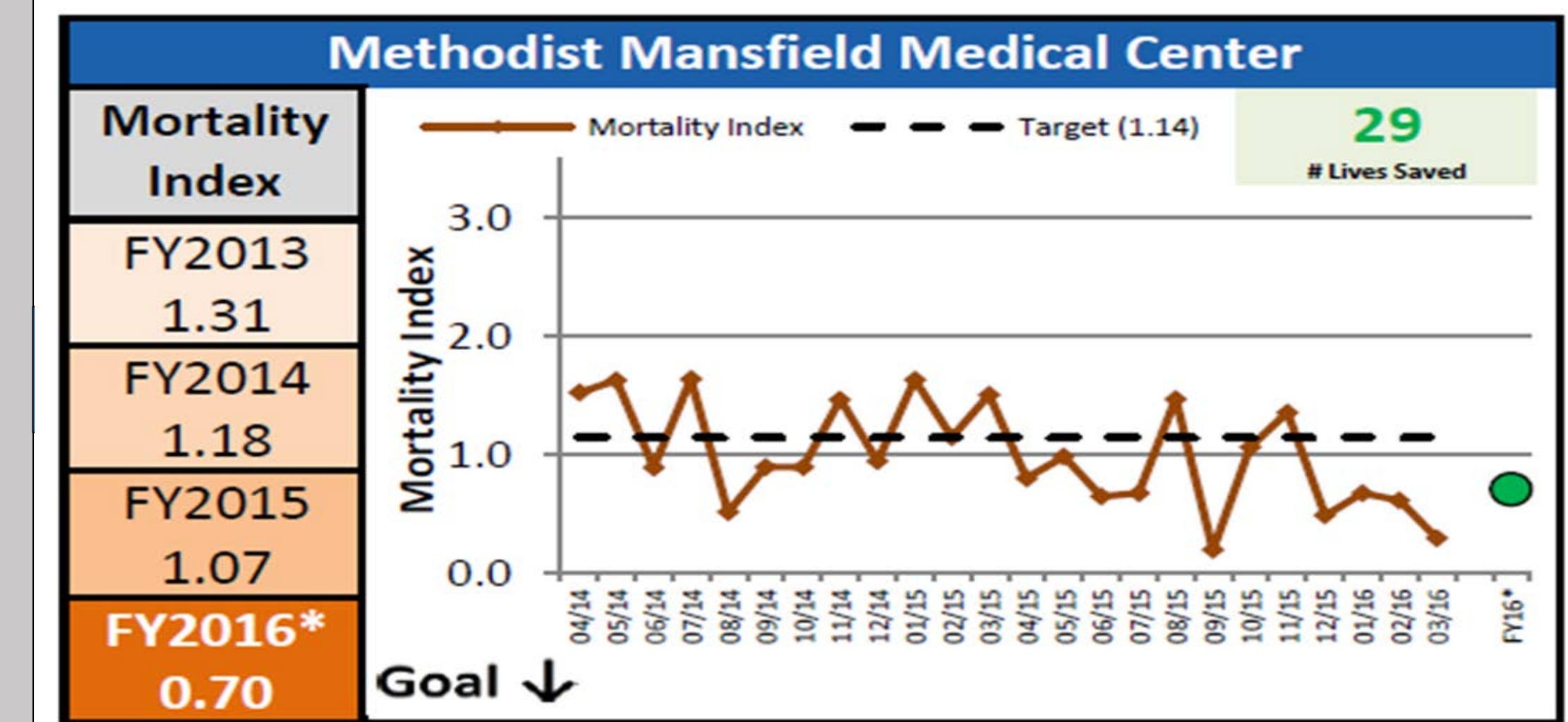


### Conclusion

#### Lessons Learned:

1. Staff need to be educated in a consistent manner, using an algorithm, which eliminates variation in trainer methods and potential for biases
2. Staff sign the education tool which re-enforces the accountability
3. On boarding of new staff to sepsis process and checklist is essential
4. Annual competency and monthly monitoring of process will help eliminate drift
5. Patient stories and lives saved help to sustain the momentum and change the culture

**Sepsis O/E Mortality- 29 LIVES SAVED!**

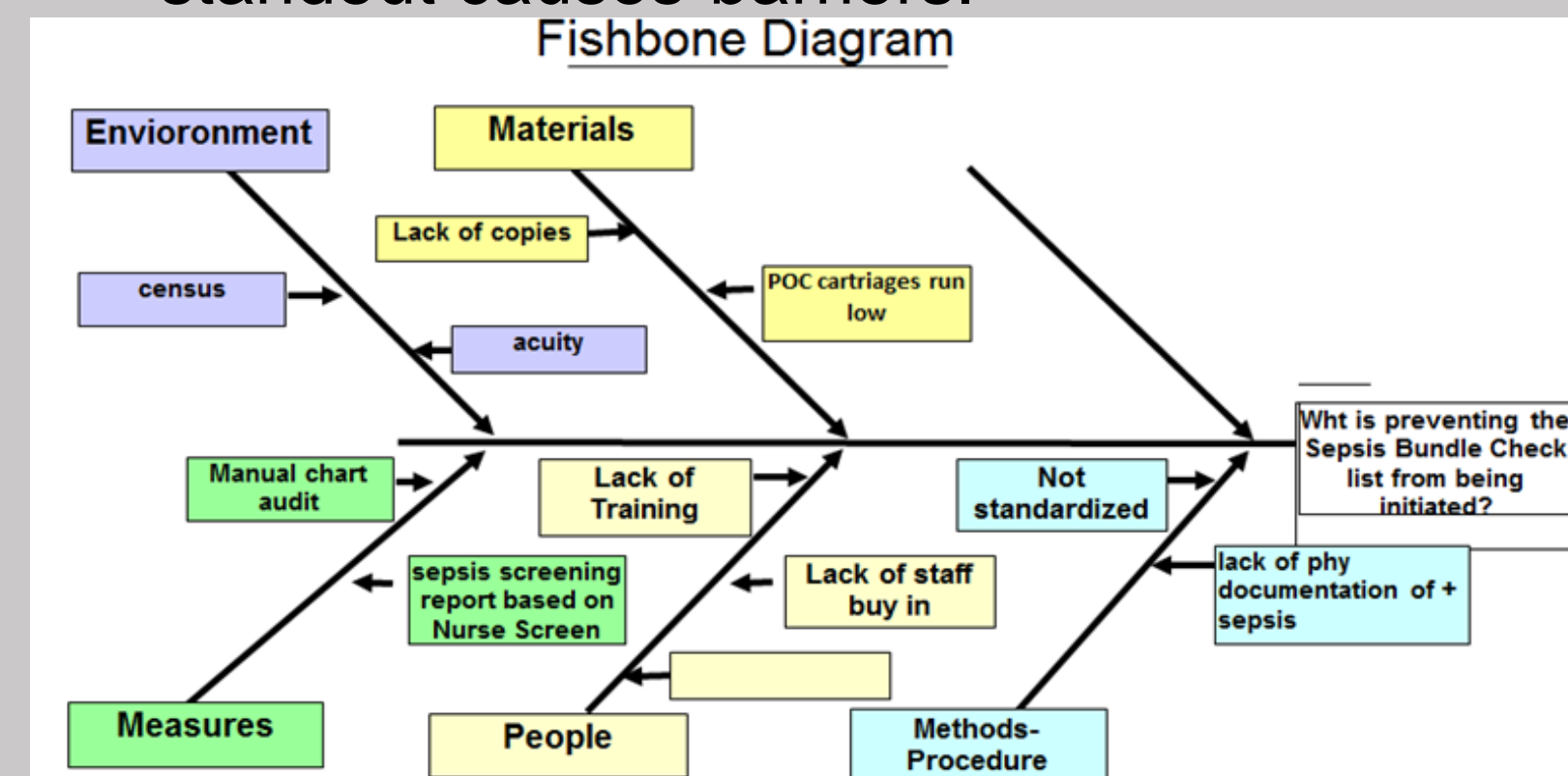


### Methods (Plan, Do, Study, Act Methodology)

#### PLAN: November 7, 2015: Discovery

- Several Gemba activities revealed:
  - Checklist not available
  - Checklist could be more intuitive
  - Lack of knowledge of checklist-inconsistent education
  - Lack of accountability with checklist
  - Physician & Nurse resistance-using script
  - Need to reassess patient
  - Secretaries shredding checklist

- Fish Bone(Cause and Effect) Diagram: Revealed: Location of checklist, checklist flow and understanding of it's use, were some of the standout causes-barriers.

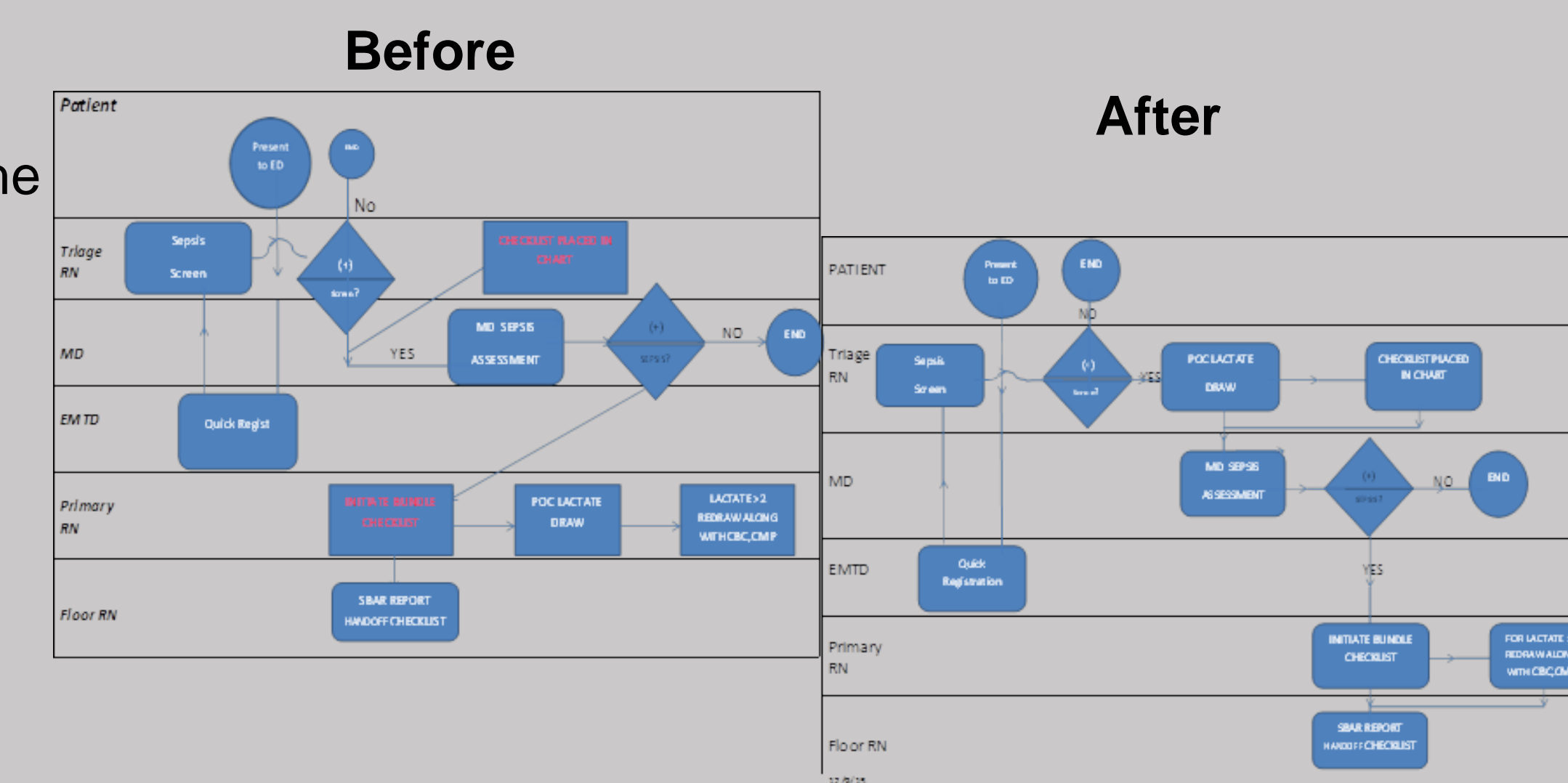


#### DO: Several small tests of change were done.

- Checklist-yellow paper to distinguish easily in record
- Moved education of process to algorithm so there was consistency in training
- Added signature to education algorithm for accountability

#### Swim lanes: revealed waste in process.

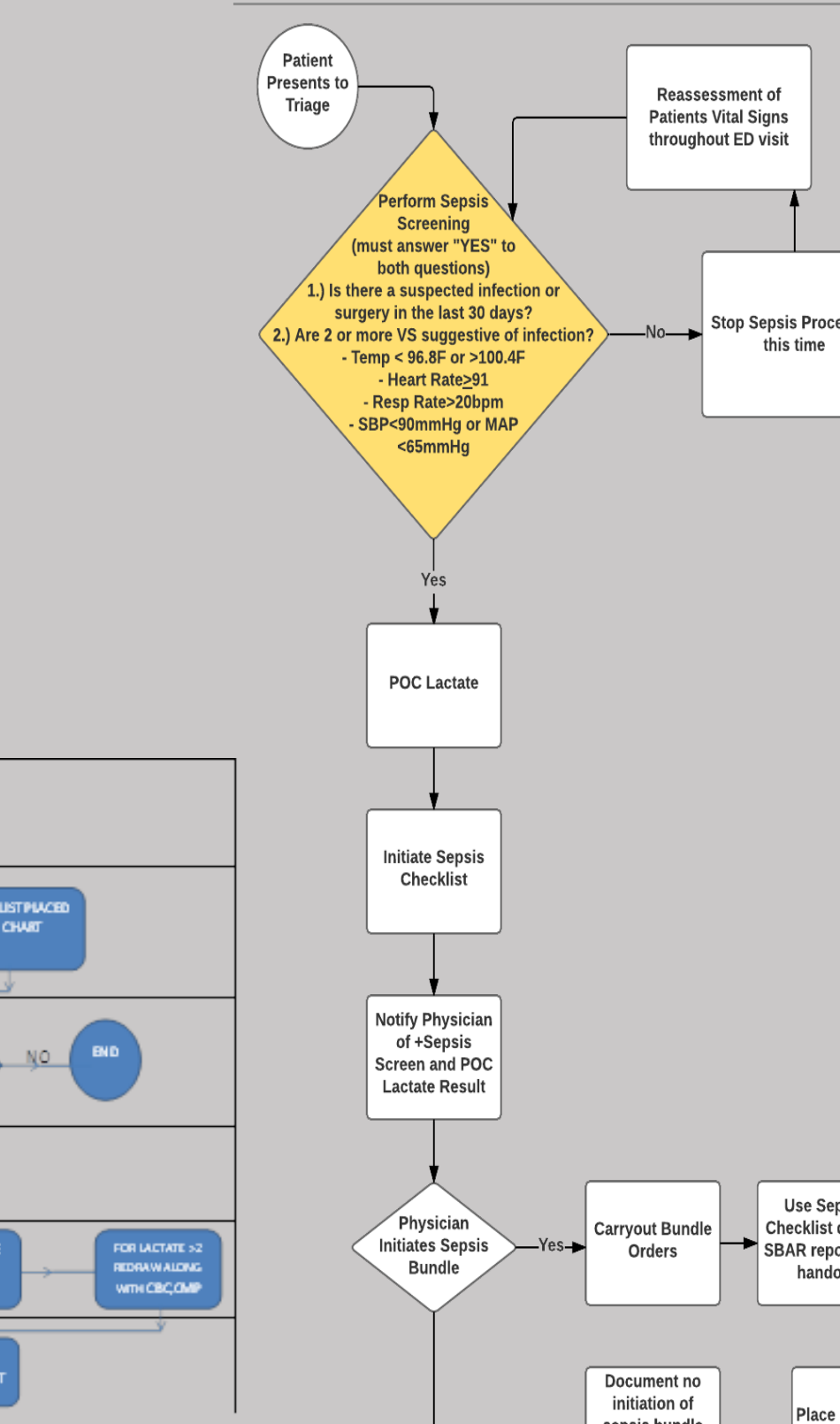
- Moved location to triage-initial patient entry
- Moved POC lactate to Triage-ease with initiation checklist



**Study:** Use of checklist continued to improved as changes were made based on flow and staff input

#### Algorithm Checklist Education

ED SEPSIS PROCESS



**ACT:** Checklist is now part of ED culture

#### SEVERE SEPSIS BUNDLE CHECKLIST

DATE: \_\_\_\_\_  
[CODE SEPSIS: Date, Time, RESPONSE TEAM: Physician, RN, RT, CC Charge RN, Pharmacy, Phlebotomy]

#### Initial Resuscitation Bundle: To be Initiated Within 1 HOUR

- Initial POC Lactate Level \_\_\_\_\_ Time \_\_\_\_\_ Initials \_\_\_\_\_
  - Blood Cultures x2-PRIOR to admin of abx-(may admin abx after 1<sup>st</sup> culture). Time \_\_\_\_\_ Initials \_\_\_\_\_
  - Administer broad spectrum antibiotics Time \_\_\_\_\_ Initials \_\_\_\_\_
  - Administer 30ml/kg crystalloid (NS or LR) challenge for hypotension. Total ml Given \_\_\_\_\_ Start time \_\_\_\_\_ End \_\_\_\_\_ Initials \_\_\_\_\_
- If initial POC Lactate is greater than or equal to 2mmol/L:
- Re-draw stat lactate, CBC, CMP within 2-4 hrs. Time \_\_\_\_\_ Initials \_\_\_\_\_

#### Septic Shock Bundle: To be Initiated Within 6 HOURS

- Vasopressors (for hypotension that doesn't respond to initial fluid resuscitation) to maintain a MAP of 65 or greater. Time \_\_\_\_\_ Initials \_\_\_\_\_
  - In the event of persistent hypotension (MAP <65) despite volume resuscitation or if initial POC lactate greater than or equal to 2:
    - Physician to Re-Assess volume status with a repeat focused exam by the physician including vital signs, cardiopulmonary, skin, capillary refill, and peripheral pulses.
- OR TWO OF THE FOLLOWING:
- Measure CVP, Central Venous O2 Time \_\_\_\_\_ Initials \_\_\_\_\_
  - Bedside Cardiovascular ultrasound Time \_\_\_\_\_ Initials \_\_\_\_\_
  - Dynamic assessment of fluid responsiveness by:
    - Passive leg raise or Time \_\_\_\_\_ Initials \_\_\_\_\_
    - Fluid challenge Start time \_\_\_\_\_ End \_\_\_\_\_ Initials \_\_\_\_\_

**\*CHECKLIST STAYS ON CHART-with PATIENT THROUGHOUT HOSPITAL STAY \*\***  
(ED staff: make copy for ED Dir before patient leaves ED) Patient Leave ED  
**\*NOT A PART OF THE MEDICAL RECORD-return to Quality at discharge\***  
Rev 4/15/16 MMMC

### Disclosures and References

- 1) Lean and 6 Sigma Course: www.6sigmatek.com.
- 2) Surviving Sepsis Campaign International Guidelines for Management of Severe Sepsis and Septic Shock. www.ccmjournal.org pgs. 580-637.
- 3) Sepsis: Journey of collaboration to Success, John Park, MD Mayo Clinic, May 5, 2015