

Methodist Le Bonheur Healthcare

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System-wide Leadership on Achieving Better Clinical Outcomes in Severe Sepsis and Septic Shock

American Nursing Association
January 26, 2012: 02:45 PM - 04:15 PM

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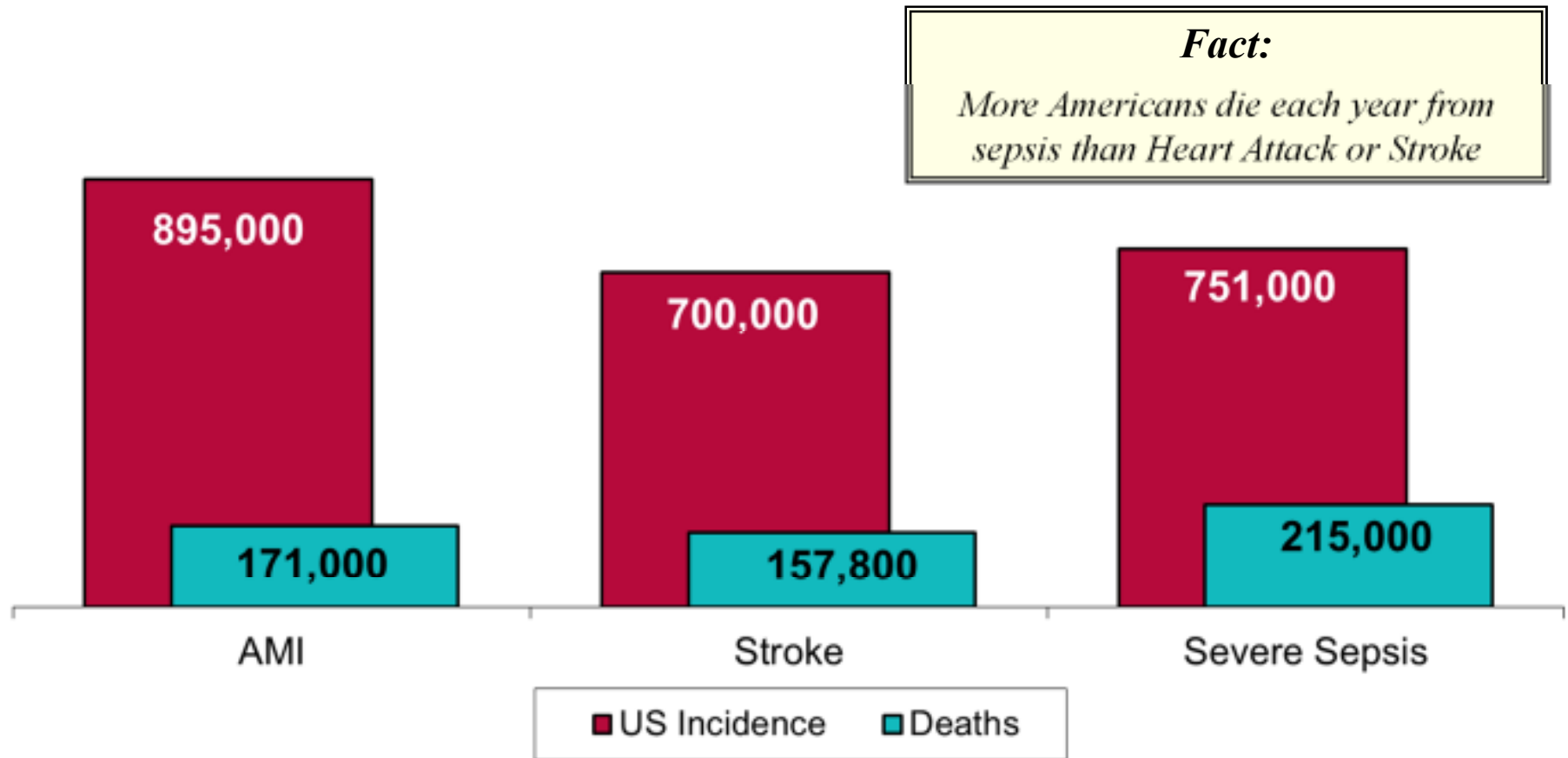
Learning Outcomes

- Learn how technology can be used as an effective and timely adjunct to nursing assessments.
- Learn how technology can be used to transition best clinical practices into common clinical practices.

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Severe Sepsis is a serious – and growing problem



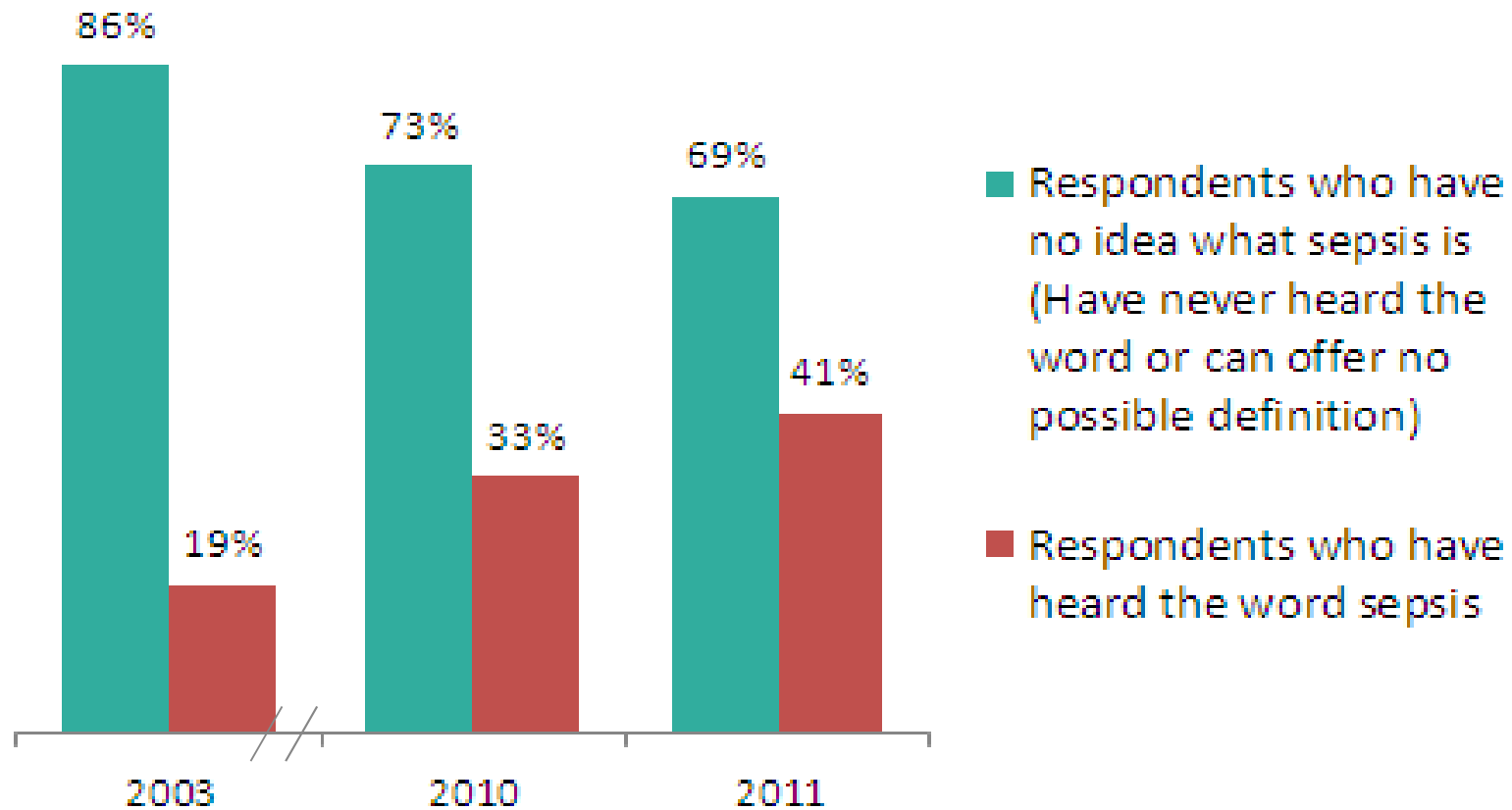
Centers for Disease Control (www.cdc.gov):

- Hospitalization rate for sepsis/septicemia as a principal diagnosis more than doubled from 2000-2008
- The rate as a principal or secondary diagnosis increased by 70%

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But unlike AMI or Stroke, few recognize early signs of developing sepsis



Source (www.sepsisalliance.org)

2003: Rubulotta, et al. Critical Care Medicine, 2009

2010/2011: Harris Interactive Poll commissioned by Sepsis Alliance

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Sepsis Rescue Initiative

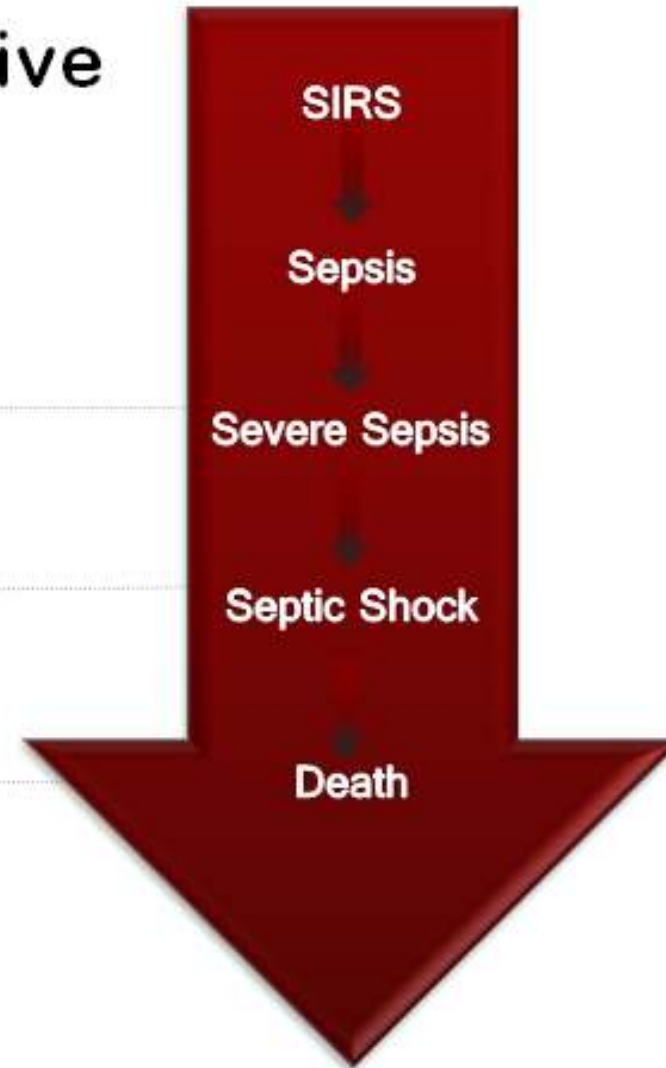
Intervene HERE

(Mortality risk 28.6%)

Versus HERE

(Mortality risk 40% - 50%)

To prevent THIS



SIRS Temp, pulse, respiration, WBC (2 must be present)

Sepsis SIRS + evidence of infection

Severe Sepsis Sepsis + organ dysfunction (new onset)

Septic Shock Severe Sepsis + severe low blood pressure

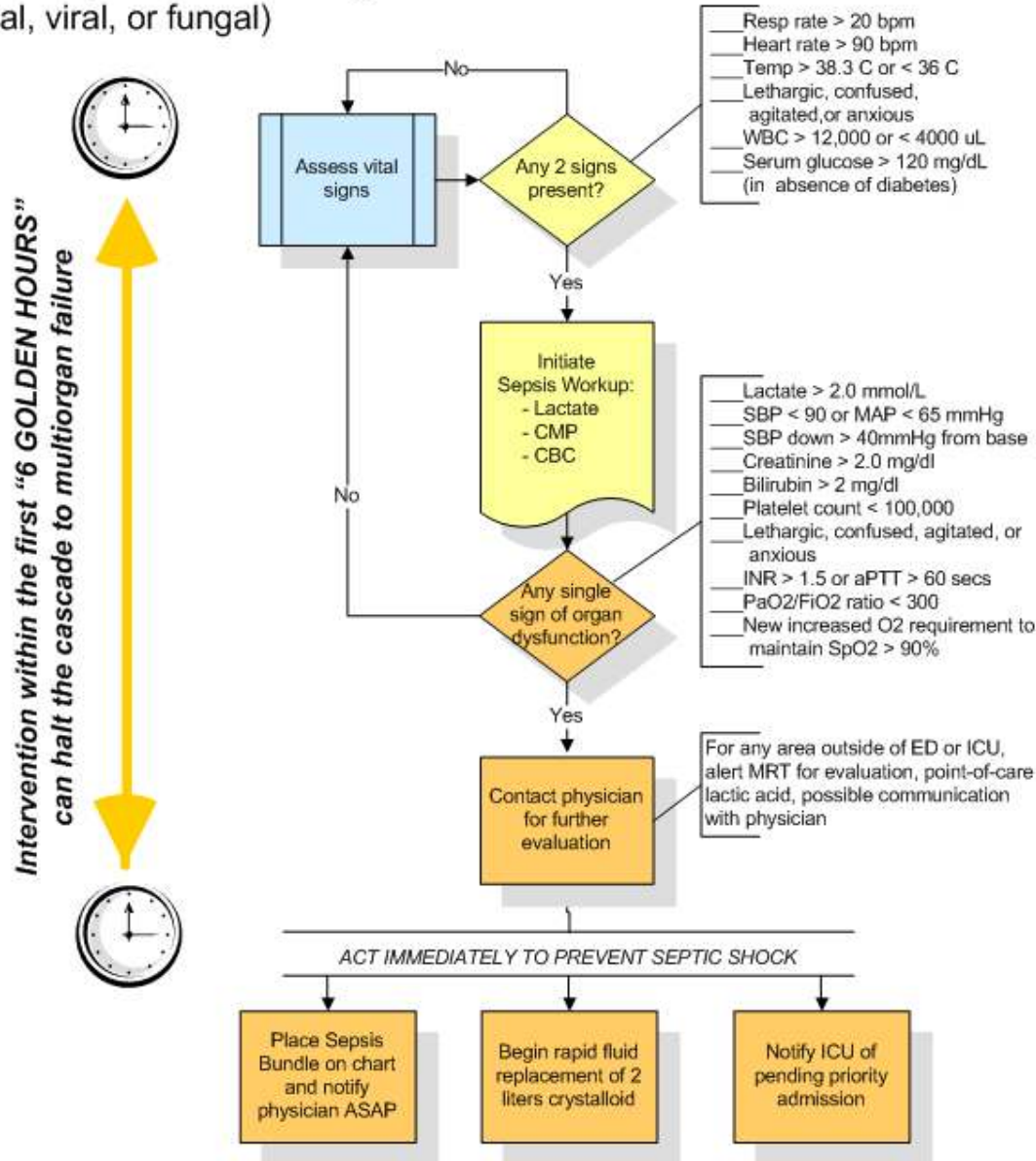
SIRS: Systemic Inflammatory Response Syndrome

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Severe Sepsis Screening Tool

(Bacterial, viral, or fungal)



Problems with manual screening

- Assumes required lab values available
- Gap syncing lab with vital sign results
- Requires review of medical history with each screening to determine new onset
- Positive signs may appear moments after screening
- To be effective, must screen hourly

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Challenge #1: Culture

Sepsis Myths – Common and Firmly Held

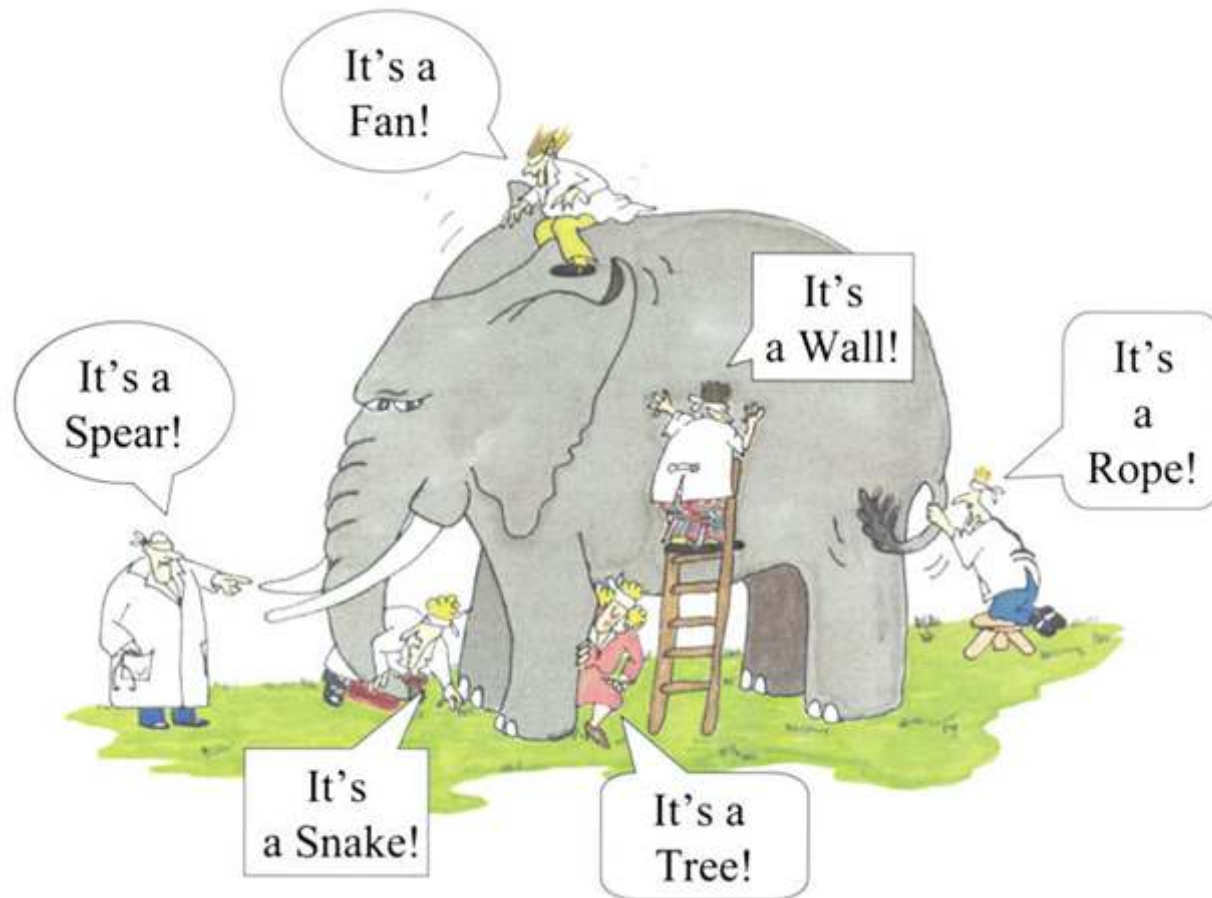
- “Everyone coming through the ED will screen positive.”
- “I can tell just by looking who is or isn’t seriously ill.”
- “You need a positive culture to diagnose sepsis.”
- “Only 80-year olds get severe sepsis.”
- “That patient doesn’t need to go to ICU.”
- “They don’t even have a fever.”
- “My patient does NOT have sepsis!”
- “You are calling too many things sepsis”
- “There are no early warnings for sepsis – especially not lactic acid!”

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Challenge #2: Logistics

Doctors may see an incomplete clinical picture

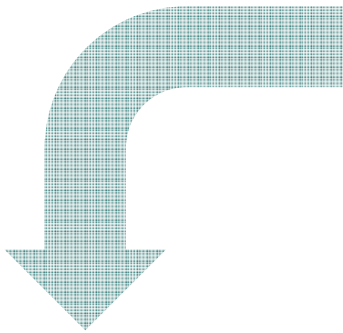


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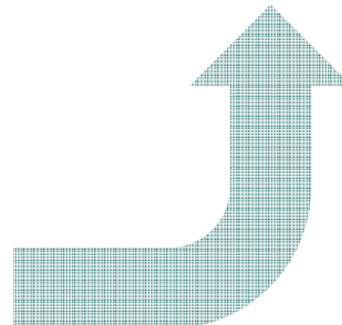
Challenge #3: Technology

Needed data is spread throughout the chart



VS/PAIN		11/7/20 07 3:50
Vitals		
<input type="checkbox"/> Temp		38.4 H
Temp route		Oral
<input type="checkbox"/> Pulse		
<input type="checkbox"/> Apical Heart Rate		86
<input type="checkbox"/> Resp rate		22 H
<input type="checkbox"/> BP (systolic)		138
<input type="checkbox"/> BP (diastolic)		75
<input type="checkbox"/> MAP		

LABORATORY RESULTS			
CHEMISTRY	<input type="checkbox"/> Sodium	<input type="checkbox"/> Potassium	<input type="checkbox"/> Chloride
11/8/2007 5:58 AM	135 L	3.5 L	105
11/7/2007 4:20 PM	138	3.8	101
CHEMISTRY	<input type="checkbox"/> Protein, T	<input type="checkbox"/> Albumin	<input type="checkbox"/> Total Bilirubin
11/8/2007 5:58 AM			
11/7/2007 4:20 PM	5.0 L	1.9 L	0.5
CHEMISTRY	<input type="checkbox"/> GFR-Estim	<input type="checkbox"/> CEA (Mono)	<input checked="" type="checkbox"/> Lactic Acid
11/8/2007 5:58 AM	98.4 *	1.1 *	
11/7/2007 4:20 PM	76.0 *		4.1 * C
HEMATOLOGY	<input type="checkbox"/> WBC	<input type="checkbox"/> RBC	<input type="checkbox"/> Hemoglobin
11/8/2007 5:58 AM	10.2 H	2.70 L	7.9 L
11/7/2007 4:20 PM	10.9 H	2.87 L	8.4 L



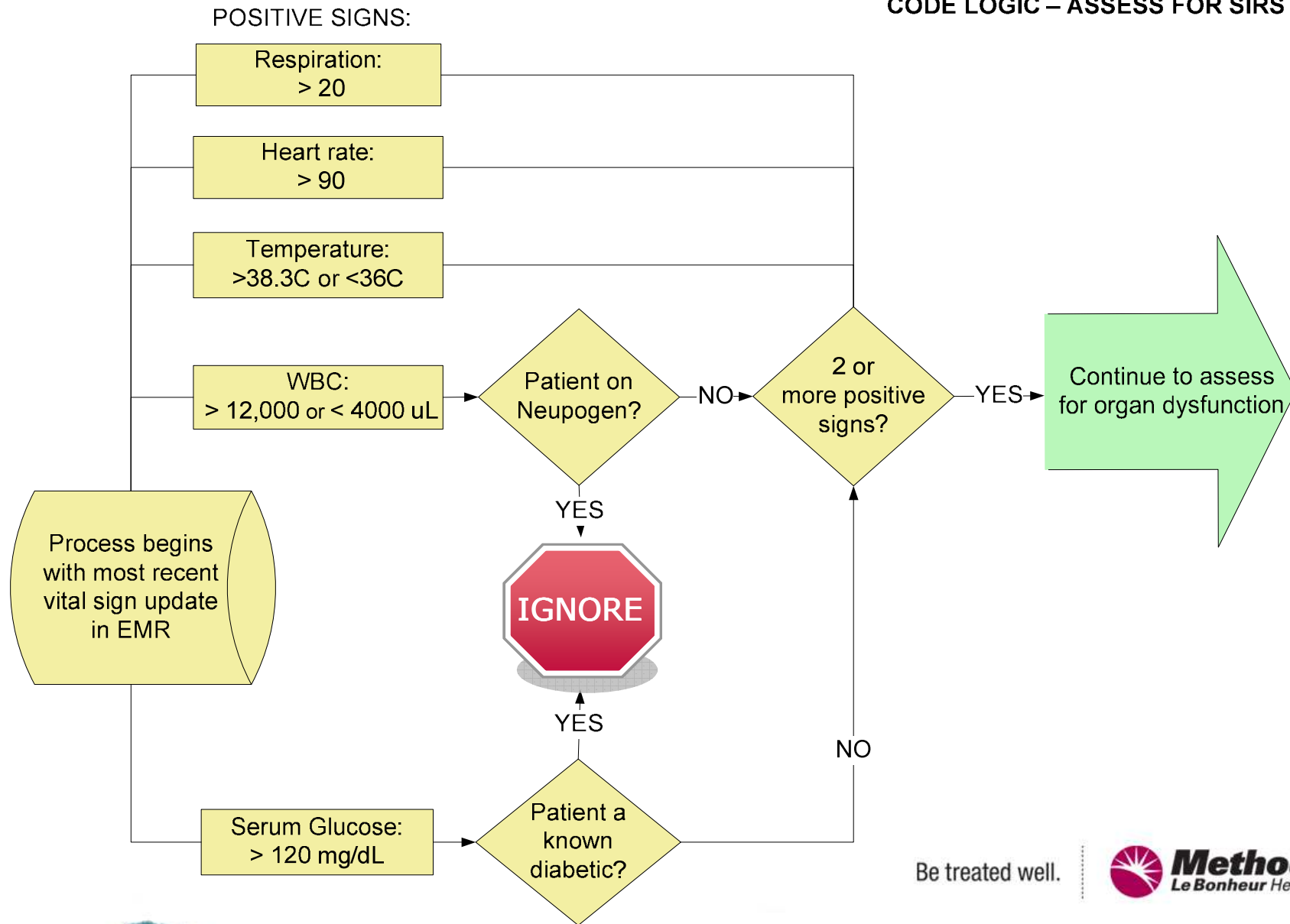
- 2 Signs of SIRS
- + 1 Sign of Organ Dysfunction

Case of Severe Sepsis

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SEPSIS RULE AUTO ALERT CODE LOGIC – ASSESS FOR SIRS

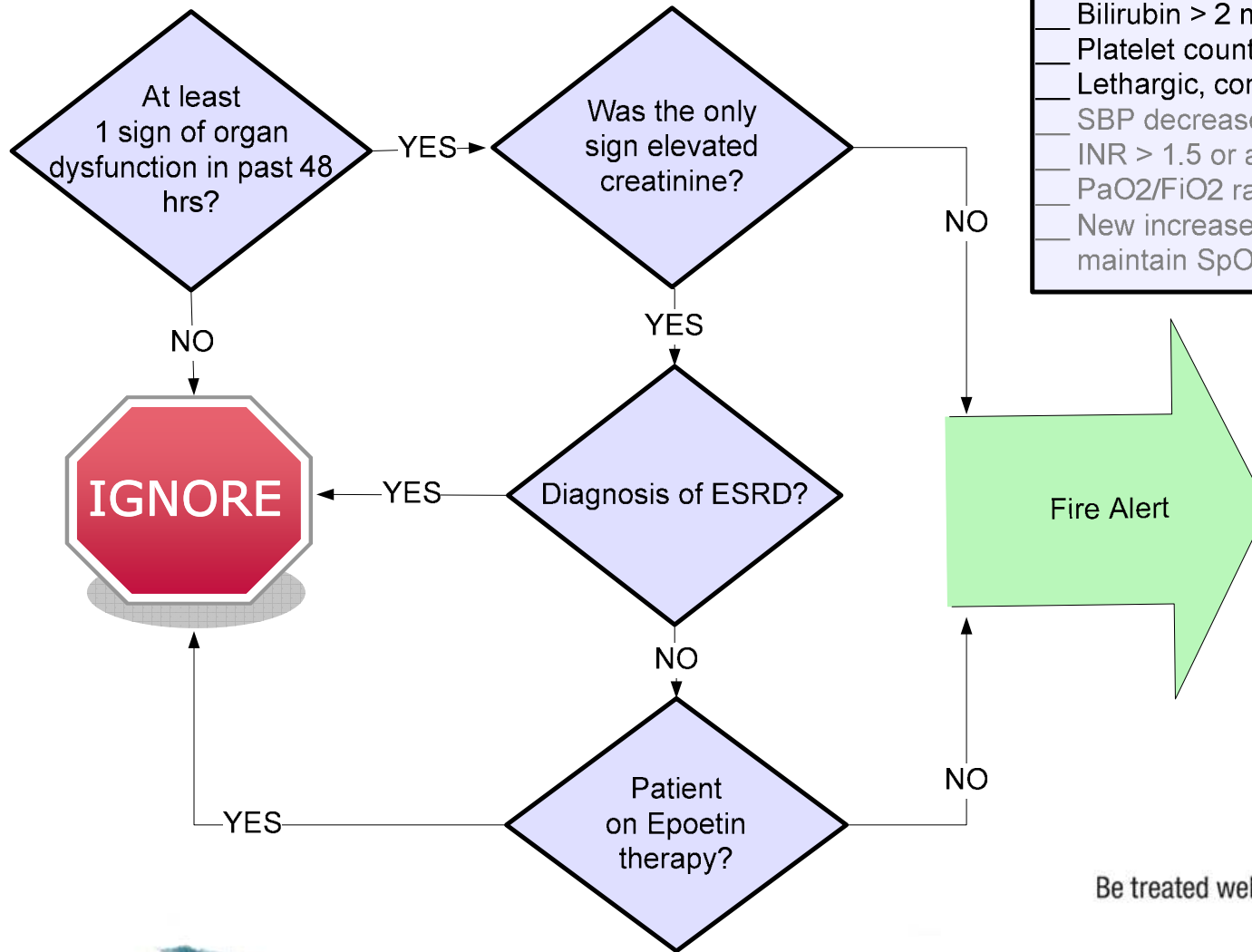


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**SEPSIS RULE AUTO ALERT
CODE LOGIC – ORGAN DYSFUNCTION**

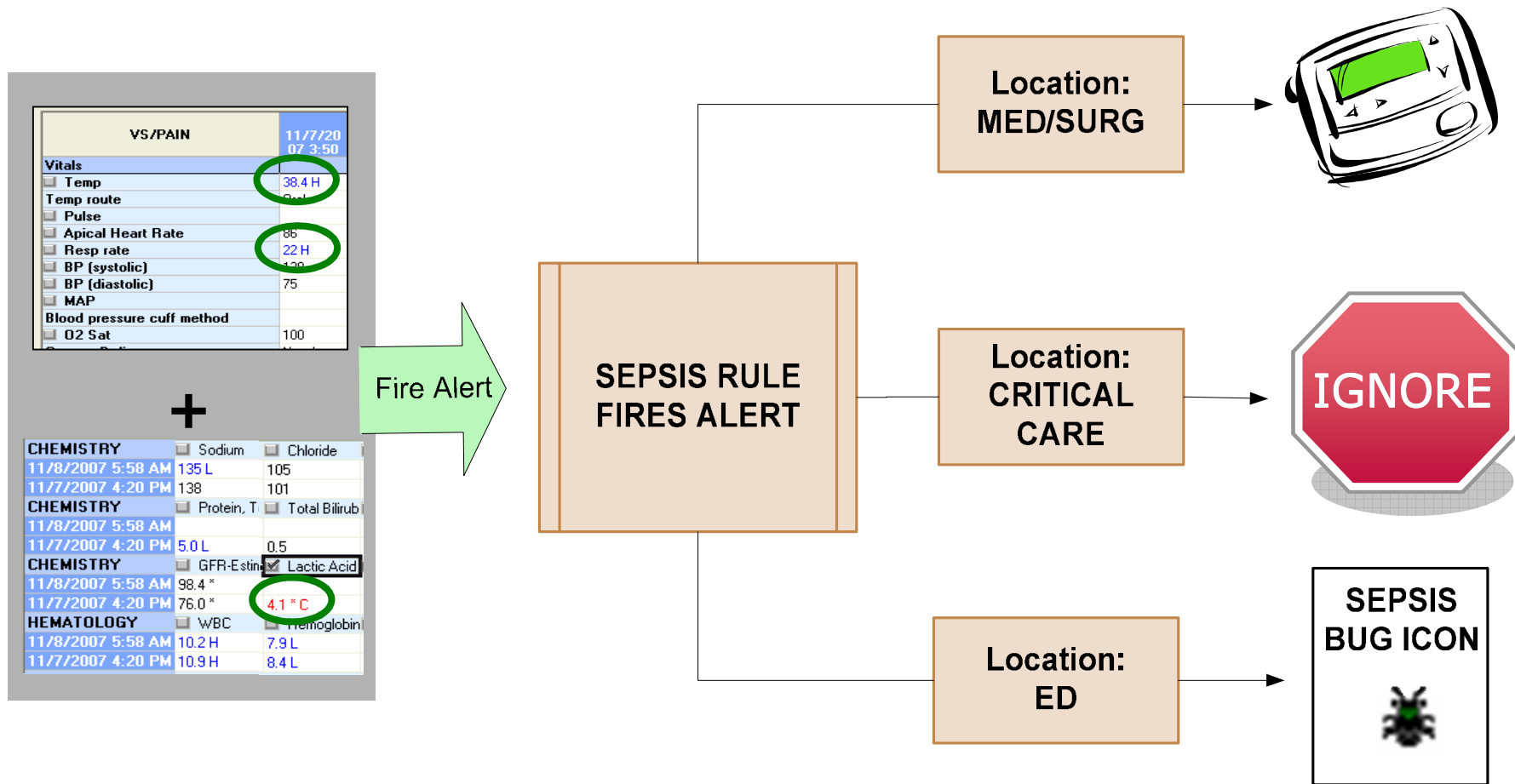
- ORGAN DYSFUNCTION Signs:**
- Lactate > 2.2 mmol/L
 - SBP < 90 or MAP < 65 mmHg
 - Creatinine > 2.0 gm/dl
 - Bilirubin > 2 mg/dl
 - Platelet count < 100,000
 - Lethargic, confused, agitated, anxious
 - SBP decrease > 40mmHg from baseline
 - INR > 1.5 or aPTT > 60 secs
 - PaO2/FiO2 ratio < 300
 - New increased O2 requirement to maintain SpO2 > 90%



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What Happens when Alert is Triggered?



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Location 'ED' orders sepsis bug icon to display

FirstNet Organizer for Hendley, Belinda R

Task Edit View Patient Provider List Help

As Of 1:34 PM

Tracking List

North W/R w/VS

North Current Census North All Beds North Minor Care View North Chest Pain Center North ED Waiting Room North Triage North Provider List

All patients (35/35) Quick Filter: My Patients Patient Name:

Bed	Sp	Sep	S/A	Reason for Visit	VS	Re	All	Event	MD	NP	RN	L	X	LOS	Comment
N01,A			63 y 1:	Dyspnea; 2: Su	Red		☀	🏠👤🩺		Jo	LM	20/13	📅	6:45	IMU
N01,B	♥		63 y 1:	Chest pain	Red		☀	📅	JS		JH	11/10	📅	5:51	cpc
N02,A	♥		60 y 1:	Chest pain; 2:	Red		☀	📅	DM		LM	18/15	📅	15:24	imu-to cath
N03,A	♥		53 y 1:	Chest pain; 2:	Red		☀	📅🏠👤🩺			JH	11/9	2/1	6:54	347
N04,A	♥		46 y 1:	Chest pain; 2:	Red		☀	📅	DM		JH	12/10	📅	10:01	pos treadmi
N05,A	♥	🐛	57 y 1:	Chest pain	Red		☀	📅	JS			8/6	📅	1:29	track3
N06,A		🐛	64 y 1:	Dyspnea	Red		☀	📅	JS				📅	1:36	amb
			85 y 1:	Abdominal pai	Red		☀	📅				10/9	📅	6:05	tel
			55 y 1:	SOB - Shortne	Red		☀	📅	JS				📅	2:53	AMB
	♥		25 y 1:	Chest pain; 2:	Red		☀	📅🏠👤🩺				10/9	📅	4:18	x4th, mon4:
N10,A			92 y 1:	Fall; 2: Fall; 3:	Red		☀	📅		Jo	NS		📅	4:05	
N11,A	♥		61 y 1:	Chest pain	Red		☀	📅	JS		NS	9/7	4/1	2:08	
N12,A			26 y 1:	Vaginal bleedi	Red		☀	📅			NS		📅	3:21	
N13,A			52 y 1:	Back pain	Red		☀	📅		Jo	SC	6/5	📅	3:46	
N14,A			53 y 1:	Altered gait	Red		☀	📅			SC		📅	2:48	
N15,A			62 y 1:	Abdominal pai	Red		☀	📅		Jo	SC		2/1	5:44	CT@1300
N16,A			94 y 1:	Altered menta	Red		☀	📅			SC		📅	6:36	amb
N17,A			22 y 1:	Abdominal pai	Red		☀	📅					📅	2:20	
N18,A			85 y 1:	Hip pain-swell	Red		☀	📅	WB		JS		📅	19:45	reg534
N19,A	♥		86 y 1:	Chest pain; 2:	Red		☀	📅	WB		JS		📅	20:35	IMU
N20,A			77 y 1:	Hematuria	Red		☀	📅					📅	2:42	x20

Severe Sepsis Alert

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Challenge #4: Ensure alert is addressed

Nursing documentation requirements

If no action taken:

NURSING CLINICAL NOTE

NURSE to document acknowledgement of sepsis alert and reason for not taking further action.

If MRT assessed:

MRT ASSESSMENT

MRT to document findings of assessment and action taken.

If Physician contacted:

MD NOTIFICATION

Nurse to document communication with the physician in iView, including actions taken.

Valid reasons to not contact physician:

- Patient documented Comfort Measures Only
- Organ dysfunction is not new onset for patient
- Physician already treating severe sepsis and condition not worsening
- Clinical judgment , well-documented

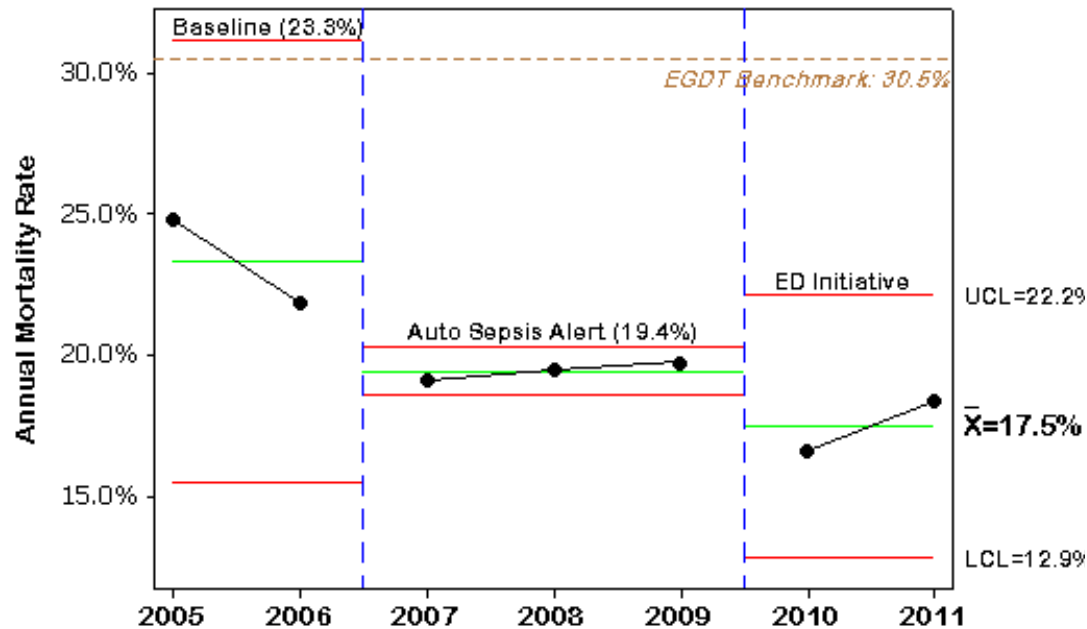
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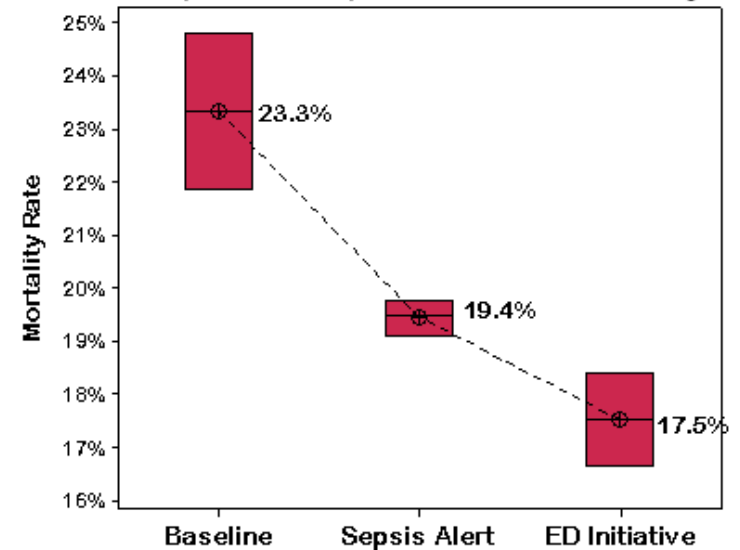
Impact of Auto Alert on Sepsis Mortality

Sepsis Mortality Rate

Methodist North Hospital (Deaths with sepsis-related diagnosis)



Impact of Sepsis Alert on Mortality



Reduction statistically significant, $p = 0.021$

Number of patients discharged to 'Home' or 'Home Health' rose 20%

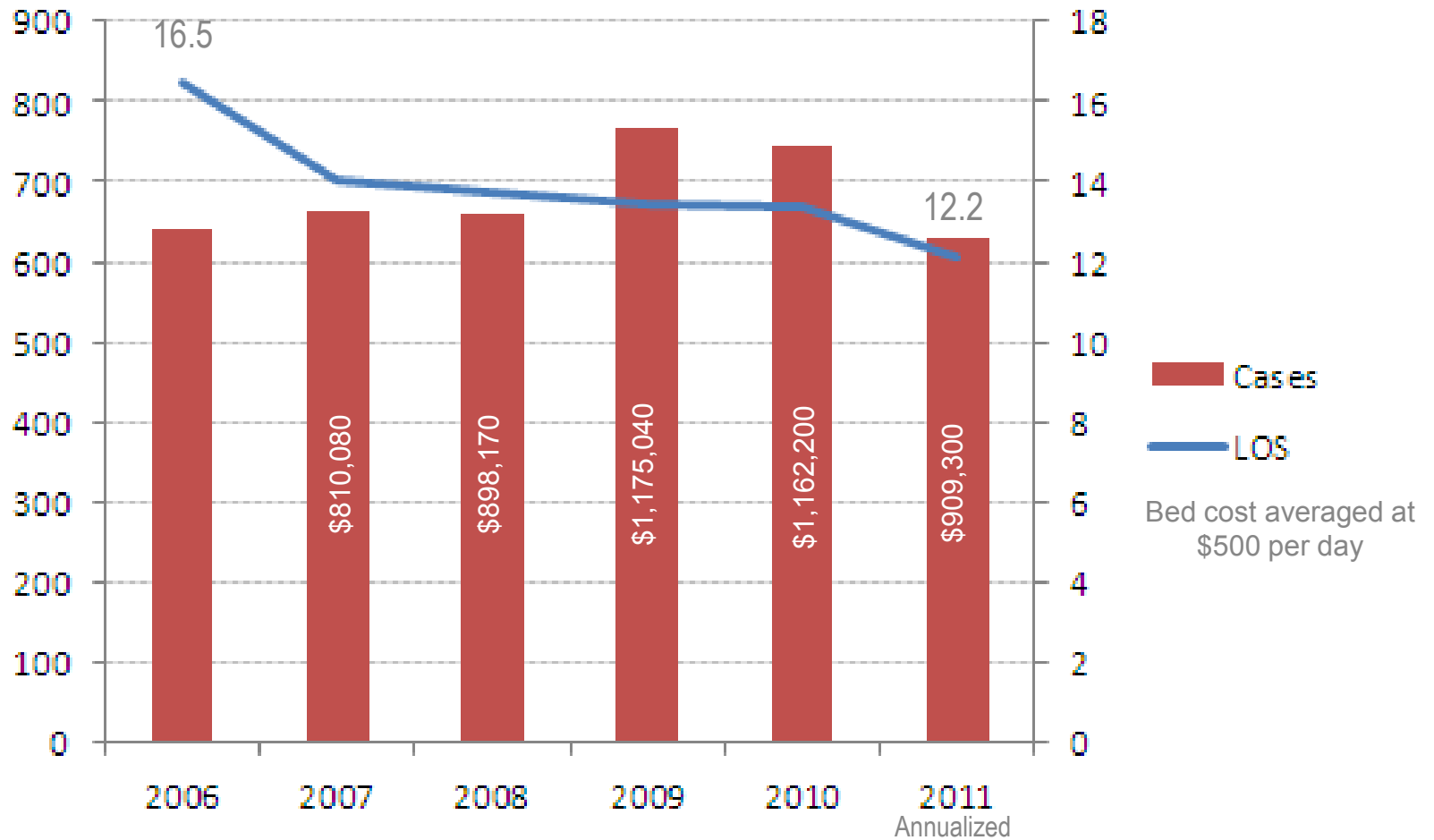
Notes:

- 2005 data sampled; 2006-2011 all discharges
- EGDT Benchmark from Rivers, et al.
- ED Initiative to reduce turnaround time, door-to-medical screen

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Financial Impact of Early Intervention



5-year impact: \$5,000,000

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Lessons Learned

- Engage physician champions early in the process – ED, Intensivist, and Internal Medicine
- Point-of-Care lactic acid testing invaluable – ED and MRT team (Respiratory Therapist)
- Feedback loop from ICU for delays in intervention
- Monitor alerts to ensure consistent engagement
- Provide scripting for nurse-physician communication
- Encourage/support nurses who may be faced with non-engaged physicians
- Celebrate improved outcomes
- Educate community on signs of sepsis

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Questions



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References

- Angus, DC, et al. *Critical Care Medicine*, 2001; 29:1303-1310
- Hall, et al. (June, 2011). Inpatient Care for Septicemia or Sepsis: A Challenge for Patients and Hospitals. *NCHS Data Brief*, 62. Retrieved 9/18/2011 from <http://www.cdc.gov/nchs/data/databriefs/db62.pdf>
- Rivers, et al. (2001). Early Goal-Directed Therapy in the Treatment of Severe Sepsis and Septic Shock. *New England Journal of Medicine*, 345: 1368-1377
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- Shapiro, NI, et al. (2006). *Critical Care Medicine*, 34: 1025-1032

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