



Resuscitating the Emergency Center to Improve Efficiency

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MD Anderson
~~Cancer Center~~

Making Cancer History®

What Are We?

A Trauma Center (sort of)

Oncologic

perforation

bleeding

obstruction

Iatrogenic

sepsis

postoperative

treatment specific

U.T. MD Anderson Cancer Center

The Numbers

21,000 patient visits per year

> 90% of visits are existing patients

1,200 visits are new patients

failing before scheduled appointment

no scheduled appointment

> 40% admission rate

History

Cancer center, component of U.T. System

Late 1980's – early 90's Station 19

Mid 1990's – Emergency Center

2007 – new dedicated space

Increasing complexity and volume of patients

Increasing hospital occupancy



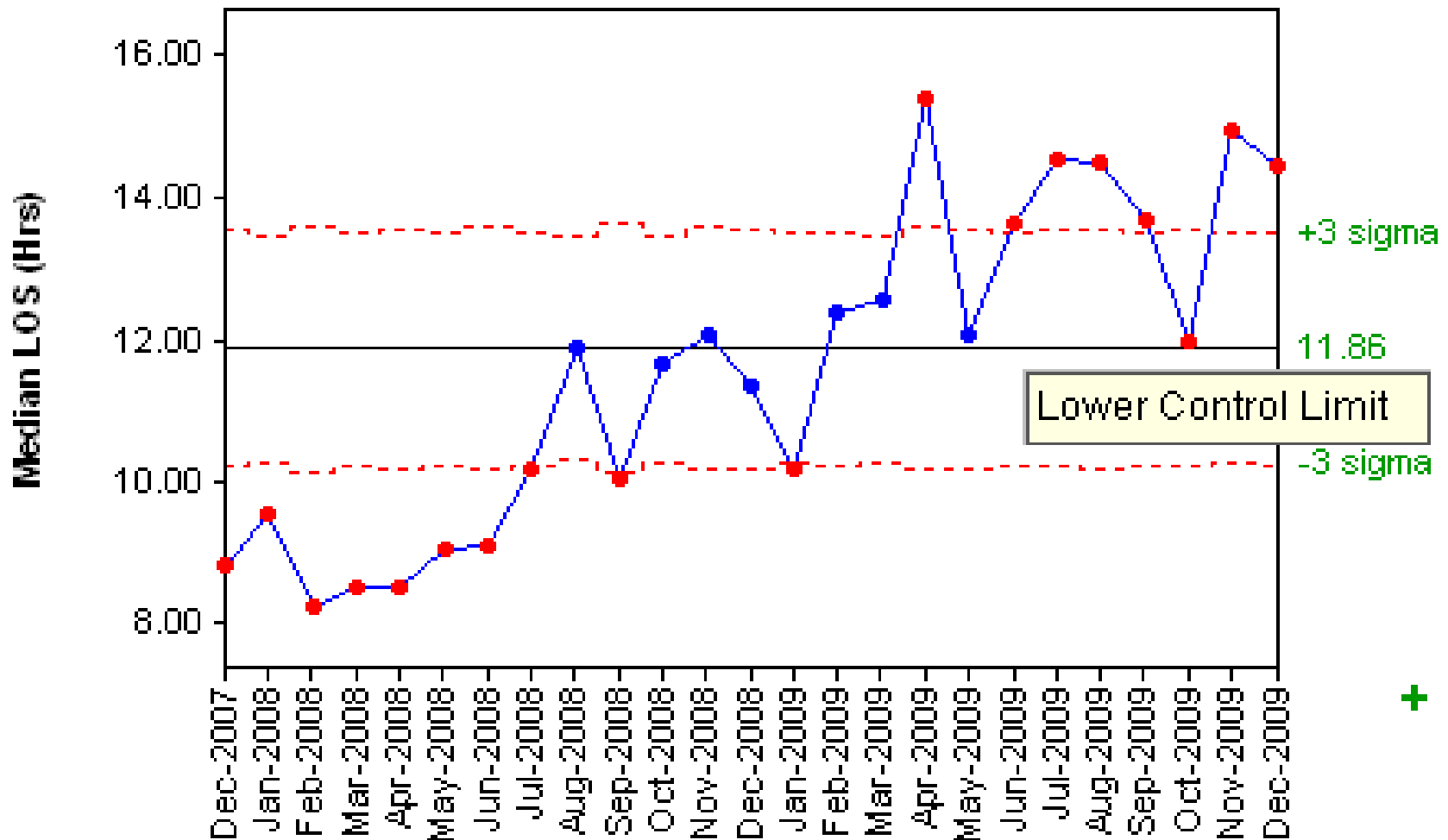
Average Hospital Occupancy (%)

by Month 9/2007 – 4/2010



BETAEC Median LOS for Pts Admitted (Hrs)

Summary

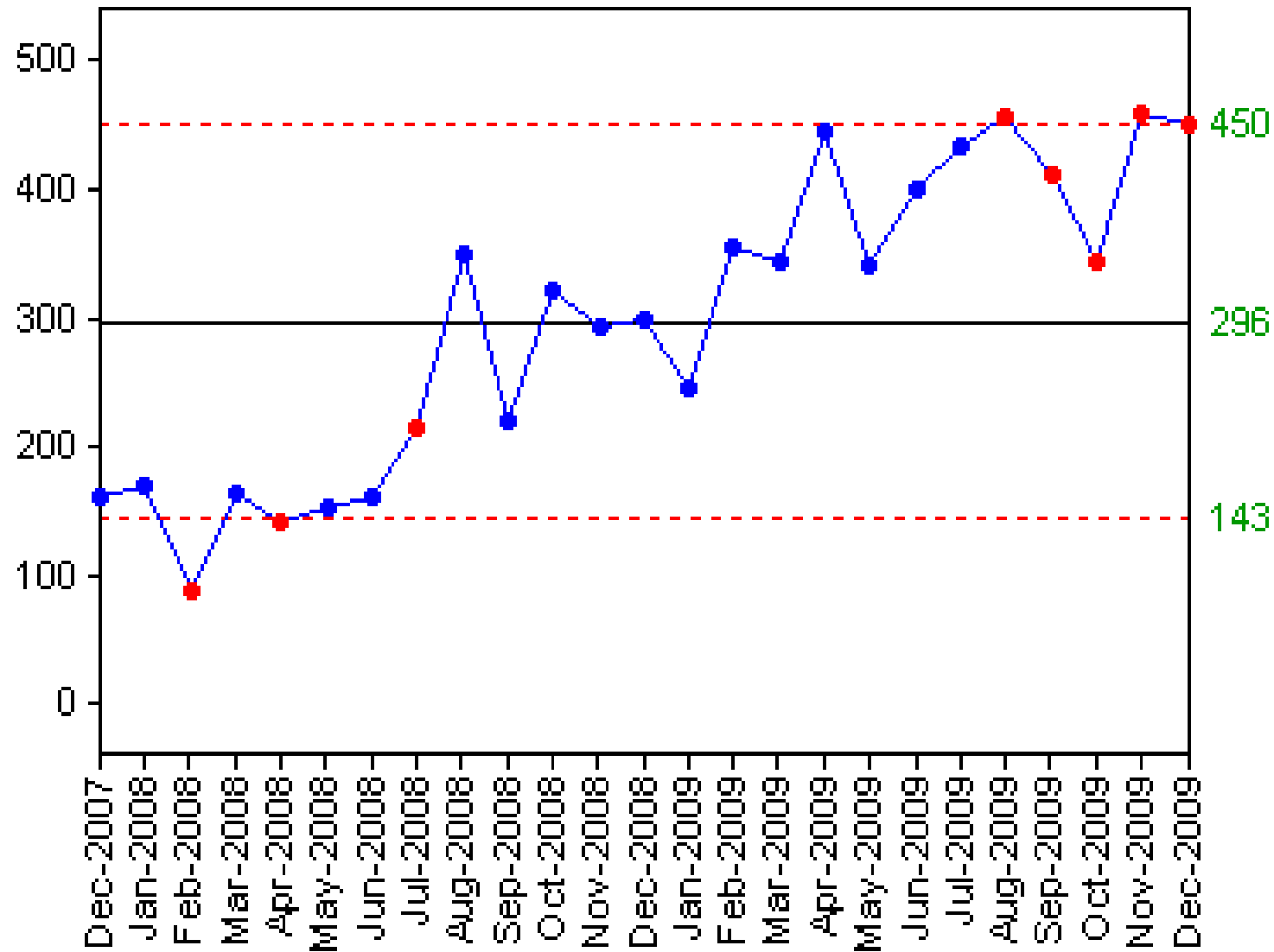


BETA EC Stay More than 18 hours N Pts

DISPO_HOME_NOT_HOME = ALL

Summary

Number of Cases



Dealing with a Challenge

Five Stages

Denial

Anger

Bargaining

Depression

Acceptance

Kubler-Ross, *On Death and Dying*, 1979

Alternative Stages

Recognition

Response

Recognition

Task Force convened 5/09

Analyzed problems and unique situation

Report accepted

Implementation begun 9/1/09

Recognition

Environmental

EC role in the institution

EC responsibility for patients

Responsibility to community at large

Realizing strengths

Partnering

Recognition

Patient Factors

Complexity of patients
Underlying comorbidities
Complications of cancer
Complications of treatment
Survivorship

Response

Change of nursing reporting relationship

Emergency Services reporting to PIC

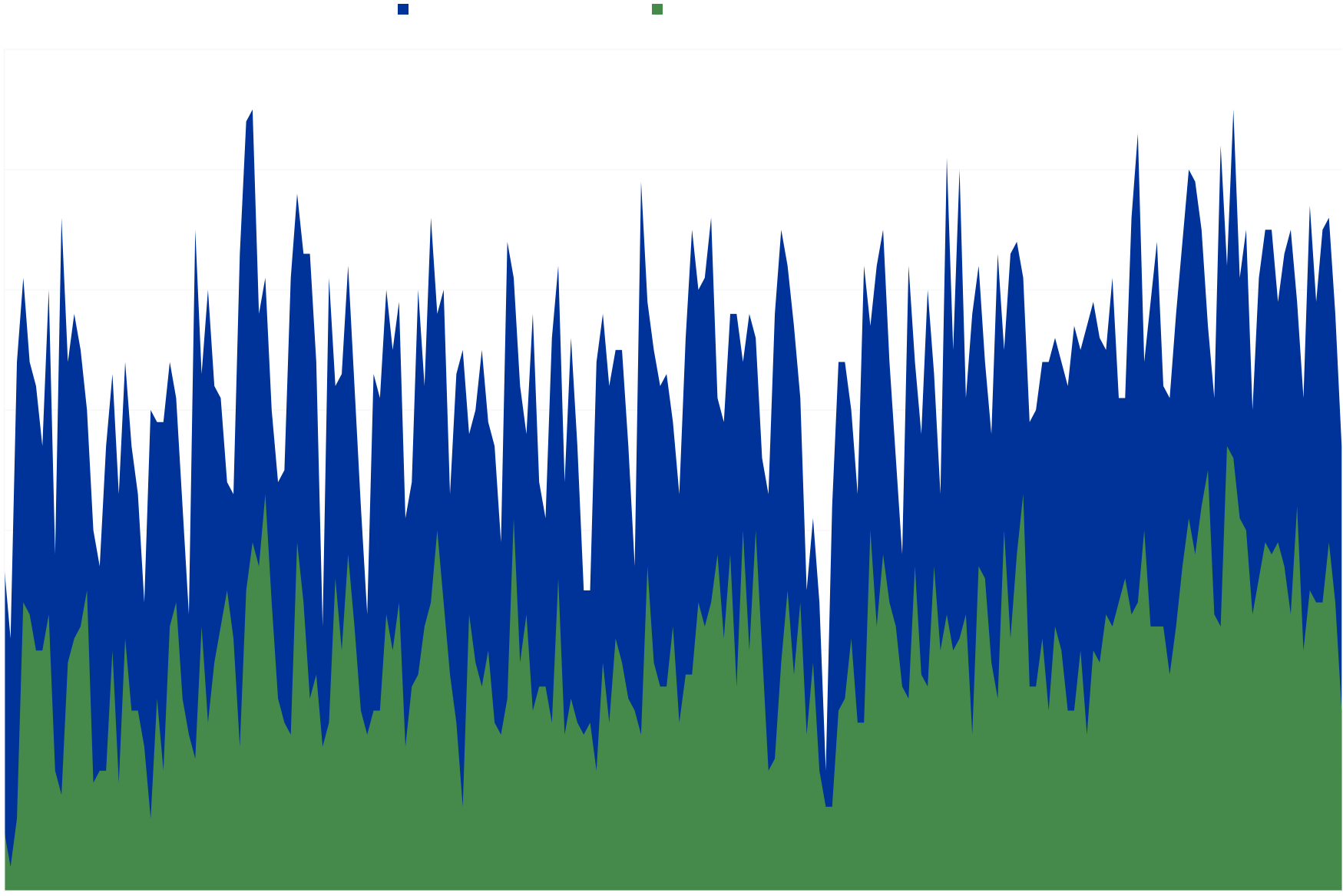
Communication and integration across institution

Inpatient support and Department of Emergency

Medicine

Emergency Center Urgent Priorities

- 1) Critical staffing analysis
- 2) EDIS
- 3) Overcrowding
- 4) Diagnostic services support
- 5) Process Improvement



EDIS

Emergency Services

Emergency Department Information System (EDIS)

EDIS to optimize patient through-put

Reduce handoff errors

Billing compliance

Maintain an electronic record

Emergency Services Emergency Department Information System (EDIS)

Work-flow and detailed functional analysis
completed

Infrastructure/Technology analysis
completed

Evaluating response from vendor

Overcrowding

Emergency Services

Overcrowding – Contributing Factors

- EC as a back door for planned admissions
- Inappropriate referral to the EC
- Inpatient census exceeding capacity
- Communication problems

Communication - Vocera

Within EC

Between EC and

Clinics

ICU

Radiology

Transportation

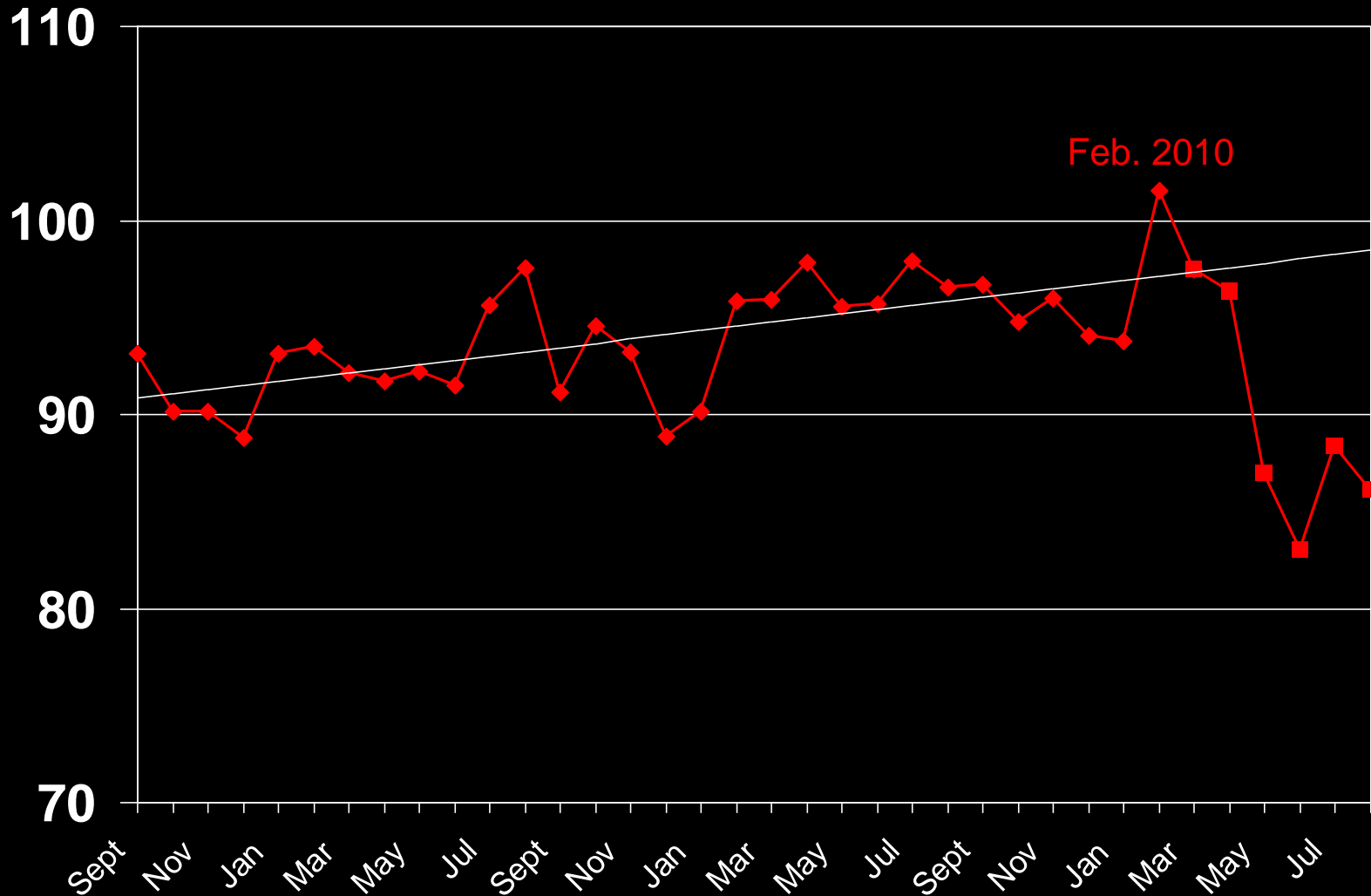
Emergency Services

Overcrowding – Solutions

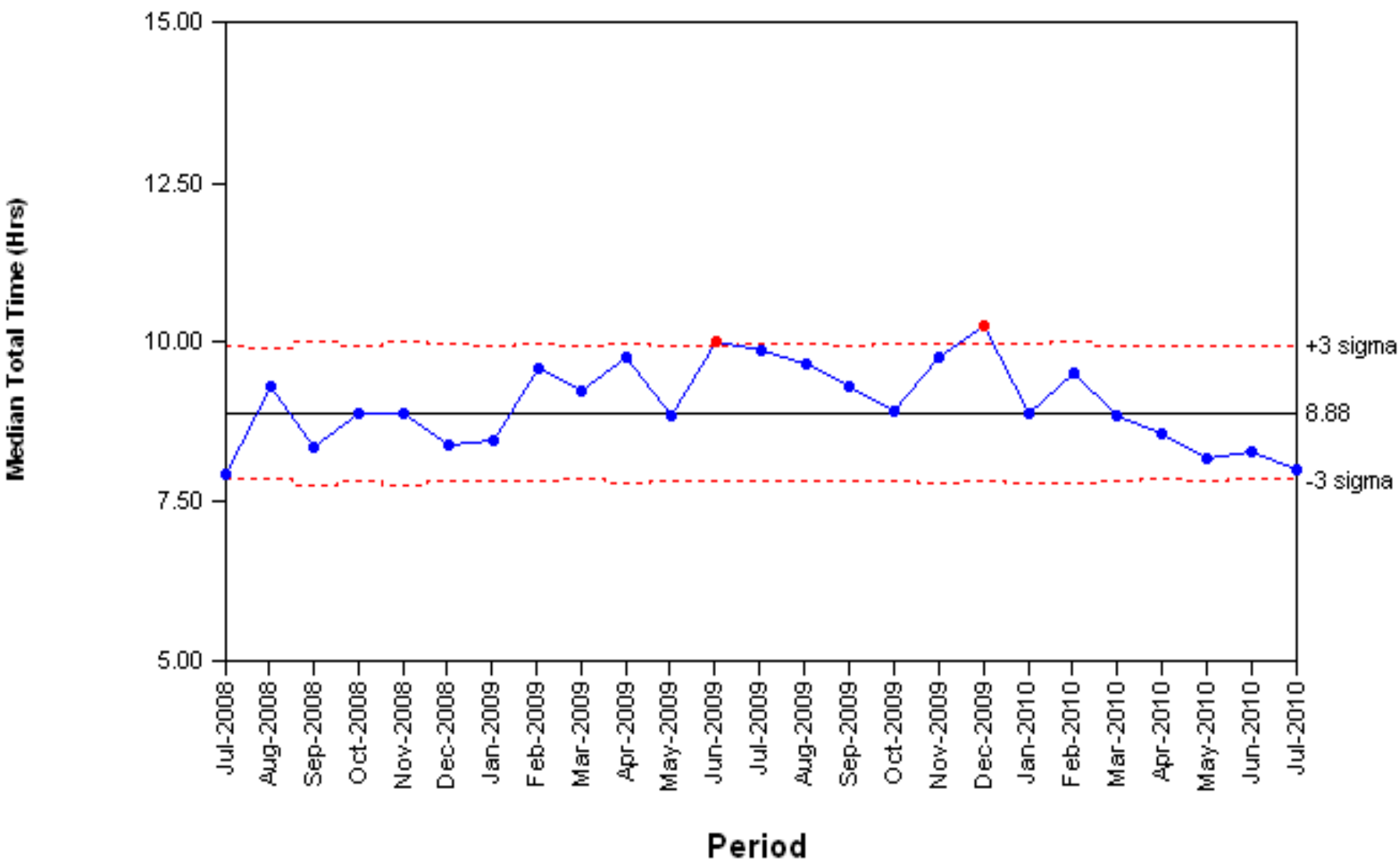
- Treat appropriate patients in clinics or ATC
 - Lovenox, IVF's or blood products, and procedures
 - CAD workgroup addressing
- Use of Discharge Waiting Area
- Accordion space
- Full Capacity Protocol

Average Hospital Occupancy (%)

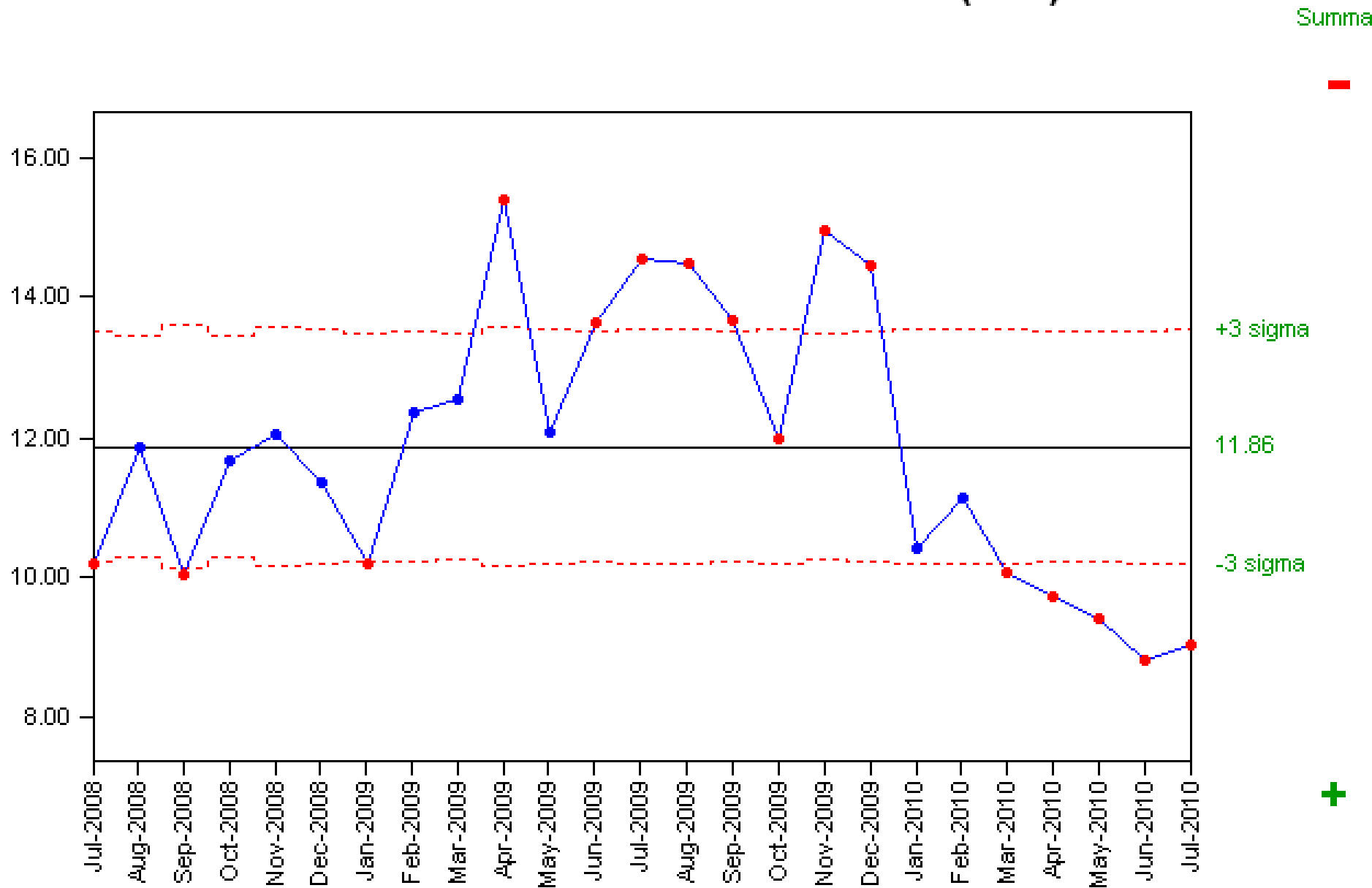
by Month 9/2007 – 8/2010



EC: Median Total Time (Hrs)



EC: Median LOS for Pts Admitted (Hrs)



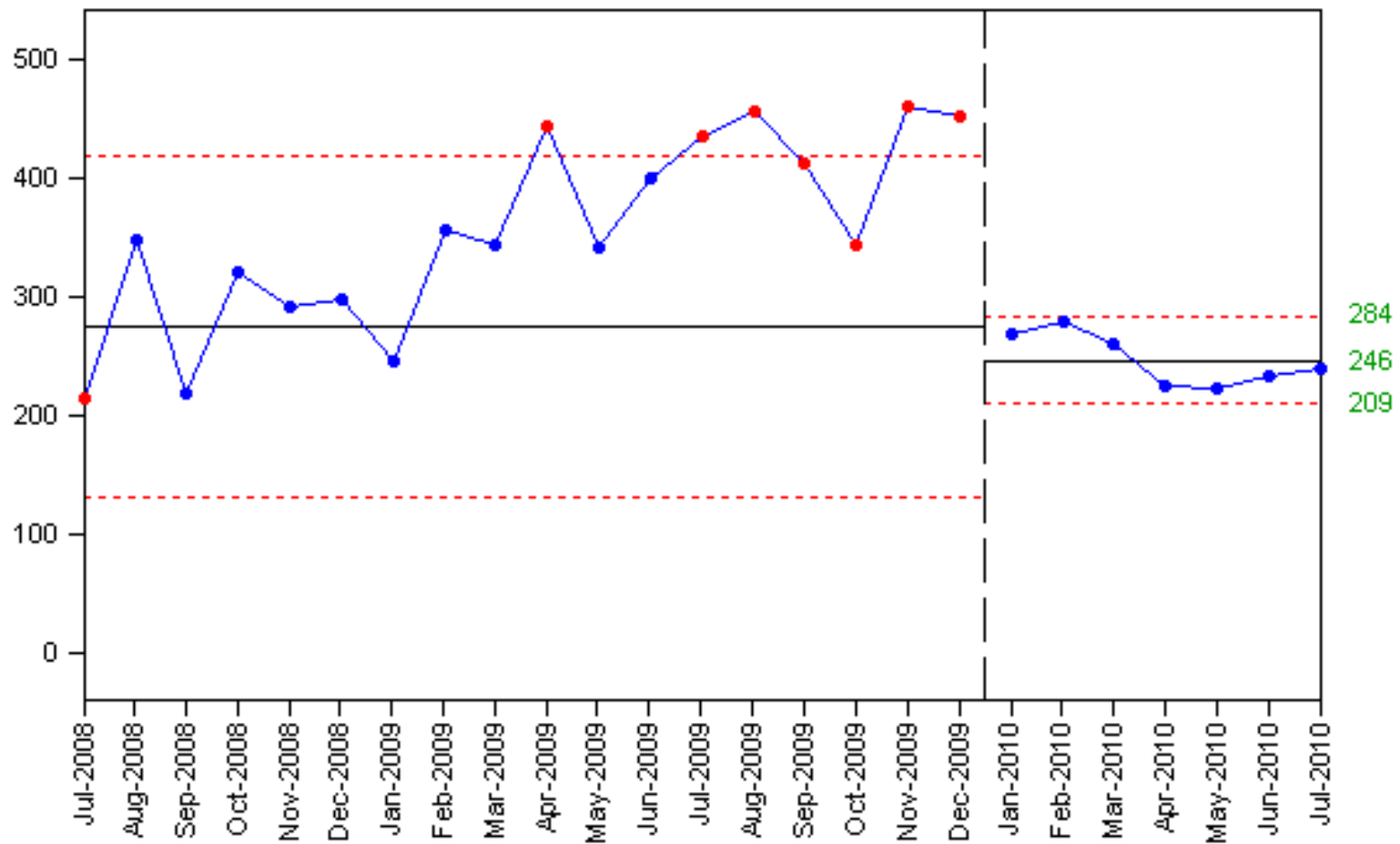
EC: Stay More than 18 hours N Pts

DISPO_HOME_NOT_HOME = ALL

Summary

Baseline

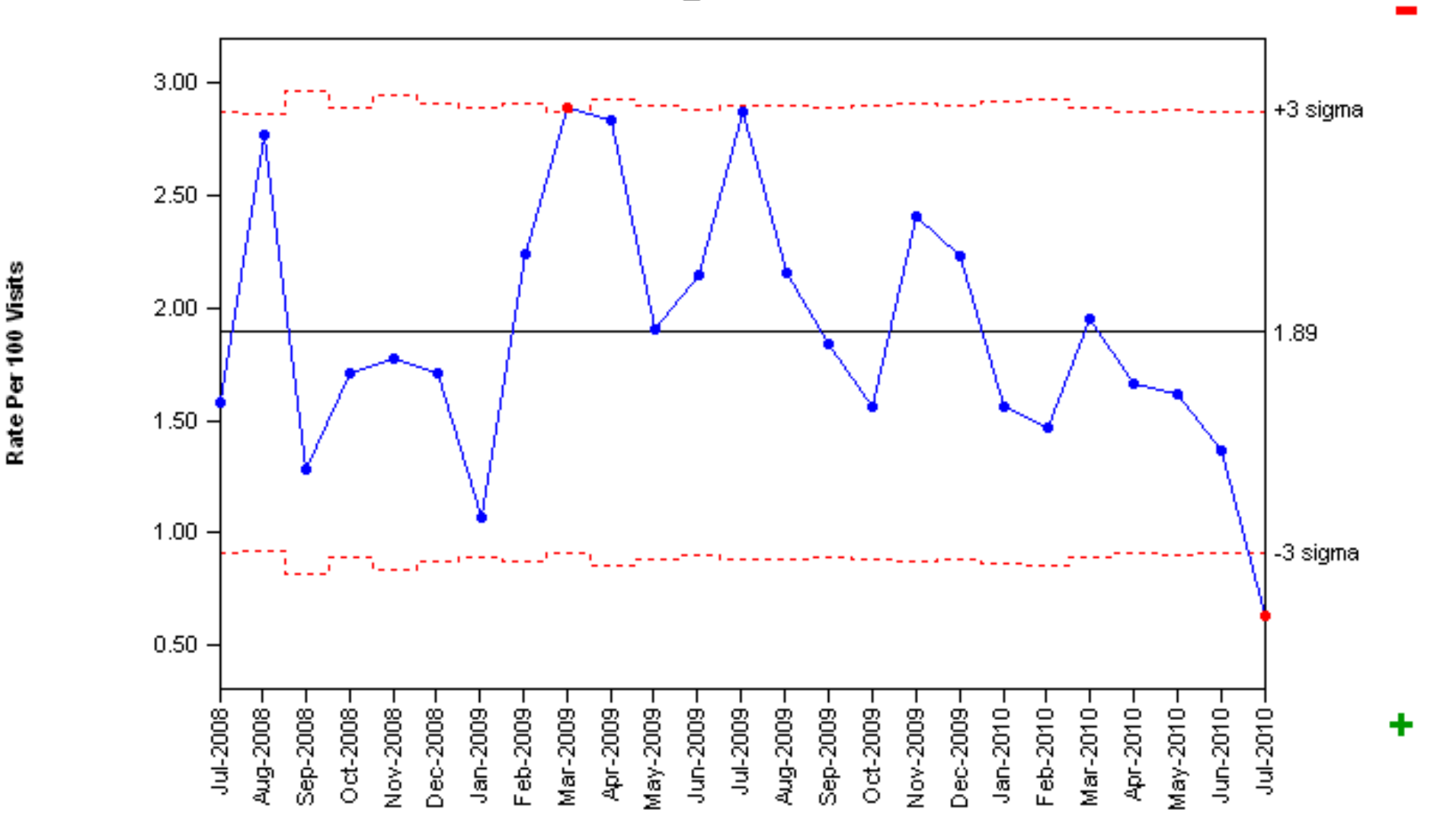
New Process Change



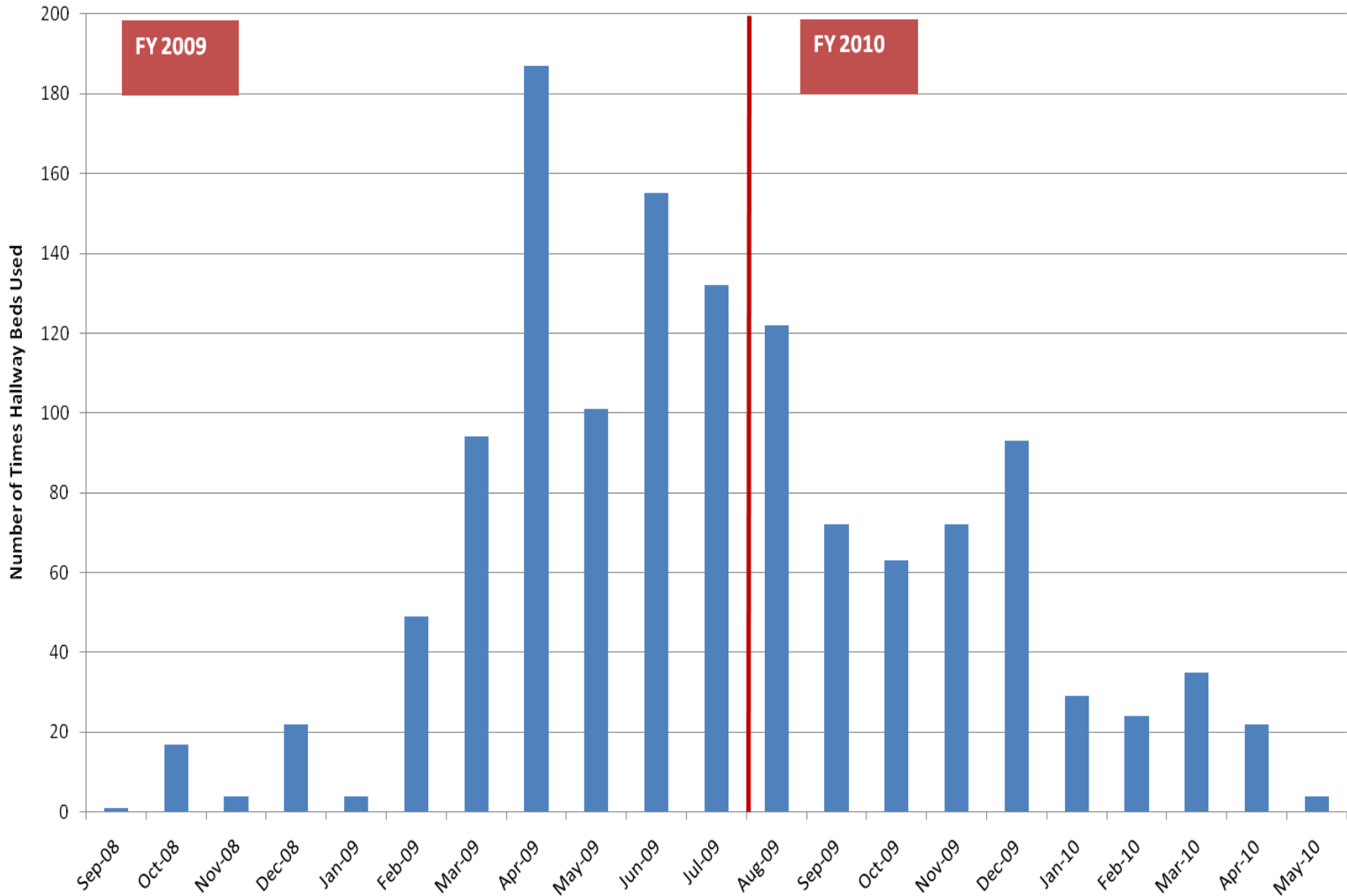
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EC: Left w/o Treatment N Pts

DISPO_DETAIL = ALL



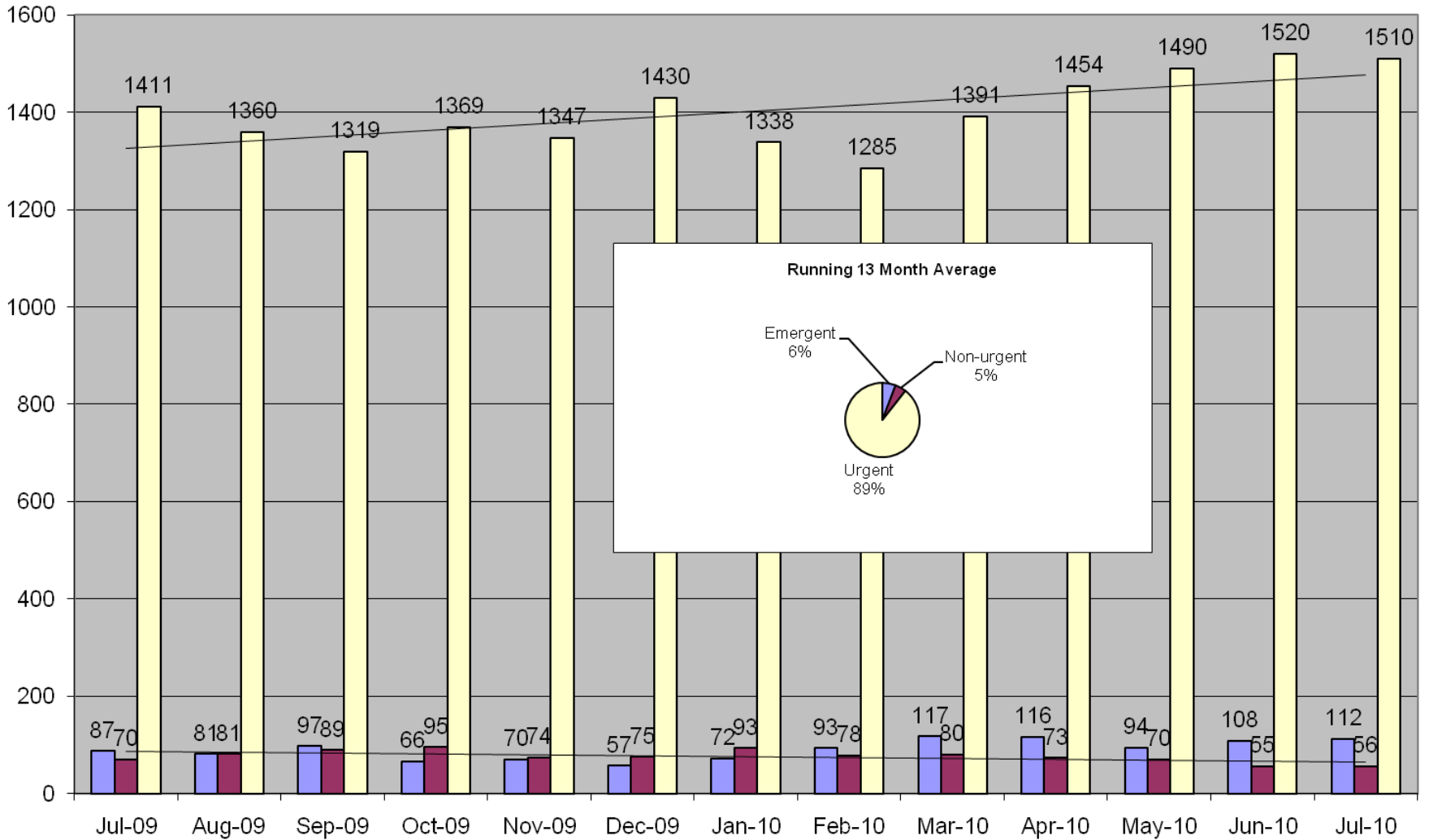
Emergency Center Hallway Bed Usage Sep 2008 - May 2010



	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10
■ Hallway Beds Used	1	17	4	22	4	49	94	187	101	155	132	122	72	63	72	93	29	24	35	22	4

EMERGENCY CENTER

Urgency at Triage - Source EC Tracking System



	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10
Emergent	87	81	97	66	70	57	72	93	117	116	94	108	112
Non-urgent	70	81	89	95	74	75	93	78	80	73	70	55	56
Urgent	1411	1360	1319	1369	1347	1430	1338	1285	1391	1454	1490	1520	1510

Process Improvement

Diagnostic Testing and Lab Medicine

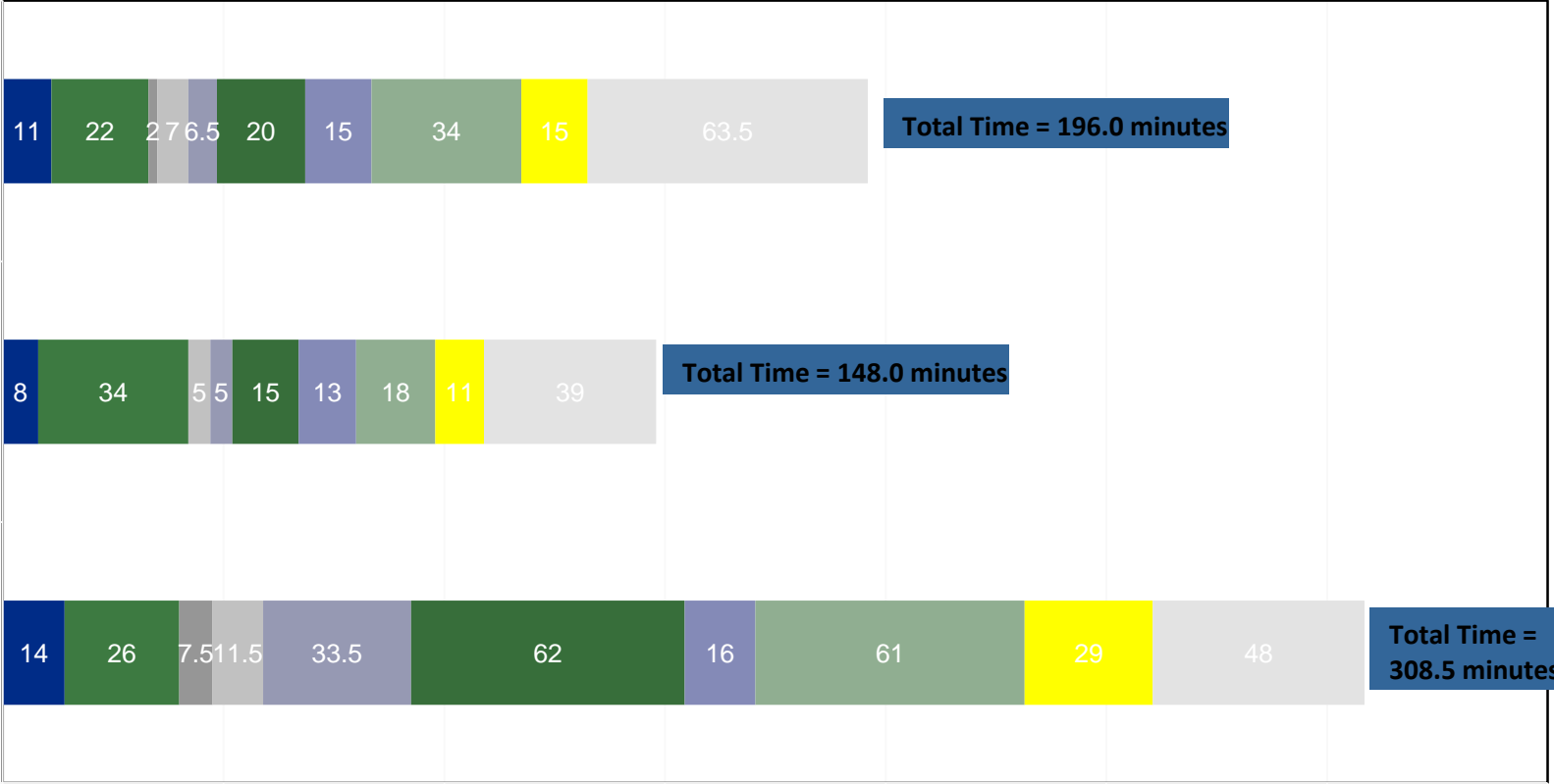
POC testing

Cross training for ECG's

Streamlining Transfusion Services

Diagnostic Imaging

Median Times EC Order to CT Report Call



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-

Diagnostic Imaging Working Group

Prioritization

Streamlining imaging protocols

Contrast delivery

Transportation

Sepsis

Early Goal Directed Therapy (EGDT)

Aim

Improve Compliance with EGDT for
sepsis from 36% to 70%

Through measurement of urine output

The CS&E Team

- Team Members
 - CS&E Participant: Terry Rice, MD
 - CS&E Participant: Katy Hanzelka, PharmD
 - Team Member: Debra Ruiz, RN
 - Team Member: Marie Hariri, RN
 - Team Member: Nada Fadul, MD
 - Team Member: Carmen Gonzalez, MD
 - Team Member: Imrana Malik, MD
 - Team Member: Debra Smith, RT
 - Facilitator: Larry Vines
- Sponsor
 - Susan Gaeta, MD

Surviving Sepsis Campaign Guidelines

Early Goal-Directed Therapy (EGDT 6Hrs)

Central venous pressure (CVP) 8–12 mmHg

Mean arterial pressure (MAP) 65 mmHg

Urine output (UO) 0.5 mL/kg/hr

Mixed venous oxygen saturation 65%

MDACC - ICU sepsis related mortality increased from 32% to 35% to 41% in 2004, 2005, and 2006 respectively

Implementing the Change

- Education
 - Physician, Respiratory therapist, Patient service coordinator, Nursing
- Sepsis Protocol
- Sepsis Documentation Tool
- Point of care blood gas and lactic acid

RN Documentation Form

Circulatory Capillary Refill <input checked="" type="checkbox"/> < 2 secs <input type="checkbox"/> Delayed Heart Sounds <input checked="" type="checkbox"/> Regular <input type="checkbox"/> Irregular Pulses: RT, LT Radial: / / Pedal: / / Edema: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N Location:	Respiratory Effort <input type="checkbox"/> Unlabored <input type="checkbox"/> Labored <input type="checkbox"/> Cough <input type="checkbox"/> Dyspnea <input type="checkbox"/> Hypervent <input type="checkbox"/> Nasal Flaring Breath Sounds <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Crackles <input type="checkbox"/> Wheezing <input type="checkbox"/> Diminished <input type="checkbox"/> Absent	Neuro Eye Opening <input checked="" type="checkbox"/> Spontaneous <input type="checkbox"/> To voice <input type="checkbox"/> To pain <input type="checkbox"/> None Verbal Responses <input checked="" type="checkbox"/> Oriented <input type="checkbox"/> Confused <input type="checkbox"/> Inappropriate words <input type="checkbox"/> Incomprehensible sounds <input type="checkbox"/> None Pupils B = Brisk S = Sluggish D = Dilated P = Pinpoint F = Fixed Size/Rxn L: B R: B	GI Abdomen <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Distended <input type="checkbox"/> Guarding <input type="checkbox"/> Rigid Tenderness <input type="checkbox"/> LUQ <input type="checkbox"/> RUQ <input type="checkbox"/> LLD <input type="checkbox"/> RLQ <input type="checkbox"/> Epigastric <input type="checkbox"/> None <input type="checkbox"/> Vomiting <input type="checkbox"/> Other Bowel Sounds <input type="checkbox"/> Absent <input type="checkbox"/> Vomiting Present <input type="checkbox"/> Last BM Nutrition Appetite: <input type="checkbox"/> G <input type="checkbox"/> F <input type="checkbox"/> P Dysphagia: <input type="checkbox"/> Y <input type="checkbox"/> N Feeding Tube: <input type="checkbox"/> Y <input type="checkbox"/> N	GU <input type="checkbox"/> Flank pain <input type="checkbox"/> Dysuria <input type="checkbox"/> Hematuria <input type="checkbox"/> Frequency <input type="checkbox"/> Anuric <input type="checkbox"/> Euky <input checked="" type="checkbox"/> Voiding <input type="checkbox"/> Conduit <input type="checkbox"/> Elimination <input type="checkbox"/> Stoma <input type="checkbox"/> Constipation <input type="checkbox"/> Diarrhea <input type="checkbox"/> Grade	Skin / Ortho <input checked="" type="checkbox"/> Warm <input type="checkbox"/> Dry <input type="checkbox"/> Cool <input type="checkbox"/> Diaphoretic Color <input checked="" type="checkbox"/> Pale <input type="checkbox"/> Cyanotic <input type="checkbox"/> Mottled <input type="checkbox"/> Jaundice <input type="checkbox"/> Flushed Mucous Membranes <input checked="" type="checkbox"/> Moist <input type="checkbox"/> Dry <input type="checkbox"/> Erythema <input type="checkbox"/> Lesions Ortho N/A <input type="checkbox"/> Pain <input type="checkbox"/> Swelling Deformity <input type="checkbox"/> Limited movement Oral Mucosa Stomatitis: <input type="checkbox"/> Yes <input type="checkbox"/> No Grade																						
Psychosocial: <input type="checkbox"/> N/A Chaplain: <input type="checkbox"/> Y <input type="checkbox"/> N Prostheses: <input type="checkbox"/> N/A Restraints: <input type="checkbox"/> Y <input type="checkbox"/> N	Eye Contact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Affect <input type="checkbox"/> Appropriate <input type="checkbox"/> Inappropriate Motor Behavior <input checked="" type="checkbox"/> Cooperative <input type="checkbox"/> Restless <input type="checkbox"/> Agitated <input type="checkbox"/> Anxious Speech <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slurred Support Systems <input type="checkbox"/> Lives alone <input type="checkbox"/> Family/Significant Other <input type="checkbox"/> Language barrier <input type="checkbox"/> Age Specific	Fall Risk Assessment <input type="checkbox"/> Call Bell Within Reach <input type="checkbox"/> Side Rails Up X2 <input type="checkbox"/> Eye <input type="checkbox"/> Walker <input type="checkbox"/> Cane <input type="checkbox"/> Dentures <input type="checkbox"/> Glasses <input type="checkbox"/> Limb <input type="checkbox"/> Hearing Aid <input type="checkbox"/> Electrolynx	<input type="checkbox"/> Y <input type="checkbox"/> N Currently using tobacco <input type="checkbox"/> Y <input type="checkbox"/> N Vaccines Pneumococcal (Last 5 yrs.) <input type="checkbox"/> Y <input type="checkbox"/> N Flu (This Season Oct - Jan)	VITAL SIGNS Time: 2305 01:30 03:00 04:00 05:00 B/P: 91/50 84/47 79/42 84/47 87/58 HR: 90 98 98 98 103 RR: 20 20 20 20 20 Temp: 36.8 Pulse: 97 97 99 99 99 Pain Scale (0-10):	IV Site: <u>Left foreve</u> Ge: <u>22</u> Attempts: <input type="checkbox"/> CVC <input type="checkbox"/> LL <input type="checkbox"/> PAC <input type="checkbox"/> DRSG DI <table border="1"> <thead> <tr> <th>Time</th> <th>IV Solutions / Additives</th> <th>Vol.</th> <th>Time</th> <th>IV Solutions / Additives</th> </tr> </thead> <tbody> <tr> <td></td> <td>NS</td> <td>1000</td> <td></td> <td></td> </tr> </tbody> </table>	Time	IV Solutions / Additives	Vol.	Time	IV Solutions / Additives		NS	1000														
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Labs Done <input type="checkbox"/> CBC <input type="checkbox"/> Cl- <input type="checkbox"/> Na+ <input type="checkbox"/> HCO3 <input type="checkbox"/> K+ <input type="checkbox"/> UA C+S <input type="checkbox"/> Bun <input type="checkbox"/> ABG <input type="checkbox"/> Crea <input type="checkbox"/> C Blood <input type="checkbox"/> CHEM <input type="checkbox"/> TX <input type="checkbox"/> PT/PTT <input type="checkbox"/> PH	PRN/One - One Time Medications <table border="1"> <thead> <tr> <th>Time</th> <th>Medications</th> <th>Dose</th> <th>Route</th> <th>Pain Scale</th> <th>Init.</th> <th>Time</th> <th>Result</th> <th>Init.</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Time	Medications	Dose	Route	Pain Scale	Init.	Time	Result	Init.										EVALUATION <table border="1"> <thead> <tr> <th>Time</th> <th>Result</th> <th>Init.</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Time	Result	Init.				* Pain level > 4, document intervention Non-Pain Related Results S-Successful U-Unsuccessful Radiology <input type="checkbox"/> Portable CXR <input type="checkbox"/> CXR <input type="checkbox"/> Abdominal Series <input type="checkbox"/> KUB <input type="checkbox"/> Other Ultrasound <input type="checkbox"/> Abdomen <input type="checkbox"/> Pelvis <input type="checkbox"/> Venous Doppler of Extremity CT Scan <input type="checkbox"/> Head
Time	Medications	Dose	Route	Pain Scale	Init.	Time	Result	Init.																			
Time	Result	Init.																									
RN Init. Signature/Credentials/ID Code	RN Init. Signature/Credentials/ID Code	RN Init. Signature/Credentials/ID Code	RN Init. Signature/Credentials/ID Code	RN Init. Signature/Credentials/ID Code																							

Sepsis Documentation Tool

THE UNIVERSITY OF TEXAS
MD ANDERSON
CANCER CENTER

Sepsis Acute Documentation Tool

Goals: MAP > 65 mmHg, Urine Output > 0.5 mL/kg/hour

If MAP ≤ 65 mmHg, record BP and pulse every 15 minutes, If MAP is > 65mmHg, record BP and pulse every 1 hour

Monitor temperature, RR, and SpO2 every 1 hour for all patients

Weight: _____ kg
 $MAP = \frac{(DBP \times 2) + SB}{3}$

Time Increments	Vital Signs							IV Fluids			Intake			Output		Notify MD of vitals and I/O's every hour
	Time	BP	MAP	Pulse	Temp	RR	SpO2	IV Solution and Volume / Vasopressors	Stop Time	IV fluids	IVPB volume	PO	Urine Output	Other Output		
0																
15																MD notified
30																
45																
60																(MD Name)
15																MD notified
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Results

	Before n = 106	After n = 26
Serum lactate measured within 1 hour	64 (60%)	16 (61%)
Intravenous fluid in EC (mL)	1979 ± 1081	2507 ± 50
Goal MAP within 6 hours	78 (74%)	23 (88%)
Urine output recorded	38 (36%)	17 (65%)
Vasopressor administered	62 (58%)	13 (50%)
Time to Vasopressor (hours)	4.15 ± 3.01	3.21 ± 1.35
28 day mortality	39 (36.8%)	3 (11.5%)*

Unless otherwise indicated, data mean +/- SD

*P=0.01

EGDT Conclusion

- Better documentation improved EC use communication with ICU
- POC Lactic acid for early recognition of severe sepsis and septic shock
 - Average time to LA 5.5 hours to 1.5 hour
- Improvement in mortality
 - Possible difference in severity of illness
 - Small sample size

Resuscitating an EC

Conclusions

- 1) For many patients the EC is the lynchpin
- 2) Changes can occur
- 3) Requires
 - 1) Commitment
 - 2) Communication
 - 3) Continuous process improvement.

Resuscitating an EC

Conclusions

- 1) Changing Expectations
- 2) Changing Processes
- 3) Changing Culture
 - 1) Within the EC
 - 2) Within the institution

emergency



center