

Nursing Grand Rounds

Part 1
(21 minutes)

UNIVERSITY OF WASHINGTON
MEDICAL CENTER
UW Medicine



IT Solutions: Identifying Sepsis Early

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Background

National Data

- Mortality
 - Severe sepsis: 30-50%
 - Septic shock: 50-60%
- Approximately 750,000 cases annually with 210,000 deaths

Institute for Healthcare Improvement. Sepsis Commentary. Retrieved April 24, 2008, from IHI: A resource from the Institute for Healthcare Improvement Web site: <http://www.ihl.org/IHI/Topics/CriticalCare/Sepsis/>

Background

UWMC data

- Review of ICD-9 code data for patients at UWMC in 2005 diagnosed with sepsis revealed a mortality rate of 39%, consistent with the national average
 - 038.XX: Septicemia
 - 785.52: Septic shock

Multidisciplinary Approach

- ICU Local Practice Council
 - Sub-group: Nurses, physicians, pharmacists, computer specialists within CIS, materials management
- Multi-layered project:
 - Screening tool development
 - Physician order sets designed using evidenced-based recommendations from the Surviving Sepsis Campaign
 - Sepsis education

Purpose

- Evaluate the utility of an electronic screening tool to aid bedside clinicians in early recognition of patients at risk for sepsis

Methods

- Created sepsis screening tool based on 2004 Surviving Sepsis Guidelines
- Incorporated screening tool into the electronic medical record across medical center in March 2007

Sepsis & Septic Shock

- Known or suspected infection
- Two or more of the following (SIRS) criteria
 - Temperature > 38.3°C or < 36.0° C
 - Heart rate > 90 beats/min
 - Respirations > 30 breaths/min or PaCO₂ < 32 mmHg or increased O₂ requirement to maintain SpO₂ > 90%
 - WBC > 12,000 or < 4,000
- One of the following hypotension criteria
 - Hypotension (SBP < 90mmHg or MAP < 70mmHg after fluid challenges)
 - Lactate level > 4 mmol/L

Sepsis Screen

Assessment Flowheet		03-14	04-08
SEPSIS SCREENING TOOL		02:00	04:00
Suspected Infection	Yes	Yes	Yes
Increased O2 Needs	Yes	Yes	Yes
Fluid Bolus	No	No	No
Temperature	37.8	37.8	37.8
Heart Rate	92	92	92
Respiratory Rate	20	20	20
PaO2	115.8	115.8	115.8
Systolic BP	99	99	99
Mean BP	66	66	66
Lactate	2.2	2.2	2.2
Sepsis Screen Results/Actions	+ Call PD + Call PD		

Assessment Flowheet		03-14	12:00
SEPSIS SCREENING TOOL		05:30	12:00
Suspected Infection	Yes	Yes	Yes
Increased O2 Needs	Yes	Yes	Yes
Fluid Bolus	No	No	No
Temperature	38.3	38.3	38.3
Heart Rate	97	97	97
Respiratory Rate	20	20	20
PaO2	115.8	115.8	115.8
BP	115.8	115.8	115.8
Systolic BP	84	84	84
Mean BP	63	63	63
Lactate	2.2	2.2	2.2
Sepsis Screen Results/Actions	Re-screen		

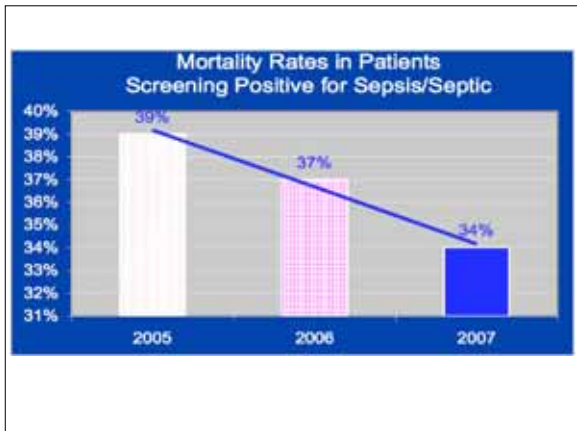
Sepsis Order Sets

- Initial Treatment Orders available for
- Acute Care (non-ICU settings)
 - Labs, Lines, Volume Resuscitation, Antibiotics
- ICU Phase: Target Goals and Treatment Orders
 - CVP = 8-10 mmHg (12-15 mmHg for ventilated patients)
 - MAP ≥ 65 mmHg
 - ScvO₂ / SvO₂ goal ≥ 70%
 - Laboratories
 - Supplemental O₂
 - Fluid resuscitation
 - Antibiotics
 - Vasoactive infusions
 - Other

Results

March 2007 -2008

Screens completed	24,257
Number of patients screened*	12,380
Number of patients with positive screens	372 (3%)
Number of patients with positive screen and positive blood cultures	118 (32%)



Conclusions

- Electronic screening tool has been welcomed by nursing staff as an efficient way to aid the early identification of patients at risk for sepsis
- Screen requires minimal data entry. Data auto-populate from other sources
- Feedback is immediate describing the patient's risk

Conclusions

- Electronic entry allows for tracking and aggregating data elements for ongoing analysis
- Implementation of evidenced-based practice guidelines for sepsis requires a simple system for early identification of patients at risk
- Using technology to assist clinicians to recognize sepsis early is an important step to early implementation of treatments may have a direct effect on mortality

Next Steps Using Screen

- Further studies and data analysis needed to evaluate sensitivity and specificity of sepsis screen variables in various patient populations
- Implement automatic paging of on-shift STAT RN (member of the Rapid Response Team) for occurrences of positive sepsis screens

Future Implications

- **Early Warning Scoring Systems (EWSS)**
 - Automated program that pulls criteria from the chart, scores it based on its given value and formulates a list in increasing value, representing increasing complexity or worsening condition

Future Implications

Example:

■ Respiratory rate: 8	
Value: 2	Value: 1
■ Heart rate: 102	
■ Systolic blood pressure: 111/78	
Value: 0	
■ Level of sedation: Mild	Value: 1
■ Temperature: 37.9 ° C	Value: 0
■ Hourly urine output (for previous 2 hours): 60mL	Value: 0
	Score: 4

Future Implications

- **Other documentation/high-risk patient surveillance**
 - Identification of patients at high risk to develop nosocomial pressure ulcers
 - **Pulseless electrical activity (PEA) Arrest**

Nursing Grand Rounds

Part 2

(38 minutes)

You can access this presentation at the 21:00 minute point in the video.

Effectiveness of a “Lean Supply Chain Bundle” on Efficiency and Nursing Staff Satisfaction

University of Washington Medical Center

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Anne Bailey
Manager, Rehabilitation

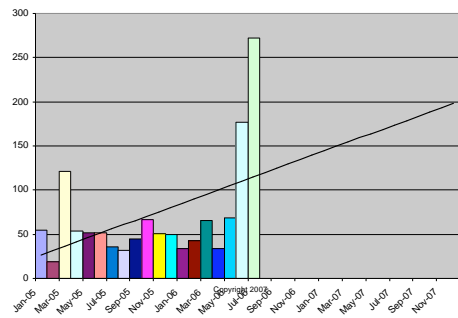
Key Themes

- 🔍 Observe the process to understand various forms of waste (Patient, RN, MD, MM)
- 🔍 Test “LEAN” changes to supply chain before hospital-wide implementation
- 🔍 Measure efficiency and nursing satisfaction after implementing “LEAN” bundle

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4S PAR-stock Supply “STATS”



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Types of Waste

- 🔍 Overproduction
- 🔍 Waiting
- 🔍 Unnecessary transport
- 🔍 Over processing or incorrect processing
- 🔍 Excess inventory
- 🔍 Unnecessary movement
- 🔍 Defects
- 🔍 Unused employee creativity

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Source: The Toyota Way

Toyota Consistency

Front Car Seat Installation:

- 🔍 Sequence of 7 tasks
- 🔍 Order of bolt installation
- 🔍 The amount of torque
- 🔍 Time per bolt installation
- 🔍 Distance car travels
- 🔍 Overall time (55 seconds)



Source: Spear and Bowen, “Decoding the DNA of the Toyota Production System”, Harvard Business Review, Sept.-Oct. 1999, p. 96

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Healthcare Variation

Pre-surgery patient blood draw:

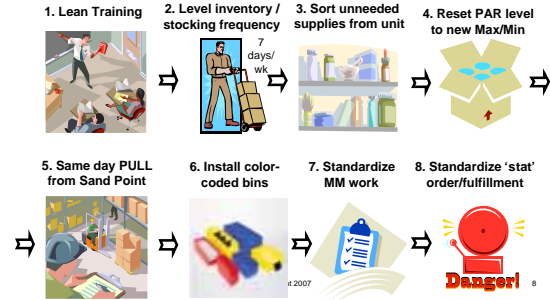
- Sometimes RN
- Sometimes tech
- Sometimes phlebotomist
- Sometimes no one
- Blood draw happens at different times
- Blood draw happens at different locations



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Lean Methodology on Pilot Units



5 S



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Source: The Toyota Way

6NE – Clean Supply Room (Before)



6NE – Clean Supply Room (After)



6NE – Bulk Supply Room (Before)



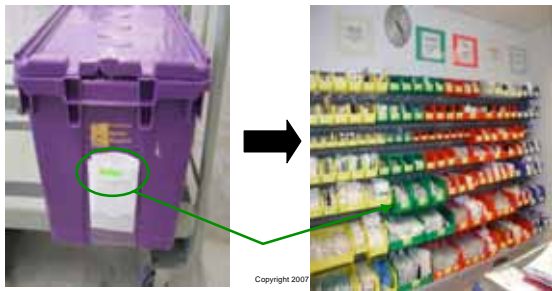
6NE – Bulk Supply Room (After)



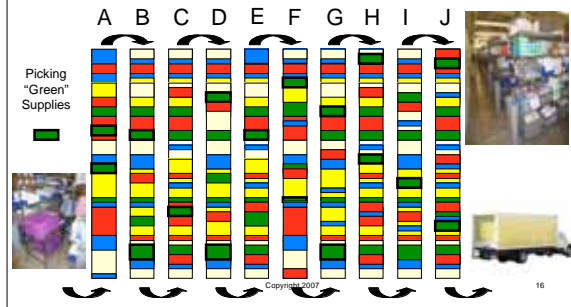
Stocking Units (Before)



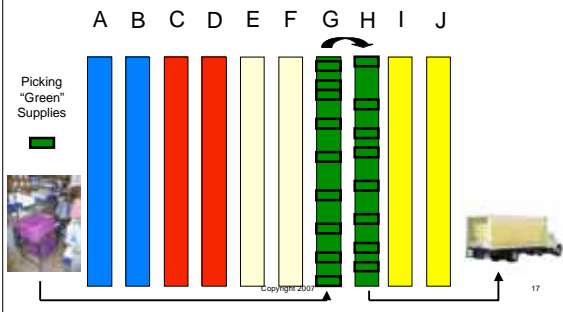
Stocking Units (After)



SandPoint – Supply Rows (Current)



SandPoint – Supply Rows (Future)



Old Way To Request Supplies

Kanban Card System



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Kanban Card System



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Kanban Card System

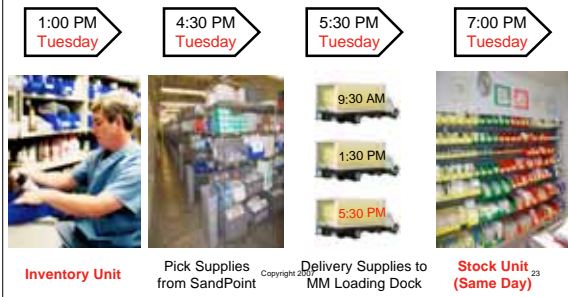


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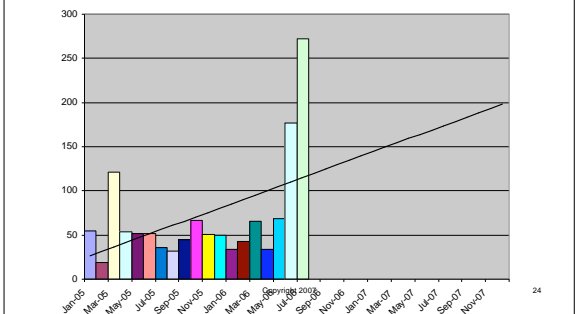
Supply Delivery (Old Turnaround Time: 24 Hours)

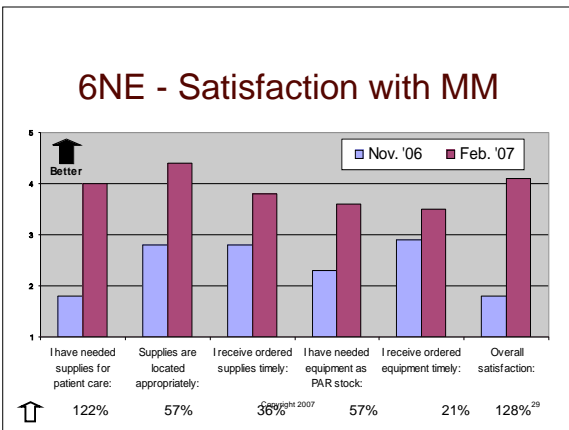
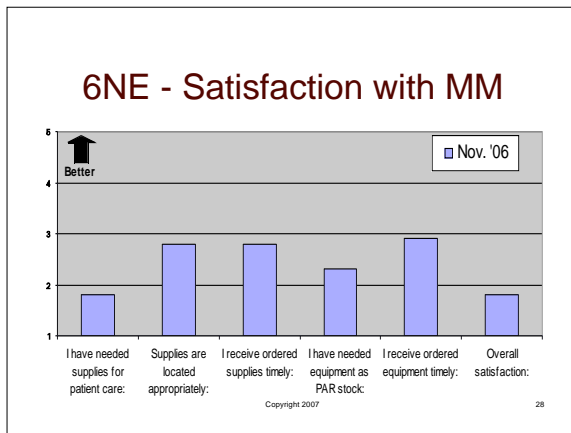
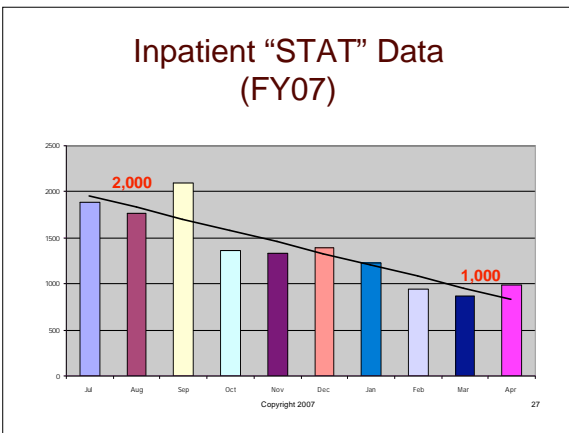
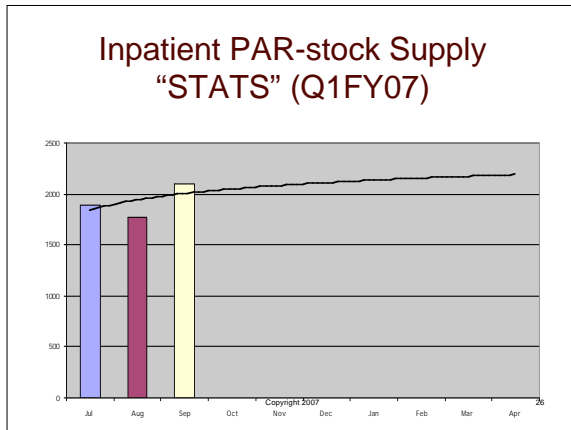
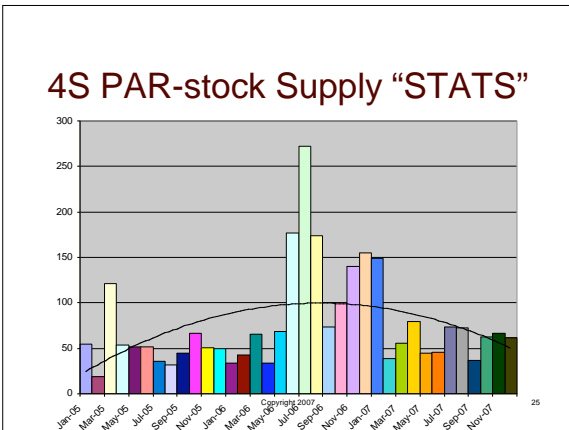


Supply Delivery (New Turnaround Time: 6 Hours)



4S PAR-stock Supply "STATS"





MM Staff Efficiency on 6NE

- Before "lean" bundle:**
 - Approx. 1 hr. 45min. to inventory & re-stock
- After "lean" bundle:**
 - Approx. 1 hr. to inventory & re-stock

Time Savings: 45 minutes/day
% Savings: 43%

Lessons Learned

- Get out of the conference room and “Go and See” the waste
- Get front-line staff from key areas involved in identifying waste/testing changes
- Wrap the successful tests into a “bundle” to be implemented hospital-wide

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