

# Somerset Medical Center

Information Services  
*Patient Safety Initiative*  
*CPOE*

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# Somerset Medical Center

- **Non-Profit Community Minor Teaching Hospital**
- **355 Licensed bed**
- **298 maintained / 240 average census**
- **Annual Statistics**
  - **56,000+ Emergency visits**
  - **30,000+ Inpatient / Same Day Visits**
  - **250,000+ Outpatient procedures**
  - **1800 FTEs (2100 people)**
  - **700 Independent Staff Doctors**
- **Payer mix 45% Medicare / 45% commercial**
- **Average LOS = 4.8 – 5.2 days**
- **Net revenue = \$240 million**
- **Positive operating margin**



# Agenda

- **Healthcare Industry Drivers for Change**
- **SMC's Information Services Patient Safety Strategy**
- **Intended Benefits and Reasons for Change**
- **Implementation time line**
- **Adoption to Date**

# Healthcare Industry Drivers for Improvements in Patient Safety

- 1999 Institute of Medicine Report (IOM) “To Err is Human” finds that approximately 44,000 deaths occur per year due to medication errors
- 2000 Leapfrog Group Responds recommending Hospitals implement the following by 2010:
  - Computerized Physician Order Entry
  - Intensivists in ICUs
- 2003 FDA proposes Federal Legislation to bar code all medications and Adverse Drug Event Reporting
- 2004 JCAHO requires full medication profiling
- 2004 Presidential State of the Union Address emphasizes the need for electronic health records to improve patient safety
- CA State Legislation requires IS patient safety initiatives be implemented by 2005
- July 2004 – IOM updates error statistics and predicts # of deaths maybe double the original estimate

# Healthcare Industry Drivers for Improvements in Patient Safety

- 2007 Joint Commission Standards
    - Medication Reconciliation
  - 2009 ARRA Act signed into law in February
    - Meaningful Use Criteria
      - 10% CPOE for all orders by 10/1/2010
      - 100% CPOE for all orders by 10/1/2012
- {Providers defined as MD, DO, RN, PA, NP)

## Most Common Causes of Medication Errors and Healthcare Technologies Markets Response

### Common Errors

- Illegible hand written doctor orders
- Incorrect Medication
- Drug & IV Administration

### Technology Response

- CPOE
- Medication Bar Coding
- Electronic Medication Administration

**Goal: Reduce Patient Medication Errors**

# **SMC Information Services**

## ***Patient Safety Strategy - Prerequisites***

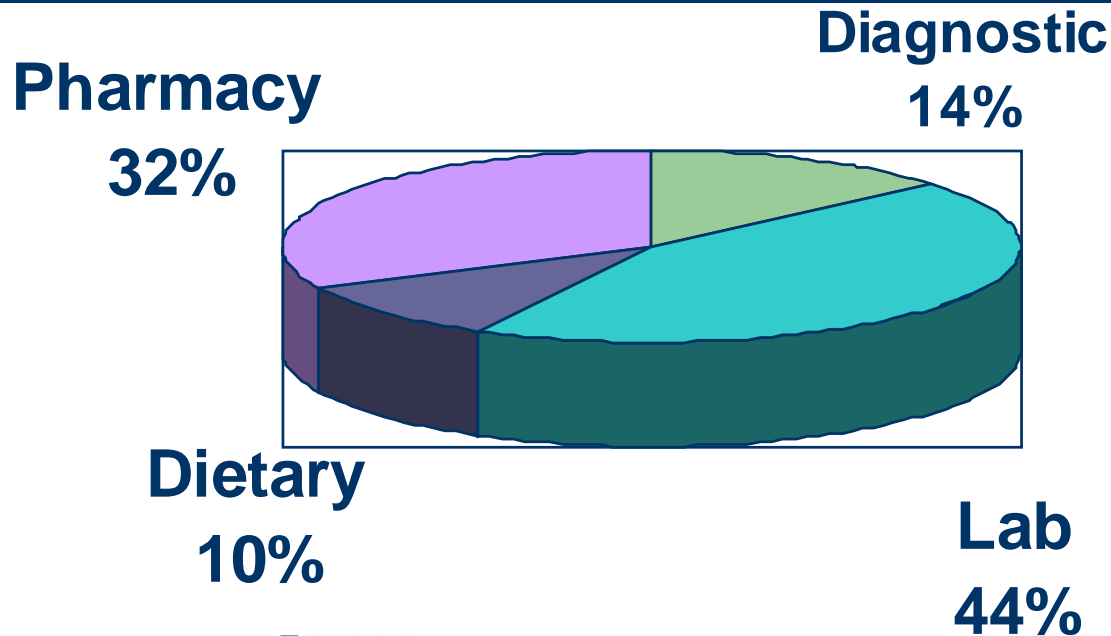
- **Project Millennium Phase I**
  - **Integrated Pharmacy, Order Entry, and Lab systems**
  - **Integrated Electronic Clinical Data Repository**
    - **Orders, Results**
    - **Nursing Documentation and Vital Signs**
    - **Nursing Task and Patient Access Lists (PAL)**
    - **Pre & Post-Op reports & discharge summaries**
- **24x7 Pharmacy Operations**
- **Expanded pharmaceutical profiling**
- **Limited floor-based cabinet Medications and access**
- **“Care Set” (Order Set) build**
- **Pharmaceutical “order sentences” build**

# Intended Benefits and Reasons for Change

- **Computerized Physician Order Entry**
  - **Elimination of order illegibility**
  - **Increased speed of care delivery from order to result**
    - => **Reduced Average Length of Stay**
  - **Reduce duplicative testing**
    - => **Reduced cost per admission**
  - **Leapfrog Certification and compliance with national quality initiatives**
  - **Auto product selection within the Pharmacy**

# Order Distribution – September 2008

{Data Source = Budget to Actual Report}

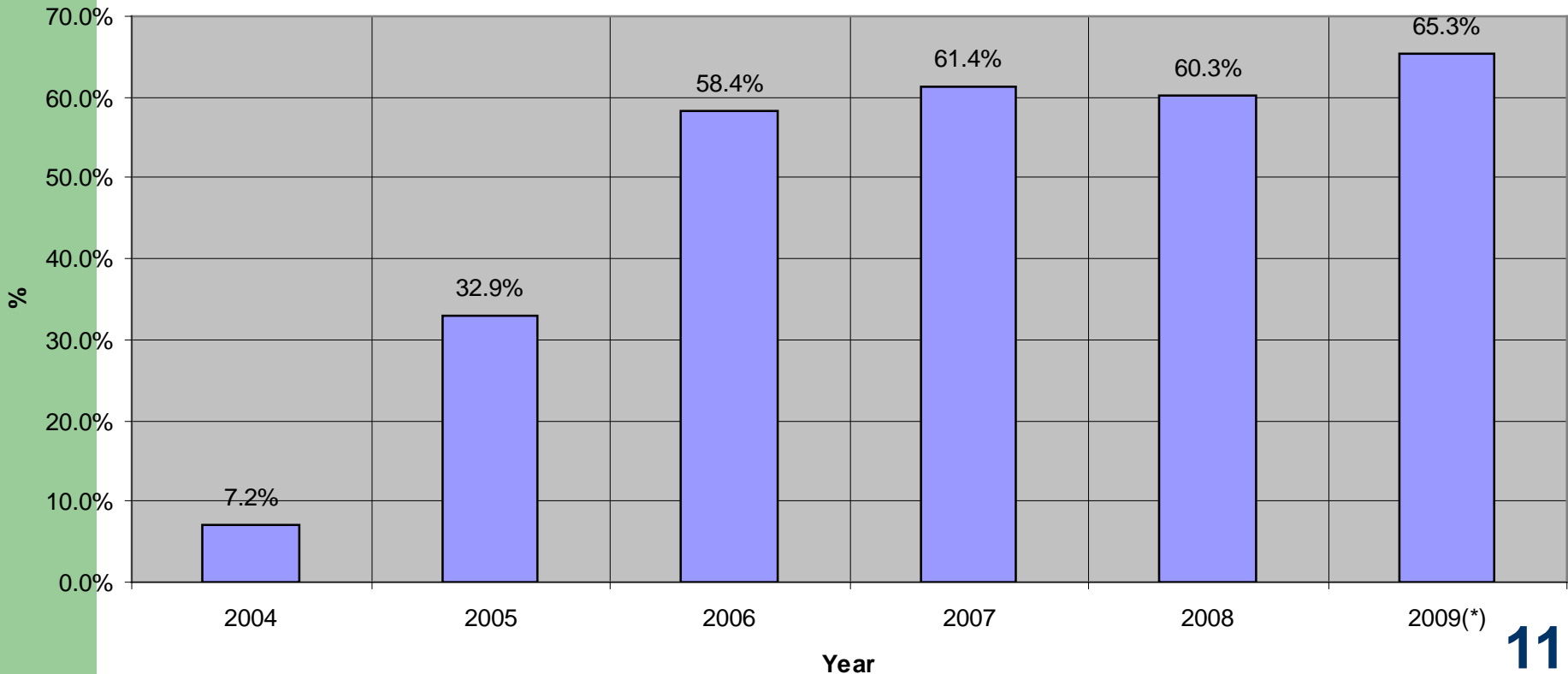


Lab	=	58,362
Diagnostic	=	18,136 {Includes rehabilitation & respiratory treatments}
Pharmacy	=	42,797
Dietary	=	13,156 {Meals / ALLOS}



# SMC CPOE Adoption Over Time

Inpatient Medication CPOE % Adoption (\*-thru Q309)



## EMR Adoption Model<sup>SM</sup>

Stage	Cumulative Capabilities	2008 Final	2009 Q1
Stage 7	Medical record fully electronic; HCO able to contribute CCD as byproduct of EMR; Data warehousing in use	0.3%	0.3%
Stage 6	Physician documentation (structured templates), full CDSS (variance & compliance), full R-PACS	0.5%	0.8%
Stage 5	Closed loop medication administration	2.5%	3.6%
Stage 4	CPOE, CDSS (clinical protocols)	2.5%	2.8%
Stage 3	Clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology	35.7%	37.0%
Stage 2	Clinical Data Repository, Controlled Medical Vocabulary, Clinical Dec, may have Document Imaging	31.4%	32.1%
Stage 1	Ancillaries – Lab, Rad, Pharmacy – All Installed	11.5%	9.0%
Stage 0	All Three Ancillaries Not Installed	15.6%	14.5%
	Total Hospitals	n = 5166	n = 5170



SMC Now

Data from HIMSS Analytics™ Database N = 5166/5170 ©2009 HIMSS Analytics

# Improvements With CPOE

- Patient Care
  - Visual Display
  - Suggested Orders
  - System Logic
- Regulatory Compliance
  - Suggested Orders
  - Automated Orders

ZZZTEST, ALSPEC - Add Order

**ZZZTEST, ALSPEC** Age: 49 years Sex: Male MRN: 00610749 Location: 3 W...  
 Allergies: heparin DOB: 1/21/1960 Fin Number: ... Inpatient [8/1...

Find:  Starts with:  Type:  Inpatient

Folder:  Search within:  All At location:  Somerset Med C

Clobetasol 0.05% Cream  
 Clobetasol 0.05% Gel  
 Clobetasol 0.05% Oint  
 Clobetasol 0.05% Soln  
 Clomid  
 clomiPHENE  
 clomiPRAMINE  
 Clomipramine Level

clonazepam  
 Clonazepam Level  
 Clonidine Inject  
 Clonidine Patch 0.1mg  
 Clonidine Patch 0.2mg  
 Clonidine Patch 0.3mg  
**Clonidine Tab (Antihypertensive)**  
 Clopidogrel

ZZZTEST, ALSPEC - 00610749

Order Sentences

Order sentences for: Clonidine (Clonidine Tab (Antihypertensive))

0.1 mg, By Mouth, ONCE, NOW (within the hour), Tab  
 0.1 mg, By Mouth, Tab, ONCE  
 0.1 mg, By Mouth, Tab, OnCall  
 0.1 mg, By Mouth, Tab, Daily  
 0.1 mg, By Mouth, Tab, q12hr  
 0.1 mg, By Mouth, Tab, q8hr  
 ..  
 0.2 mg, By Mouth, ONCE, NOW (within the hour), Tab  
 0.2 mg, By Mouth, Tab, ONCE  
 0.2 mg, By Mouth, Tab, OnCall  
 0.2 mg, By Mouth, Tab, Daily  
**0.2 mg, By Mouth, Tab, q12hr**  
 0.2 mg, By Mouth, Tab, q8hr  
 ..  
 0.3 mg, By Mouth, ONCE, NOW (within the hour), Tab  
 0.3 mg, By Mouth, Tab, ONCE

1. Tall Man
2. Clinical Cues (Klonopin)
3. Dose/Freq Suggestions
4. Next Dose Timing

Clonidine (Clonidine Tab (Antihypertensive)) Order 9/30/2009 10:00 PM 0.2 mg, By Mouth, q12hr, 9/30/2009 10:00 PM, 30, day(s), Tab, Stop date 10/30/2009 10:00 AM

Details for Clonidine (Clonidine Tab (Antihypertensive))

Details | Order Comments

Remaining Administrations: 60 Stop: 10/30/2009 10:00:00 AM

Order details	Detail values
<b>Strength dose [0.2]</b>	0.2
Strength dose unit [mg]	
Route of administration [By Mouth]	
Frequency [q12hr]	
First Dose Timing Priority	
<b>Requested start date and time [9/30/2009 10:00 PM]</b>	
PRN [No]	
PRN Reason	
Duration [30]	
Duration unit [days]	



Component	Order Details
<input checked="" type="checkbox"/> Order Set Name	T;N
<b>Warfarin (Coumadin) Orders</b>	
Previously resulted lab tests and warfarin administrations will display in the lower left corner of this order set.	
To see the CHEST 2008 reference for administering Warfarin: Right Click on any warfarin order and click on Reference Click on the "Reference" tab (NOT Drug Reference)	
To designate yourself as the Warfarin Designated Prescriber please enter your name in the Communication Order below.	
<input type="checkbox"/> Physician Communication Orders - Continuous	T;N, Designated Warfarin Prescriber:
<b>Single Day Dosing (one time orders)</b>	
If you order "Warfarin 0mg" all "Daily" orders will be discontinued assuming you want to order Warfarin separately every day.	
<input type="checkbox"/> Warfarin (Warfarin 0mg (Zero mg) Dose)	No Dose Today, By Mouth, One Time
<input type="checkbox"/> Warfarin	0.5 mg, By Mouth, One Time, 1, dose(s)/times, Tab
<input type="checkbox"/> Warfarin	1 mg, By Mouth, One Time, 1, dose(s)/times, Tab
<input type="checkbox"/> Warfarin	2 mg, By Mouth, One Time, 1, dose(s)/times, Tab
<input checked="" type="checkbox"/> Warfarin	2.5 mg, By Mouth, One Time, 9/30/2009 2:00 PM, 1, dose(s)/times, Tab, Stop date 9/30/2009 2:00 PM

1. Transmit Information
2. Patient Clinical Information
3. Evidence Based References

**Decision Support**

IDENTIFIED ORDER:  
**Warfarin**

Drug Reference | Education Leaflet | Reference

Warfarin [Search]

CarePlan information  
  Chart guide  
  Nurse preparation  
  Patient education  
  Policy and procedures  
  Scheduling information

In patients beginning warfarin (vitamin K antagonist) therapy, the CHEST guidelines recommend the initiation of oral anticoagulation with doses between 5 and 10 mg for the first 1 or 2 days for most individuals, with subsequent dosing based on the INR response.

In elderly patients or patients who are debilitated, are malnourished, have congestive heart failure, have liver disease

OK

	3/20/2009 10:00 AM
INRA	7.00
PT Anticoag	19.9

# Patient Care - System Logic

- Dose Range Checking
  - Decimal Place Errors
  - Age Variations
  - Kidney Function
- Interaction Checking
  - Drug to Drug
  - Allergies
  - Duplicates
- Rules
  - Derived from documentation, orders, results



Component	Order Details
JCAHO: NPO until bedside swallowing screen if applicable.	
<input checked="" type="checkbox"/> Physician:Nurse One Time Communication	T;N, Bedside Swallowing Screen by Nursing
<input type="checkbox"/> S/H Dysphagia-Bedside Swallow	T;N, Urgent, CVA
<input type="checkbox"/> NPO (Diet - NPO)	Start: T;N
<input type="checkbox"/> Regular Diet (Diet - Regular)	
<input type="checkbox"/> ADA Diet (Diet - Diabetic)	
<input type="checkbox"/> Cardiac Diet (Diet - Cardiac)	
<input type="checkbox"/> Liquid Diet (Diet - Liquid)	T;N
<input type="checkbox"/> Pureed Diet (Diet Pureed)	T;N
<input type="checkbox"/> Mechanical Soft Diet (Diet - Mechanical Soft)	T;N
<input type="checkbox"/> Tube Feeding Order Set	
<b>Respiratory</b>	
<input type="checkbox"/> Oxygen therapy	
<b>IV Access</b>	
<input type="checkbox"/> Sodium Chloride 0.9% (IIC)	2,500 mL, InjSoln
<input type="checkbox"/> Dextrose 5% in Water (D5W)	1,000 mL, IV, 7, day(s), mL/hr
<input type="checkbox"/> Dextrose 5% with 0.45% NaCl (D51/2NS)	1,000 mL, IV, 7, day(s), mL/hr
<input type="checkbox"/> Sodium Chloride 0.9% (NS)	1,000 mL, IV, 7, day(s), mL/hr
<b>Medications</b>	
<b>GI Prophylaxis</b>	
NOTE: For CrCl < 50, change the frequency of Pepcid to "Daily"	
<input type="checkbox"/> famotidine (Pepcid)	20 mg, IV Push, q12hr, InjSoln
<input type="checkbox"/> famotidine (Pepcid)	20 mg, By Mouth, q12hr, Tab
<b>DVT Prophylaxis</b>	
JCAHO: Every non ambulatory patient should have DVT prophylaxis within 48 hrs. of admission if applicable.	
<input checked="" type="checkbox"/> Compression Boots (Pneumatic Boots)	T;N
<input type="checkbox"/> DVT Medical Prophylaxis Protocol	
<input type="checkbox"/> Physician:Nurse One Time Communication	No DVT Prophylaxis Intervention
<b>Antiplatelet/Anticoagulant</b>	
If t-PA used, reset the Antiplatelet Starting Dose/Time to 24 hours after t-PA.	
JCAHO: If Atrial Fibrillation, discharge on anticoagulation, unless contraindicated.	
**** BY MOUTH:	
<input type="checkbox"/> Aspirin	81 mg, By Mouth, Chew Tab, Daily
<input type="checkbox"/> Aspirin	325 mg, By Mouth, Tab, Daily
<input type="checkbox"/> Clopidogrel (Plavix)	75 mg, By Mouth, Tab, Daily

**SMC is a Designated Stroke Center  
Stroke Protocol Order Set  
Joint Commission Requirements**

# Vaccinations - Flu Season

This is a READ ONLY box. Previous documented Vaccine data from previous admissions will populate here.

The top documentation is what was documented on the PREVIOUS admission - date and time is when it was recorded.

IF the patient received a vaccine here at SMC, the date and time it was administered will be documented BELOW the Admission Documentation

## Documented Vaccine Info:

### Automated Vaccine Orders

### Based on Nursing Documentation

#### Pneumococcal Vaccine Received

- Yes
- No
- Unable to assess

*Required Field*

Year Received

*Note \*\* Pneumovax should have been received within past 5 years to qualify it under 65, (Immunized more than 5yrs. ago and was not yet 65 at the time of immunization)*

#### Contraindications for Pneumo Vaccine

- Previous reaction to pneumo vac
- None

*Required Field*

#### Risk Assessment for PneumoVax

- Age 65 or > & never received pneumo vac
- Immunized > 5 yrs & not 65 at time
- Age 65 or > & vaccine hx uncertain
- <65yr, no pneumovax hx, has disease risk

**Disease Risks:**  
Pulmonary Disease  
Cardiac Disease  
Diabetes  
Immunosuppression (Di  
Medication Induced)

#### This Season Flu Vaccine Received

- Yes
- No
- Unable to assess

*Required if pt did not receive vaccine*

#### Contraindications for Flu Vaccine

*Required if pt did not receive vaccine*

- Allergy to eggs
- Has received Flu vac this season
- Allergy to thimersol (preserv)
- Hx of Guillian Barre
- None

**\*\*NOTE**  
Disease Risks for Flu  
patients <65 are same  
Pneumovax and rule w  
fire off of Admission H

#### Pneumococcal

- Yes
- Pt does not meet criteria

#### Flu Vaccine

- Yes
- Pt does not meet criteria
- Pt unable to answer

**Only offer flu vaccine on  
pts < 65 with same  
disease risks as**

# SMC Status



# The next leap forward.....



# Process.....process.....process.....

- **Admission Orders – pre hospital**
  - never admitted before
- **Telephone Orders**
  - need to design process (pharmacy & nursing buy in)

# Process.....process.....process.....

- **Short term orders – auto D/C ??**
  - *Anesthesia Orders – Recovery Room*
  - *ED Physician Orders – Dialysis orders*
- **Conditional Orders**
  - *Regular Diet if tolerating liquid diet*
  - *switch to PO (by mouth) when tolerating diet*

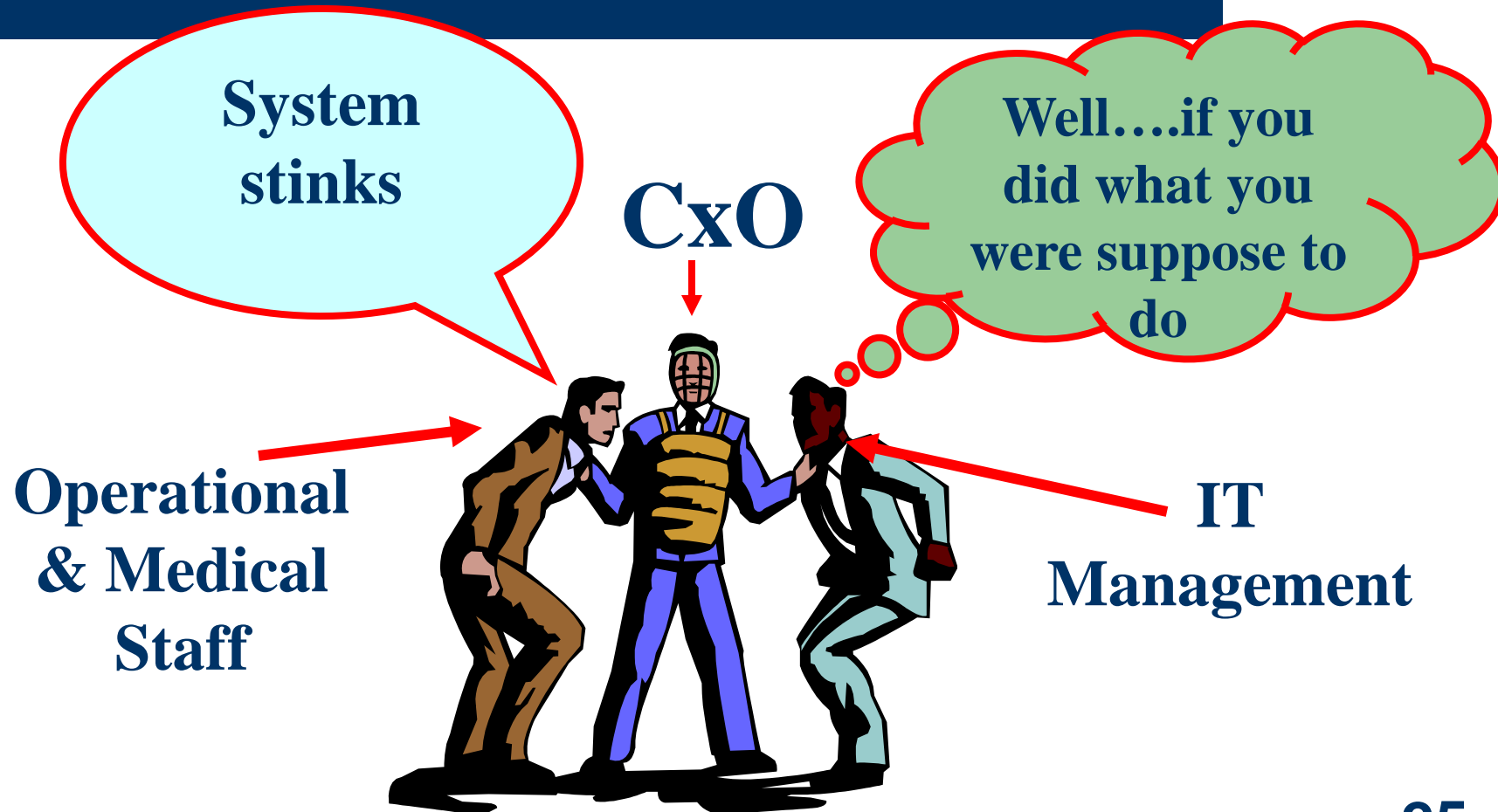
# Process.....process.....process.....

- **Make sure that nursing has:**
  - **been involved with process development**
  - **agrees, buys-in and understands process**
  - **is educated and well-versed on the process**

.....**if not**



# Noncompliance results in.....



## Other barriers...

- **Device availability**

Types: netbooks, rovers,  
tablets

- **Automation of Workflow**

*Florence Nightingale*

