Leveraging Technology for Nursing Handoffs

Presented to

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By

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Northwestern Memorial® Hospital

This project was approved by the Institutional Review Board of Northwestern University.

The authors declare that they have no vested interest in any product or company referenced in this presentation.

Agenda

- Introduction to Northwestern Memorial Hospital
- Background
- Pre-implementation Findings
- Electronic SBAR Design and Implementation
- Post-pilot Findings
- Conclusions

Northwestern Memorial Hospital

Northwestern Memorial Hospital

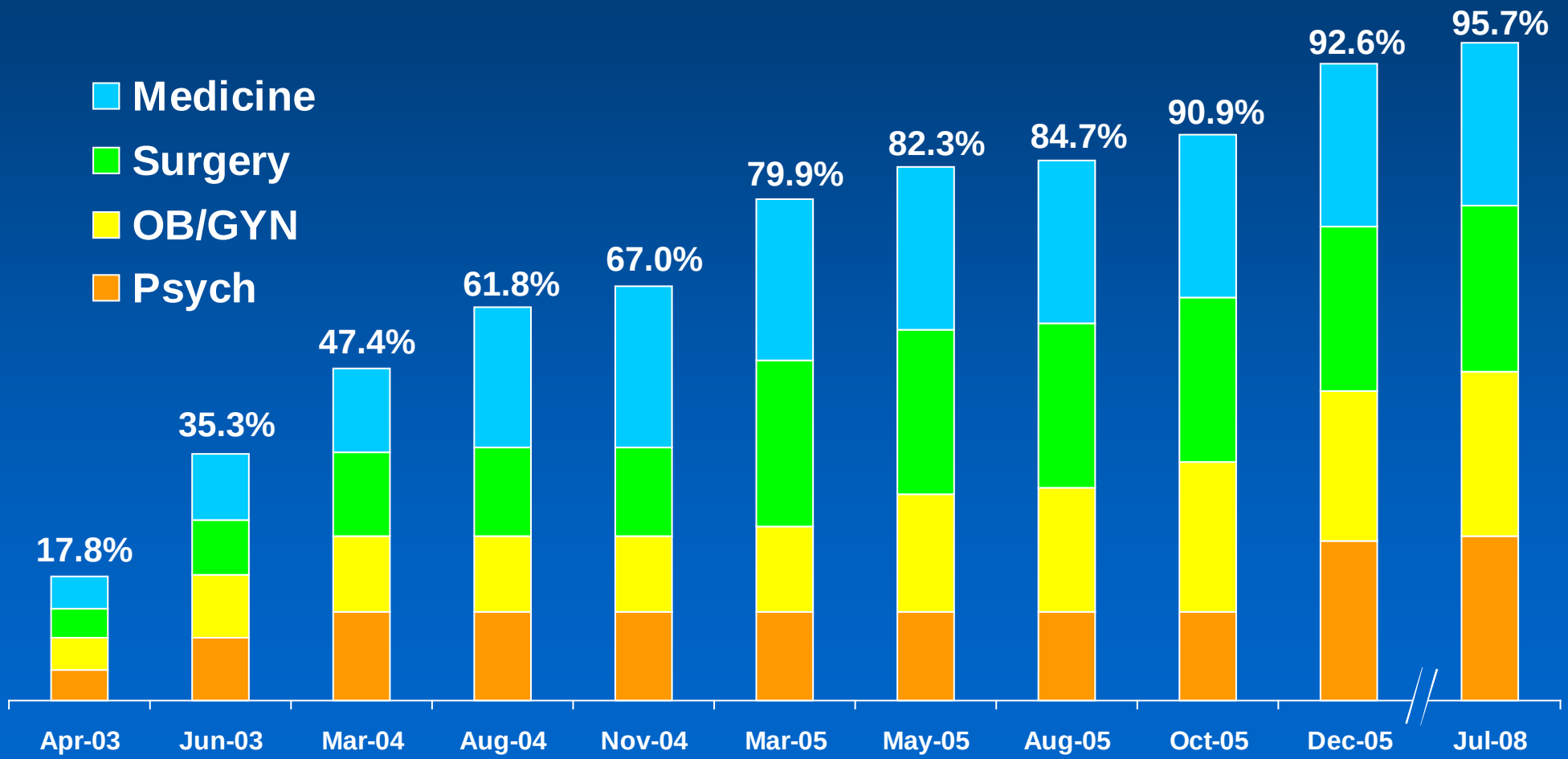
- Mission: “Academic Medical Center Where the Patient Comes First”
- Strategic Goals: Best Patient Experience, Best People, Exceptional Financial Performance
- Primary Teaching Affiliate of Northwestern University’s Feinberg School of Medicine (>500 Residents / 125 Fellows)
- RNs 1000

State of the Art Facilities

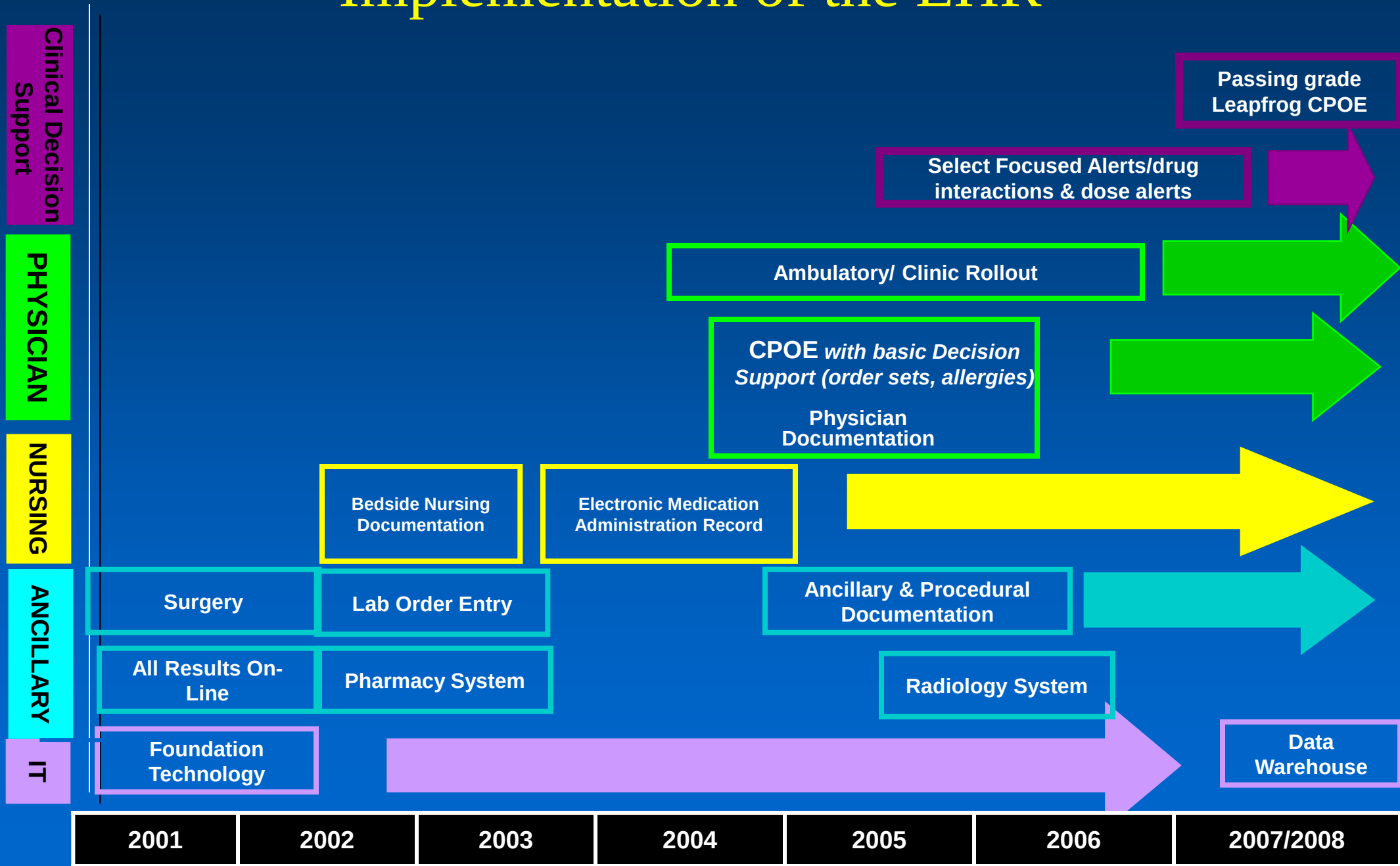
- **$580 Million** Redevelopment Project
- **3 Million square feet** covering one city block
- High Tech – **"Most Wired"**
- **Level I** trauma networks and
  Level III neonatal intensive care unit
  - 9000+ deliveries

Total Beds:	744
Total Admissions:	43,312
Total Outpatient Visits:	438,979
Total Outpatient Clinics:	13
ED Visits:	73,881
Average Daily Census:	596

NMH Medical Record:
96% of the Inpatient Health Record is Electronic



Implementation of the EHR



Background

Maximizing the Quality, Safety, and Efficiency of Handoffs

- Handoffs present a known threat to patient safety
- Transfer of accurate information is fundamental to provision of safe and effective care
- Higher levels of nursing time per patient-day are associated with better patient outcomes*

*Needleman, J, Buerhaus P, Mattke S, et al. (2002). Nurse-staffing levels and the quality of care in hospitals. *New England Journal of Medicine, 346,* 1715-1722.

Elements of an Effective Handoff

- Face-to-face verbal report with written / paper summary
- Availability of current, up-to-date information
- Information given in predictable order
- Limited interruptions
- Unambiguous transfer of responsibility

Patterson ES, Roth EM. Woods DD, Chow R, Gomes JO. (2004). Handoff strategies in settings with high consequences for failure. *Int. Jour. Qual. Health Care*, *16*, 125-132.

Identified Handoff Failures

- Content omissions / missing information
- Lack of current information
- Failure-prone processes
  - Double handoffs
  - Not face-to-face
  - Illegible notes

Arora V, Johnson J, Lovinger D, et al. (2005). Communication failures in patient sign-out and suggestions for improvement. *Quality & Safety in Health Care*, *14*, 401-407.

Nursing Efficiency

- Little attention to date on nursing change-of-shift report practices, but . . .
- Time and motion study: nursing documentation accounted for 27 per cent of total shift time*
- Maryland Nursing Workforce Commission survey: nurses estimate that they spend 25 to 50 percent of time on documentation**
- 63 percent reported that they often or very often were kept from spending as much time with patients as needed**

*Hendrich A, Chow M, Skierczynski B, Lu Z. (2008). A 36-hospital time and motion study: How do medical-surgical nurses spend their time? *The Permanente Journal*, *12*(3), 25-34.

**Maryland Nursing Workforce Commission. (2007). Challenges and Opportunities in Documentation of the Nursing Care of Patients.

Physician Sign-out Reports

- Preliminary advances in electronic sign-out sheets from medicine
- UWCores system at the University of Washington
- Adaptation at NMH

Physician Sign Out

Northwestern Memorial® Hospital

PHYSICIAN SIGNOUT

Service List:

Page: 1
Printed: 06/12/07 16:21
Run By: NISMITH
Script: LP_PM_PHYSICIAN_ROUNDS

LOCATION: Feinberg 16 E

[redacted] Admit Date: [redacted] Days) MRN: [redacted] DOB: [redacted] Y) Sex: [redacted]

ROOM/BED: [redacted] ATT: MULCAHY, MARY F. PCP: MULCAHY, MARY F. [ph: 707-0894]

Allergies: No Known Allergies

Scheduled		PRN
Dexamethasone Tab 4 mg PO Daily (8 AM)	Oxycodone HCl Tab ER 50 mg PO BID	Acetaminophen Tab 650 mg PO Q 6 Hours PRN (Pain/Fever)
Docusate Sodium/Sennosides Tab 2 Tab PO BID	Tolterodine Tartrate Tab 2 mg PO BID	Naloxone HCl Inj 200 mcg IV Push As Needed PRN (CNS/Respiratory De
Lactulose Oral Soln 30 mL PO Daily	Warfarin Sodium Tab 1 mg PO Daily (8 AM)	Oxycodone HCl Tab 10 mg PO Q 1 Hour PRN (Pain)
	pregabalin 100 mg PO TID	

Code Status

Patient does NOT have active DNR order

CBC/Chem (most recent within 30 days)

137	102	18	91
4.0	28	0.7	

LAST CHEM: 06/12 04:00

	10.5 L		306
9.0			
	30.4 L		

LAST CBC: 06/12 04:00

Vitals (last 3 within 24 hours)

Date/Time	TempF	BP	Pulse	RR	SaO2	FiO2
06/12 14:00	96.3	96/49	87	20	93	
06/12 07:04	97.5	95/57	77	20	96	
06/11 22:49						

24 Hr Tmax: 97.8

Admit Weight: 61 kg 06/11 07:11
Current Weight: 58 kg 06/03 22:05

Additional Labs

Date/Time	Type	Val
06/03 19:41	INR	3.1 H
06/03 19:41	PTT	56.0 H
06/03 19:41	CA	8.9
--------	MG	--
06/04 03:46	PHOS	4.3

Written Notes

Key Factors for Consideration

- Failures in communication between healthcare personnel have been clearly implicated as a threat to patient safety
- Reporting tools are fundamental to an effective framework for clinician communication
- Tools must reflect key patient information, be legible, relevant, accurate, and up to date

Leveraging existing electronic clinical information can streamline and simplify workflow processes and generate intended results.

Pre-Implementation Findings

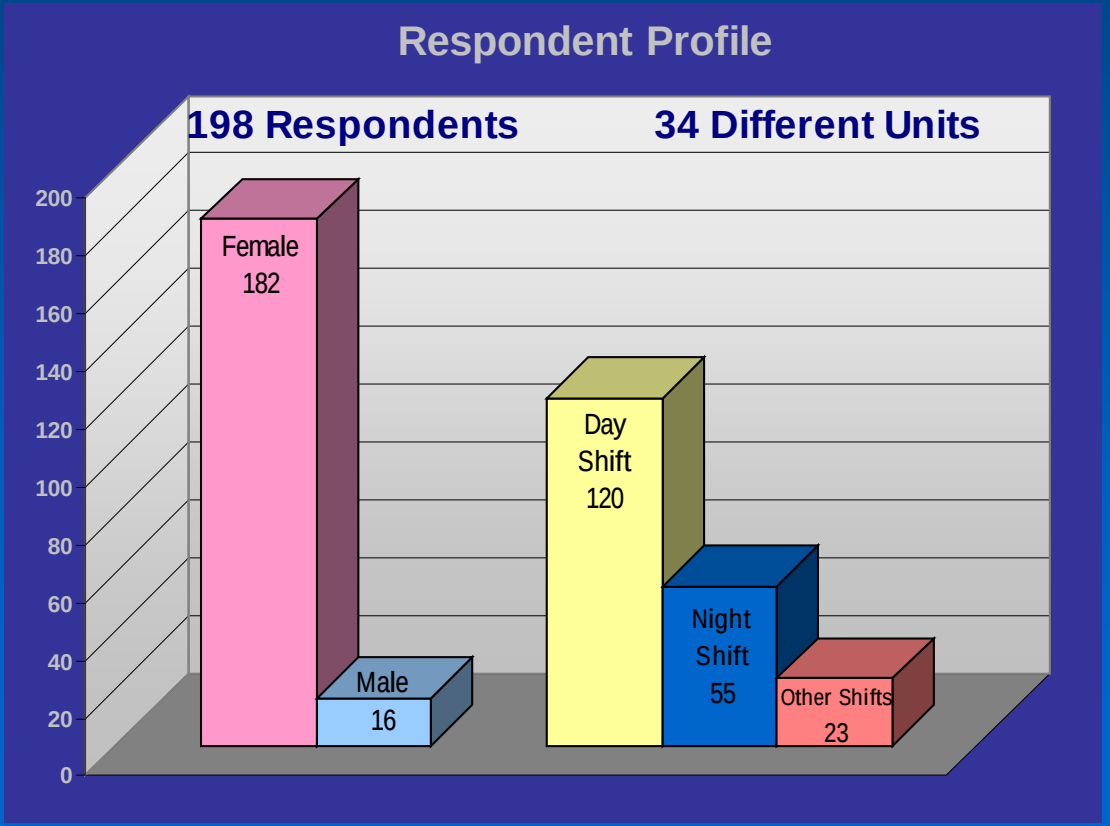
Baseline Nursing Handoff Practices at NMH

- Nursing shift report involved transcription of information from the electronic medical record to paper
- Unit-created paper forms in SBAR format in place, but use varied
- Broad identification of a need for an electronic standardized report form

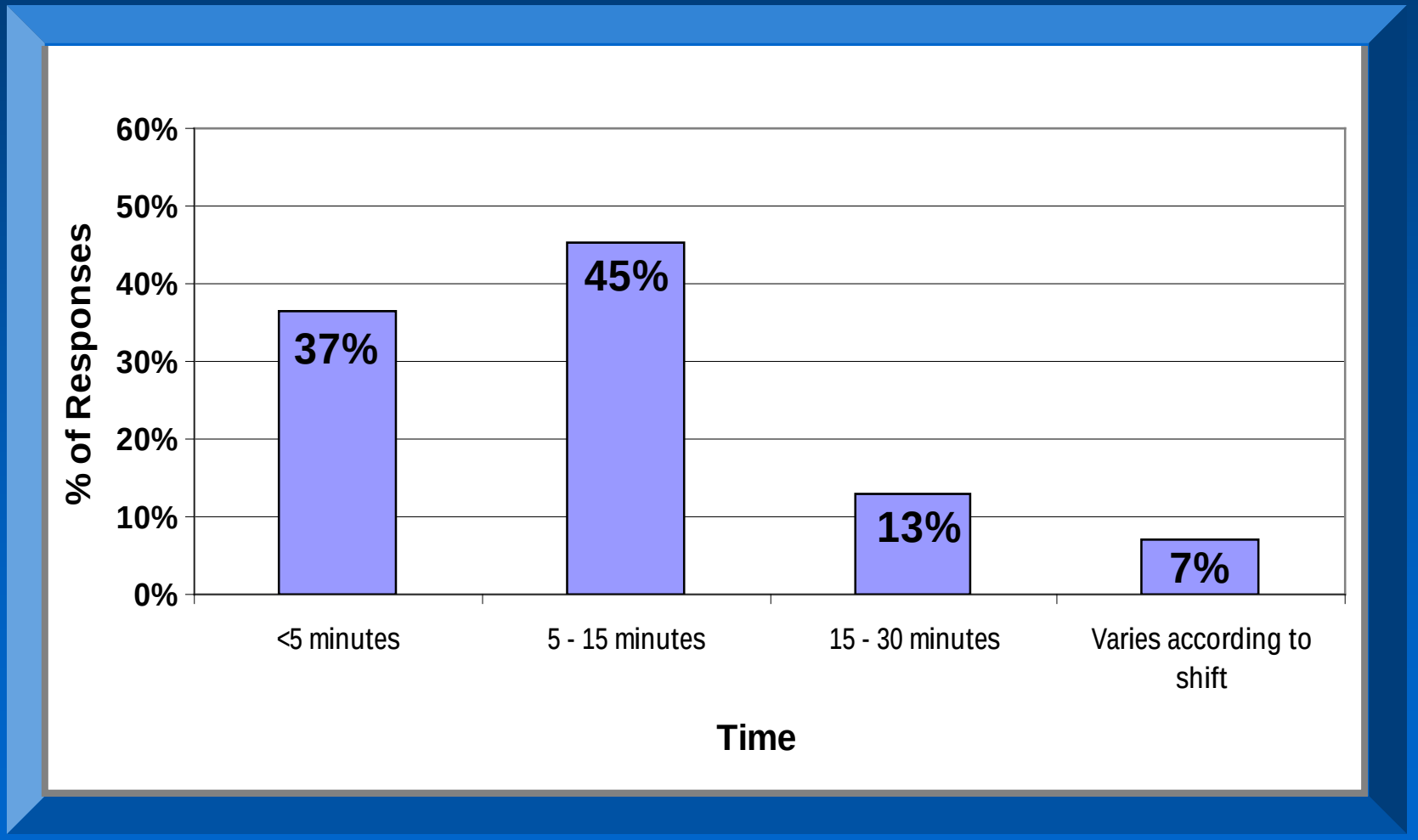
Pre-Implementation Nursing Report Survey

To obtain nurses' perceptions of the quality, safety, and efficiency of change of shift reporting

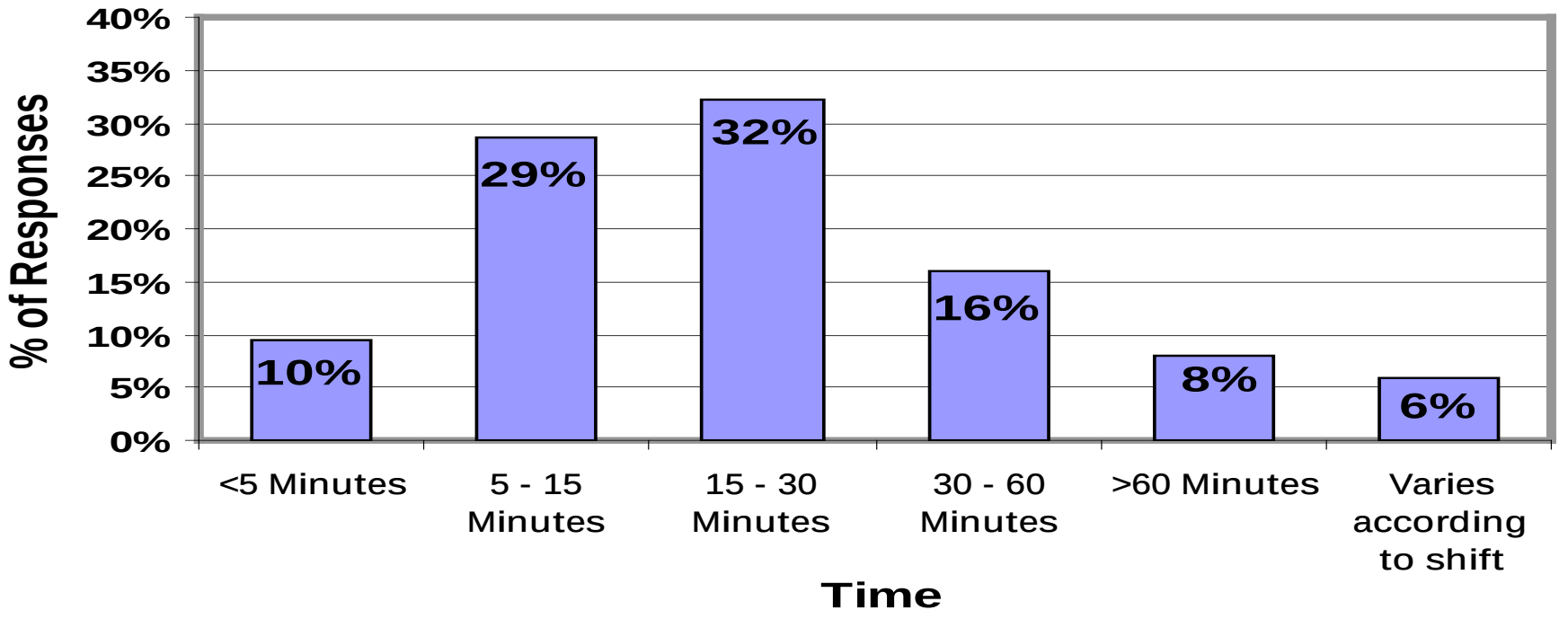
- **Administered online in September 2007**
- **198 of 1000 RNs responded (19.8%)**
- **Wide range of clinical units from all shifts**



Time to Prepare Report on Each Patient

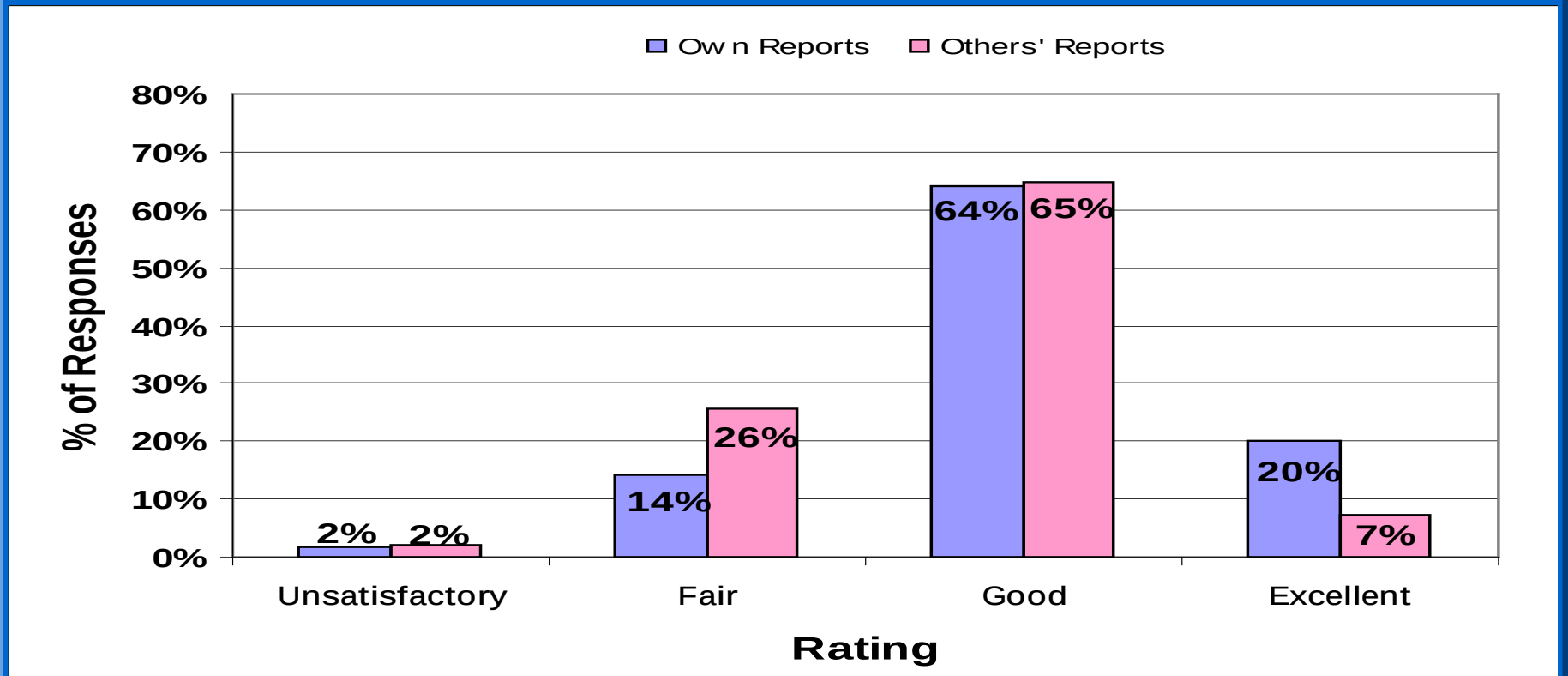


Total Time to Prepare Report for All Patients



Perceived Report Quality

20% rate their own reports as excellent, but only 7% rate the reports they receive as excellent!



Can you think of a time that something bad happened or almost happened because you did not receive a complete or accurate report?

30% responded “yes”

- Medication/procedure given late or not done
  - Repeat electrolyte levels not done after administering potassium
- Medication/procedure not documented
  - The previous RN had not charted a particular medication, so could not determine if it had been administered
  - Patient was supposed to receive coumadin but order not signed off
- Information missing from report
  - DNR status, DVT information, previous fall, patient confusion, patient isolation, complicated surgery (close observation required), vital signs

What is the most challenging thing about current report practices?

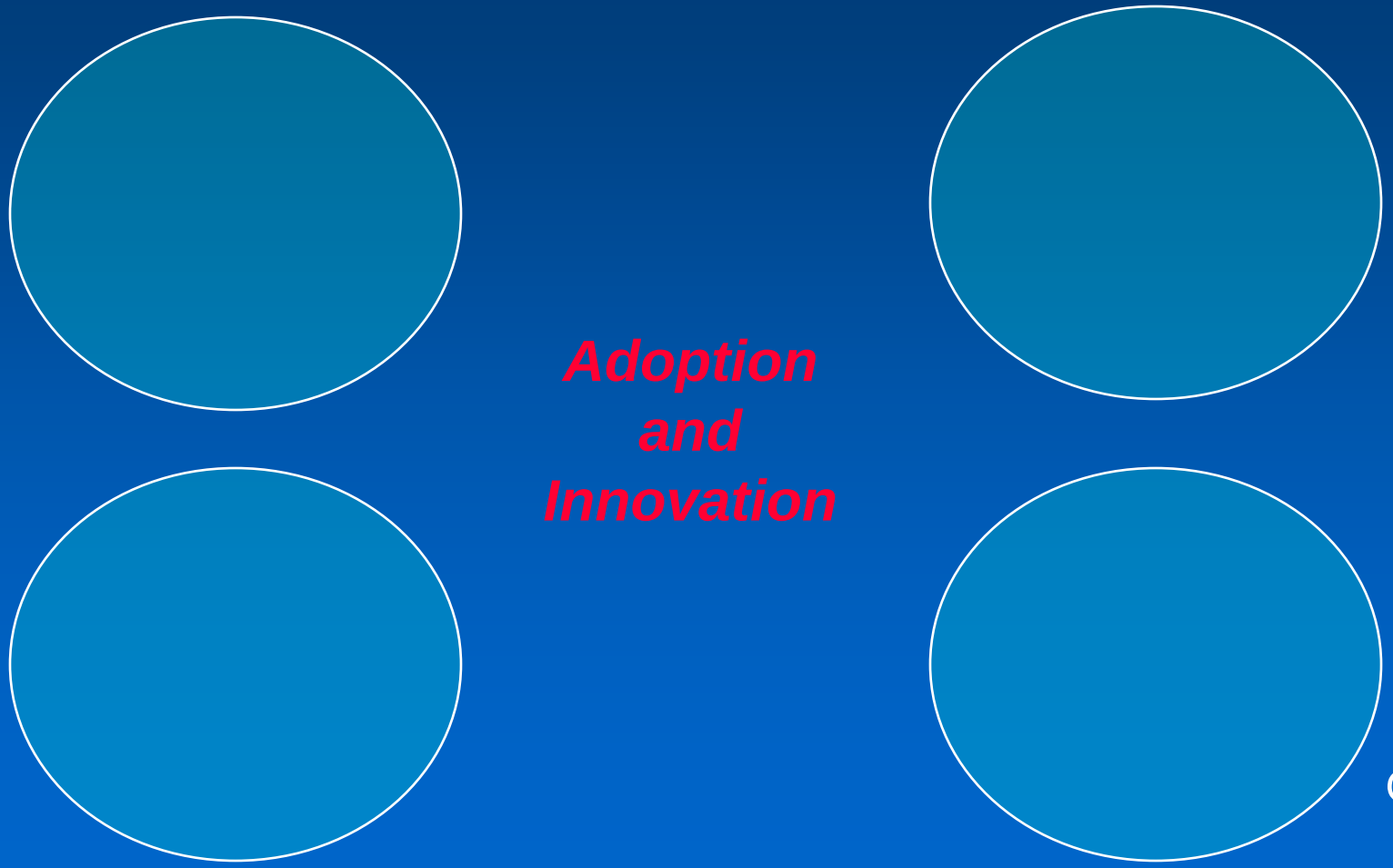
- Completing report
  - Being concise
  - Lack of time to prepare report and give handoff
  - Including relevant information only
- Receiving report
  - Inaccurate and missing information
  - Reading handwriting
- SBAR form
  - Not being able to use PowerChart to download information
- Lack of consistency
  - Discrepancies between report sheet and orders

Do you have suggestions for improving the report process?

- Computerize the form
  - Have a computer-generated sheet on PowerChart that populates with necessary information that does not need to be written out each day (e.g., patient demographics, history, allergies), with space to type in additional information and that can be updated throughout shift for next shift
- Completing the SBAR form and handoff
  - Be specific and concise during handoff
  - Standardize reporting process and form across the hospital

Electronic SBAR Design and Implementation

Multiple Levers Create a Powerful Platform for EHR Adoption



Leadership & Organization

- Nursing leadership initiative to standardized change-of-shift report, 2006
  - Improvement initiative using the SBAR template (Situation, Background, Assessment, Recommendation)
- CNE charged nursing informatics committee to create electronically generated SBAR form
- Convened workgroup – June 2007
  - RN representatives from all inpatient care areas, Information Technology, patient safety, and informatics
  - Charged group with design, development, and implementation of electronic SBAR

SBAR Automation

Overview

- **Linkage to BPE/BP/Finance:** Best People and Best Patient Experience
- **Problem Statement:** Nursing report shift to shift currently includes transcription of information from PowerChart to paper which is time consuming and risk prone due to the potential for transcription errors and incomplete information. As well, there is lack of standardization nurse to nurse and unit to unit for report information transfer.
- **Goal/Benefit:** Improved accuracy of information used for nursing report by developing an electronic report that pulls electronically recorded information into a template that can be printed. Identification of core patient information (based on specialty) for patient status, care delivery, and recommendations will facilitate standardization of the report process.
- **Scope:** Develop electronic SBARs for the following specialties: OB/Gyne, Neonatal Intensive Care Unit, ICUs, Med/Surg, and Psychiatry
- **System Capabilities/Deliverables:** Development of a report that pulls specified patient information from the medical record, allows the addition of free text content either electronically or written, and can be printed and used for nurse to nurse report.
- **Resources Required:** IT, Nursing Technology & Informatics Committee, identified task force members from across nursing specialties, quality/clinical informatics, patient safety

Key Metric(s): baseline

Report times: Preparation 5-15 mins/ patient

Quality of report: Nurse recollects time that something bad happened or almost happened because of not receiving complete or accurate report - 31% yes

% Units using electronic SBAR for report: 0%

Milestones:

	Description	Date (mo/yr)
#1	Report design	July 07 - February 08
#2	Baseline metric measurement	September 07
#3	Pilot implementation 12E Feinberg	March 8, 2008
#4	Med-Surg Roll out – tbd	
#5	Other specialty report development and roll out - tbd	

Sponsor: Julie Garrett **Project/Process Owner:** K. Leonard/C. Cabansag **Improvement Leader:** S. Kitt

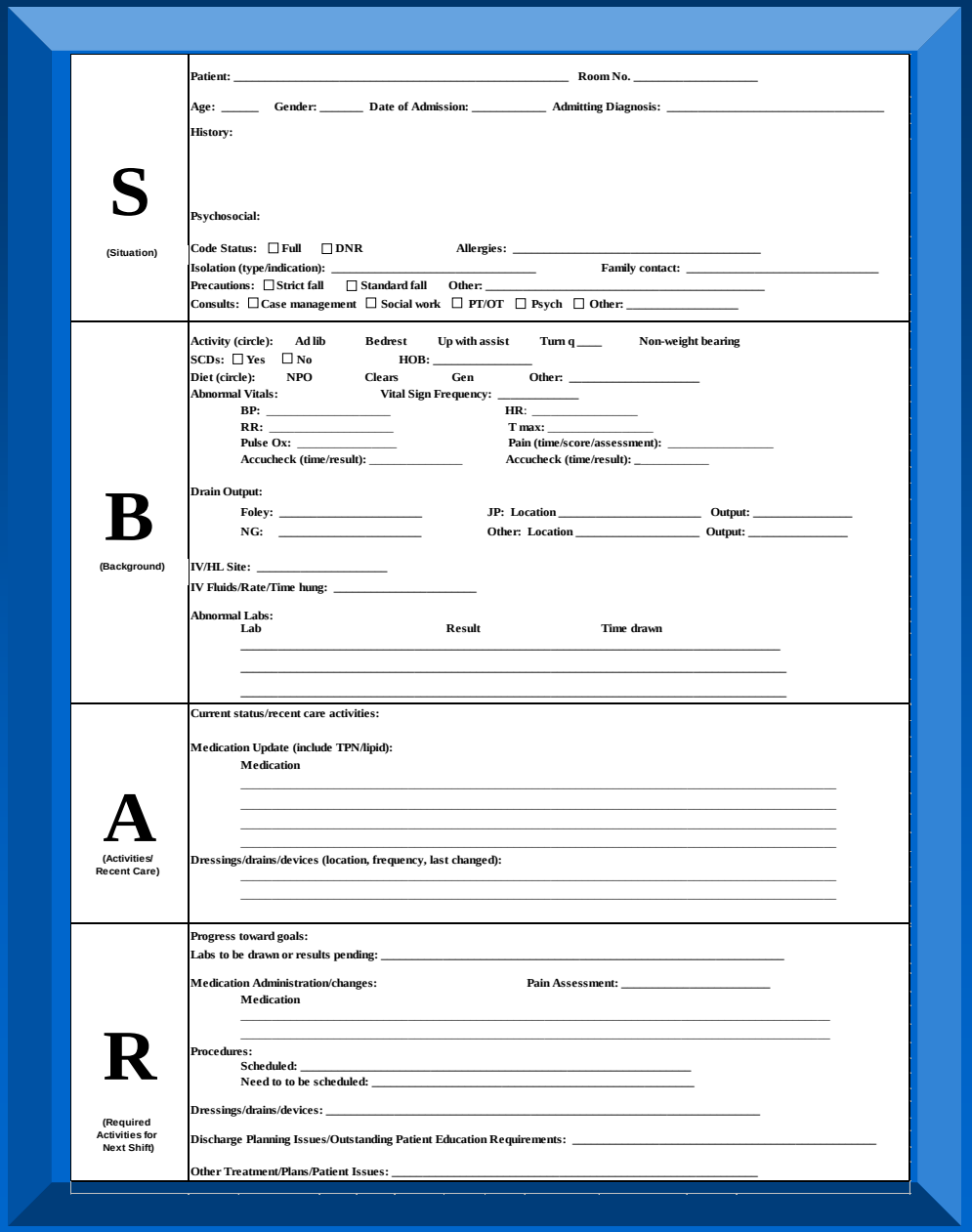
Design

- **Review of standard inpatient SBAR content**
  - Collected all specialty versions of paper SBAR
  - Found variability in content
  - Variability in format (3 per page vs. one)
  - Trialed MD sign-out as a potential solution

Design

- **Design decisions**
  - SBAR format in landscape orientation
  - Agreement to “pull in” as much of desired EMR content as possible
  - Identified minimal standard information (not sub-specialty based)
  - Allow free text capability (either electronically or on paper)
  - Accommodate need for paper version workflow
  - 3 patients/page
  - MD sign-out not sufficient
- **Mock-up**

Paper Nursing Report Tool: SBAR Format



S (Situation)

Patient: _____ Room No. _____

Age: _____ Gender: _____ Date of Admission: _____ Admitting Diagnosis: _____

History:

Psychosocial:

Code Status: ☐ Full ☐ DNR Allergies: _____

Isolation (type/indication): _____ Family contact: _____

Precautions: ☐ Strict fall ☐ Standard fall Other: _____

Consults: ☐ Case management ☐ Social work ☐ PT/OT ☐ Psych ☐ Other: _____

B (Background)

Activity (circle): Ad lib Bedrest Up with assist Turn q____ Non-weight bearing

SCDs: ☐ Yes ☐ No HOB: _____

Diet (circle): NPO Clears Gen Other: _____

Abnormal Vitals: Vital Sign Frequency: _____

BP: _____ HR: _____

RR: _____ T max: _____

Pulse Ox: _____ Pain (time/score/assessment): _____

Accucheck (time/result): _____ Accucheck (time/result): _____

Drain Output:

Foley: _____ JP: Location _____ Output: _____

NG: _____ Other: Location _____ Output: _____

IV/HL Site: _____

IV Fluids/Rate/Time hung: _____

Abnormal Labs:

Lab Result Time drawn

_____

_____

_____

A (Activities/ Recent Care)

Current status/recent care activities:

Medication Update (include TPN/lipid):

Medication

_____

_____

_____

_____

Dressings/drains/devices (location, frequency, last changed):

_____

_____

R (Required Activities for Next Shift)

Progress toward goals:

Labs to be drawn or results pending: _____

Medication Administration/changes: Pain Assessment: _____

Medication

_____

_____

Procedures:

Scheduled: _____

Need to to be scheduled: _____

Dressings/drains/devices: _____

Discharge Planning Issues/Outstanding Patient Education Requirements: _____

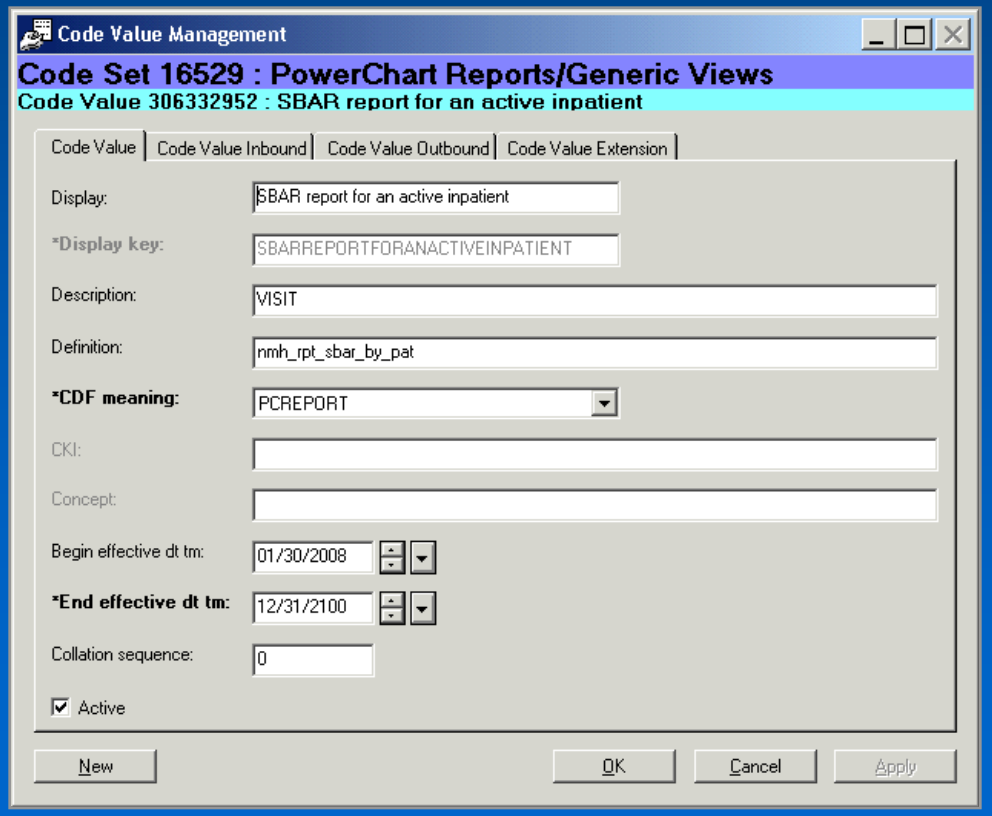
Other Treatment/Plans/Patient Issues: _____

Design Build

- Iterative (to say the least)
  - Once “wish list” defined, feasibility determined
  - 3 patients per page (not feasible)
  - Landscape orientation for printing (not feasible)
  - Change in design based on results of coding (pending orders)
- Coding done in Cerner Command Language (CCL) for script
- Discern Visual Developer for formatting
- Data pulled from person table, results, orders and form documentation

Cerner Technology

- Cerner “Report Launched From PowerChart” functionality used
  - Add row to code set 16529 with script name, pc report as CDF meaning and visit as Description.
  - Set preferences at position level in Pref Maint to display report in chart.
  - Cycle servers 52, 54, 79 and 81 (or as appropriate for your site).



Nursing SBAR (Situation)

Northwestern Memorial Hospital

Nursing SBAR

Printed: 04/04/2008 08:50
Redheendran, Anjana RN

SITUATION

PATIENT, NAME **DOB:** 01/01/1976 **Sex:** Male **Room:** F/12E /1208
MRN: 111111111 **Admit Date:** 03/06/2008 **LOS:** 29days
Service: GENERAL SURGERY **Weight:** 154lbs on 03/31/2008 15:36
Attending Physician: LIEBOVITZ, DAVID

Allergies:	No Known Allergies				
Patient Risk:-->	Fall: Strict	Braden:	13 Moderate Risk	Isolation	Gloves/Gown
Consults:	IR Consultation* 03/28/08 / Consult Nutrition Support team				
Problems:	MRSA/VRE .... (more..)				

Nursing SBAR (Background)

BACKGROUND

Reason for Hospitalization: 3/6 GSW x 16 to chest /abd/head and to OR for ICP monitor placement.

Past Medical History: asthma, bronchitis, drug abuse

Activity: Up to chair

I & O 8 Hour Shift Total (mL)

Intake: 1000

Output: 576

Urine: 575 **NG Tube:** 0 **Others:** 1

R DL PICC change 4/7; foley cath and diaper in place

Diet Order: 4/2/2008 15:17 Tube Feedings - Intermittent

NPO Order: 3/12/2008 10:39 NPO

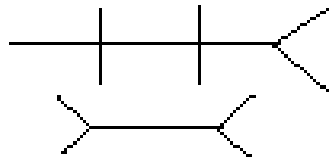
24 Hrs T Max: 99.8

Vital Signs: Q 4hrs **Chemsticks:** TID with meals and HS

Temp F	BP	Pulse	RR	SaO2	FIO2	Pain	Disoriented to
99.8 04/04 06:48	158/99 04/04 06:49	105 04/04 06:50	18 04/04 06:51	100 04/04 06:52	40 04/04 06:53	0 04/04 06:54	Unable to Assess 04/04 06:55
99	140/93	97	18	97	35	0	Unable to Assess

CBC/Chem Within 24 Hours:

LAST CHEM: 04/03 04:00



LAST CBC: 04/03 04:00

Additional Labs:

Date/Time	Type	Result
3/4/2008 3:16	Magnesium	2.6

Last Medication Reconcilliation done : (date/time) and by:

PRN medications administered in the last 8 hrs:	Unscheduled medications not yet given	Continuous Infusions
acetaminophen-hydrocodone 04/03/2008 Per Tube		

Nursing SBAR
(Assessment & Recommendations)

ASSESSMENT & RECOMMENENDATION (Goals)

Patient Assessment / IV Site /Would Documentation Freetext:

Vitals Q4 hrs

Active Restraint Order: 04/03/2008 09:35

Pain Documentation Freetext

Lt Shoulder, Chest, Rt forearm with 4x4

Pending Labs & Procedures Freetext:

Radiology IR Consultation* 03/28/2008 09:35 -- Ordered

Discharge Planning/Patient Education Issues Freetext

Case Management Note: Discharge Recommendations: Transfer to Acute Inpatient Rehab

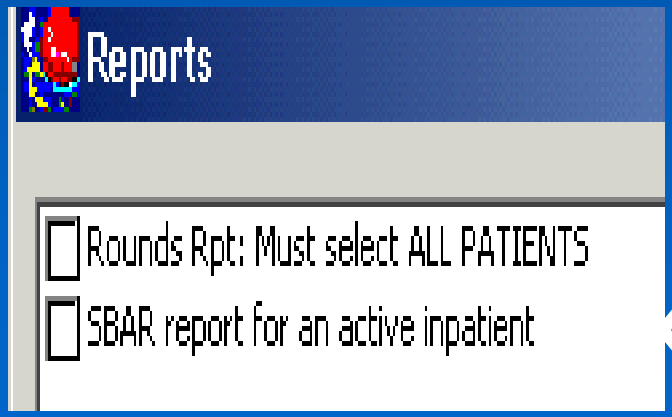
Deployment & Optimization

- Finalized version piloted on one unit
  (Telemetry & Surgical Oncology)
- Training with job aide document
- Coaching support at change of shift
- Workflow process: 12 East, General Surgery (Pilot Unit)
  - Off going shift creates or updates existing form
  - Each patient SBAR is printed individually and organized in preparation for the next shift
  - Oncoming shift reviews the SBAR and utilizes during walking rounds
  - *Per nurse preference, the electronic updates are done throughout the shift or at the end of the shift.

Printing the SBAR

Three step process to modify report and print

Ad hoc chart



SBAR Additions:

History & Psychosocial Family Issues:	7/6 admit thru ED with appe, right to OR for open appe, to 12 E at 1430.
Other Input & Outputs:	LR @ 110cchr in L AC. NPO. Foley. PCA dil 0.2 Q15 min. Still NPO Has Foley- draining good amount
Patient Assessment:	A/O x3, pain well controlled by PCA.Using her IS as ordered
Wound Documentation:	midline gauze drsg, clean and intact
Pending Labs & Procedures:	labs done 07/07
Outstanding Patient & Family Education:	nice and pleasant, to ambulate today, Up in chair since 0630
Discharge Planning Issues:	potentially dc today

Deployment & Optimization

- 4 month pilot (tweaks occurring along the way)
- Overall were very satisfied with tool, but….
- Outstanding issues identified
  - Not easy to read
  - Fields weren't static making it difficult to find information for each patient
- Decision to re-code to address above issues
- Final version just being finalized for implementation (July 08)

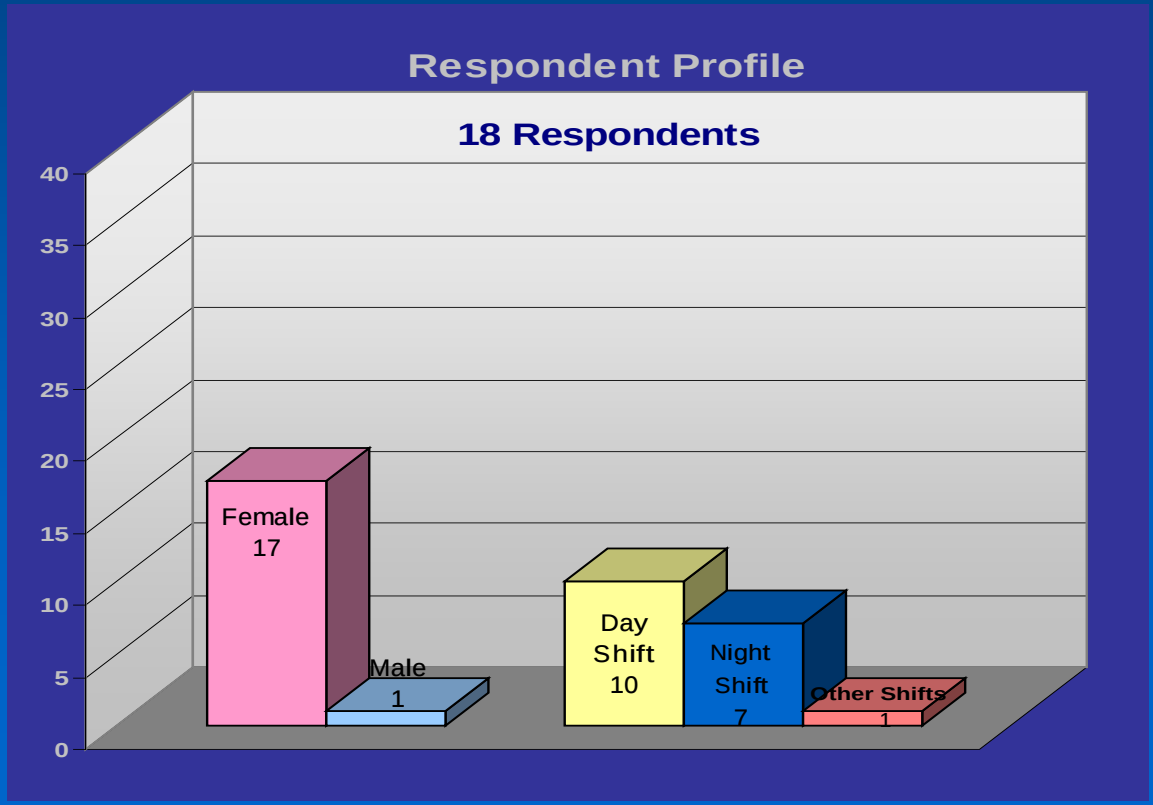
Don't let perfection get in the way of progress, BUT, if fundamental issues exist, they must be fixed, despite timeline constraints!!

Post-Pilot Findings

Post Implementation Nursing Report Survey

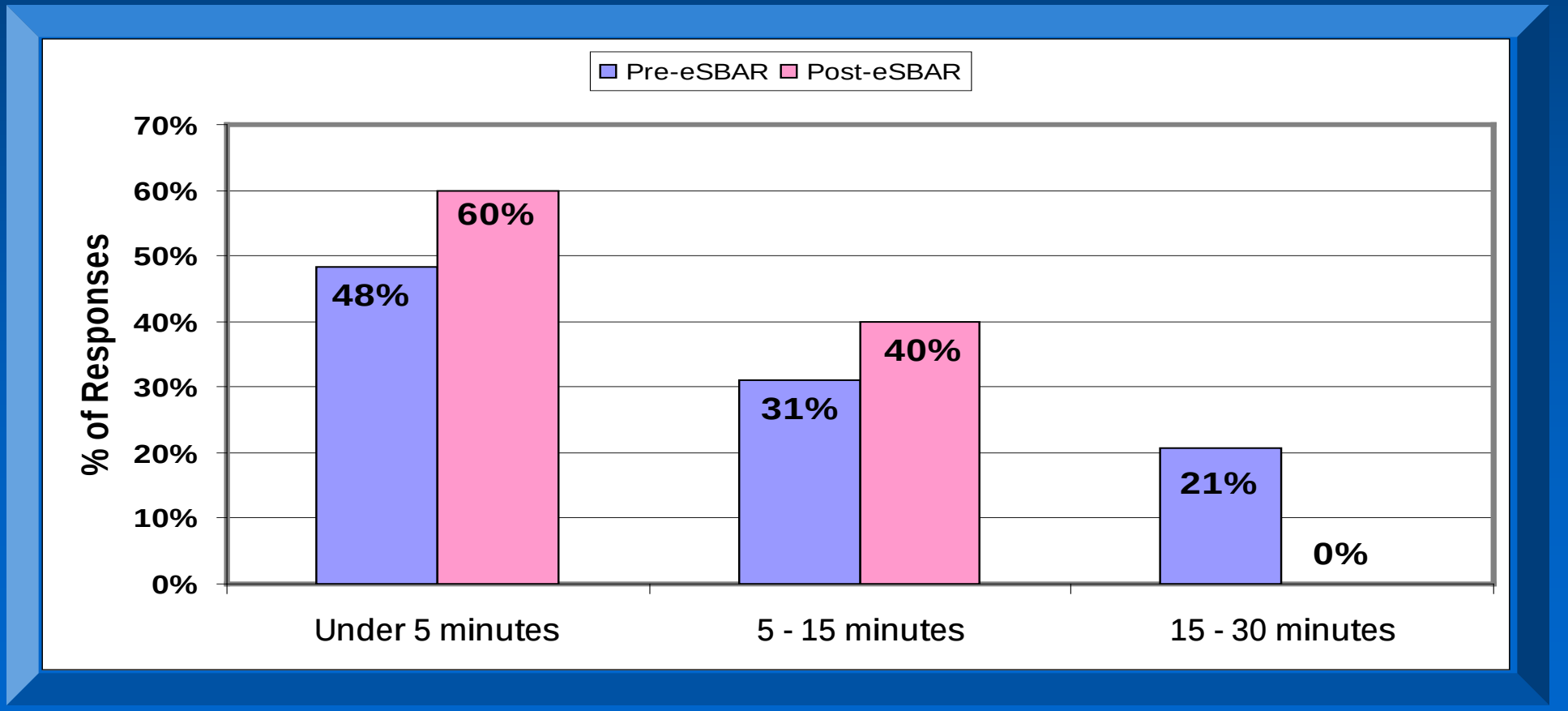
To obtain nurses' perceptions of the quality, safety, and efficiency of change of shift reporting

- **Administered online in July 2008**
- **18 of 40 RNs responded (45%)**
- **32 from unit participated in pre-implementation survey**



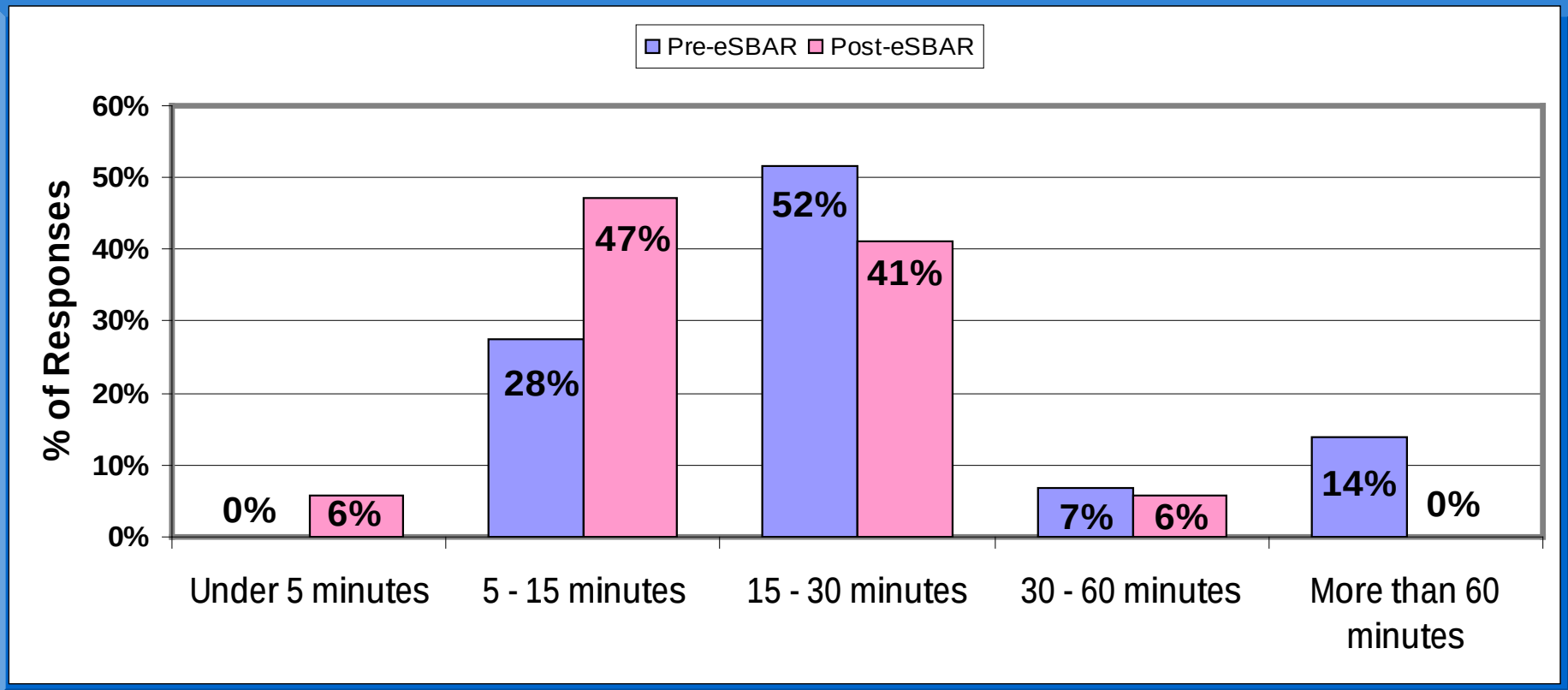
How long do you spend preparing report on each patient?

100% of report preparation takes 15 minutes or less



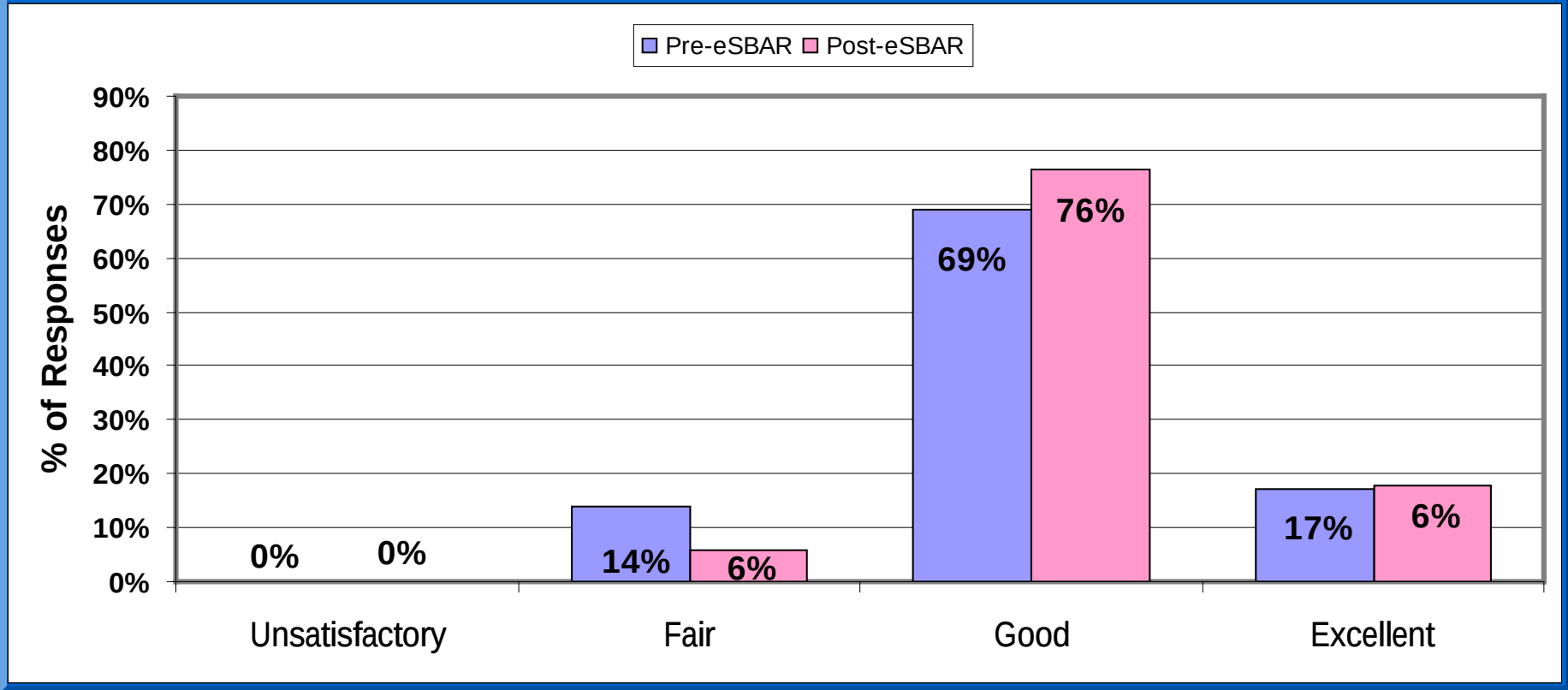
How long do you spend preparing report in total?

Largest shift to the 5-15 minute timeframe



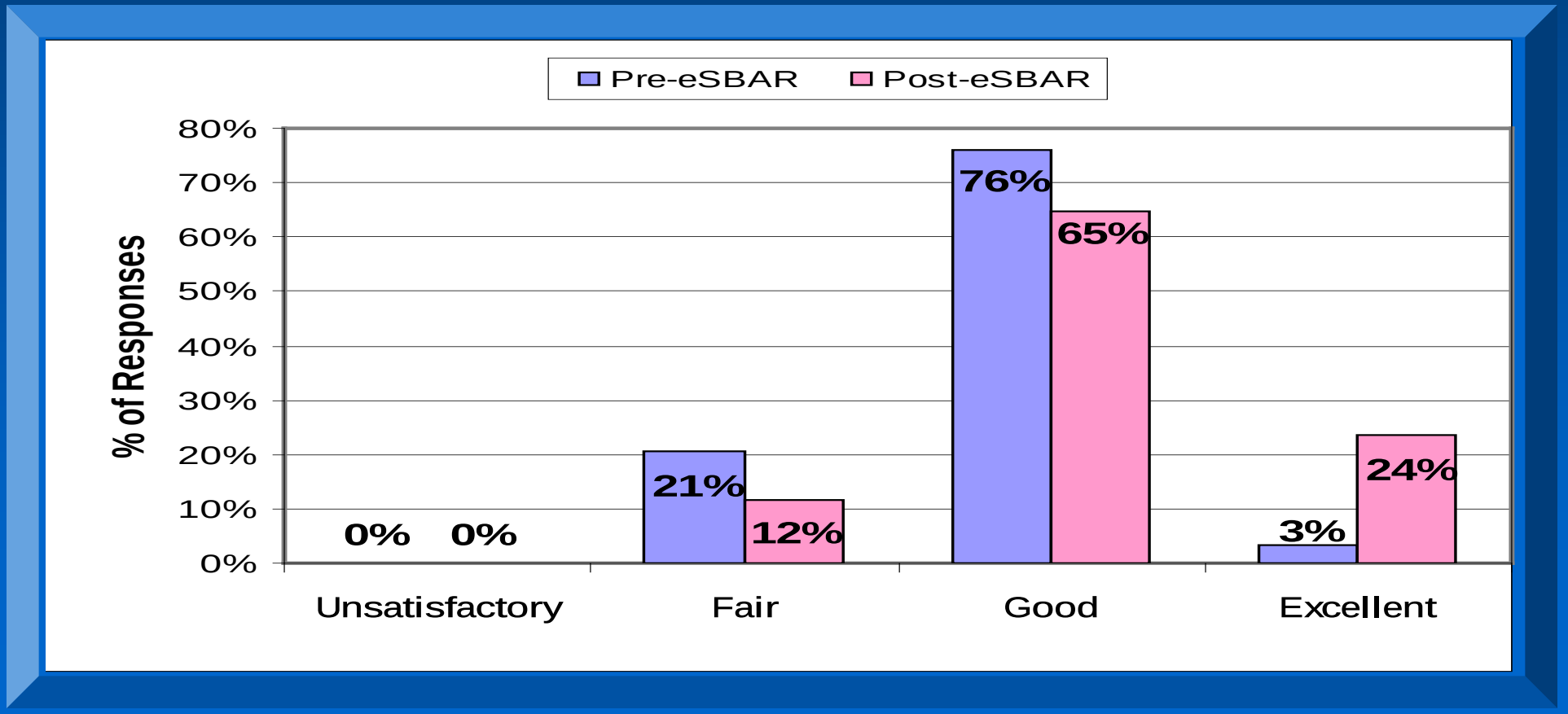
Do you feel your reports are…?

Slight improvement in perception of report quality



How would you rate the quality of the report you receive?

"Excellent" ratings increased 8-fold



Can you think of a time that something bad happened or almost happened because you did not receive a complete or accurate report?

6.9% responded “yes”

- My patient had a blood sugar of 35 in early am, it didn’t pull up on the SBAR and was not reported to me.
- Previous nurse didn’t update report sheet
- Patient had no IV access and RN didn’t explain situation, the patient really needed IV access

What is the most challenging thing about current report practices?

- Ensuring important patient information highlighted orally for receiving nurse
- Chemstick orders don’t show up
- Getting accustomed to the form
- Time to develop SBAR for new patients
- Waiting to print report until current days lab results are posted

Do you have suggestions for improving the report process?

- Bigger sections for free texting
- Awkward to read, not easy to locate information
  (this will be fixed with the changes to be implemented).
- Nope, I love it!

Conclusions

- Electronic report format is the way to go
- Design that is incorporated into workflow is essential
- Stakeholder lead in design is imperative
- Can be used for situations beyond scope of charter
  - Downtime communication - print along with MARS
  - Patient transfers
- Future implementation and evaluation will be used to continue the improvement process