

# BCMA Multidisciplinary Process Improvement Phase 2: *Post Implementation System Evaluation*



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*University of Maryland SINI Presentation July 22, 2006*



## ***Acknowledgements***





# Objectives

1. Describe the process, structure and outcome for an interdisciplinary post-implementation product and system evaluation.
2. Discuss the development of an educational intervention and measures of educational effectiveness in post-implementation product and system evaluation.
3. Identify how lessons learned can contribute to development of best practices for post-implementation product evaluation and system analysis.



# Overview

- 2004 Miami VA Healthcare Systems decision to improve Bar Code Medication Administration processes
- Purchased and implemented of Mobile Medication Workstations
- Team building and project management
- Measurable improvement in nursing outcomes post intervention
- System design analysis and evaluation





# Process Improvement

## **Phase 1**      **2005**

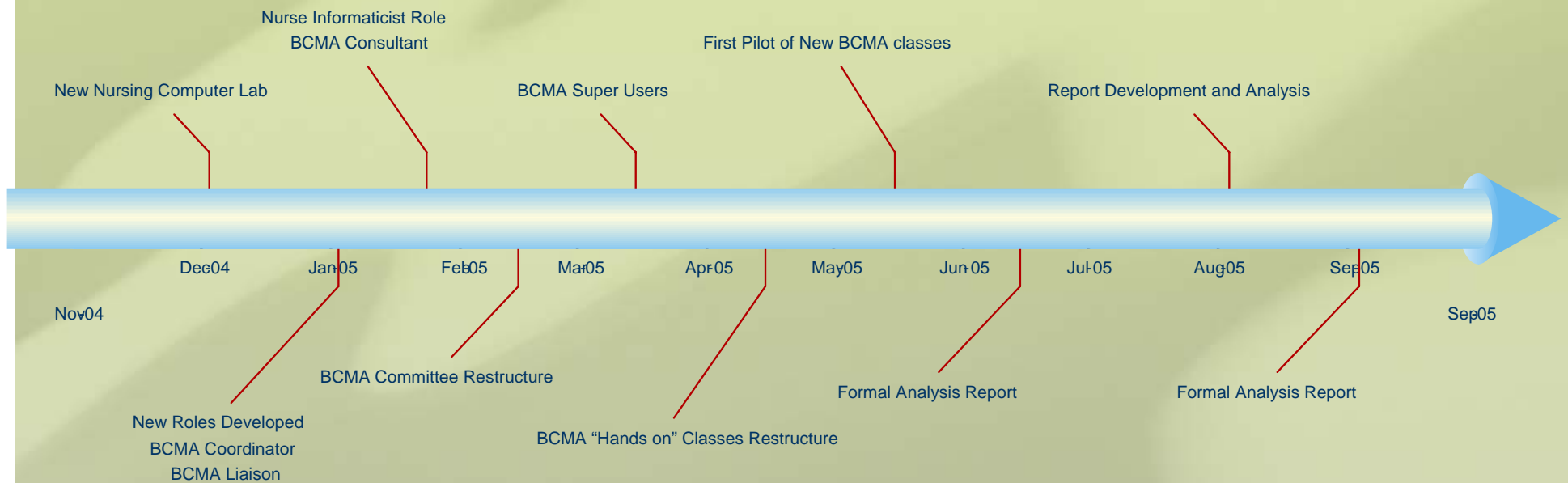
- Build multidisciplinary team
- Implement effective project management principles
- Careful selection of point of care technology
- Assess medication administration workflow
- Assess point of care medication administration technology
- Implement innovations to improve BCMA process

## **Phase 2**      **2006**

- Systematic evaluation newly purchased mobile medication workstations (MMW)
- Continued improvement of BCMA process



# Phase 1 Timeline



TEAMWORK



# BCMA TRIAD

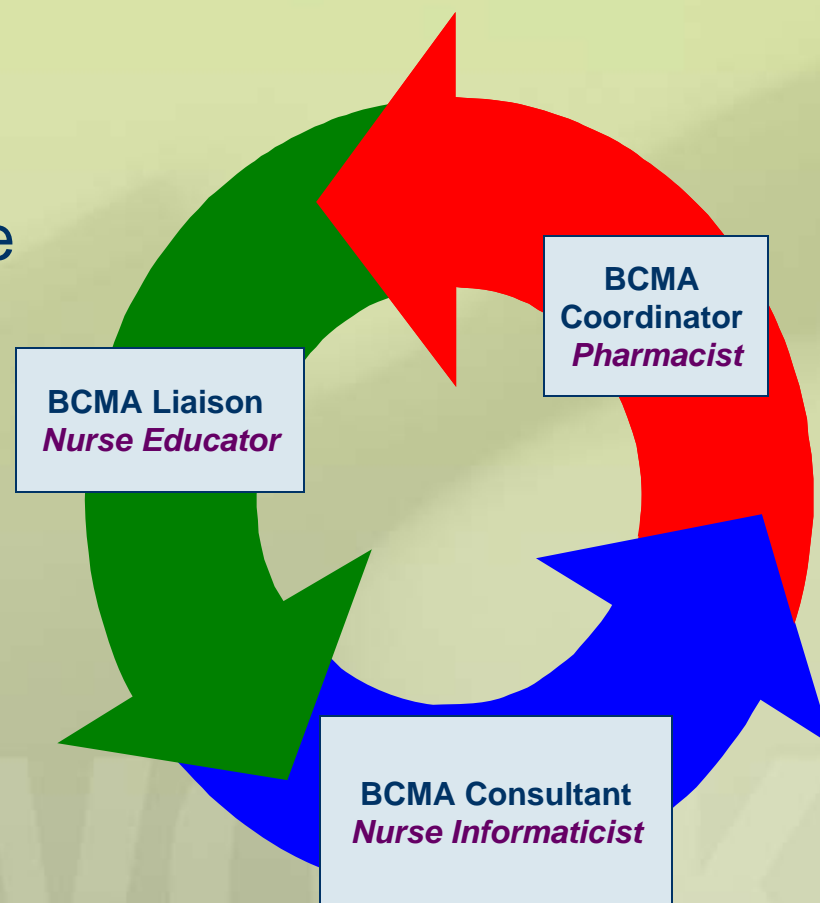
## Miami VA Healthcare System

Department of Veterans Affairs  
Office of Nursing Service

Institutional goals of Nursing Service  
Excellence and Administrative  
service Excellence

- *Magnet & Baldrige Journey*

Interdisciplinary Collaboration





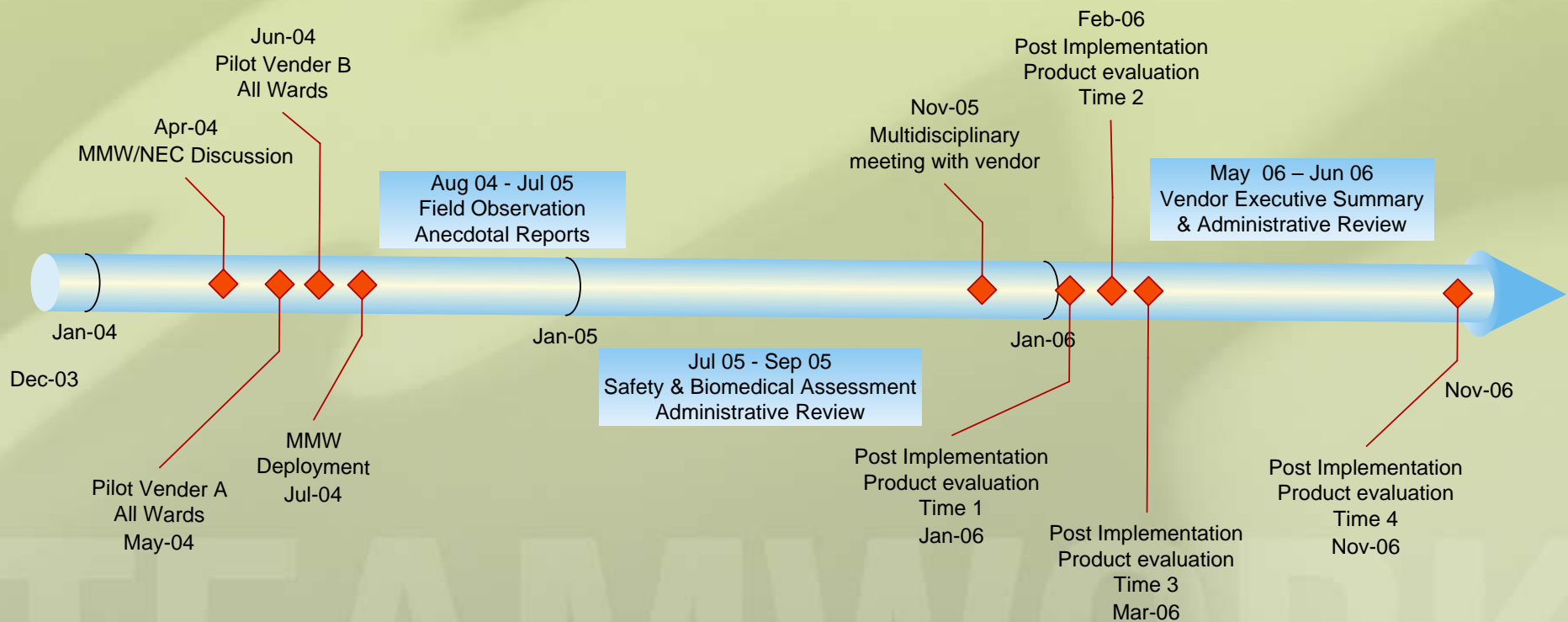
# Anecdotal Reports...*Data*

- Nurses reported problems with MMWs
  - **Batteries, Keypads, Scanners**
- Workflow and patient care interruptions related to new MMWs
- Biomedical staff assessed MMWs facility as under performing
- Equipment malfunctions with serious employee injury potential
  - Problematic MMWs were immediately removed from service**
- Administrative data collection revealed significant nursing & patient care problems that jeopardized contractual agreement
- Multidisciplinary process team mobilized by Nursing.



# Phase 2 Historical Overview

## PROJECT TIMELINE – Phase II





## Phase 2

# Multidisciplinary Process Improvement

- Nursing mobilized BCMA multidisciplinary process team
- Post implementation product/system assessment & evaluation project on MMWs
- Systematic evaluation of MMW performance over 90 days:  
January, 2006 - March, 2006
- Re-education of nursing staff to the use of the Mobile Medication Workstation (MMW)
- Planned monthly assessment and measurement
- 90 day preparation time given to Vendor and Miami VAHCS prior to intervention



# Project Team

## **Miami VAHCS**

*Cathy Rhoades, RN, MS, Nurse Informaticist*

*Robert Pastorello, Chief, Biomedical Engineering*

*Michael Lloyd, RPh. BCMA Coordinator*

*Kathryn Sapnas, PhD, RN, Chief Nurse Education & Research*

*Andrew Reeves, Biomedical Technician*

*Robert Cusidor, Biomedical Technician*

*Marie Schafer, RN, MSN, BCMA Nurse Liaison*

*Gwen Moore, Chief, Acquisitions and Materials Mgmt.*

## **Vendor**

*Vendor A Senior VP Sales & Marketing*

*Vendor A Field Service Engineer*

*Vendor A Regional Account Manager*



# Methods

- Biomedical Technicians on MMW off-site
- Before, During and After Med Pass Nurses' Knowledge Assessment and MMW Evaluation
- Evaluate MMW Performance During Med Pass
- Measure MMW Cart Power Levels
  - Battery check
- Evaluation Data and Comments

TEAMWORK



# Immediate Actions

- MMW evaluation was conducted
- MMW3 batteries were tested and replaced
- Battery/charger design was identified as defective
- Vendor replaced all MMW batteries and updated charging circuits
- Increased MMW inventory on nursing units

TEAMWORK



# Knowledge Assessment

- **Eight nursing units evaluated:**  
12AB, 12CD, 11AB, 9AB, 4AB, NH1, NH2, SCI
- **Collaborative process in MMW questionnaire development:**
  - Nursing questionnaires self-administered
  - **Pre Med pass evaluation:**
    - 8 questions on MMW use and function:
      - 5 True/False, 3 multiple choice
  - **Med pass evaluation:**
    - 14 questions,
      - 12 True/False, 1 multiple choice, 3 “please describe”
  - **Post pass evaluation:**
    - 6 questions
      - 1 True/False, 1 Likert-type, 1 multiple choice, 3 “fill in the blank”
  - **Individual nurse scores ranged from 62.5% - 100%**
- **Assessment of each MMW followed the med pass**





# In-service Process

- Nurse Executives briefed
- Nurse Managers were contacted individually prior to assessment
- Bargaining unit approval obtained



- Staff on all shifts of 8 Nursing units fully in-serviced on proper use of the MMW:
  - Pre-Med Pass assessment
  - Proper use of the MMW provided during the Med Pass
  - Post-Med Pass disposition of the carts assessed
- Assessment answers were provided immediately following questionnaire administration
- “User and Troubleshooting” guide reviewed and provided for all MMWs

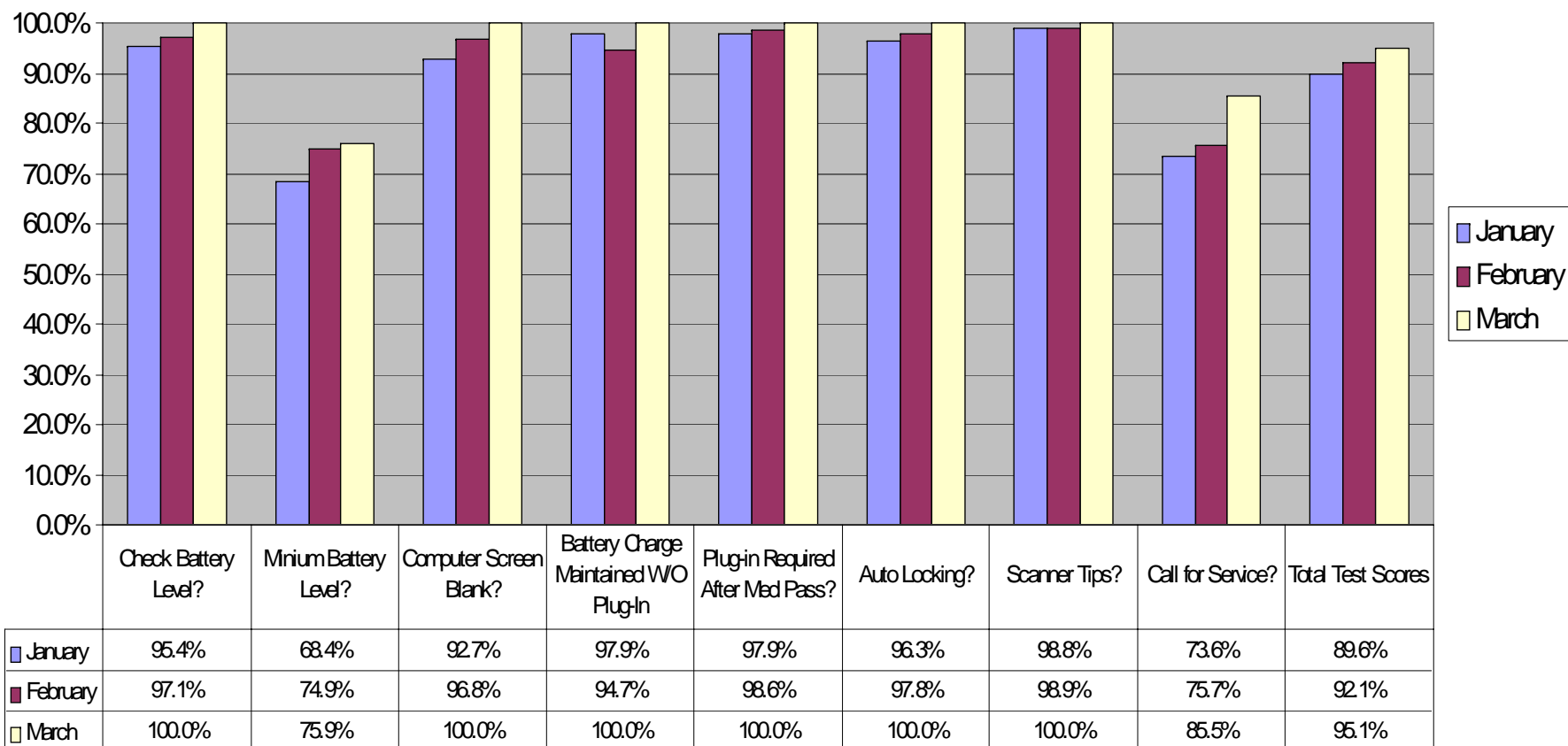


# Results and Interventions

- Two areas of focus for nurse re-education emerged:
  - Recommended battery level of MMW prior to starting Med Pass
  - Who to call for service
  - Process and process owner needed
    - Biomedical Engineering identified as process owner
    - Implemented a BCMA Beeper
      - Biomedical Engineering Monday –Friday day shift
      - Pharmacy off-shifts and weekends (spares carts)
      - Facilitates monitoring status of all medication carts and handheld scanners



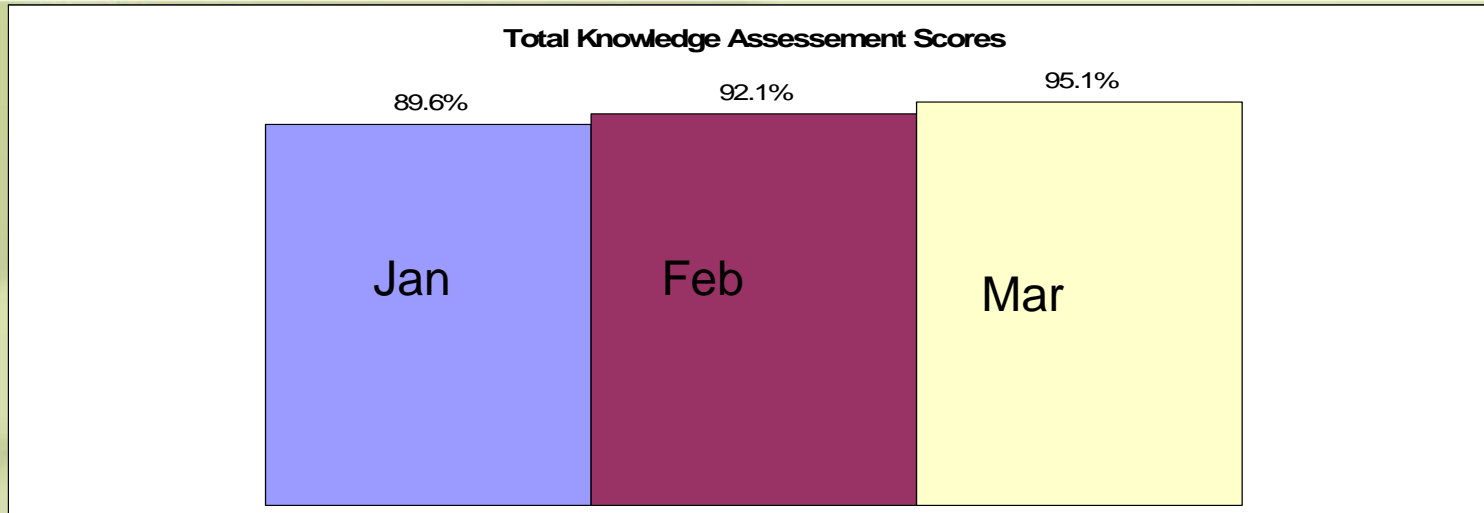
# Overall Nurses' Knowledge Assessment



*\*90 day advance notice prior to intervention*



# Overall Results



Two questions were problematic & showed marked improvement from January to March 2006:

- Recommended battery level for use
- Who to call for troubleshooting or service issues

	Minium Battery Level?	Call for Service?
March	75.9%	85.5%
February	74.9%	75.7%
January	68.4%	73.6%



# Evaluation Comments

<i><b>January '06</b></i>	<i><b>February '06</b></i>	<i><b>March '06</b></i>
Network Connectivity IEEE 802.11B	Network Connectivity IEEE 802.11B	Cart Related Issue - Battery
Scanner Issues - <i>IT</i> - <i>Biomedical</i>	Scanner issues - <i>IT</i> - <i>Biomedical</i>	Physical Plant Design issue: - <i>Space in Nursing Station</i> - <i>Electrical Outlet Configuration</i>
Bar Code Quality	Bar Code Quality	Nursing Staff Knowledge
New Process Implementation: - <i>BCMA Beeper</i>	Cart Related Issues - <i>Battery</i> - <i>Design</i>	



# Summary

- MMWs are performing adequately
- Increased nursing satisfaction with MMW
- Continued attention:
  - Plug MMWs in when not in use
  - Bar code scanning
  - Wireless connectivity areas in NH1, NH2
  - Ensure wireless system security
  - Nurses not consistently requesting assistance when MMW performance is questionable



# Lessons Learned



- Project management contingency plan
- Identify a process owner
- Schedule systematic observations immediately post implementation
- Determine project success measure prior to implementation
- Plan systematic post product implementation BEFORE implementation
- Physical plant & system limitations can create a barrier to implementation
- Collaborative post-product implementation data collection & analysis



# Limitations

- Measures not tested for reliability & validity
- Evaluation design bias
- Vendor conducted the survey, in-services and product evaluation

TEAMWORK



# Plans for Ongoing Assessment

Ongoing project management and technology assessment by Nursing Informaticist with team:

- Nursing, Biomedical Engineering, IT & Pharmacy
- Continue to monitoring network connectivity
- Monthly MMW monitoring by Biomedical staff
- Continued assessing & troubleshooting scanning problems
- Open two-way communication
- Ongoing process improvement
  - Repeat measures in November 2006





# Discussion



- **Importance of pre-implementation planning**
- **Workflow and human factors**
- **Systematic Post implementation Evaluation**
- **Ongoing Follow up**





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