

# Nursing Practice and the Flow of Information: An Observation of Kardex Use

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# Introduction to Spectrum Health

Largest employer in West Michigan

- 18,000 employees
- 1,500 physicians
- 3,000 nurses
- 2,000 volunteers
- Service area as a tertiary care center, covering a population of 9 million.
- Nine hospitals with numerous outpatient centers and physician office practices
- System includes hospital group, medical group, and a health plan



# Statement of the Problem/Opportunity

Flow of information between clinicians

- Critical to safety culture
- Hand-off report



Kardex

- Contains patient-specific information
- Directs care based on provider orders
- Facilitates clinician communication
- Tracks patient significant events



# Statement of the Problem/Opportunity

## Paper Kardex Reality

- Updated in pencil; erased
- Thrown away
- Not unusual for key information to be permanently lost
- Recall is totally dependent on the nurses memory

## Electronic Kardex Vision

- Key patient info auto-populates Kardex
- Real-time
- Used for information exchange
- Used by interdisciplinary team members





# Statement of the Problem/Opportunity

## Shared Leadership: Design

- Process Improvement principles
- Informatics project methodology
- Interdisciplinary workgroups

## Innovation: Build

- Share vision with Information Technology
- Design in-house built eKardex
- Partner for further optimization

## Research: Improve

- Design research to describe nursing staff use of the Kardex

# Specific Aims of Research

To describe information flow and communication between nurses and others before and after implementation of an electronic Kardex.

Three part study

- Kardex survey – nursing staff perceptions
- Kardex itself – information item changes over time
- Kardex observaton – nursing staff use to aid communication



# Specific Aims of Research

## Kardex Observation Study:

- Descriptive, comparative study of information flow
  - Between nurses and others
  - Hand-off reports, team communication, and patient care

Observations	Hand-off report
<ul style="list-style-type: none"> <li>■ Nurses receiving and giving information</li> <li>■ Identify when (if) the Kardex is used</li> <li>■ Differences between paper and electronic Kardex</li> </ul>	<ul style="list-style-type: none"> <li>■ Content</li> <li>■ Extent report duplicated Kardex content</li> <li>■ Amount of report addressing nurse-sensitive indicators</li> </ul>



# Setting and Sample

## Two Acute Care Hospitals

- Adult (>700 beds)
- Adult (200-299 beds)

## Ten staff nurse participants

- Medical-surgical
- Progressive care
- High-risk obstetrical
- Critical care

## Observation of each nurse

- 3 to 4 hours at shift beginning or end
- Once pre-implementation of electronic Kardex
- Once post-implementation of electronic Kardex



# Data Collection Procedures

- Pilot validation of data collection tools
  - Introduction to unit
  - Information Activity Log
  - Nurse perceptions of Kardex use / hindrances
- IRB approval received as minimal risk study
- Research observer manually recorded information activity

## Data collected

- Unit structure / processes
- Hand-off report content
- Communication tools used
- Information flow during interactions
  - Nurse to Nurse
  - Nurse to Nurse Assistant
  - Nurse to Interdisciplinary Team Member
  - Nurse to Patient



# Data Analysis Methods

## Coding

- Triangulation approach by study investigators
  - Coded report statements for themes
  - Compared report information to Kardex
  - Identified information item duplicates, discrepancies and nurse-sensitive indicators

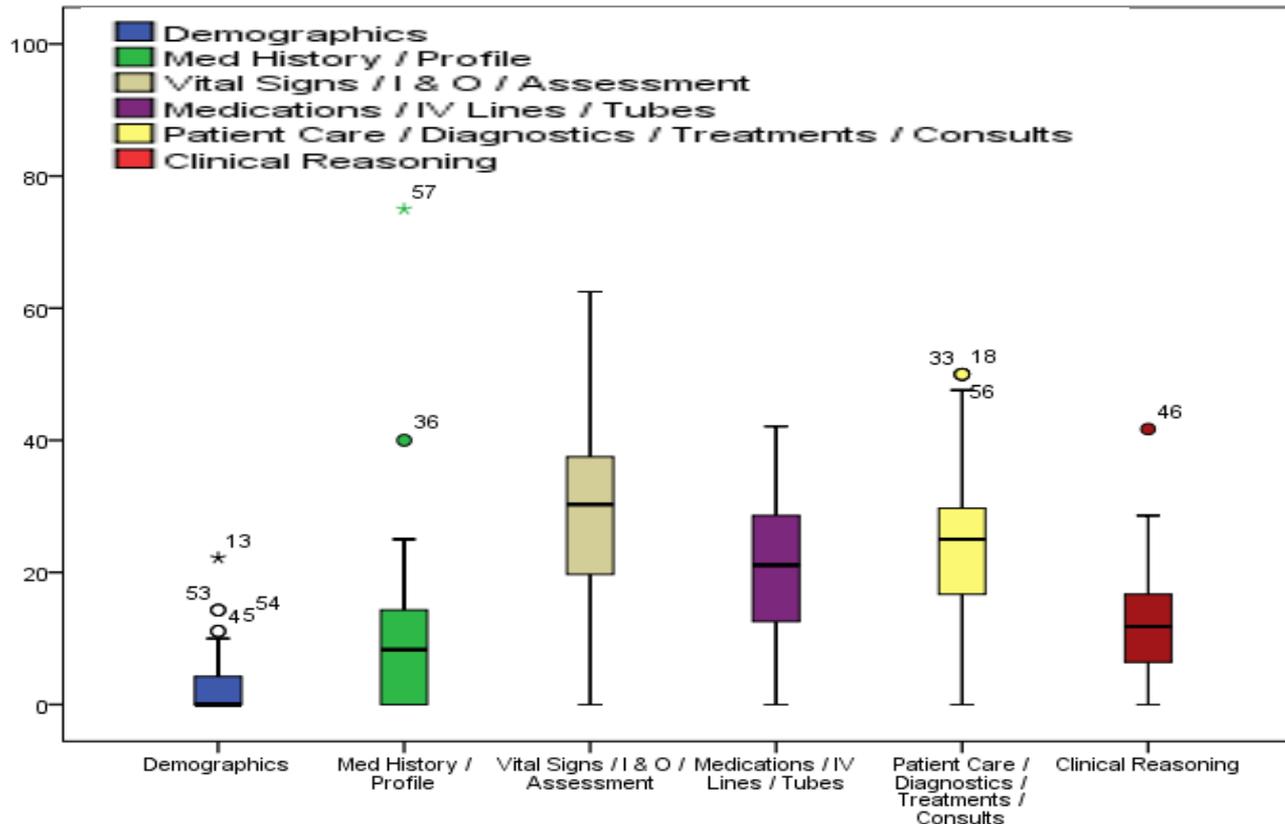
## Statistics

- Descriptive statistics
- Chi-square comparisons
- Level of significance set at  $p < 0.05$



# Findings

The observations generated a sample of 1143 Nurse to Nurse report statements relating to 67 patients.

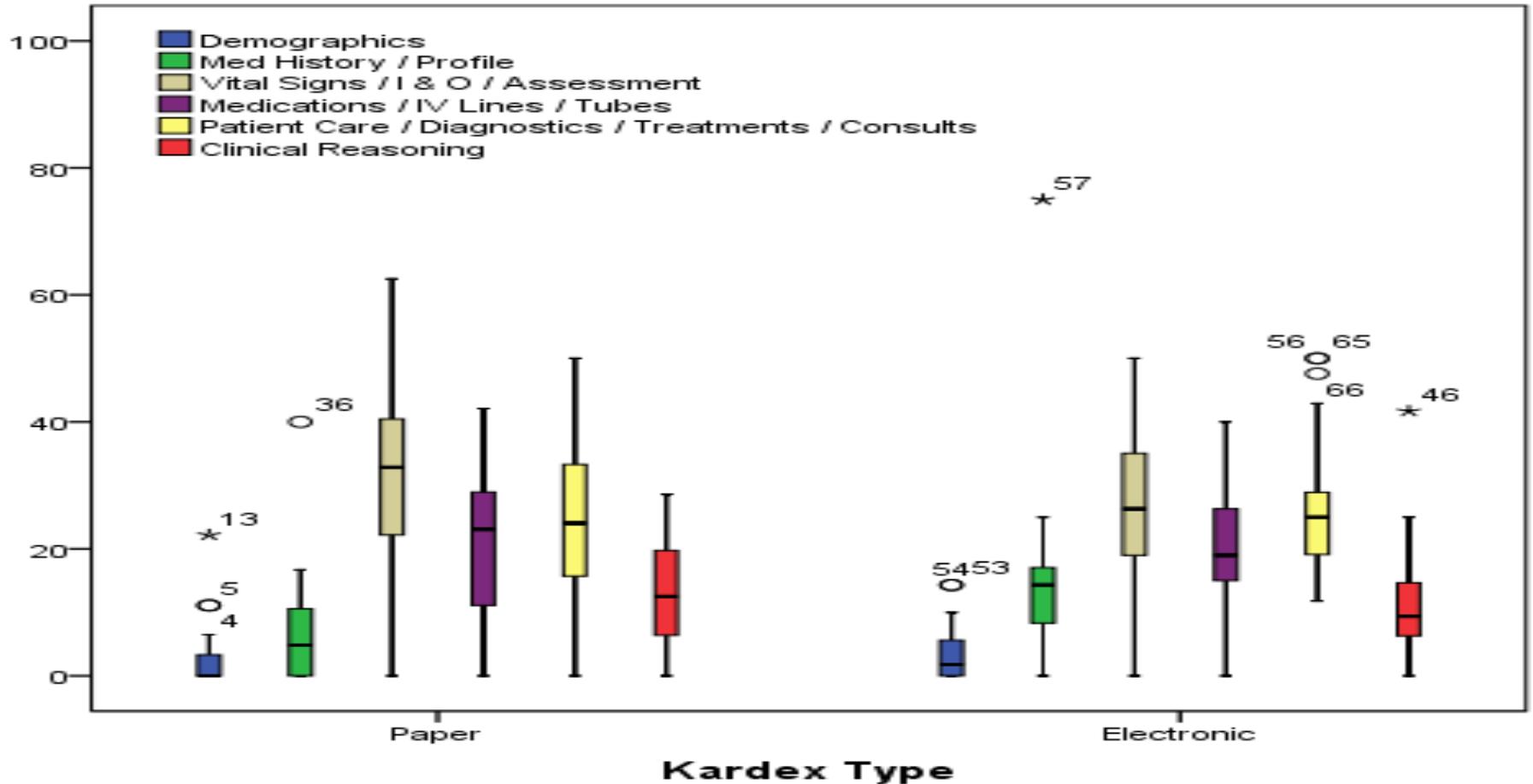


Percent of report content (n = 67 patients)

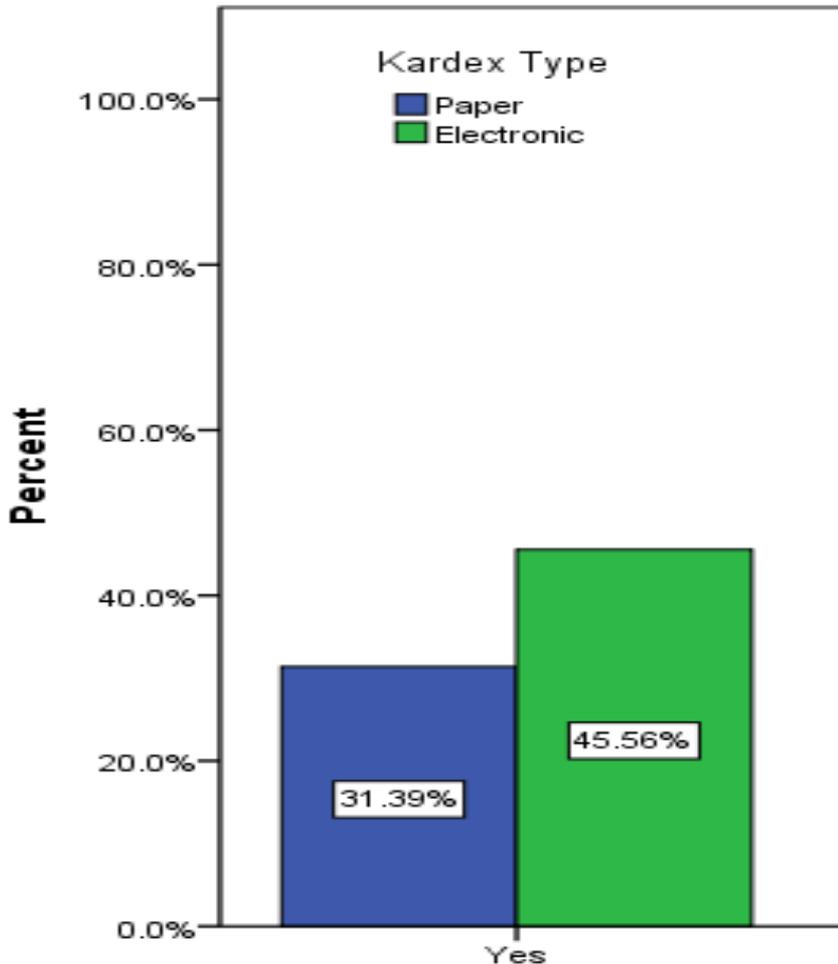


# Findings

Percentage of Report Content: Paper (n = 36) vs. Electronic (n = 31) Kardex



# Findings



Report statements duplicate Kardex (n = 1134)

Fisher's exact (p < 0.001)

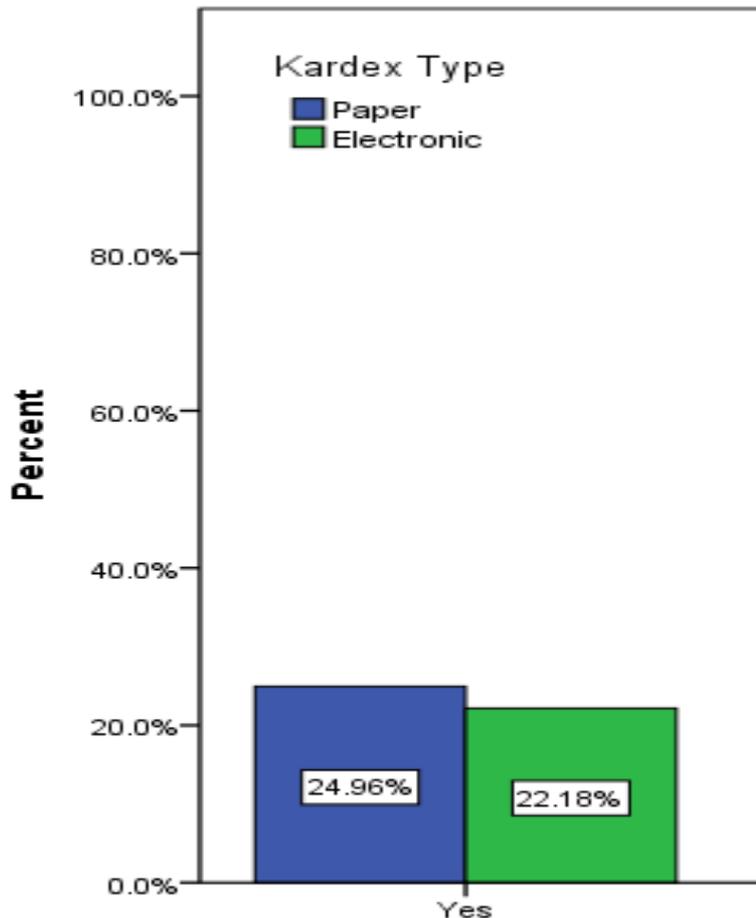
Significant difference between report statements duplicating paper vs, electronic Kardex information items.



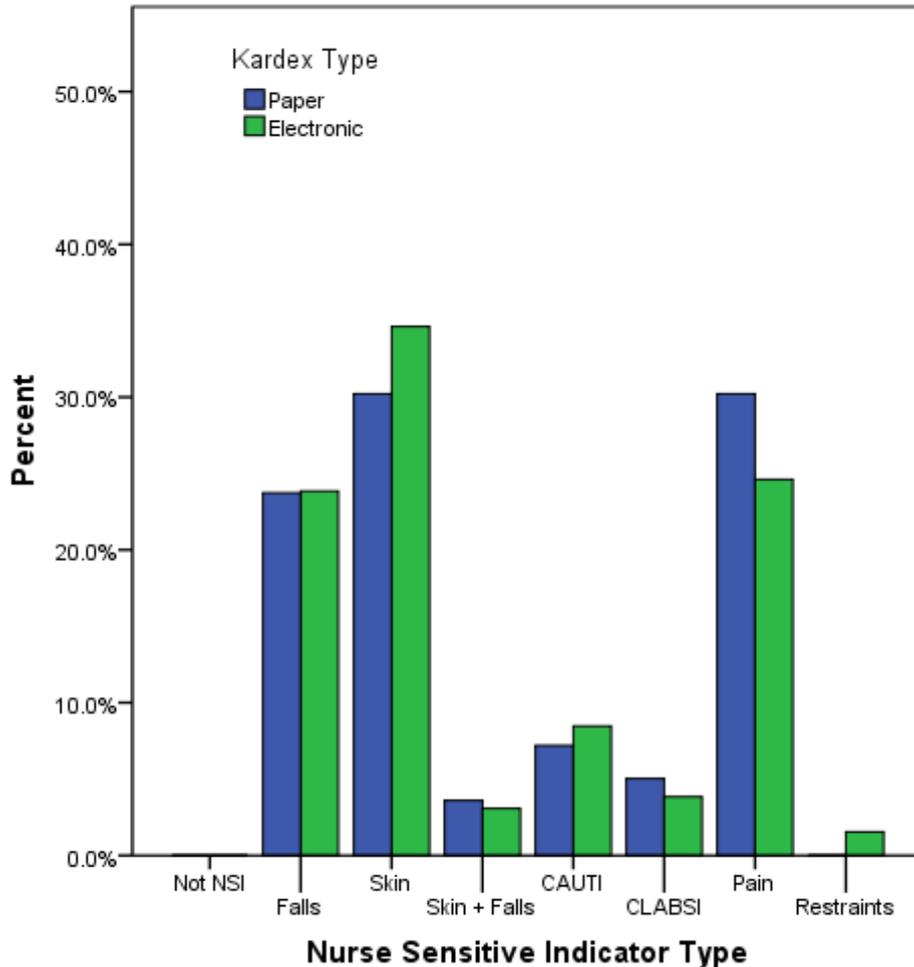
# Findings

Report statements related to  
Nurse-Sensitive Indicators  
(n = 1143)

Fisher's exact (p = 0.295)  
No significant difference



# Findings



Report statements relating to Nurse-Sensitive Indicators:  
 Paper (n = 139) vs.  
 Electronic (n = 130) Kardex

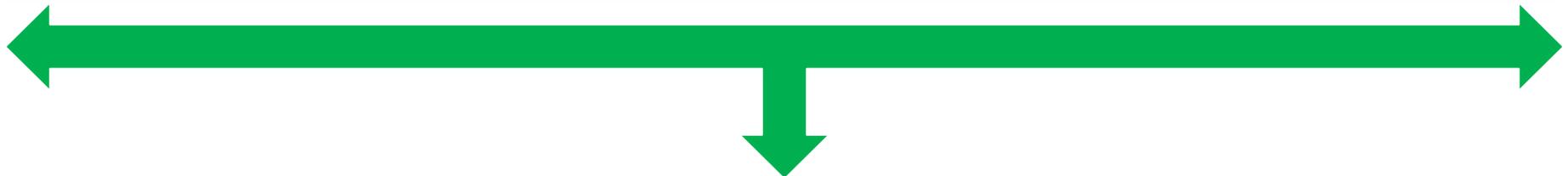
$X^2 (7) = 4.929, p = 0.669$   
 No significant difference



# Discussion, Conclusions, or Recommendations

## Paper Kardex

- Consistently contained data
- Sporadically contained information, knowledge, results of wisdom



Goal is that the electronic Kardex is a place where the entire informatics continuum is represented and perceived as valuable.



# Discussion, Conclusions, or Recommendations

## Informatics Continuum examples:

- Reporting the patient's diet, blood glucose check frequency
- Reporting that “vital signs are stable”
- Prescribing actions to take for the next shift
  - Pain has been well controlled with oral Vicodin™; offer every 4 hours, even when sleeping
- Nurse-Sensitive Indicator Information
  - Not discussed in a way that effectively predicted risk or prescribed preventative activities
- Clinical Reasoning
  - No change in percentage of report content, even though more report items were present on the electronic Kardex



# Discussion, Conclusions, or Recommendations

## Clinical Informatics Council & Information Technology

- Continue to optimize the eKardex to support nurses' practice
  - Display of nurse-sensitive indicator information
  - Ability to complete orders from the Kardex

## Nurse Practice Council & Shared Leadership Councils

- Continue to develop hand-off report practices
- Maximize use of electronic and other communication tools



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