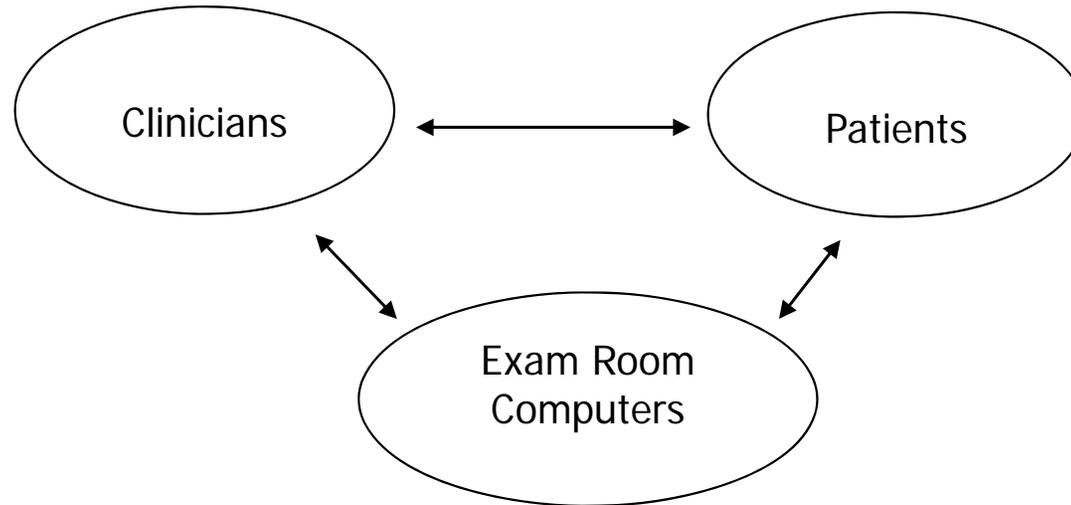


The Computer Will See You Now: How IT Affects Doctor-Patient Communication



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Today's Presentation:

- I. Overview of this topic
- II. The persistence of paper with the electronic health record (data from completed pilot study)
- III. Understanding variations in CPRS use among primary care clinicians (new HSR&D IIR grant)
- IV. “Rapid ethnography” for evaluation of clinical information systems in the field (the latest in methodological development)
- V. Concluding remarks

Background:

- Clinician-patient relationships central to ambulatory care
- Increasing use of information technology (IT) in health care.
- Increasing use of EMRs at the point of care, i.e., the exam room.
- Potential for IT to enhance clinical care
- Concerns that IT could create barriers for the relationship
- Limited information on IT effects on clinician-patient communication

The Persistence of Paper with the EHR

- HSR&D COE pilot grant
- Alissa Russ, PhD

Saleem JJ, Russ AL, Justice CF, et al. Exploring the persistence of paper with the electronic health record. *International Journal of Medical Informatics*. 2009; 78(9):618-28.



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PROCEEDINGS of the HUMAN FACTORS AND ERGONOMICS SOCIETY 52nd ANNUAL MEETING

Paper Use with the Electronic Medical Record: An Important Supplement

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Healthcare organizations are increasingly implementing electronic information technology (IT). Even in institution...

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Using Hur

Jason J. Saleem
MD, M

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Research Pap
Impact of
Efficient
Nurses

Background

- We're going "paperless"!
- "Paper persistence" with CPOE (Ash et al., 2007; Campbell et al., 2006)
- Workaround strategies to VA's BCMA (Patterson et al., 2006)
- Limitations of EHRs (e.g., Hatzband & Groopman, 2008)
 - Copied, repetitive notes that desensitize clinicians to new, important data
 - Less attention directed toward the patient
- "Shadow" paper chart (Wears, 2008)
- Lack of integration of health IT into clinical workflow (many refs)
- Visual organization of EHR data incompatible with clinical care delivery activities (Varpio et al., 2006)

Study Objective

- Explore and understand human-technology integration factors (e.g., computer usability and human-computer interaction issues) at the EHR level that may be causing healthcare workers to rely on paper alternatives.

Methods

- Semi-structured interviews
 - CPRS is designed to be used by a broad range of VA healthcare workers
 - N=20 (3 physicians, 2 pharmacists, 2 NPs, 4 RNs, 2 health techs, 1 dietician, 3 administrators, 3 IT specialists)
- Example questions
 - What paper-sources do you use in your clinical work?
 - Have you ever experienced frustration in viewing or combining information from CPRS (e.g., patient data) during your clinical work? *Example(s)*.
 - Have you ever manually transformed patient data from CPRS onto paper to better organize information during your clinical work? *Example(s)*.
 - What is your ideal workflow during your clinical work and how does it relate to CPRS?

Methods (cont.)

- Inductive qualitative analysis
- Integrating findings across interviews into emerging themes; recurrent paper-based “workaround” strategies
- Two independent coders for all 20 transcripts
- Series of six consensus meetings
 - Development and refinement of coding scheme
 - Resolution of coding differences

Methods (cont.)

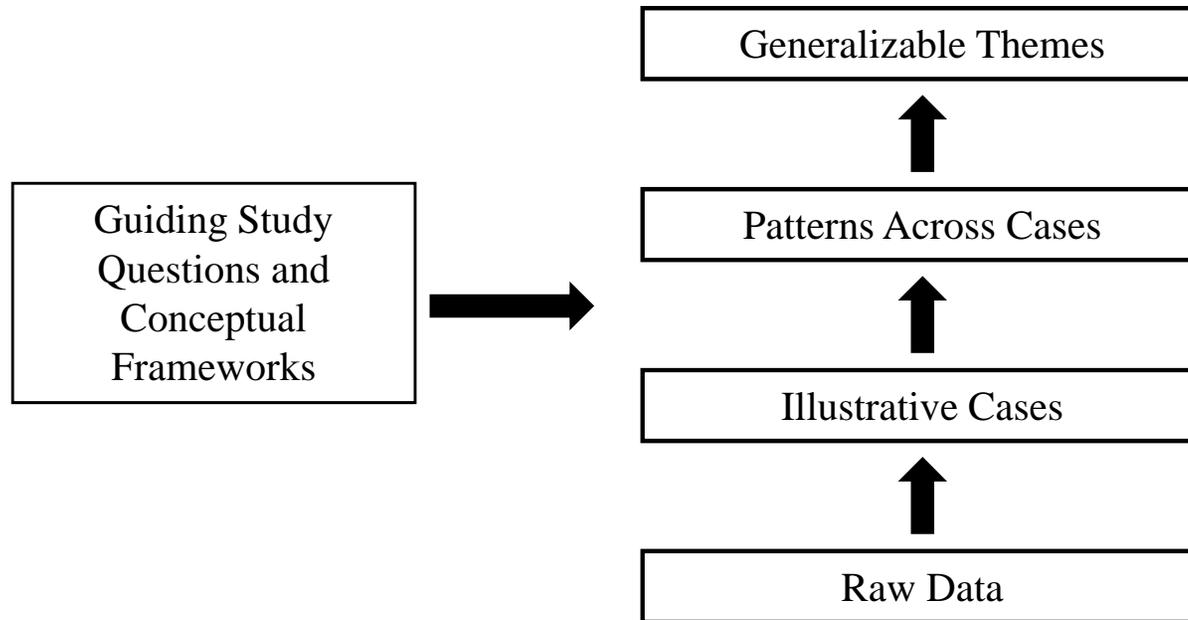


Fig. – Data analysis and abstraction process [Roth & Patterson, 2005], where higher levels in the hierarchy represent a greater level of abstraction, ending in generalizable themes.

Results

Paper use with the electronic health record related to the following:

Efficiency (20)	Task Specificity (12)
Knowledge / Skill / Ease of Use (20)	Task Complexity (9)
Memory (17)	Data Organization (9)
Sensorimotor Preferences (15)	Longitudinal Data Processes (9)
Awareness (12)	

Results

Paper use with the electronic health record related to the following:

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Sensorimotor Preferences (15)	Longitudinal Data Processes (9)
Awareness (12)	

Efficiency

- Using a workflow process that improves actual or perceived efficiency.
- Many of the cases related to ordering.
- Example: The Emergency Department currently does all orders on paper.
 - Phys → Nurse → Clerk → Computer
 - The order is processed from the paper form before it gets entered in the computer system

Memory

- Reminder about "old" or existing information.
- Use of paper as a cognitive memory aid and disposable display device (Ash et al., 2006)
- Example: Pharmacist makes hand notes on printouts from CPRS and transfers the new handwritten data back into CPRS later in the day. “The hand notes help me remember. I do this for discharges and inpatients.... There can be 6-12 discharges/day. It is not possible to make these types of notes in CPRS [in real time]. I don’t know how you would do this in the computer... We need paper to do our job.”

Sensorimotor Preferences

- Preferred sensory input for task
- Participants described a preference for the following: mobility; ability to “hear” something; hold something “tangible”; something concrete to “deliver”; and/or work with something that can be easily manipulated (e.g., hand notes).
- Example: “I ‘hear’ the paper being dropped in my basket [indicating new unscheduled patient has checked in]. I also glance at the basket to make sure someone has not put a piece of paper in my basket.”

Awareness

- Recognize new / important information: notify, alert, trigger; adjusting "signal to noise" ratio.
- Example: "The patient brings...a sheet of paper – colored pink for high blood pressure.... There is a [computerized] clinical reminder for high blood pressure, but I guess this is a way to make sure we see that the patient has high blood pressure in case we don't see it in the computer."
- Some electronic processes may be insufficient in terms of a signal to noise ratio (i.e., ability to alert clinicians reliably and consistently)

Longitudinal Data Processes

- Task requires processing multiple data points across time.
- Example: Use of a paper notebook system - “I add important footnotes – anytime the [international normalized ratio] INR is too high, greater than 8.0. The primary care provider will think the INR was too high only this one time but I have the data in my notebook to show that it was too high three times.”

Discussion

- Paper Use with the Electronic Health Record: An Important Supplement or Negative Circumvention?
- Paper processes are not necessarily inefficient or inferior to corresponding computer processes.
- “Paper often serves as a necessary, sometimes superior, cognitive memory aid (Campbell et al., 2006).”
- Some paper-based workarounds may increase the opportunity for losing clinical information.
- Workaround strategies may increase efficiency but create new potential paths to medical error (Patterson et al., 2006)

Discussion / Conclusion

- 9 categories that represent distinct reasons why paper continues to be used with the EHR
- Policy / design implication: assume there will always be paper;
 - “Watch where people walk and put the sidewalk there.”
- Paper workarounds: One source of variation in CPRS use among primary care clinicians.
 - Physician: “I don’t think it’s [charting in CPRS during the patient encounter] conducive to having a good conversation. It also gives [poor] body language. If you were typing your notes [from this interview] right now I would say, ‘Are you listening to me?’ ”

Understanding variations in CPRS use among primary care clinicians

- 1. How does the presence of a computer in the exam-room impact communication between patients and clinicians?*
- 2. What are the barriers and facilitators to exam room computing?*
- 3. What accounts for individual and organizational difference in rates of exam room computing?*

Understanding variations in CPRS use among primary care clinicians

- Setting: Three VA outpatient centers: Indianapolis, Memphis, and Charleston S.C.
- Population:
 - Primary care clinicians at the clinics
 - Regularly scheduled patients
- Sample: convenience sample of PCP's and patients

Methods: Phase 1

Location: Clinicians' regular exam-rooms

Design: Video, and rapid ethnography using direct observation, pre-, during and post encounters

Pre-visit use of
CPRS

Physician-patient
encounters

Post-visit use of
CPRS

Analyses: Qualitative analyses of Videotapes, ethnographic field notes, and opportunistic interviews

Video Coding

- Preliminary Coding
 - Review of tapes by entire research team to develop initial themes.
- Major Coding Categories (From Frankel et al, 2005)
 - Visit organization
 - Interpersonal skills
 - Technical mastery skills
 - Spatial organization

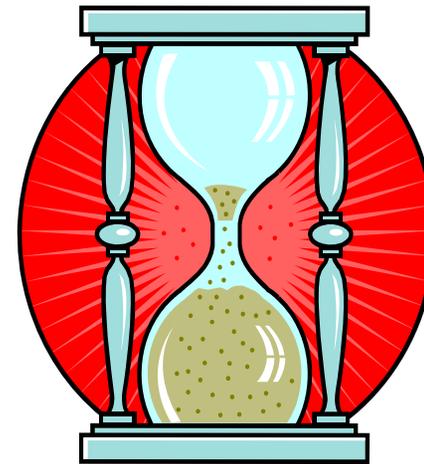
Thematic Analysis of Ethnographic and Interview Data

- Coders independently review field notes and interview data underlining portions of the text that seem significant
- Assign provisional category names
- Meet to reconcile provisional categories
- Once established, agreed upon categories used to code the entire corpus
- Categories are linked together logically into themes

Baseline Visit Organization Skills

Without a computer, not creating an agenda can make a visit

- Inefficient
- Disorganized
- Run over schedule



Exam room computers will “amplify” this effect

Interpersonal Skills

Clinicians with good interpersonal skills

- Encourage patient input
- Listen to patients' concerns
- Maintain eye contact
- Chart intermittently or not at all during visit

Technical Skills

Inability to successfully navigate program leads to:

- Inability to access data consistently
- Wastes of time
- Frustration for clinicians and patients

Spatial Organization of the Visit





Phase 2: Understanding Organizational Variation

- Semi structured interviews with hospital leaders to understand what organizational factors may influence the use of computers at the point of care.
- Interviews will be subjected to thematic qualitative analysis

Summary

- Variations in computer use at the point of care has the potential to increase or decrease the quality of clinician-patient communication which in turn has been linked to processes and outcomes of care
- Individual differences in skills and attitudes as well as differences in organizational approach may account for large variations in use of exam room computing
- More research is needed to understand the potential impact of IT innovations on the clinician-patient relationship
- Guidelines and training programs could help clinicians use the new technology more effectively

Rapid Assessment Process (RAP)

Joan Ash, PhD et al., AMIA 2008:

- “Rapid ethnography”
- Traditional ethnography takes time
 - researchers must develop cultural competence and knowledge and develop rapport and trust
- Rapid methods use several techniques to expedite this process:
 - data are collected and analyzed by teams;
 - insiders who know the culture are included as team members;
 - the focus is narrow and problem-oriented

Concluding Remarks

- Like any new technology, exam room computers have the potential to add to or detract from the physician's efficiency and effectiveness of practice and the patient's experience of care
- Little is currently known about how this technology is *actually* used by PCPs in the real time running organization of visits
- A human factors approach coupled with qualitative descriptive methods is useful for addressing this gap in knowledge and developing solutions that optimize computer use on both sides of the stethoscope

Thank you for your time and
attention !

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