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A National Web Conference on Managing Change to Achieve Successful Health IT Implementation

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2:30pm – 4:00pm ET

Moderator and Presenters Disclosures

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Managing Change in Health IT Implementation: A View from Human Factors and Systems Engineering

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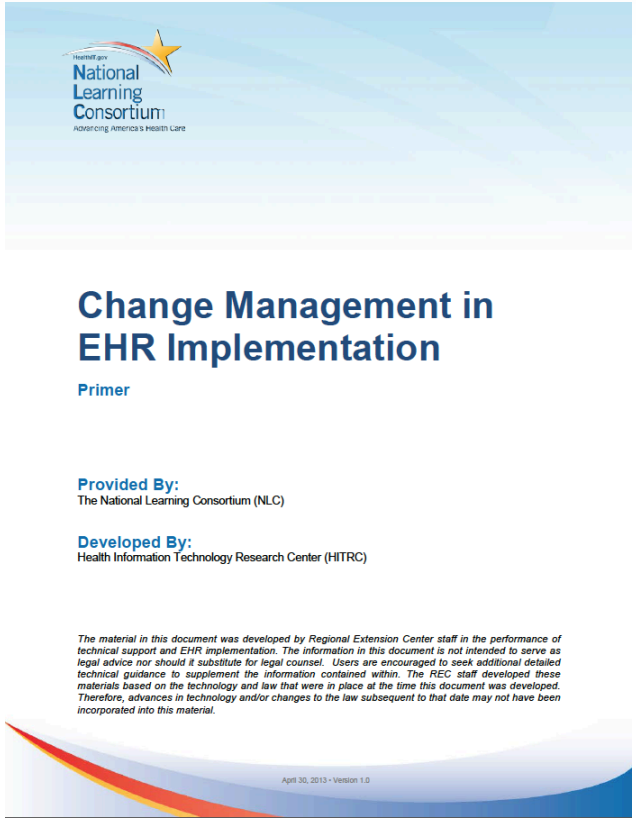
July 15, 2014

Health IT is a Major Change!

- Change needs to be managed.
- Various approaches to change management for health IT implementation include:
  - Kotter's Change Management Model
  - Organizational change
  - Resistance to change
  - Stress management and coping (uncertainty)
  - Project management
  - **Human factors and systems engineering**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Change Management in EHR Implementation

Primer

Provided By:
The National Learning Consortium (NLC)

Developed By:
Health Information Technology Research Center (HITRC)

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Health IT Design and Implementation – Human Factors

- Health IT design:
  - Usefulness, usability
- Health IT implementation:
  - Principles for implementation and predictors of technology acceptance (Karsh, 2004)

DEVELOPING RESEARCH AND PRACTICE

Beyond usability: designing effective technology implementation systems to promote patient safety

B-T Karsh

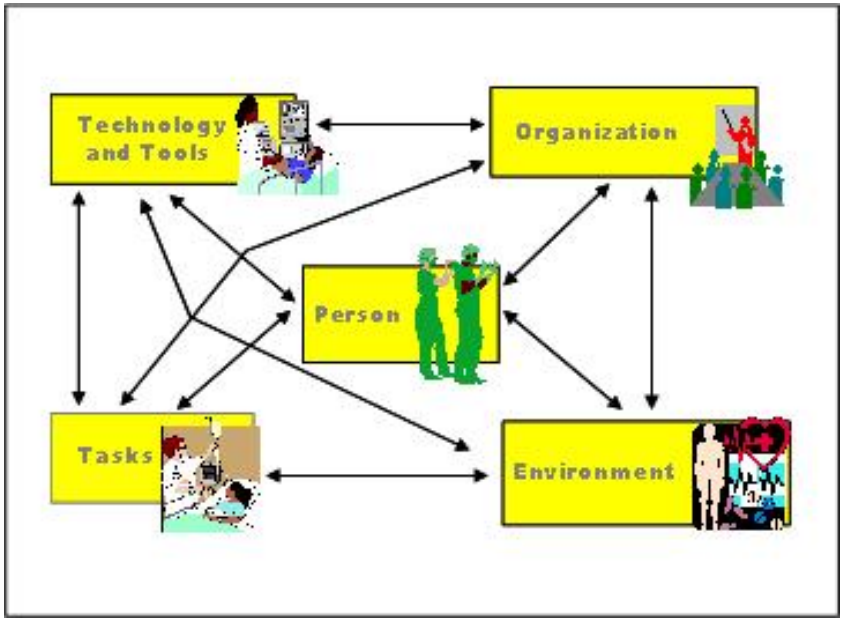
Qual Saf Health Care 2004;**13**:388–394. doi: 10.1136/qshc.2004.010322

Human Factors and Systems Engineering

Health IT is part of the work (sociotechnical) system.

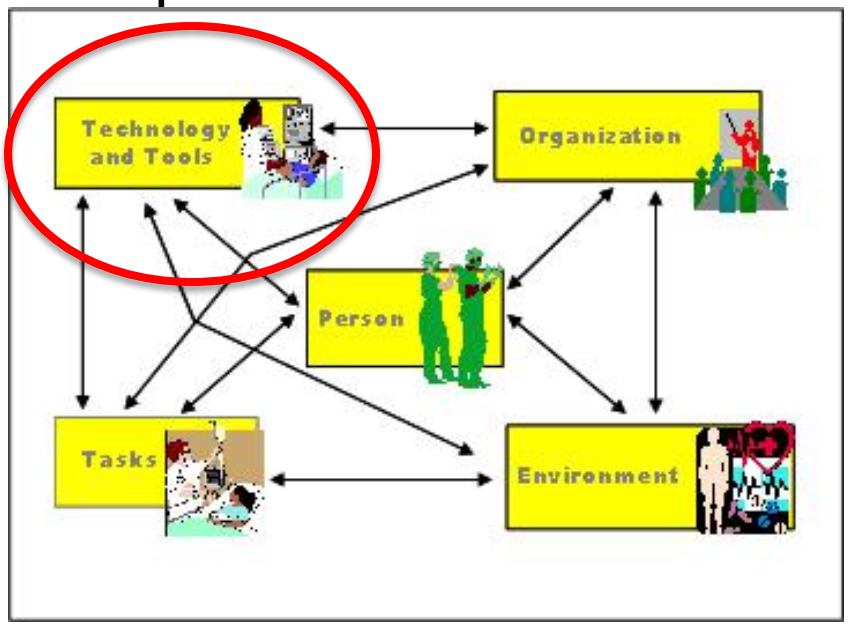
1. System interactions
2. Anticipation of impact of health IT and planning new work system
3. Emergence

Model of Work System (Smith & Carayon-Sainfort, 1989)



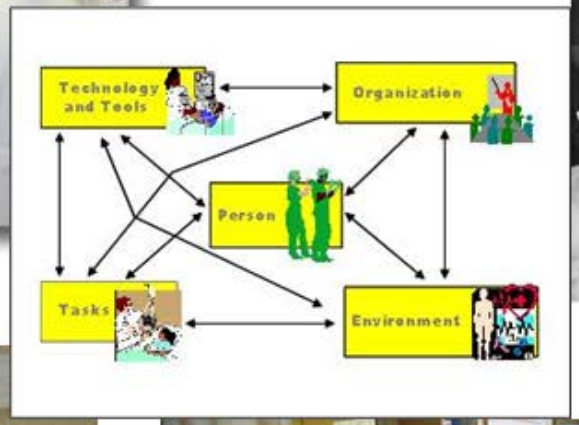
1. Understanding Health IT in the System

- Health IT **will** influence the work system and be influenced by the work system.
  - Tasks done and by whom (distribution)
  - Physical environment
  - Interactions between health care professionals and with patients
  - Other technologies
  - Skills and training
  - Work organization
  - And so forth…

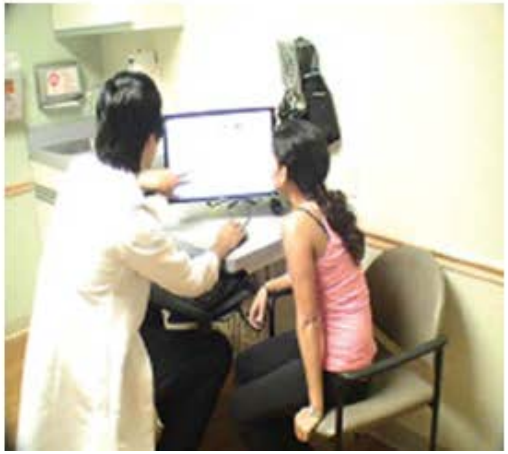


Health IT in Use

(Morrison et al., 2011)



(Asan & Montague, 2014)

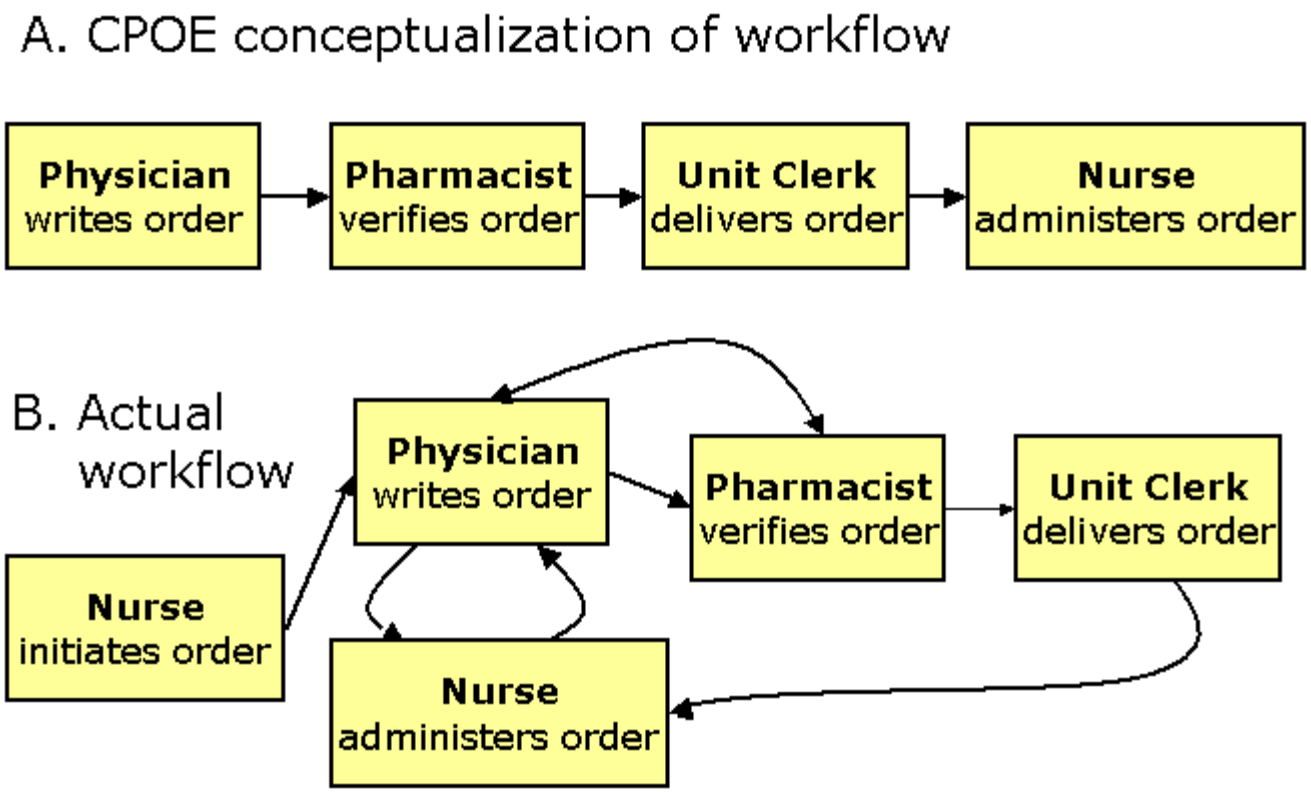


2. Engineering Approach to Health IT-Supported Workflow

- Anticipate new work system with health IT
- Understand current work and workflow
- Work as imagined versus work as done

What is the work?

Actual versus Prescribed Workflow



(Cheng et al., 2003)

Actual versus Prescribed Workflow

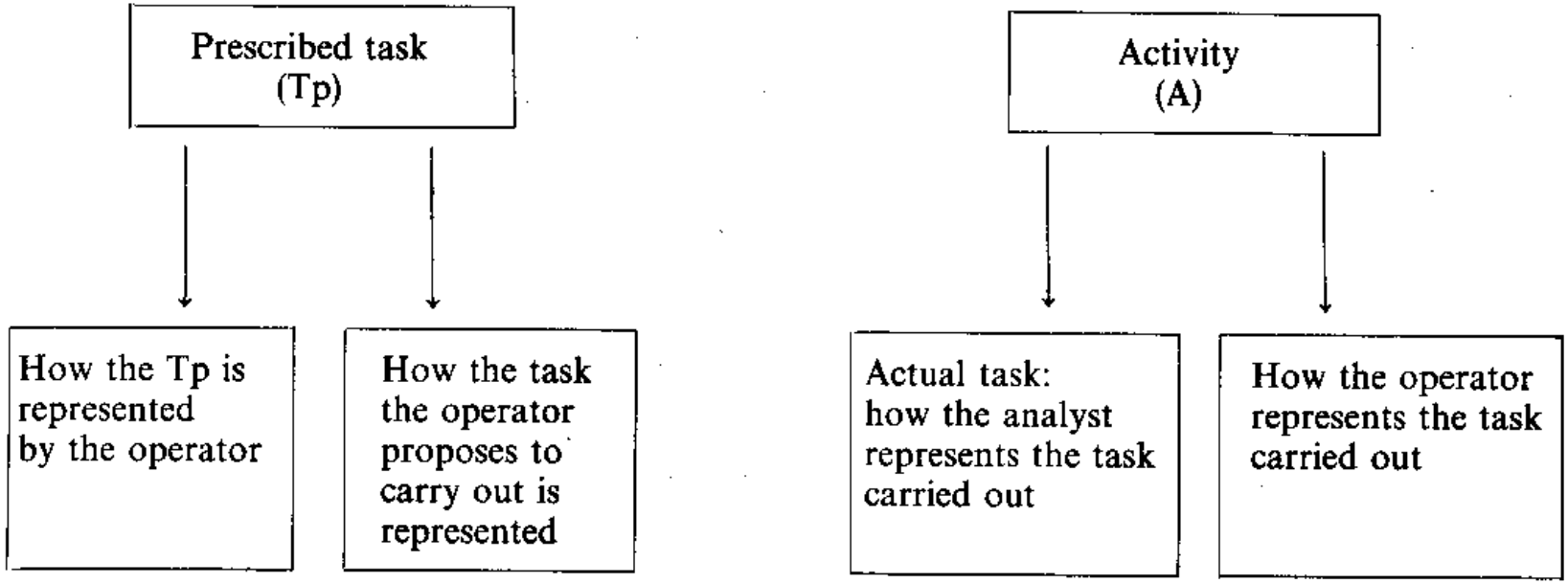


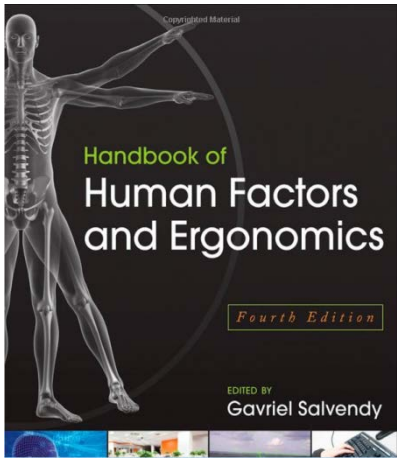
Figure 1. Task, activity and representations. The origin of the arrows indicates a source of representations shown in the lower boxes.

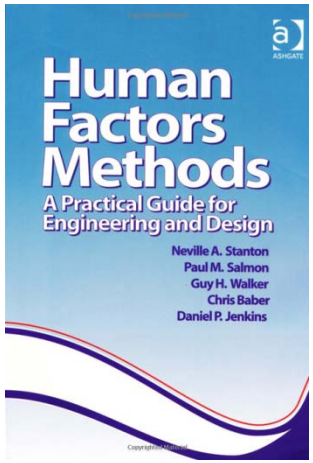
(Leplat, 1989)

Human Factors Methods

- Work and workflow analysis
  - AHRQ Workflow Assessment for Health IT Toolkit
  - http://healthit.ahrq.gov/workflow

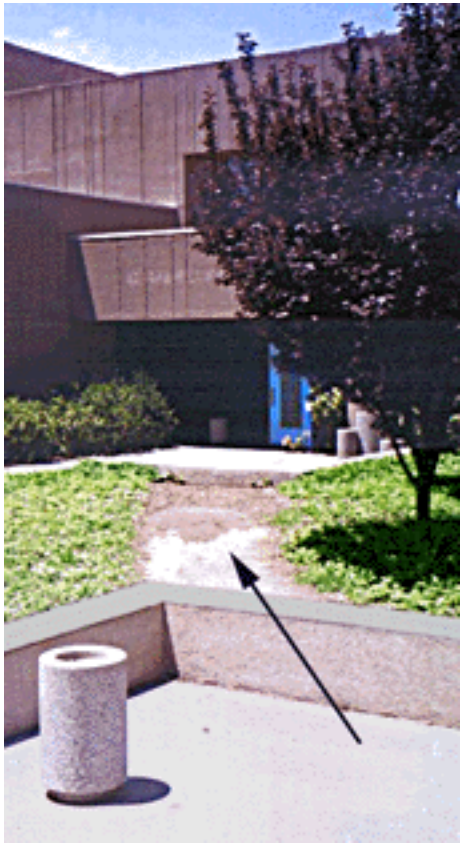
Who are the users of technology?





3. Emergence as System Property

- Importance of work and workflow analysis, proactive risk assessment, planning, project management, etc…
  - But you cannot predict the future!



- Health IT in use:
  - Worker adaptation to/of system
  - 'Workarounds'

Example of Adaptation

- Use of computerized patient documentation systems:
  - Physicians, nurses, and administrative staff at four VA sites (inpatient, outpatient)
  - Focus groups
  - Three tensions:
    1. Increased use of documentation system for communication
    2. Pressure to structure data input and minimize narrative
    3. Decreased ability to support higher-level sensemaking

(Weir et al., 2011)

Episodic Change–Continuous Change

Characteristics	**Episodic changes**	**Continuous changes**
Nature of change	Infrequent, discontinuous, intentional	Ongoing, evolving, cumulative
Time scale	Distinct period of time during which an event occurs	Multiple continuous changes over a period of time
Emphasis	Preparation for change and short-run adaptation	Long-run adaptability
Key concepts	Focus on inertia and potential for leverage	Learning at various levels: individuals and organization
Change agent	'Prime mover who creates change'	'Sensemaker who redirects change'

(Weick & Quinn, 1999)

Managing Change in Health IT Implementation

- It is a system!
- Analyze work and workflow.
- Expect to be surprised.
- Engage in continuous improvement and learning.

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Cognitive Task Analysis as a Change Management Tool for Health IT Implementation

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15 July 2014

AHRQ Grant: R18 HS018170

Nature of Expertise

- Organizational routines
- Ability to change routines
- Tacit and dispersed knowledge
- Knowledge work, non-observable behavior, and the limits of introspection

Cognitive Task Analysis

- Long track record in high-stakes, time-pressured, team-based knowledge work
- A family of highly structured qualitative methods
- Used to understand the (sometimes hidden) cognitive components of a task
- Primarily valuable for cognitively complex tasks

Macrocognition

- Decisionmaking
- Learning
- Sensemaking
- Mental models
- Planning and replanning
- Coordinating
- Monitoring
- Detecting problems
- Managing uncertainty
- Managing risk

Project Objectives

- Apply Cognitive Task Analysis (CTA) methods in three federally qualified health centers (FQHCs) to
  - Identify macrocognitive skills and functions in *clinical care* routines
    - Decision points
    - Information handling
    - Failure points
    - Workarounds
  - Identify macrocognitive skills and functions in *organizational change* routines

Project Objectives (cont.)

- Provide detailed CTA report to practices
- Implement Cielo Clinic system (universal registry, clinical reminders, reporting and panel management)
- Evaluate usefulness of CTA reports

CTA Report

- Outlined macrocognitive features of clinical and change routines; distributed versus dispersed knowledge
- Provided detailed recommendations and rationales for clinical and organizational workflow, constraints and affordances of health IT
- Provided implementation tools (sequence, log, etc.)

Methods

- Sequential case comparison
- Limited-resource settings (rural FQHCs)
- Task Diagram and Team Audit CTA methods
  - Clinical routines level
  - Change management level
- Report delivery and followup
- Use of reports and success of implementation

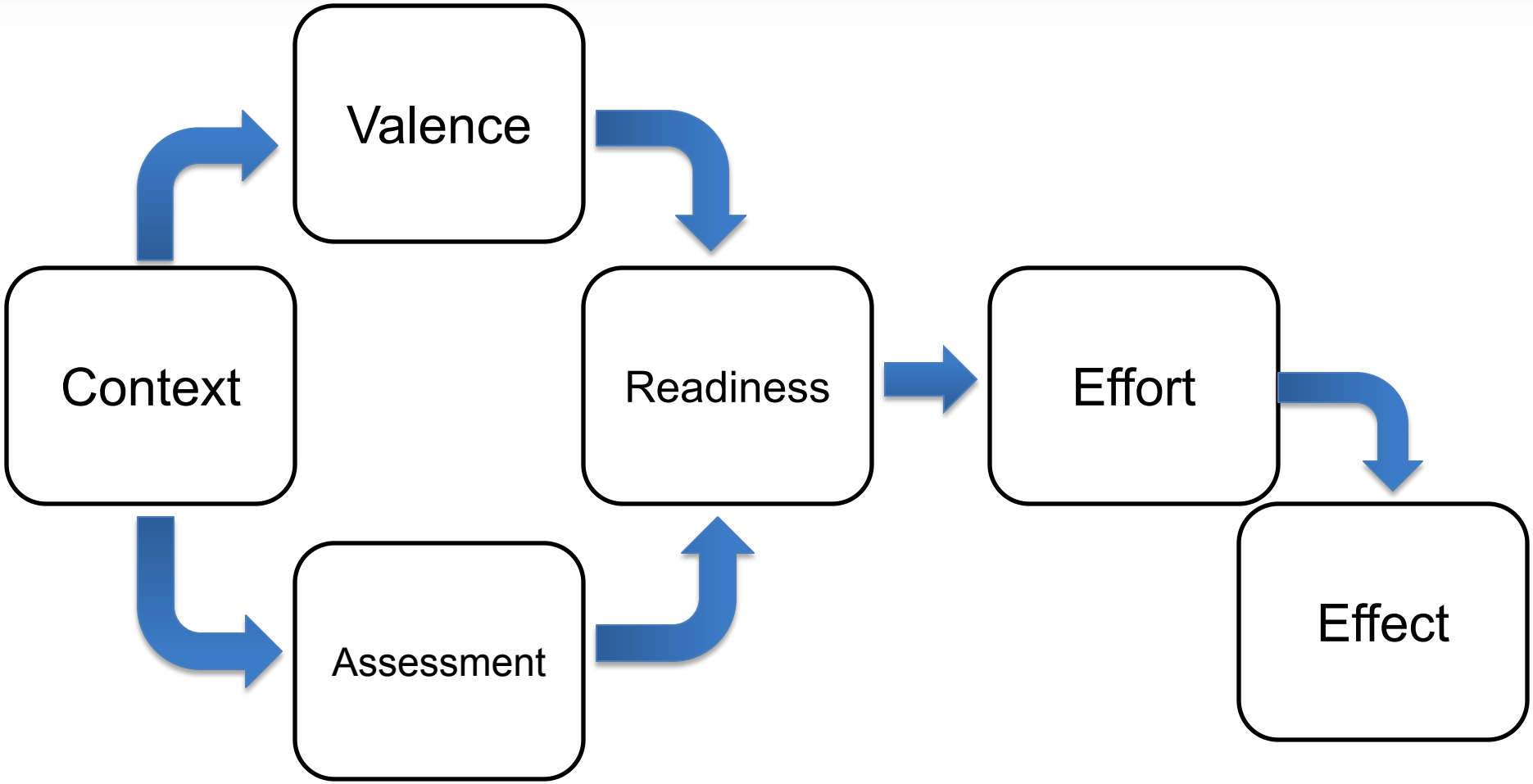
Results

- CTA methods readily applied at both levels
- Revealed details of clinical care routines, especially dispersed knowledge
- Made tacit and dispersed knowledge, skills (and deficits) in organizational change explicit – change capacity

Results (cont.)

- Practice A: planning and coordination deficits; unable to act on report and proposed remedies, failed
- Practice B: good planning/replanning and uncertainty management skills; able to persist despite highly disruptive external context
- Practice C: good coordination, limited planning/replanning and monitoring; improved with CTA-derived feedback; successful reimplementation

Lessons for Change Management



(After Weiner, 2009, Impl Sci 4:67)

Lessons for Change Management (cont.)

- Understand organizational routines as knowledge work
  - Including the tacit and dispersed knowledge
  - Does the information technology pass the right information to the right places?
- Understand and work with the team's macrocognitive skills profile
- Remedy macrocognitive skills deficits before attempting change

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Barriers and Facilitators to Electronic Health Record (EHR) Adoption in Home Care

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July 15, 2014

AHRQ Grant: R21 HS021008

EHRs in Home Care

- Home care
  - An increasingly effective way of managing chronic illness using skilled nursing care
  - Ordered at hospital discharge or by primary care provider

- Electronic health records (EHRs)
  - Intended to enable clinicians' access to patient health information
  - High EHR adoption rate in home care (29%)*
  - Little is known about EHR impact on clinical process, patient care**

*Resnick, 2010

** Stolee, 2010; Staggers, 2010

Aims

- Identify barriers and facilitators to use as intended of a home care point-of-care EHR
  - Investigate before and after EHR implementation
  - Rationale:
    - Identified barriers can be addressed, facilitators supported with interventions
      - For example, redesign software, recommend implementation strategies
    - Assessing EHRs that are used as intended enables assessment of EHR impact on quality of care

Study Setting, Population, Intervention

- Home care agency in Philadelphia
- 137 clinicians (predominantly nurses)
- Data from all Medicare patients
- EHR
  - Vendor-supplied
  - Centralized input of documentation pre-2010
  - Point-of-care implemented in 2010

Mixed Methods Research Design

QUANTITATIVE DESIGN (primary)

Procedures
Pre-, post- (137 clinicians)
Surveys
EHR usage
Documentation completion
Reimbursement

Products
Longitudinal analysis

X X X O X X X

Intervention

O X

Qualitative Design (secondary)

Procedures
EHR functionality
Observation (selected clinicians)
Followup interviews (selected clinicians)

Product
Thematic analysis

- Link qualitative (secondary) data with QUANTITATIVE (primary) results
- Integrate QUANTITATIVE (primary) outcomes with qualitative (secondary) findings

Legend
X = observation
O = intervention

Mixed Methods Research Design (cont.)

- Quantitative component (statistically analyzed)
  - Assess clinician perceptions
    - EHR Nurse Satisfaction (EHRNS) survey administered post-implementation
  - Describe clinicians' actual EHR usage
    - Pre/post study design
    - Measure EHR impact on documentation timeliness, patient outcomes
- Embedded qualitative component (thematic content analysis)
  - Interviews completed with selected clinicians at one point in time post-implementation
- Mixed methods analysis
  - Sort results from each data source by theme
  - Summarize themes in matrix

Results: Demographics

- 77 consented clinicians (56%)
- 71 responded to the survey (52%)
  - Mostly experienced, middle-aged, female clinicians
  - Mostly nurses and therapists (PT, OT)
  - 35% had prior EHR experience
- 6 observed and interviewed (4%)

Results: Clinician Satisfaction Across All Methods

- Computer hardware:
  - Inadequate battery power caused clinicians to makes note on paper
- EHR data completeness/ correctness/ timeliness:
  - Timely documentation
  - Incomplete data: medications, hospital stay history, physician contact
- Appropriateness of patient care:
  - Display of patient info needed for care decision or to initiate conversation with patient
- Team communication: EHR facilitated team communication

Results: Clinician Satisfaction, Dissatisfaction

- Clinician satisfaction on surveys, dissatisfaction in interviews with:
  - Organizational support
    - Need for field support
  - Software usability
    - Poor screen flow for finding information, entering data
    - Poor information display
  - Software functionality
    - Care plan documentation cumbersome and redundant
  - Efficiency
    - Takes longer to put in more data (approx.100 OASIS items)

Results: Clinician Dissatisfaction, Neutral

- Clinician dissatisfaction across all methods with:
  - Training
    - Need for ongoing training
  - Unintended consequences
    - Disrupts patient rapport
- Neutral perceptions of EHR impact on patient outcomes
  - EHR had impact on some patient outcomes

Quality Assurance, Performance Improvement

- Observed change management
  - Management use of secondary data from EHR
  - Improved clinicians' compliance with documentation timeliness guidelines
  - Increased clinicians' documentation productivity
  - Improved timeliness and completeness of documentation

Discussion: Hardware Issues

- Hardware field support
  - Home care nurses travel and lack access to
    - Backup hardware
    - On-site technical support
- Less than reliable, unusable hardware
  - Increases nurse workload, decreases efficiency
  - For example, duplicate documentation on paper, in EHR

Discussion: Mismatch of Functionality, Workflow

- Decreased clinician efficiency while
- Increased clinician use of EHR
- Clinical disciplines differ in organization of documentation
  - Therapist: body position
  - Nurse: body system

Clinician EHR Use as Intended

- Sustained increase in documentation timeliness
- Data availability
  - Reduce time needed to locate, collate information
  - Support team communication
- Capture quality data for process improvement

Need for Ongoing Training

- Better ways to document
  - Eliminate redundant documentation
  - Improve efficiency
- Especially important for clinicians who practice independently in the home
- Have few opportunities to learn from colleagues about new, faster ways to use EHR to get their work done

Provide Clinicians with Feedback from EHR Data

- Currently provide documentation timeliness compliance data
- Opportunity to share patient care process, health outcome data
  - Support quality assurance, care management efforts
  - May impact patient outcomes where EHR had some impact
  - Clinicians more likely to value system if it supports their patient care goals: more likely to use EHR as intended

Effective Change Management Observed During Study

- Current efforts: improve quality of clinician OASIS documentation
- Change management → minimized barriers
  - Provided clinicians with timely feedback from EHR data
    - Increased documentation productivity
    - Improved timeliness and completeness of documentation
  - Created positive impact on team communication
    - Clinicians obtain patient data from EHR because EHR data are complete and reliable
    - Reduced phone calls among clinicians to request patient information (reduced interruptions)

Opportunities for Effective Change Management

- Create and act on data from operational feedback systems
  - Hardware maintenance data from IT support to address need for field support
- Elicit and respond to feedback from clinicians
  - Improve workflow/EHR functionality match to improve clinician efficiency
- Implement continuous training
  - For all clinicians, not just nurses
  - System updates, shortcuts

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