New Directions for VHA
Cognitive Support

Jonathan R. Nebeker MS MD
VHA
University of Utah
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VA EHR Way Forward

• A renaissance?
• Modular extensible architecture?
• Open source community?
• Value behavioral sciences?
Decision vs. Cognitive Support

• Decision support
  – Here’s the right decision/task
  – Sometimes consider Workflow
  – Rarely consider Cognition

• Cognitive support
  – Give rich information environment that supports cognition in context of problem and workflow
Translating frameworks for Cognitive Support

• Moving away from
  – Paper-based-chart metaphor (13 years)
  – Event-driven decision support
  – Human factors as usability analysis

• Moving towards
  – Information rich environments
  – Cognitive Systems Engineering

• Using theory to inform design
Theoretical Foundation

• Cognitive System Engineering
  – Joint Cognitive Systems
  – Contextual Control Model
• Mindsets & Goal pursuits
Contextual Control Model

Physician
Patient
Nurse
Pharmacist
Social Worker
etc.

Construct/Shared understanding of patient health

Determine

Action/ Care Plan

Events/ Feedback

Modifies

Disturbances

Produces

Healthcare of Patient
Control Characteristics

• Breadth
  – Time
  – Data space

• Relationships (complexity)
  – What is related
  – Implications of relationships

• Adapting to uncertainty and unusual
  – Data gathering strategies
  – Decision-making strategies
COCOM + Action Phases

Physician
Patient
Nurse
Pharmacist
Social Worker
etc.

Shared understanding of patient health

Evaluate

Deliberate

Modifies

Events/Feedback

Care Plan
Act

Determines

Plan

Disturbances

Healthcare of Patient
CCOCM + Mindsets

Physician
Patient
Nurse
Pharmacist
Social Worker
etc.

Updating (Breadth)

Sensmaking (Complexity and Uncertainty)

Construct/Shared understanding of patient health

Determines

Planning

Events/Feedback

Modifies

Disturbances

Produces

Action/ Care Plan

Healthcare of Patient
Goals

• Reduce cognitive load (make it easier) to:
  – Consider breadths of data
  – Complexity of relationships
  – Deal with uncertainty

• Improve shared cognition
  – Targets clinicians and teams

• Facilitate mindset transitions and focus on appropriate goals
New EHR Paradigm

• Reduce to basic concepts
  – Conditions, Interventions, Observations
• Annotate observations
• Relate
  – Terminologies, Knowledge bases, Ad hoc
Example of Integrated Control
Status and Goals
Design Principles

• Maximize ease of attaining high levels of control characteristics.
  – Breath, relationships, decision strategies
• Make information present or rapidly accessible (for rapid cognitive cycling)
• At each step, ask what information is needed for task and mindset.
• Not “only right information at right time”
Integrated Documentation & Quality Measurement

• Update observations
• Orders write plan
• Plan satisfied quality measures
• Assistance from terminology
  – NDF-RT
  – Clinical Enterprise Terminology
Planning

- Medication reconciliation in context
  - Change in medications
  - Conditions (acute and chronic),
  - Status of conditions (observations)
- Feed forward control
Access to Free Text

• Need to break up documentation and link to key concepts.
• Allows focus on one type of information across time.
Demo