UX Makes All the Difference for Clinicians

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About Us

Eva Karp

• Senior Executive for a leading healthcare informatics organization
• 27 years in HIT with leadership roles in consulting, strategy and development for three healthcare informatics suppliers
• Currently working on my doctorate in healthcare administration at Medical University of South Carolina

Nancy Staggers

• Entrepreneur, consultant & Professor, Health Informatics
• Research program in UX for health IT products
• Former IT executive, enterprise EHR projects
• Career Army officer
• 30 years in HIT
Conflicts of Interest

Nancy Staggers
Has no real or apparent conflicts of interest to report

Eva Karp
Senior executive leadership holding over 10K in Cerner stock
Topics

• Introduction
  – UCD defined
  – Benefits of UCD

• A primary pain point for clinicians
  – Telling the patient’s story
  – Why is it difficult for IT design?

• Sample UCD project
  – Cerner patient story project
  – Projected benefits

• Conclusions and next steps
Learning Objectives

• Correlate the role of user-centered design (UCD) in providing a foundation for safe patient care

• Explore common UCD issues with clinical HIT applications

• Discuss the effect of UCD on clinical workflow

• Identify how UCD can improve clinicians' job satisfaction
Clinicians satisfaction: improved by using UCD

Treatment: Improved patient safety and treatment outcomes

Electronic secure information improved with UCD

Patient engagement: telling their own story, care self-management

Savings: labor costs, inefficiencies, reduction in errors, litigation
Introduction
What is UCD (User-Centered Design)?

An approach to designing a product or service where the end user is placed in the center of the process\(^1\)

What’s Critical to UCD?

• An early and central focus on users in the product design and development
• Iterative design
• Systematic measures of the interactions between users and products$^{2,3}$
Why Care about UCD?

Increased Individual Effectiveness, Efficiencies

Increased User Productivity/Efficiency

Decreased User Errors/Increased Safety

Improved Cognitive Support

Improved patient, provider organizational outcomes

Value of Usability

Increased Organizational Efficiencies

Decreased Maintenance Costs

Decreased Customer and Individual Training and Support Costs

Decreased Development/Time Costs

HIMSS, 2011
A Clinician Primary Pain Point: Telling the Patient’s Story
What is “Telling the Patient Story?”

• Handoff, signout, handover

• Exchange between health professionals of information about a patient accompanying either a transfer of control over, or of responsibility for the patient

• Basic purpose
  – Information transfer
  – Responsibility transfer
What Really Happens

• Sifting through vast information
  – “Information foraging”
• Rapid-fire communication
• Filled with jargon
• Informal
• Often unstructured
  – Based on individual preferences
• Simultaneous cognitive activities
  – What is going on?
  – Priority-setting
  – Planning for the shift, tasks
  – Detecting missing, erroneous information
Why Is Designing Handoffs Difficult?

- Additional critical purposes of handoffs
- Supporting cognitive work
- The context as an imperative
Other Critical Purposes

- Identifying erroneous thinking\(^5\)
- Coaching, educational\(^6\)
- Setting priorities
- Care organization
- Emotional support\(^7,8\)
- Socializing new nurses into the expected role\(^9,10\)
- Group cohesion\(^8,9\)
- Communicating group values\(^9\)
- Social\(^5,6\)
Supporting Cognitive Work

• IT approach versus the actual activity
  – Information transfer versus cognitive support
  – Nurses’ “Brains”
    – “The nursing summary report has about 50% of the information we need…”11
  – Planning, caring for groups of patients
  – Handoffs as a single event versus the whole shift
Supporting Cognitive Work, cont.

• “At a glance” information and visual cues
  – What’s new? Labs, rads, stat orders
  – Important status changes?
    • Vitals, labs, pain?
  – Over-due, missed meds?
  – Next tasks? Across my patients?
  – Trends across the shift?
  – Important items to track, chart
Context as an Imperative

- This facility
- This unit
- This shift
- This patient
- This clinician/nurse$^{11,12,13}$
UCD and Telling the Patient’s Story

- More than just a simple understanding of the user
  - Understanding the thinking about care in this context
  - Employing cognitive task analysis, observations
  - Understanding goals
  - Understanding the complex activity in depth
  - Paper persistence

- Good design has the potential of making a significant difference in clinicians’ lives
Have you ever heard?

• I have lost the story!

• Could clinicians describe what “the patient story” is?

• What has changed?
Clinical Practice in the 70’s!
Clinical Practice today
The story changes as we connect the Care Continuum

Smart Layer

goals / plans • care management • healtheRegistries • longitudinal record

SEPSIS • APPOINTMENT ADHERENCE • FALLS RISK • HEART FAILURE • MEDICATION ADHERENCE

member

Home in 6 weeks
Gain my independence
Attend grandson’s graduation
Attend family reunion

Post Acute – Long term Care

Acute Care
Transitional Care
Home Care
Skilled Care

Physician

Acute conditions/ disease management
Maintain/progress ADLs, progress to optimal health goals
Maintain health, independence, chronic disease management
Maintain ADLs, support care goals, comfort care

Care Manager

Member

Transition plan (surgeon)
Transition plan (oncology)
Transition plan (renal)

Administered
Administered / self managed
Self managed
Self managed

Himss16
Clinician involvement is critical, but...

Healthcare teams caring for the same patient are not necessarily located together.

The digitized content related to the patients care needs to be accessible from anywhere.

As such, the design of the story will have a direct impact on how team members “interact dynamically, interdependently, and adaptively.”

“If I had asked people what they wanted, they would have said ‘Faster horses’.” (Henry Ford)
We engaged the User Experience team

- Our user experience team leverages a multi-disciplinary design approach based on active involvement of users for a clear understanding of the user and task requirements, and the interaction of design and evaluation"15

- Teams consist of researchers, human factors, industrial and user interface design architects
- Design is guided by observing, working with and studying users and their workflow, goals and tasks
- Healthcare executives
- Practicing clinicians
We wanted to solve the age old question, “What is the patient story?”

- We created a workgroup with participants from different disciplinary backgrounds
  - Physicians, nurses, Informatics professionals, Regulatory, Risk and Quality, Development team, Strategist with clinical expertise across the continuum
- Literature search
- Interviews
- Brainstorming sessions
  - Evaluated various examples of summary level views were reviewed
  - Reviewed different approaches that clients and industry have taken to solve this
  - Developed a working definition and defined criteria based on discussions and workgroups
- Prototyped visuals
- Executed on-site walkthroughs and discussion with clinicians and other stakeholders
- Revised prototype based on walkthroughs and client feedback
Problem Statement:

Care providers do not have a single view that allows them to see the persons story with relevant context across the health continuum

Providing this view will improve the patient experience and allow clinicians to provide a more guided personalized care.
What we heard!

• Clinician’s want a visual representation of the patient's clinical story reflected in a timeline view with temporal relationships when appropriate

• The information should be clinically relevant to the patients diagnosis and reflect the temporal relationship of diagnostics, interventions, the patient’s current presentation and outcomes

• If relevant the timeline should cross multiple venues and/or transitions of care

• “Know me” concept – would be nice as one click away, but it depends on the clinician/patient relationship

• The ability to drill down to the original sources when desired
What is the Patient Story?

- Know me as a person
- Attributes unique to me
- Preferences
- Patient goals and concerns
- Related past events
- Timeline of events and sequential order
- Relevant Notifications
Success would be!

- The clinician is able to familiarize themselves with the patient's history, current status, and progress since last seen.
  - Role and venue based
  - Significant and subjective information display
  - Access to detailed information
  - The ability to flex information over various periods of time.
  - View trends of physiological data and clinical results
  - View plans of care reflecting progress towards goals and objectives.
The View – the bar continues to rise!

Timeline
- The timeline displays the relationship and progression between the patient’s history, current condition, and prognosis.

Across the Continuum
- It includes external information such as outside records, consulting doctor notes, health coach reports, and home monitoring data to create a single patient story.

History
- What got them here?
- Lifelong issues
- Recent past - What has happened in the last 12 hours or 3 days?

Present
- What is important today or during ‘my shift’?
- Personal preferences and goals

Future
- What are their future appointments?
- Algorithm-based health projections
Visual cueing

• Visual representation of data can be powerful because they leverage the human visual system consisting of eye and the visual cortex of the brain.\textsuperscript{19}
  – The view should tell a story
  – Pattern Recognition
    • Facilitate visual cueing to trends, variances, and critical issues
    • Correlate and connect data like medications, related results, and medication reactions
  – New Information
    • Highlight changes in the patient’s condition and relevant updates since the user has last viewed the chart
  – Smart Alerts
    • Identify issues and alert the clinicians to provide relevant decision support
Overview

**Situation**

PT has suddenly become hypotensive. BP is 88/45.

**Background**

He had a small bowel resection 3 days ago and is receiving IV fluids at 1250ml/hr. He is normally fit and well with no relevant past medical history.

**Assessment**

His airway is patent. Pulse is regular. His blood pressure is 88/45 with a capillary refill of four seconds. Urine output has dropped over the past 3 hours to 10ml. At the moment he is alert and complaining of abdominal pain. He has also been vomiting. Temperature is 38.7. I think he is septic, possibly abdominal.

**Recommendation**

Stat bolus of 500ml normal saline (with patient group directive 1013) and organize and send for urgent ECG.

**Goals and Concerns**

**Patient: Patient is concerned about the chill still currently simmering on the stove in her home.**

**Clinical:** Discharge in 3 days to home.

**Historical Timeline**

[Timeline details showing various events and conditions, such as hyperlipidemia, migraine, depression, and treatment notes like medication orders and lab results.]

**Detailed Timeline**

[Timeline chart showing clinical trending data such as blood pressure, heart rate, and respiratory rate over time with specific dates and times highlighted.]
Condition specific views will still be needed
HIMSS Value Steps

Clinicians satisfaction: improved by using UCD

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Questions & Contact Information

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References