Improving EHR Usability: A Tale of Two Hospitals

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Introduction

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1. Explain the challenges hospitals face in driving meaningful use of EHRs and other technologies by physicians when a lack of usability interferes with workflows.

2. Describe how usability issues affected operational efficiency, patient care and safety, data security, and physician satisfaction at Orange Coast Memorial Medical Center and Hunterdon Medical Center.

3. Delineate how awareness computing expedited the login/logout process by delivering the appropriate virtual desktop to clinicians based on user identity, role, location and device via the tap of a proximity badge.

4. Explain how multiple clinicians use the same workstation without losing their data, cognitive thought process or place in their current application.

5. Show the effect of faster access and simplified workflows on physician job satisfaction.

Learning Objectives

- Patient Protection and Affordable Care Act (ACA)
- ED visits have increased dramatically over the last 15 years
Supply and Demand

- Pre-ACA need
- Established need today
- Number physician retiring during that time

Source: A workforce capacity study conducted for State of KY by Deloitte Consulting in 2014

Impact of Regulation

- Electronic documentation and ordering (HITECH)
Impact of Regulation

* Eleven Core Measures specifically address the Emergency Department

To Scribe or Not to Scribe?
Emergency Services Contractors

- Emergency services professionals have increasingly joined independent groups and contract across multiple hospitals

MemorialCare Health System
A Nonprofit Integrated Delivery System

- Hospitals (6)
- Medical Group
- IPA
- Health Plan
- Numerous outpatient, imaging, and surgery centers across Orange & LA Counties
- One of Top 100 Integrated Healthcare Networks nationwide and Top 10 in the West (IMS, 2012)

OCMMC
- 215 staffed beds
- 68,435 discharges annually
- 33,000 ED visits
MC*21

- Patient safety
- Patient service
- Patient satisfaction

LEAN

**Lean Measures**

**Processing time**
- 57,200 total hours saved

**Patient Wait Time**
- 118,000 total hours of patient wait time eliminated

**Materials**
- $623,000 total potential materials savings

**Space**
- 1,600 square feet reallocated for patient care use
Orange Coast Memorial ED

- Primary EMR: Epic ASAP
- PACS: Phillips iSite PACS
- Dictation: Nuance Dragon
- App Virtualization: Citrix XenApp required for Epic

Orange Coast Memorial ED Tomorrow

New Emergency Pavilion
A NEW VISION TO SERVE OUR GROWING COMMUNITY... WHEN IT MATTERS MOST
Life at MemorialCare in 2011

* EMR Adoption
* What worked?
* What didn’t work?

Mobility

* Mobility is “the ease of movement”
* The average nurse walks more than 4 miles during an average 12-hour shift
* A tethered clinician is an inefficient one
Roaming Challenges

* Computer doesn’t know you have arrived:
  * Desktop applications
  * Profiles
  * Permissions
  * Printer doesn’t know you have moved devices

Patient-Centric Workflow

Nurse:
  - Cares for 4 patients simultaneously
  - Interacts at least 1x/hr according to nursing policy, so combined with initial workup plus discharge and overall LOS, each patient is seen 4-9x during ED stay.
  - Accesses the record 3-5 times for each patient
Patient-Centric Workflow

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Per Shift:
- 72-120 logins
- @21 seconds each
- = 25 min/shift

What Do CIOs Want?

* Security
* Productivity
* Physician Satisfaction
* Patient Satisfaction
* Manageability
What Challenges are CIOs Up Against?

- Regulatory
- Legal
- Technology Adoption
- Clinician Satisfaction

Creating appropriate compromise between accessibility, mobility & security

Common EMR user complaints:
- Login time/system access
- Multiple login/logoffs
- Device dependency
- Clicks to relevant patient data

Biggest fear for an IT shop supporting EMR:
- Protecting electronic patient data
- Dissatisfied/disengaged EMR users
The CIO Answer: Expand the Pie

Enforce Security without Reducing Productivity

- Virtualization platform:
  - Security
  - Manageability
  - Roaming
- Card / card reader
  - Security
  - Productivity
- Speed
  - Productivity
  - SSO
- Security
  - PHI
  - Access
- EMR
- Dictation software
- Awareness (user, role, location, device type)
  - Printing
  - Productivity vs necessary security
  - Desktop intelligence (app provisioning, launch, minimize, hide)

“Awareness”: Purpose-Built Systems & Devices

Smart Homes

Internet

Mechanical Systems

Smart Automobiles

Everyday Objects & Appliances

Microsystems

Smart Phones
Hunterdon Healthcare

- 178 licensed bed teaching hospital
- Not-for-profit hospital located in rural Flemington, New Jersey
- Offers a full range of preventive, diagnostic and therapeutic inpatient and outpatient hospital and community health services
- 8,600 inpatients annually
- 33,000 ED visits
- American’s Most Wired for past 13 of its 14-year existence
- Magnet status

Hunterdon ED

- Primary EMR: Optum ED Picis Pulsecheck (IBEX)
- PACs system: GE
- Inpatient EMR: Quadramed QCPR

- Double “Block O” layout – Open inner circle of shared computers with outer ring consisting of exam rooms
- Physician cubby:
  * Hi-Res/Diagnostic Quality PACS viewing computer
  * Physician dictation devices
A Day in the Life

- Seeing patients: 247 minutes
- Time on computer: 365 minutes including...
  - Charting/entering orders and labs to be done: 219 minutes
  - Looking up old medical records: 42 minutes
  - Entering discharge instructions/prescriptions: 41 minutes
  - Entering admit orders/completing transfer forms: 63 minutes
- Discussions with other physicians: 69 minutes
- Researching medical issues: 13 minutes
- Eating lunch: 5 minutes
- Personal phone call: 4 minutes
- Miscellaneous down time: 12 minutes
- Sign out to oncoming physician: 5 minutes

“How Time is Spent During an Emergency Department Shift,” 3-5-2012, White Coat’s Call Room, a blog from inside the Emergency Department, Emergency Physicians Monthly.

A Day in the Life: Comparatively

<table>
<thead>
<tr>
<th>Activity</th>
<th>Mins</th>
<th>% of 12hr Shift</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time on Computer</td>
<td>365</td>
<td>50.7%</td>
</tr>
<tr>
<td>Seeing Patients</td>
<td>247</td>
<td>34.3%</td>
</tr>
<tr>
<td>Communication with Colleagues</td>
<td>74</td>
<td>10.3%</td>
</tr>
<tr>
<td>Medical Miscellaneous</td>
<td>18</td>
<td>2.5%</td>
</tr>
<tr>
<td>Personal Miscellaneous</td>
<td>16</td>
<td>2.2%</td>
</tr>
</tbody>
</table>
What Do Physicians Want?

- “Physicians want to get on and off the computer quickly.”
- “Physicians want access, speed and efficiency. They want to maximize their clinical productivity.”
- “Physicians want to get off on time when their shift ends” [and not have to stay after - or spend their weekend - catching up on documentation.]

Challenges
- Volume
- Regulatory
- Legal
- Ergonomic
- Time pressures

Productivity Impact

1. Decreased time to access relevant information
2. Increased patient-centric workflow
3. Awareness updates
4. Increased clinician satisfaction
Patient Impact

1. Decreased time to access relevant information
2. Increased patient-centric workflow
3. Awareness updates
4. Increased clinician satisfaction

Patient-Centric Workflow

1. Physician logs in & reviews patient records before entering room.
2. Upon entering room physician logs in again to bring up patient record.
3. Physician interacts with the patient.
4. Desire to have more focus/less distraction or dictate, physician goes to a set-away devices to place orders or dictate. Physician logs in again to complete documentation tasks.
5. Physician are often called away to answer questions or provide care... Logout
6. After interruptions ... physician logs in again & resumes charting.
Physician are often called away to answer questions or provide care... Logout

Desire to have more focus/less distraction or dictate, physician goes to a set-away devices to place orders or dictate. Physician logs in again to complete documentation tasks.

After interruptions ... physician logs in again & resumes charting.

Every patient interaction = 105 seconds of login time

Efficiency Impact

1. Decreased time to access relevant information
2. Increased patient-centric workflow
3. Awareness updates
4. Increased clinician satisfaction
Physician Impact

1. Decreased time to access relevant information
2. Increased patient-centric workflow
3. Awareness updates
4. Increased physician satisfaction

Sixty-five percent of clinicians have considered leaving medicine because it is no longer rewarding to them.

Thirty-one percent of clinicians experience burnout more than half the time due to work, and the reported leading cause of burnout was patient overload (49 percent).

Results from survey administered at Academy of Integrative Health & Medicine annual conference (San Diego, 2014)

Time to Access Relevant Patient Information

BEFORE
No VDI - No Workflow Solution

- 21 seconds to log into Epic Hyperspace
- 11 seconds to log into iSite
- Repeat Epic login 72 times/day
- Repeat iSite login 25 times/day
- Repeat Dragon login 5 times/day @ every workstation

29.78 Total Login Minutes Per Person Per Shift

AFTER
VDI & Workflow Solution Deployed

- Upon Tap
- 8 second reconnect to roaming desktop
- 0 seconds to reach Epic patient data
- 0 seconds to log into Nuance Dragon
- 6 seconds to reach iSite patient data

9.70 Total Login Minutes Per Person Per Shift

69% SAVINGS per person per shift
ED Access Time

It took ~51 seconds* to access the patient chart in the ED.

* Average based on 27 samples taken on 12/13/12 at HMC

Workarounds Due to ED Access Time

1. Clinician does not log out of EMR/application when they leave the room/station, that is either leave record up or minimize EMR app and/or manual turn screen black
   • Why: To avoid having to wait through a lengthy login again

   Risk: Patient privacy, patient safety due to possible documentation in wrong record
Workarounds Due to ED Access Time

2. Clinician logs out of EMR but does not secure the desktop
   • **Why:** To avoid having to wait through a lengthy login again
   
   **Risk:** System vulnerable to threats, subsequent users have access to that last clinician’s profile, that is, applications such as email

Workarounds Due to ED Access Time

3. Clinicians uses generic Windows logon or shares login
   • **Why:** To avoid having to wait through a lengthy login again
   
   **Risk:** Logging / audit inaccuracies
Workarounds Due to ED Access Time

4. Clinician locks the desktop (ctrl + alt + delete) under their login so others are forced to restart Windows to use device
   • **Why**: To avoid having to wait through a lengthy login again
   
   **Risk**: *Inefficient use of device and unproductive for co-workers*

Preparing for Change

* Physician Leadership - Understanding change 1st hand
* Marketing internally
* Training realistically
* Support
Fast Access to Data

* Card tap
* Seconds to access desktop
* Roaming

Security

* Badge tap to secure:
  * Tap in
  * Tap over
  * Tap away
* Password (PIN or tap only)
* Screen obscure upon short term lack of use
* Auto-disconnect upon extended lack of use
Immediately molding of the desktop based upon:
- Who
- Role
- Location
- Device
- Patient

What is Next?

Security & Accessibility & Relevance
- Workflow Support with Roaming Desktops
- Login Ease with strong security
- Support other healthcare initiatives
- Awareness Updates
- Clinician’s PC frustration alleviated
**Nurse Time Savings: Wait Time**

Inpatient nurses estimated logging into a computer 6 times/hr or 72 times across a 12-hr shift.

**Baseline:** The average time a nurse waits:

- To log onto a patient room device using shared logins = 21.6 mins/shift
- + For previous user to logoff = 9 secs x 7 logins (10% time) = 1.0 mins/shift
- Average login time across computers = 22.6 mins/shift

<table>
<thead>
<tr>
<th>Login Wait Time</th>
<th>Pre-Optimization</th>
<th>Post-Optimization</th>
<th>Time / Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per shift, per nurse</td>
<td>22.6 mins</td>
<td>7.2 mins</td>
<td>15.4 mins</td>
</tr>
<tr>
<td>Annually, all shifts, all nurses (40 RNs/shift, 730 shifts/yr = 29200)</td>
<td>10,998 hrs</td>
<td>3504 hrs</td>
<td>7494 hrs</td>
</tr>
<tr>
<td>Hospital Cost ($60/hr per nurse)</td>
<td>$659,920</td>
<td>$210,240</td>
<td><strong>$449,680</strong></td>
</tr>
</tbody>
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*Baseline data captured by Aventura in Jan 2012*
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Thank you.
Questions?