EHR: Pearls and Pitfalls

Sue Wolver, MD FACP
Associate Professor, General Internal Medicine
Assistant CMIO
Virginia ACP
March 7, 2015
Conflict of interest

- None
Objectives

■ The Why
■ Pearls: What has the EHR done well?
■ Pitfalls: What has the EHR not done well?
■ Provider satisfaction?
■ Wolver’s top 10
■ Future directions
The Why

- Burning platform

- Simon Sinek
Jeanne has been fighting stage IV metastatic breast cancer for six years. Her records have wound up in more than 20 different health organization EMRs as she's progressed on her "journey" of therapies and surgeries.

Rise Of The Health Care COMsumer: ePatient Dave

- Terminal Stage IV Cancer patient.
- Zero options via traditional channels.
- Survival options found in patient community.
- Leading voice on Patient Partnership

"Patient is not a third person word"
The Why
The How: Meaningful Use

Stage 1
Data capture and sharing

Stage 2
Advanced clinical processes

Stage 3
Improved outcomes

Improved quality of patient care

- Better clinical outcomes
- Improved population health outcomes
- Increased transparency and efficiency
- Empowered individuals
- More robust research data on health system
Jury is still out

- Too early
- Hard to measure
What has the EHR done well?

- Patient safety
- Quality measures
- Population Health
- Outcomes
- Patient engagement
- Communication
Patient Safety

- Medications
- Dashboards
Patient Safety: Medications

- Drug/Drug; Drug/Allergy; Bar coding

**Allergy**

- No drug allergies were found.

**Drug/Drug (1)**

- DC: Severity: Medication
- Major: adalimumab (Humira 40 mg/0.8 mL)
- Contraindicated: subcutaneous kit

**Drug/Food**

- No interactions were found.

---

**Increased INR**

Deaths have been caused by Warfarin - Bactrim interactions. Consider a different antibiotic, decreasing the dose of warfarin, or close INR monitoring.

**Alert Action**

- Cancel order
- Continue with this order
- Modify order

OK
Patient Safety: Medications

- Enabling medication management through Health IT
  - Literature review on medication management processes (>40,000 articles, included 428)
  - Showed substantial to moderate improvement through Health IT
Patient Safety: Medications

Summary: Impact on Serious Medication Errors

1. MD
   - Med Orders
   - Order Entry & decision support-55% reduction
   - Ordering Errors (49%)

2. Pharmacist
   - Dispensing
   - Dispensing Errors (14%)
   - Pharmacy Barcoding-67% reduction

3. Medication Admin Record
   - eMAR-100% reduction
   - Transcription Errors (11%)

4. Medication on Wards
   - Administration Errors (26%)

5. RN
   - Administration
   - Administration at bedside - 51% reduction

6. Patient


VCU Health System
MCV Hospitals and Physicians
## Patient Safety: Dashboards

- **Assimilation of information: Safety Dashboard**

<table>
<thead>
<tr>
<th>EWS</th>
<th>CODE</th>
<th>AIRWAY</th>
<th>L/T/D</th>
<th>PRECAUTIONS FLAGS</th>
<th>PAIN SCORE</th>
<th>LAST WEIGHT</th>
<th>SKIN RISK</th>
<th>RE-STRRAINT</th>
<th>MED ▲</th>
<th>VAX</th>
<th>MED REC</th>
<th>OVERDUE TASKS</th>
<th>DVT</th>
<th>DIET</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>FULL</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>0 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>DNR</td>
<td>CVC</td>
<td>+1</td>
<td>3</td>
<td>0 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>FULL</td>
<td></td>
<td></td>
<td>+2</td>
<td>0 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>FULL</td>
<td>CVC</td>
<td>+1</td>
<td>8</td>
<td>0 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>FULL</td>
<td>CVC</td>
<td>+1</td>
<td>7</td>
<td>0 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>FULL</td>
<td>CVC</td>
<td></td>
<td>+2</td>
<td>0 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>FULL</td>
<td>CVC</td>
<td>+1</td>
<td>5</td>
<td>0 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Patient Safety: Dashboards

- One step further: Early Warning System

![Early Warning System Dashboard](image-url)
Quality

- Patient identification
- Screening/ preventive care services
As Scottish mathematician and physicist Lord Kelvin said more than 100 years ago, “If you cannot measure it, you cannot improve it.”

- First step: find the patients eligible for the intervention
Quality

- Improved Quality of Care Screenings
  - Breast Cancer
  - Diabetes
  - Chlamydia
  - Colorectal Cancer
  - Recording of body mass index and blood testing for patients with diabetes
  - Blood pressure control for patients with hypertension

Quality

- Mixed results
  - Too early, workflow issues
  - 6000 patients, 9 measures, 3 improved
  - Improved documentation of smoking and antithrombotic therapy, improved BP control
  - Unchanged: smoking cessation intervention, hemoglobin A1c control and cholesterol control

Population Health

- Screen an entire population for patients who
  - Suffer from a specific condition
  - Are eligible for specific preventive measures
  - Are currently taking specific medications
- Manage risk factors to improve outcomes
- Detect patterns of potentially related adverse events and enable at-risk patients to be notified quickly

http://www.healthit.gov/providers-professionals/improved-diagnostics-patient-outcomes
Population Health

- Registries
Population Health

- Group Health Cooperative used EHR to find 5000 patients overdue for colon cancer screening
- Used patient navigators
- Screening increased from 26% to 65%

Outcomes

- A national survey of doctors who are ready for meaningful use offers important evidence:
  - 94% of providers report that their EHR makes records readily available at point of care
  - 88% report that their EHR produces clinical benefits for the practice
  - 75% of providers report that their EHR allows them to deliver better patient care

http://www.healthit.gov/providers-professionals/improved-diagnostics-patient-outcomes
Outcomes

- Disease specific
- Using EHR Decision Support to Improve Asthma Care and Compliance
  - Clinical Decision Support embedded in care
  - 6% greater use of controller medications
  - 3% greater use of spirometry (6% in suburban practices)
  - 14% greater use of asthma care plan

Outcomes

- Health department NYC 2010
  - More likely to screen
    - BP, obesity, diabetes
  - Within 6 months
    - Lipid goal: 30% → 52%
    - HTN goal: 49% → 56%
      - Would translate to 12,000 lives saved nationally

Patient Engagement

- WELLNESS
  - Self-Management and Prevention

- HEALTH CARE
  - Shared Management

INTERACTIONS
Engaged Patient

- An engaged pt has lower healthcare costs
  - Least engaged have costs up to 21% higher \(^1\)

- How do we best engage them?
  - Give them their data

\(^1\) http://www.piperreport.com/blog/2013/03/28/patient-engagement-costs-improve-outcomes/
Patient Portal

- Limited data that portal can improve patient engagement
- 60% of patients who have access to their chart correct something
- More preventive care completed
- Improved follow-up for abnormal results

https://secure.mypreventivecare.com/
Open Notes

http://www.myopennotes.org/
Communication

- 2013 National Ambulatory Medical Care Physician Workflow Survey
  - 60% of physicians reported facilitated communication among care team
  - 50% reported improved management of referrals

What the EHR does best

- Improved data accessibility
- Preventive medicine
- Communication

What has the EHR not done well?

- Usability
  - Efficiency
  - Productivity
- Data presentation
  - Information overload
  - Rules and Alerts
Usability

- Requires too much training
- Many fail the rules of usability
- Too many ways to do things
  - Best way not often taught
Efficiency

- Alters workflow
- Increased cognitive load
- Creation of unsafe workarounds
- More time spent dealing with IT than patient care

https://ehrintelligence.com/2012/09/17/study-shows-health-it%E2%80%99s-positive-negative-effects-on-safety/
Productivity

- Pediatric ophthalmology practice
  - 11% less productive
  - 44% of charts completed outside of the visit

Electronic health record impact on productivity and efficiency in an academic pediatric ophthalmology practice. Redd TK¹, Read-Brown S², Choi D³, Yackel TR⁴, Tu DC⁵, Chiang MF⁶.
Productivity

- Despite achieving meaningful use
  - Most ambulatory providers at lower productivity than before EHR implementation
    - Spending more time on documentation (85 percent)
    - Seeing fewer patients (66 percent)

Data Presentation

- Alert fatigue
- Not learning for us
- Increasing cognitive load

- Note degradation
  - Note bloat
  - Copy/past
  - Clickables

**Chief Complaint/HPI:**
4 mo f/u with labs

He presented with proteinuria. It is described as chronic. The symptom is gradual in onset and ongoing. The complaint is moderate.

In addition, he presented with hypertension. It is described as chronic. The symptom is gradual in onset.

The patient also presented with hyperlipidemia. It is described as chronic. The symptom is gradual in onset.

He next presented with SLE with renal disease. The symptom is exacerbated by no known associated factors.
Provider satisfaction

Positive

- Remote access to data
- Improvements in quality care
- Ability to provide guideline-based care
- Track patients' markers of disease control over time

Negative

- Poor usability
- Time-consuming data entry
- Less time for face-to-face patient care
- Degradation of clinical documentation by trying to force it into structured fields
- Lost productivity
- Information overload

60 percent of ambulatory providers surveyed dissatisfied with their EHR

http://www.rand.org/pubs/research_reports/RR439.html

Wolver’s top 10

10. Recognize that change is hard but inevitable
9. Learn how to type
8. Don’t double document
   - Hybrid is dangerous
7. Do the training, all of it
   - Don’t take shortcuts
   - Find out who is doing it well and why
6. Have a superuser that can distill the information and changes specific to your clinic workflow
Wolver’s top 10

5. Workflow
   - Must do current state and future state
   - A broken workflow will make a broken EHR

An EHR is only as good as the processes that it supports. If the technology is not supported with well-thought processes, hospitals may invest in complicated and expensive technologies that create more waste in a system already fraught with inefficiency.

4. Everyone works to his/her level of training
   - Get some things off the provider’s plate
Wolver’s top 10

3. Use the External Medication History

2. Promote and use the patient portal

1. Use the computer WITH the patient
Patient survey

- Random sample of 4,500 U.S. patients
  - 500 responses to each question
  - How patients feel about doctors using EHRs at the point of care

> 80% didn’t feel it was very bothersome
42% prefer electronic
47% don’t care
How to use the computer in the room

1. Position the computer between you and the patient
2. Invest in mobility
3. Delegate as much as possible
4. Dictate as much as possible
5. Ignore the computer for the first 5 minutes
6. Ask about previous complaints
7. Finish the chart in the room

http://profitable-practice.softwareadvice.com/7-ways-to-maintain-patient-interaction-ehr-0113/
Future Directions

- Patient plays a more active role in adding to the record
  - Patient entered data
  - Patient verification of data

- Better user interfaces

- Smarter systems that learn from the user

- A more interactive/dynamic chart

- Smarter systems that assimilate and present information to decrease cognitive load
Decreasing cognitive load

- Jeff Belden
If Facebook Designed Your EHR: A Timeline Approach to Patient Care

January 2, 2014 by Melissa McCormack

Like many industries these days, healthcare is increasingly digital. Many doctors are now using electronic health record (EHR) software rather than pen and paper for patient records. EHRs have taken medical records into the 21st century and solved many of the administrative problems of paper charts (think illegible handwriting and the inability to quickly pull up information).
Questions?

Sue Wolver
swolver@vcu.edu