

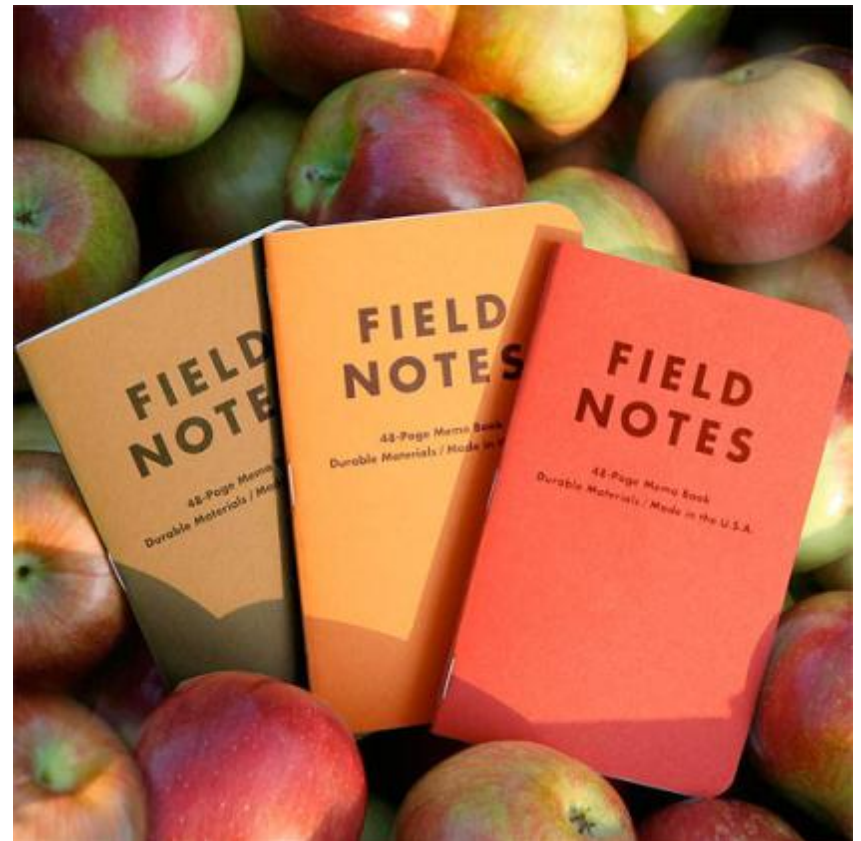
# Top 10 EHR Improvements for Integrated Care



Christine A. Sinsky, MD FACP  
AMA Integrated Physicians Practice Section  
Washington, DC  
11.15.13

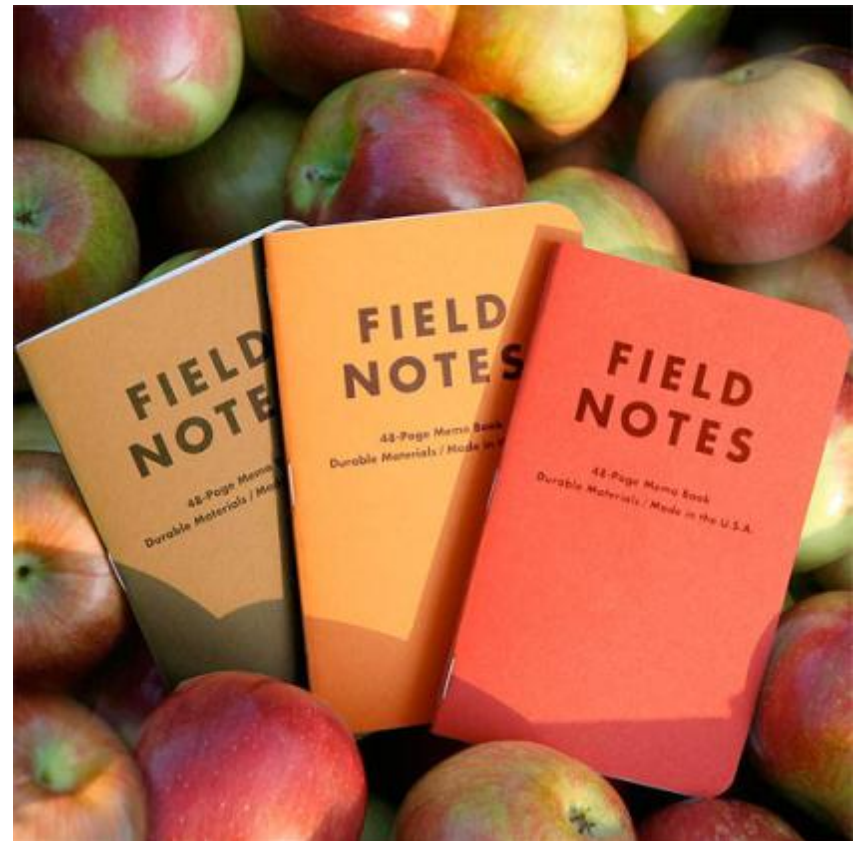
# Agenda

- What's working
- What's not
- What's needed
  - Design
  - Implementation
  - Policy



# EHRs

- What's working
- What's not
- What's needed



# Shared Information with patient



<a href="#">Calcium-D Oral Capsule 600-200 mg-unit</a> (Liquid Calcium, Liquid...)	2 DLY
<a href="#">Carvedilol 25 mg Tab</a> (carvedilol oral)	1 tab in the am and 1/2 tab in
<a href="#">Ecotrin Oral Tablet, Delayed Release (E.C.) 325 mg</a> (Adult Low Dose Aspirin...)	1 DLY
<a href="#">Enalapril Maleate 20 mg Tab</a> (enalapril maleate oral)	1 tablet(s) by mouth 2 times p
<a href="#">Glimepiride 4 mg Tab</a> (glimepiride oral)	1 tablet(s) by mouth daily
<a href="#">Lancets</a> (lancets misc.(non-drug; combo route))	test twice a day every other d
<a href="#">multivitamins w-minerals oral Tablet</a> (Antioxidant Vitamins, ...)	1 DLY
<a href="#">nifedipine oral tablet,sustained action 60mg</a> (Adalat CC, Afeditab CR...)	1 tab(s) PO QDAY
<a href="#">nitroglycerin sublingual tablet,sublingual 0.4mg</a> (NitroQuick, Nitrostat)	1 sl prn chest pain (MR q5 mi
<a href="#">One Touch Ultra Test Strips</a> (blood sugar diagnostic in vitro)	test twice a day every other d
<a href="#">Plavix 75 mg Tab</a> (clopidogrel bisulfate oral)	1 tablet(s) by mouth daily
<a href="#">Simvastatin 80 mg Tab</a>	1/2 TAB DAILY

# Shared Information with family





# Enhanced communication: web portal

**MEDICAL ASSOCIATES**  
CLINIC & HEALTH PLANS

CLINIC HEALTH PLANS

HOME ABOUT US FIND A DOCTOR CAREERS CONTACT US

**Clinic**  
[Medical Departments](#)  
[Physician and Provider Search](#)  
[Family Care Network](#)  
[Tri-State Occupational Health](#)  
[Tri-State Surgery Center](#)  
[Business Office](#)  
[24-Hour HELP Nurse](#)  
[Optical Shop](#)  
[Welcome Center](#)

**Health Plans**  
[my e-Link](#)  
[Members](#)  
[Employers](#)  
[Providers](#)  
[Agents](#)  
[Health & Wellness](#)  
[Rx Formulary](#)  
[My Flex](#)

**What's New**  
**Classes & Events**  
[Autism: Learning to be a Cool Teen](#)  
[Free Head and Neck Cancer Screening](#)

**Clinic Awarded "Patient-Centered Medical Home" Recognition** [>>learn more](#)  
Medical Associates is one of only 16 practices in the nation, and the first in the Midwest, to receive this prestigious distinction. What is a Patient Centered Medical Home? [>>watch video](#)

**Medical Associates Breast Health Center Offers New Digital Mammography Services**  
Medical Associates builds on decades of medical excellence by offering the Tri-states most advanced techniques available for diagnosing and treating breast cancer, including digital mammography.  
[>>learn more](#)

**New Patient Welcome Center**

**Looking for a doctor?**

**24-Hour Help Nurse**

**my e-LINK**

**Well child Guide**

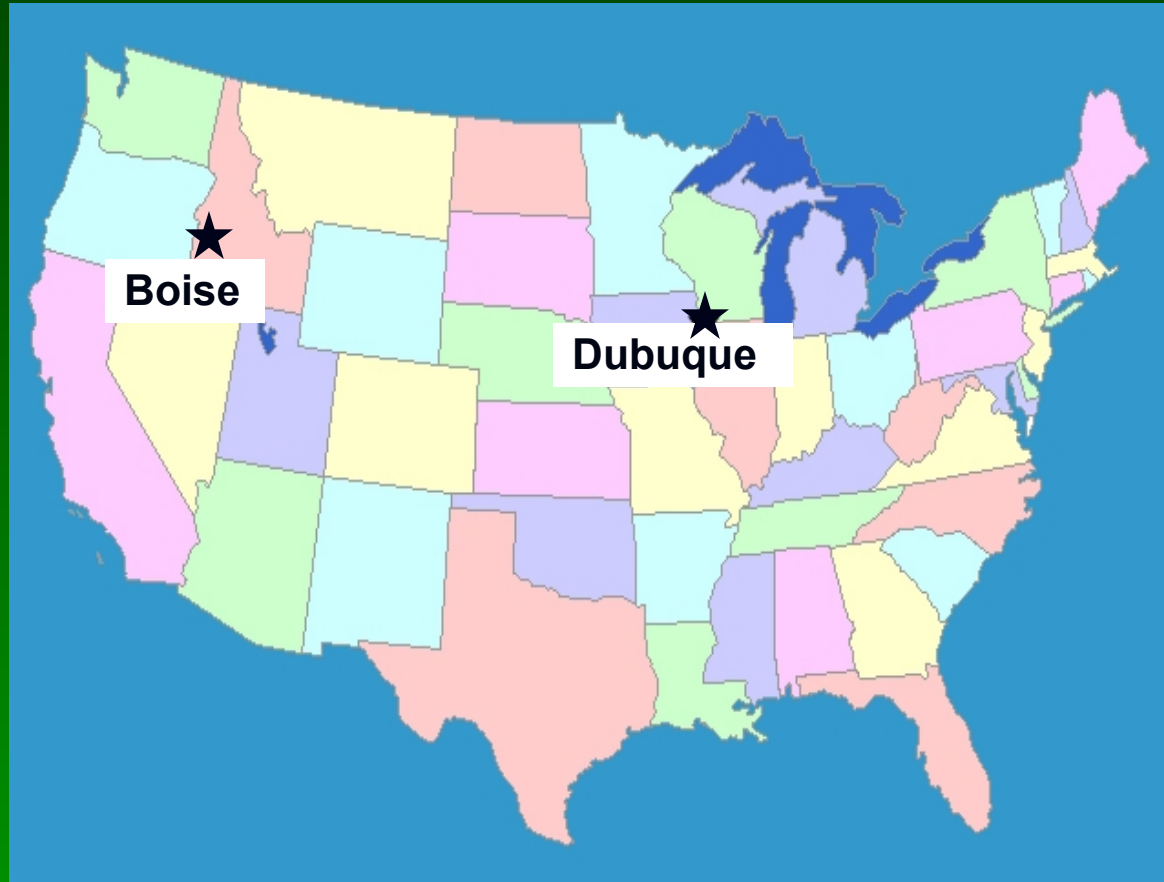
**careers**

# Shared Information

## virtual consults w/patient



# Shared Information across settings





# EHRs

- What's working
- **What's not**
- What's needed



I used to be a doctor. Now I am a  
typist.

Personal communication. Beth Kohnen, MD,  
internist Anchorage AL 8.3.11

# Four Studies and an Email

# EHR: Top 3 Reason MDs Leave



# EHR: MD Dissatisfaction

- Too much time, clerical
- Decreases face-to-face time

<http://www.rand.org/news/press/2013/10/09.html>





# In Search of Joy in Practice: A Report of 23 High-Functioning Primary Care Practices

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*Rachel Willard-Grace, MPH<sup>2</sup>*

*Andrew M. Schutzbank, MD<sup>3,4</sup>*

*Thomas A. Sinsky, MD<sup>1</sup>*

*David Margolius, MD<sup>2</sup>*

*Thomas A. Bodenheimer, MD<sup>2</sup>*



FOUNDATION<sup>®</sup>

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## ABSTRACT

WE wanted to gather innovations from high-functioning primary care practices that we believe can facilitate joy in practice and mitigate physician burnout. To do so, we made site visits to 23 high-performing family practices and focused on how these practices distribute functions among the team, use technology to their advantage, improve outcomes with data, and make the job of primary care feasible and enjoyable as a life's vocation. Innovations identified include (1) proactive planned care, with previsit planning and previsit laboratory tests; (2) sharing clinical care among a team, with expanded rooming protocols, standing orders, and panel management; (3) sharing clerical tasks with collaborative documentation (scribing), nonphysician order entry, and streamlined prescription management; (4) improving communication by verbal messaging and in-box management; and (5) improving team functioning through co-location, team meetings, and work flow mapping. Our observations suggest that a shift from a physician-centric model of work distribution and responsibility to a shared-care model, with a higher level of clinical support staff per physician and frequent forums for communication, can result in high-functioning teams, improved professional satisfaction, and greater joy in practice.

<http://annfammed.org/content/11/3/272.full>

# ↑ EHR Functions → MD Burnout and intent to leave practice

Research and applications

## Electronic medical records and physician stress in primary care: results from the MEMO Study

Fn's: e-mail, order entry, alerts, reminders, e-communication with colleagues

### ABSTRACT

**Background** Little has been written about physician stress that may be associated with electronic medical records (EMR).

implementation, with 72% of office-based physicians reporting use of an EMR. Forty per cent of these reported a system meeting basic criteria including patient history and demographics.

<http://jamia.bmj.com/content/early/2013/09/04/amiajnl-2013-001875.short?rss=1>

# Growing Dissatisfaction w EHRs

2010→2013

- Not just learning curve
- 12% dec in EHR satisfaction
- 10% inc in “highly dissatisfied”
- Fewer respondents
  - Recommend their EHR
  - Fel
- [http://www.acponline.org/pressroom/ehrs\\_survey.htm](http://www.acponline.org/pressroom/ehrs_survey.htm)

The EHR has been devastating. We can no longer teach medical students due to the time it takes to enter (primarily useless) data; I now see 4 patients per half-day whereas I used to see 8, and I actually spend less face time with these fewer patients. Working in clinic has become so painful that I have decided to leave my beloved patients—unbearable to think about.





- 18 clicks to do one fn
- EHR “so cluttered w/ non-information, hard to review past, so don’t”
- “I used to leave at 6:30 and feel good about work; now leave several hours later and spend time on weekends catching up.”





# EHRs

- What's working
- What's not
- **What's needed**
  - Design
  - Implementation
  - Policy



# Improvements: Design

## 1. Better Information Display

- Clear, concise, reduced clutter
- Cognitive workload
- High fiber notes
- Signal to noise

# What meds is this patient taking?

## Med List v.1

Displayed: All Active Orders | All Active Medications

Show More Orders...

		Order Name	St...	Details	Stop
		<b>Inpatient</b>			
		atorvastatin (Lipitor) (Atorvas...	Or...	10 mg = 1 Tab, PO, Tab, QBedtime, Routine, 10/28/10 21:00:00 CDT	11/27/2010
		insulin glargine (Lantus LONG-Acting) (Insulin Glargi...	Orde red	27 Unit = 0.27 mL, Subcut, Inject, Bedtime, Routine, 10/28/10 21:00:00 CDT, mL Do NOT mix with any other insulin product	11/27/2010 CST
		insulin aspart (NovoLOG Sliding Scale) (Insulin Aspart ...	Orde red	Low Dose Protocol, Subcut, w/meals+Bedtime, Routine, 10/28/10 17:00:00 CDT, mL **Low Dose** **CONTAINS 2 SCALES** **Generally for patients requiring less than	11/27/2010 CST
		insulin aspart (NovoLOG RA...	Or...	12 Unit = 0.12 mL, Subcut, Inject, ac din, Routine, 10/28/10 16:30:00 CDT, mL	11/27/2010
		Hypoglycemia Protocol for Adults Reference Txt (DB)	Orde red	10/28/10 12:42:00 CDT Right Click on Order to Access Ref Txt	
		insulin aspart (NovoLOG RA...	Or...	8 Unit = 0.08 mL, Subcut, Inject, ac lun, Routine, 10/28/10 11:30:00 CDT, mL	11/27/2010
		belladonna-opium (Belladonn...	Or...	1 Suppos, Rectal, Q12h, Routine, PRN Bladder Spasm, 10/28/10 9:16:00 CDT, Suppos	11/27/2010
		lisinopril (Lisinopril 20 mg Tab...	Or...	40 mg = 2 Tab, PO, Tab, Daily, Routine, 10/28/10 9:00:00 CDT	11/27/2010
		sotalol (Betapace) (Sotalol 8...	Or...	80 mg = 1 Tab, PO, Tab, Q12h, Routine, 10/28/10 9:00:00 CDT	11/27/2010
		aspirin (Aspirin 81 mg Tab E...	Or...	81 mg = 1 Tab, PO, Tab EC, Daily, Routine, 10/28/10 9:00:00 CDT	11/27/2010
		hydrochlorothiazide (Hydroc...	Or...	25 mg = 1 Tab, PO, Tab, Daily, Routine, 10/28/10 9:00:00 CDT	11/27/2010
		MetFORMIN (MetFORMIN 5...	Or...	1,000 mg = 2 Tab, PO, Tab, w/bkfst+din, Routine, 10/28/10 8:00:00 CDT	11/27/2010
		insulin aspart (NovoLOG RA...	Or...	6 Unit = 0.06 mL, Subcut, Inject, ac bkfst, Routine, 10/28/10 7:30:00 CDT, mL	11/27/2010
		nitroglycerin (Nitroquick) (Nitroglycerin Subl Tab 0.4 m...	Orde red	0.4 mg = 1 Tab, Subl, 1 Tab Subl, Q5min, Routine, PRN, Chest Pain, 10/28/10 6:35:00 ... May Give Every 5 Minutes PRN up to 3 Doses	11/27/2010 CST
		Acetaminophen-HYDROcod...	Or...	1 Tab, PO, Q4h, Routine, PRN Pain - Mild, 10/28/10 5:38:00 CDT, Tab	11/27/2010
		morphine (Morphine Inj)	Orde	2 mg = 1 mL, IV Push, Inject, Q1h, Routine, PRN, Pain - Mild, 10/28/10 5:37:00 CDT	11/27/2010

# Unclutter Med List v.2

Lantus 27 units qhs  
Insulin aspart 6-10-12-0  
Low dose correction algorithm  
Metformin 1000 mg BID

Diabetic meds  
clustered

Atorvastatin 10 mg qhs  
Lisinopril 40 mg daily  
Sotalol 80 mg BID  
HCTZ 25 mg daily  
ASA 81 mg daily

CV meds  
clustered


NTG 1/150 SL prn chest pain  
Belladonna 1 suppository PR q 12 hr prn nausea  
Acetaminophen-hydrocodone 5 mg q 4 hr prn pain  
Morphine Sulfate 1 mg IV q 1 hr prn pain


1<sup>st</sup> order

- Grouped
- Symbols
- **Clear**
- **Concise**
- **No Clutter**
- Unambiguous
- Font
- One screen


# Vitamin K for INR Reversal (TH) (Initiated Pending)


## Medications


 ADVISORY: Because of the High Risk of Thrombosis Considered.


 \*\*NOTE\*\* INR Greater than goal and Less than 5, No




 Pharmacy Communication Order


 \*\*NOTE\*\* Vitamin K NOT recommended. Place an order to lower or discontinue warfarin dose. If dose discontinued, lower dose when INR is back in therapeutic range.


 \*\*NOTE\*\* INR Greater than or Equal to 5 And Less than 9, No Significant Bleeding

 \*\*NOTE\*\* Place an order to lower or discontinue Warfarin dose. If dose discontinued, reorder Warfarin at lower dose when INR is back in therapeutic range.


 \*\*NOTE\*\* If patient unable to take oral medications, see NPO section below





   phytonadione (Mephyton\*) 2.5 mg, PO, Tab, Once


 \*\*NOTE\*\* Place an order to lower or discontinue Warfarin dose. If dose discontinued, reorder Warfarin at lower dose when INR is back in therapeutic range.


 \*\*NOTE\*\* If patient unable to take oral medications, see NPO section below


   phytonadione (Mephyton\*)  2.5 mg, PO, Tab, Once

 \*\*NOTE\*\* Patient NPO: Substitute IVPB at same dose as would be used orally

   phytonadione (Aquamephyton Inj\*)  1.25 mg, IVPB, IVPB, Once

 \*\*NOTE\*\* Serious bleeding or high risk of serious bleeding at any elevation of INR

 ADVISORY: Risk factors for serious bleeding may include thrombocytopenia, recent trauma or surgery, concomitant use of other anticoagulants, and active peptic ulcer or inflammatory bowel disease.

 ADVISORY: In patients with serious or life threatening bleeding, recommend holding Warfarin, administering Vitamin K, and supplementing with FFP, Prothrombin Concentrate, or Recombinant Factor VIIa depending on the urgency of the situation.

   phytonadione (Aquamephyton Inj\*) 10 mg, IVPB, IVPB, Once

## Laboratory

Blood Bank

Order Set:  
What goes with what?



# Improvements: Design

## 1. Better Information Display

Clear, concise, reduced clutter

## 2. Fewer clicks, scrolls, screen changes

- 21 clicks, 8 scrolls 5 screens billing invoice
- Time = Q, access, safety

# Improvements: Design

## 1. Better Information Display

Clear, concise, reduced clutter

## 2. Fewer clicks, scrolls, screen changes

- 21 clicks, 8 scrolls 5 screens billing invoice
- Time is care, access, safety

## 3. E-workflows match clinical workflows

Rather than forcing rigid, sequence

# Improvements: Design

## 4. Patient-centric, not billing

- Six pages, no meaning
- The patient presents with palpitations. The onset was just prior to arrival. The course/duration of symptoms is resolved. Character of symptoms skipping beats. The degree at present is none. The exacerbating factors is none. Risk factors consist of none. Prior episodes: none. Therapy today: none. Associated symptoms: near syncope

# The patient's story matters

patient is more than sum of series of drop down boxes  
when record hx this way we risk seeing pts as generic





## Madison VA Hospital finds stories behind the patients

[http://host.madison.com/ws/j/news/local/health\\_med\\_fit/madison-va-hospital-finds-stories-behind-the-patients/article\\_57659ff1-6f1a-5216-bd07-db4ebf2eef21.html](http://host.madison.com/ws/j/news/local/health_med_fit/madison-va-hospital-finds-stories-behind-the-patients/article_57659ff1-6f1a-5216-bd07-db4ebf2eef21.html)



# Improvements: Design

## 4. Patient-centric, not billing

- Pictures; social notes
- Longitudinal care plan
  - Visit note: driver of billing
  - Long portion: driver of care



# Improvements: Design

## 5. Design for teamwork

Rhetoric and aspirations team

Policies and technologies not



20% power; brought to knees do work and follow rules when policy/technology not aligned w/team-based

# Improvements: Design

## 5. Design for teamwork

- Multiple users, seamless transitions
- Takes 1.5 min to change users
- Team log-in
- Not every element of care loop thru to MD

# Improvements: Institutions

## 6. Upgrade Hardware

- Printer, screens

# Printer in every room

## Saves 20 min/day





# Flow Stations

Saves 30 min/day



# Large monitor

## Saves 20 min/day



Space & technology saved > 1 hr/d MD time

# Improvements: Institutions

## 7. Update staffing model

- Scribes

As a patient I would prefer data entry be the responsibility of someone other than the physician. On a recent visit to a new doctor I believe we made eye contact twice—upon her arriving and leaving.

Mary Base: <http://www.npr.org/blogs/health/2013/08/13/211698062/doctors-look-for-a-way-off-the-medical-hamster-wheel?live=1>

# Scribing at Cleveland Clinic

**Kevin Hopkins M.D.**



I get to look at my patients and talk with them again. We're reconnecting.... Our patient satisfaction numbers are up, our quality metrics have improved, our nurses are contributing more, and I am going home an hour earlier to be with my family.

Amy Hauptert MD, family physician, Allina-Cambridge 11.29.11  
personal communication



# Improvements: Institutions

## 8. Avoid Compliance Creep

- A perfect audit trail is not attainable, and is not the goal
- Unintended consequences of diminishing Q

# Improvements: **Policy Makers**

## 9. Performance measures

- Don't apply to every aspect of clinical care
- Costs of converting q thought/act into digital

## 10. Avoid regulatory micro-management

# MU 2 Micro-management

- Visit planner
  - 3 sec/pt
- COE
  - 2 min/pt
- Micromanagement



# Knights, Knaves or Pawns



Approach MDs as  
knaves and you will  
eventually get knave-  
like behavior



# Take Home Message



- EHRs: **Blessing and Burden** best/worst
  - Never go back, need continue move forward
  - Not just EHR, but entire sociotechnical-policy system
- Recommendations
  - New tech demands new delivery model  
Dr. secretary not winning; new support staff
  - Policy/technology align with team-based care  
MU CPOE, security constrains teamwork