

# Successful Implementation of Clinical Decision Support

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# Objectives

- Review the common tools used to deliver Clinical Decision Support (CDS)
- Highlight key steps for for implementing CDS interventions in an institution
- Share some lessons learned
- Identify our responsibilities as informaticists

# Who am I

- Family Physician
  - St. Peter Minnesota
  - Ramsey Minnesota
- Health Information Technologist (informatics hobbyist)
  - Logician
  - Epic
  - McKesson

# Common misconceptions about Clinical Decision Support (CDS)

- The health care institution:
  - Pop-up alerts and reminders
  - A forcing function
  - A way to *finally* get physicians to do something
- EHR Vendors:
  - Numbers:
    - Medication interactions
    - Duplicate alerts
  - Allergy checking
- Providers
  - Cook book medicine
  - Gets in their way
  - Done to save the system money



# What I have experienced as a physician

- Alerts which force me to stop what I'm doing and go somewhere else
- Cause me to lose track of what I am doing
- False alarms
- Forced choices with inappropriate options
- Feeling dumb when I realize I overlooked something



# What is Clinical Decision Support?

- A variety of approaches for delivering clinical knowledge, and intelligently filtered patient information, to clinicians and/or patients for the purpose of improving healthcare processes and outcomes\*
- Making the right thing to do the easiest thing to do

# Tools in the CDS Toolkit

- Documentation forms or templates
- Situation-specific flow sheets
- Relevant data presentation
- Referential information
- Interactive sequential advice
- Order sets
- Alerts and reminders
- Protocols and Pathways



# Templated Documentation

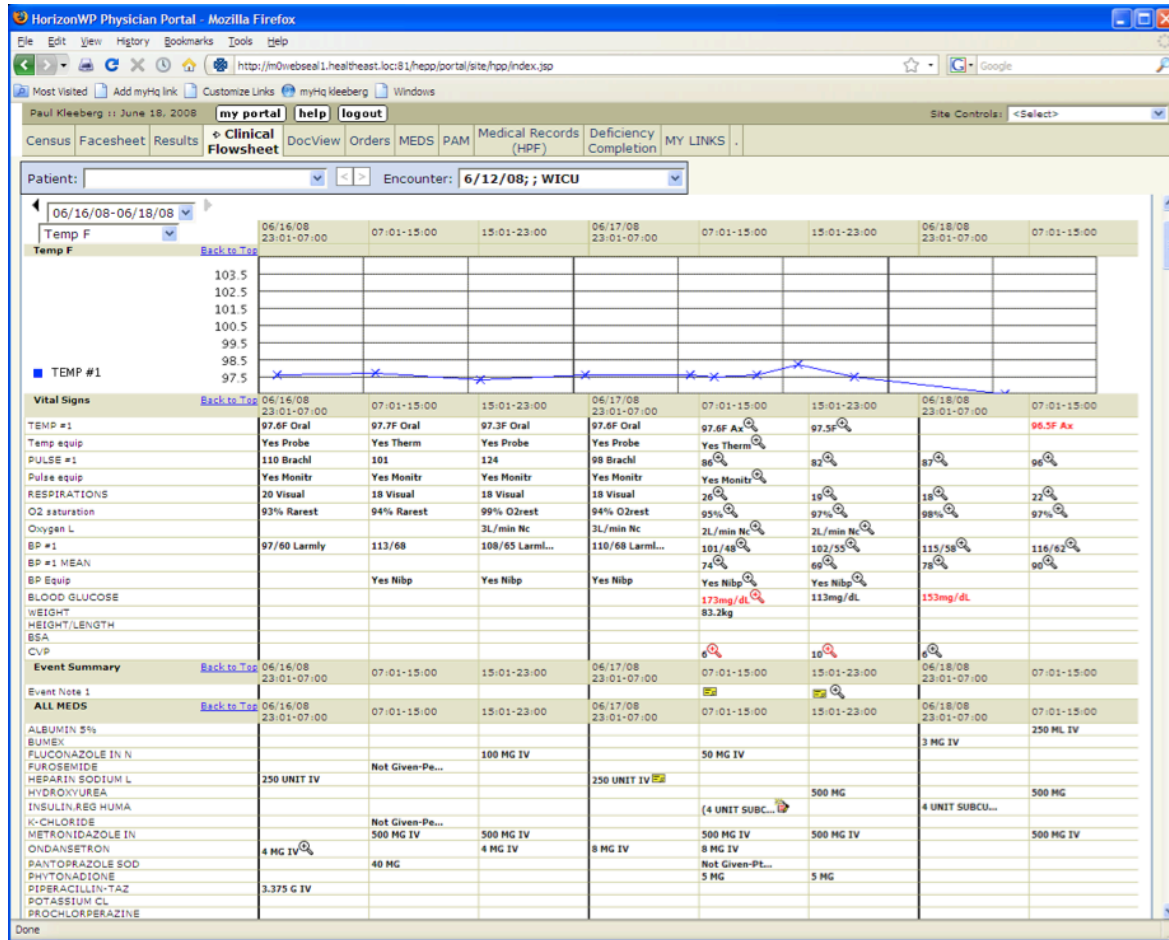
- Help prompt complete documentation for quality measures and compliance
- Guide the care provider in asking questions
- Allow for capture of discreet data elements

The screenshot displays a medical documentation software interface. At the top, it shows the user is logged in as PAUL KLEEBERG. The patient information includes: Patient: TESTER, DR. PAUL; Age: 55 yr; Gender: M; Attending: SACCOMAN...; Fac - Dept: Woodwinds...; DOB: 05/23/1953; Acct: 0180931...; Diagnosis: (A) TESTING REPEATER; Service: MED; Rm-Bed: W220-P; Admit Dt: 04/30/2...; MRN: 018093... The interface features a navigation menu with various tabs such as Vitals I/O, Pain/Healing Arts, ICU Graphics, IV Admin, IV Lines/Pumps, Inspect Wnd BRADEN, MorseSafety/Restrnts, Events/Rslts Reported, Protocols, Blood Products, Death, Peds, Postpartum, Newborn, Care Alerts, Lab Results, Radiology Results, Dictation, Education, M/S Post-Op, MEDS, Flowsheet, Psych Family, Admission, Peds Admission, Problems Hx, Chart Allergy, Med Hx, Pam Review, and Obsv/Procedure/Trans/DC. Below the navigation menu, there are controls for 'Show All', 'Expand All', 'Collapse All', and 'Add Selection'. The main area is divided into sections: 'Admission Data' (with 'More Results' and '07:42' time), 'Medical History', 'Medications', and 'Verbal/Sensory'. Each section has a list of data elements and a corresponding form field. For example, under 'Admission Data', there are fields for 'Admit Date/Time', 'Bands', 'ID Band', 'Allergy Band', and 'Oriented to'. Under 'Medical History', there are fields for 'Reason/Admit', 'Pt perception', 'Anesthesia hx', 'Flu vaccine', 'Date', 'Pneumococcal', 'Recent Exposure', 'Recent Diagnosis', 'Other', 'TB Screening', 'Lst menstr period', 'Pregnancy poss', and 'Post Menopausal'. At the bottom right, there are 'Save' and 'Cancel' buttons.



# Situation Specific Flow Sheets

- Allow for a single view of a patient relevant to the condition
- Eliminates the need to search for the information
- Increases the likelihood that important information will be seen
- Decreases the likelihood that interventions will go unordered



# Relevant Data Presentation

- Relevant lab, age or weight display when writing orders
- Suggested medication list
- Bed availability and tracking
- Targeted patient lists based on diagnosis or

**TEST, HOLLY** MRN: 103538 DOB: 02/02/1950 Allergies: Yes PCP: Brombach, William  
Sex: F AKA: HOLLY Directives: ONFILE Pri Ins: BLUE CROSS (IN STA  
Age: 58 Years H Phone: (554)345-2345 FYI: FYI Note: [Select]

### Health Management Plan

**Problems** Active All

- Atrial Fibrillation 427.31
- Benign Essential Hypertension 401...
- Type II Diabetes Mellitus With Co...

**Health Management Plan Items**

To add an item select only one problem

New Problem Details... Resolve Assess New Item... Add to Patient HMP

### HMP

Active All

HMP Item	Frequency	Last Done	Due Date	Status	Problem
BMI	1 year	13 Nov 2007	13 Nov 2008	Active	HEALTH MAINTENAN...
Colonoscopy	10 years	07 Apr 2006	07 Apr 2016	Active	HEALTH MAINTENAN...
⚠ Diabetes Follow-up	6 months	07 Jan 2008	07 Jul 2008	Near Due	Type II Diabetes...
⚠ Eye Exam	1 year	07 Aug 2007	07 Aug 2008	Near Due	Type II Diabetes...
Healthcare Directi...	5 years	13 Apr 2005	13 Apr 2010	Active	HEALTH MAINTENAN...
⚠ Hemoglobin A1C	6 months	07 Jan 2008	07 Jul 2008	Near Due	Type II Diabetes...
⚠ Lipid Profile	1 year	16 Apr 2007	16 Apr 2008	Overdue	Type II Diabetes...
⚠ Mammogram	1 year	30 Apr 2007	30 Apr 2008	Overdue	HEALTH MAINTENAN...
Microalbumin, urin...	1 year	05 Sep 2007	05 Sep 2008	Active	Type II Diabetes...
⚠ Pap Smear	1 year	16 Apr 2007	16 Apr 2008	Overdue	HEALTH MAINTENAN...
⚠ Prothrombin Time (...)	4 weeks	05 May 2008	02 Jun 2008	Overdue	Atrial Fibrillat...

Post Text to Current Note

HMP Details... Done D/C Completed New Task... Cite View Cite Selected Print

# Referential Materials

- Links from EHR to articles, protocols, drug monographs, dosing calculators, flow sheets, tables and the like.
- Information pertinent to the task at hand is available one or two clicks away



HEO Message

Monograph  
Enoxaparin Sodium

Class: ANTICOAGULANTS (20:12.04)

**Introduction**

Enoxaparin, a low molecular weight heparin prepared by alkaline degradation of unfractionated benzylated heparin of porcine intestinal mucosa origin, is an anticoagulant.

**Uses**

Enoxaparin is used for the prevention of postoperative deep-vein thrombosis and associated pulmonary embolism in patients undergoing hip- or knee-replacement surgery; patients undergoing general (e.g., abdominal, gynecologic, urologic) surgery, and in patients with acute medical conditions and severely restricted mobility who are at risk for thromboembolic complications. Enoxaparin is used concurrently with an oral anticoagulant (e.g., warfarin) in hospitalized patients for the treatment and secondary prevention of deep-vein thrombosis with or without pulmonary embolism and in selected outpatients for the treatment of acute deep-vein thrombosis *without* accompanying pulmonary embolism. Enoxaparin also is used concurrently with aspirin and/or other therapy (e.g., nitrates,  $\beta$ -adrenergic blockers, clopidogrel, platelet glycoprotein [GP] IIb/IIIa-receptor inhibitors) for the prevention of ischemic events associated with unstable angina or non-ST-segment elevation/non-Q-wave myocardial infarction (i.e., non-ST-segment elevation acute coronary syndromes).

The use of a low molecular weight heparin such as enoxaparin also is recommended by the American College of Chest Physicians (ACCP) for prevention of thromboembolism in patients with medical conditions associated with a high risk of thromboembolism (e.g., cancer, bedrest, heart failure, severe lung disease); in selected patients with major trauma†, including acute spinal cord injury†; in those undergoing intracranial neurosurgical procedures†; and in patients with acute ischemic stroke†. Therapy with a low molecular weight heparin also has been recommended for prevention or treatment of thromboembolism occurring during pregnancy and for prevention of embolism in selected patients with atrial fibrillation or flutter† who require prolonged (exceeding 1 week) interruption of oral anticoagulant therapy for diagnostic or surgical procedures or during shorter periods of interrupted therapy in high-risk patients (e.g., those with mechanical prosthetic heart valves†). Although a causal relationship has not been established and the number of patients involved appears to be small, cases of valve thrombosis resulting in death (including maternal and fetal deaths) and/or requiring surgical intervention have been reported with enoxaparin prophylaxis in patients (including pregnant women) with prosthetic heart valves; insufficient data, underlying conditions, and the possibility of inadequate

Back Home Print Close

# Interactive Sequential Advice

- Guides the user in decision making

Cholecystitis

**HELP, additional information:**

- 02 Help page (instructions, microbiology, etc.)
- 04 Click for drug information. ([R]=renal excretion, [H]=hepatic excretion, [DI]=important drug interactions, [D]=other, [M]= minimal risk)
- 06 Need an alternative antimicrobial?
- 08 Gastroenterology consult
- 10 Surgery consult
- 12 Need additional help? Consult Infectious Diseases

CHOLECYSTITIS

Adequate biliary drainage is the definitive treatment. Antimicrobials should be prescribed only if signs of infection like leukocytosis or fever are present.

If needed, antimicrobial therapy should be continued until adequate drainage is established and then stopped. Surgery and Gastroenterology involvement are essential.

Most cases are associated with streptococci, enterococci, or gram negative bacilli. Anaerobes are likely only in patients who have previous abnormalities of the biliary system, stomach, or duodenum.

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**Treatment for patients WITHOUT previous abnormalities of the biliary tract**

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- 14 Gentamicin 5 mg/kg IV QD (\$3/day) [R,D] <AND> ampicillin 2 gm IV q4h (\$68/day) [R] < OR >
- 16 Ticarcillin-clavulanate 3.1 gm IV q6h (\$42/day) [R] < OR >**
- 18 Piperacillin-tazobactam 3.375 gm IV q6h (\$33/day) [R] < OR >

**Alternative for penicillin allergy**

- 20 Moxifloxacin 400 mg IV QD (\$11/day) [R,DI] < OR >
- 22 Moxifloxacin 400 mg PO QD (\$1.19/day) [R,DI]

# Order Sets

- Orders based on disease, procedure, problem type or function
- Can be paper or electronic
- Can be built based on best practice, convenience, common practice or a combination
- Allow you to guide your users to best practice and a standard of care
- Successful adoption requires user buy in.
- Can convert currently existing order sets or buy from a content vendor

Horizon Expert Orders 10.1.0.113  
W220 P TESTER, DR. PAUL 018093179 55 years M (KLEEBERG)

**ADC VAAN DISML display**

**Admission**

**Diagnosis »**  
❑ diagnosis chronic obstructive pulmonary disease ; start on 6/18 at 1123

**Condition »**

**Vital signs »**  
❑ vital signs per hensa policy v-1 ; start on 6/18 at 1500

**Activity/limitations**

**Allergies »**  
allergy: penicillins hives moderate »Jun 18 10:30...

**Nursing instructions »**  
❑ culture and gram stain - sputum (spu) (nurse collect) ; start on 6/18 at 1123  
❑ intake and output q shift - measure ; start on 6/18 at 1500  
❑ measure weight daily ; start on 6/19 at 0900  
❑ nursing: initiate pneumococcal vaccine orders po1162 ; start on 6/18 at 1123  
❑ pain assessment q shift per unit protocol ; start on 6/18 at 1500  
❑ smoking cessation counseling if applicable ; start on 6/18 at 1123  
❑ urinalysis (ua) (nurse collect) ; start on 6/18 at 1123

**Diet »**

**Medications**  
=Scheduled medications  
❑ albuterol 0.5 mg-ipratropium 2.5 mg/3 ml inhl soln [duoneb] 0.5 ml inhl q4h-rt ; start on 6/18 at 1123

Chronic Obstructive Pulmonary Disease PO1028

**AUTOMATIC ORDERS**  
2. dvt prophylaxis po1190 »

FOR PATIENT ON STEROIDS and NOT DIABETIC  
3. bedside blood glucose monitoring 2x/day for patients on steroids and not diabetic  
+ if any blood glucose is greater than 150 mg/dl, start 4x/day fingersticks and notify md

FOR PATIENT ON STEROIDS AND DIABETIC  
4. nursing: refer to paper version of diabetes med mgmt orders po1657  
5. - pdf of diabetes med mgmt orders po1657 for completion by ordering provider

ADMISSION  
6. admit status - to icu  
7. admit status - to med surg  
8. admit status - to telemetry

**Select an item from the list** HEORx  
\$0.00

or enter another order Literature  
or press [END](#) to return to the previous list Internet

print <F1> display <F2> D/C <F3> renew cosign outlines <F4> Oops <F5> help <F6> complain <F7> done <F8>

# Alerts and Reminders

- Highlights or “pop-ups” to alert care giver to a problem (i.e. allergy or interaction) or new data (i.e. lab result) or passage of time without a specified event
- Important to strike a balance between desired outcomes and interruption of workflow

**Alternative Selection**  
**ROFECOXIB 50 MG TAB**

On Sept. 30, 2004, the FDA and Merck announced a voluntary withdrawal of rofecoxib (VIOXX) from the market. Refer to the weblink to the right.

Please select an alternative COX-2 listed below, or click "Cancel Filing Process" to go back to order entry.

**Web Links**  
FDA Press Release 09.30.2004  
Allina COX II advisory 10.28.2004

Alternative	Dose	Route	Frequency	End Date	Class	Cost
CELECOXIB 100 MG CAP [29743]						
CELECOXIB 200 MG CAP [254]						
CELECOXIB 400 MG CAP [52288]						

print <F1>   display <F2>   **D/C <F3>**   renew   coign   outlines <F4>   Oops <F5>   help <F6>   complain <F7>   done <F8>

# Protocols and Pathways



- Tools for managing/monitoring multi-step processes
- Tools for managing prolonged medical conditions over time
- In an EHR, the timing and execution of protocols and pathways are automated to maximize outcomes
- Challenging to build and create

needs clinician input for valid order  
 indicates automatic order; cross out orders not desired.

### POTASSIUM PROTOCOL ORDERS

1. If no creatinine is available, draw. Do not start protocol until creatinine clearance is calculated.
2. Weight = \_\_\_\_\_ kg Height = \_\_\_\_\_ inches SrCr \_\_\_\_\_ (To be filled in by RN).  
 Est. Creat. Clearance = \_\_\_\_\_ ml/min (To be calculated by Pharmacy). REFER TO TABLE \_\_\_\_.
3.  a. Initial use of protocol or protocol renewal when K<sup>+</sup> dose still needed today (RN to complete) Today's K<sup>+</sup> lab value \_\_\_\_\_  
 Route:  Oral Give PO unless patient is unable  
 IV Peripheral Line- Add lidocaine 10 mg if no allergy  
 IV Central Line- No lidocaine  
 Pharmacy to complete: Initial dose \_\_\_\_\_ Recheck K<sup>+</sup> level  \_\_\_\_\_ hour(s) after last dose  
 Next AM
- b. Protocol renewal only (K<sup>+</sup> dosing already completed today).

Pharmacist signature \_\_\_\_\_ Date/Time \_\_\_\_\_

4. These orders expire after three days on \_\_\_\_\_. Then check with MD. If to be reordered, initiate new order sheet and recalculate creatinine clearance.
5. Check potassium daily while on protocol in addition to specific guidelines below.  
 Document on kardex "daily K<sup>+</sup> - (K<sup>+</sup> Protocol)" and expiration date.  
 Document on main MAR "K<sup>+</sup> Protocol". Put ✓ in each time column.  
 On K<sup>+</sup> Protocol MAR, transcribe CrCl start and stop date.
6. Document daily K<sup>+</sup> results on MD order sheet and action per protocol.

TABLE A POTASSIUM REPLACEMENT PROTOCOL (Cr<1.7 and CrCl>40ml/min)				
K <sup>+</sup> LEVEL	ORAL DOSE	NEXT K <sup>+</sup> LEVEL FOR ORAL DOSE	IV DOSE	NEXT K <sup>+</sup> LEVEL FOR IV DOSE
3.6 - 3.8	K-Dur 40 mEq x1	Next AM	KCl 10 mEq IVPB q1hr x2	1 hr after last dose & repeat protocol if necessary
3.3 - 3.5	K-Dur 30 mEq q4hrs x2	4hrs after last dose & repeat protocol prn	KCl 10 mEq IVPB q1hr x4	
3.0 - 3.2	K-Dur 40 mEq q4hrs x2	2hrs after last dose & repeat protocol prn <b>NOTE:</b> K-Lor will increase K <sup>+</sup> faster than K-Dur	KCl 10 mEq IVPB q1hr x5	
2.7 - 2.9	K-Lor 40 mEq q4hrs x3		KCl 10 mEq IVPB q1hr x6	
< 2.7	K-Lor 40meq x1 and contact MD to inform of dose given and obtain further orders.		KCl 10meq IV q1h x2 and contact MD to inform of dose given and obtain further orders.	

TABLE B POTASSIUM REPLACEMENT PROTOCOL (Cr>1.7 or CrCl<40ml/min)				
K <sup>+</sup> LEVEL	ORAL DOSE	NEXT K <sup>+</sup> LEVEL FOR ORAL DOSE	IV DOSE	NEXT K <sup>+</sup> LEVEL FOR IV DOSE
3.6 - 3.8	K-Dur 10 mEq x1	Next AM	KCl 10 mEq IVPB x1	1 hr after last dose & repeat protocol if necessary
3.3 - 3.5	K-Dur 20 mEq x1	4hrs after last dose & repeat protocol prn	KCl 10 mEq IVPB q1hr x2	
3.0 - 3.2	K-Dur 20 mEq q4hrs x2	2hrs after last dose & repeat protocol prn <b>NOTE:</b> K-Lor will increase K <sup>+</sup> faster than K-Dur	KCl 10 mEq IVPB q1hr x3	
2.7 - 2.9	K-Lor 20 mEq q4hrs x3		KCl 10 mEq IVPB q1hr x4	
< 2.7	K-Lor 20meq x1 and contact MD to inform of dose given and obtain further orders.		KCl 10 meq IV q1h x2 and contact MD to inform of dose given and obtain further orders.	

Date/Time \_\_\_\_\_ Print Name \_\_\_\_\_

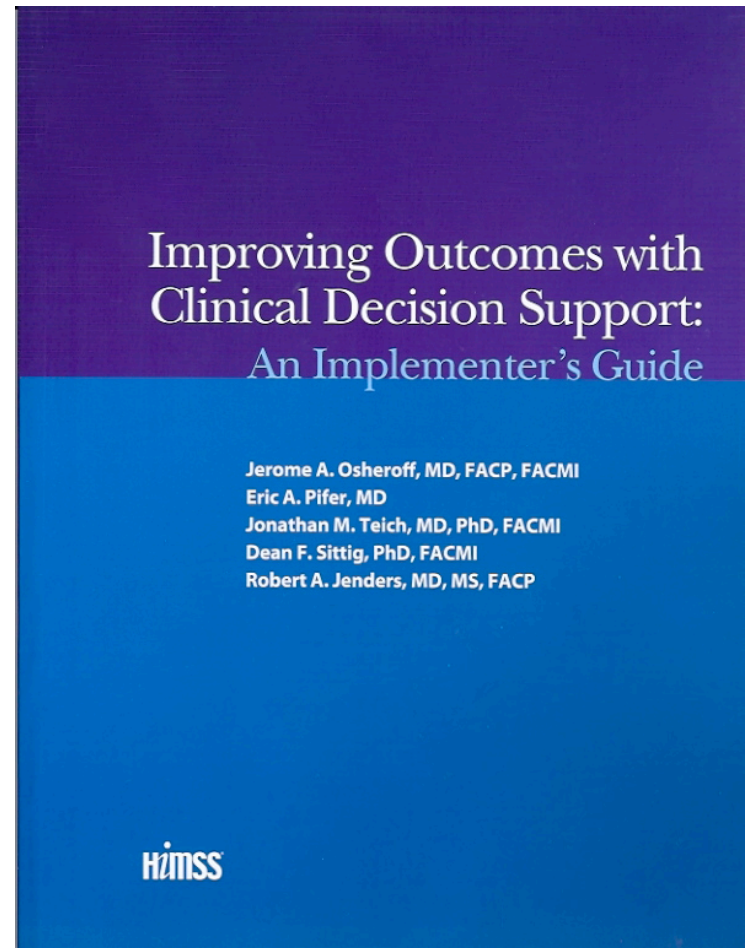
USE WITH PRE-PRINTED MAR - MR 1006-C 2/08  
 PO1006 4/04 11/04, 1/07, 2/08, 5/08



# Improving Outcomes with Clinical Decision Support: An Implementer's Guide

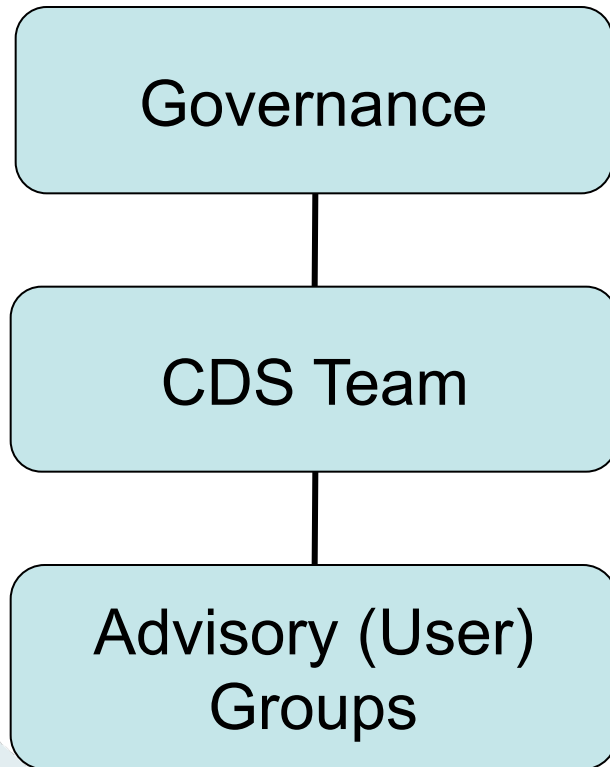
- Identify the stakeholders
- Catalog available information systems
- Select and specify CDS interventions
- Specify and validate the details and build the interventions
- Put interventions into action
- Measure results and refine the program

[http://www.himss.org/ASP/  
topics\\_cds\\_workbook.asp?faid=108&tid=14](http://www.himss.org/ASP/topics_cds_workbook.asp?faid=108&tid=14)





# Creating a team



- Governance
  - Final authority in mediating changes to the system.
- CDS Team
  - Designs, mediates, implements and monitors changes.
- Advisory Groups
  - Provide feedback on design issues both during the planning, pilot and implementation phase as well as the evaluation after the implementation.

# Members of the CDS Team

- Quality Measurement
- Health Informatics
  - Build
  - Physician
  - Reporting
- Nursing Informatics
- Pharmacy Informatics
- Lab Informatics
- Radiology
- Health Information Services
- IT Clinical Applications
- Physician Trainers



# Finding Direction



- Quality council
- Service lines
- External measures
- Areas of weakness
- Easy wins



# Educate Leadership and Manage Expectations

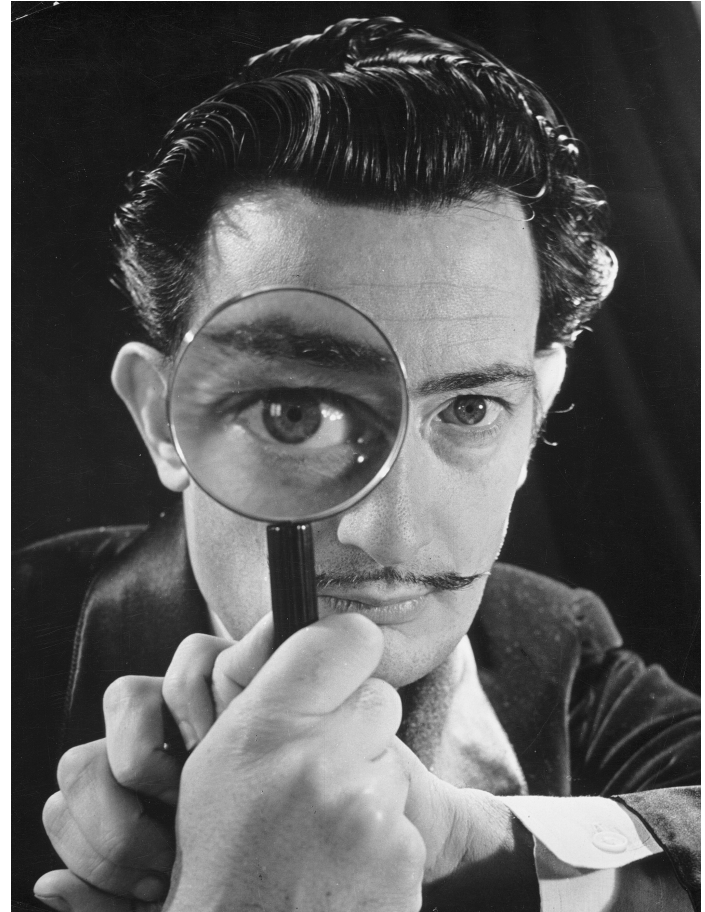
- Some can jump to early conclusions:
  - "We need to score better on our stroke scores! We need alerts and reminders!"
- Builders want to solve a problem the best they know how:
  - "To a man with a hammer, everything looks like a nail."\*



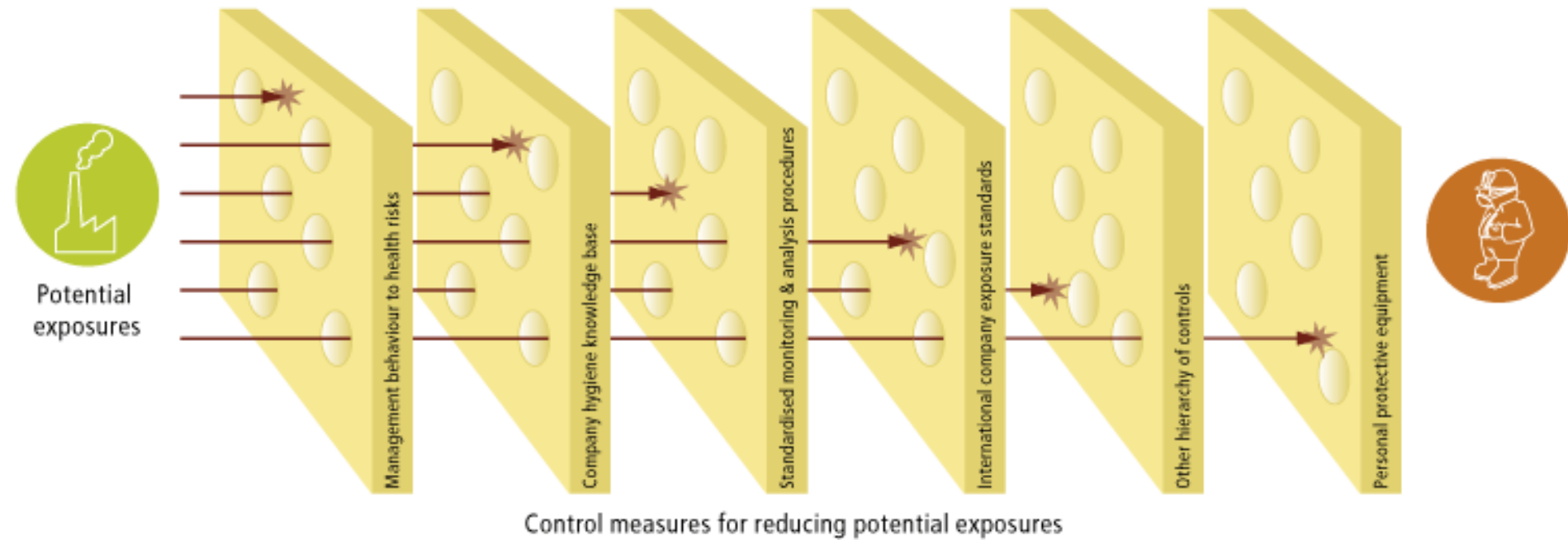
\*Commonly attributed to Mark Twain

# Once you've identified a goal

- Identify the needed data elements
  - Find out what is missing
- Examine the workflow
  - Take it apart piece by piece



# The earlier in the workflow the better

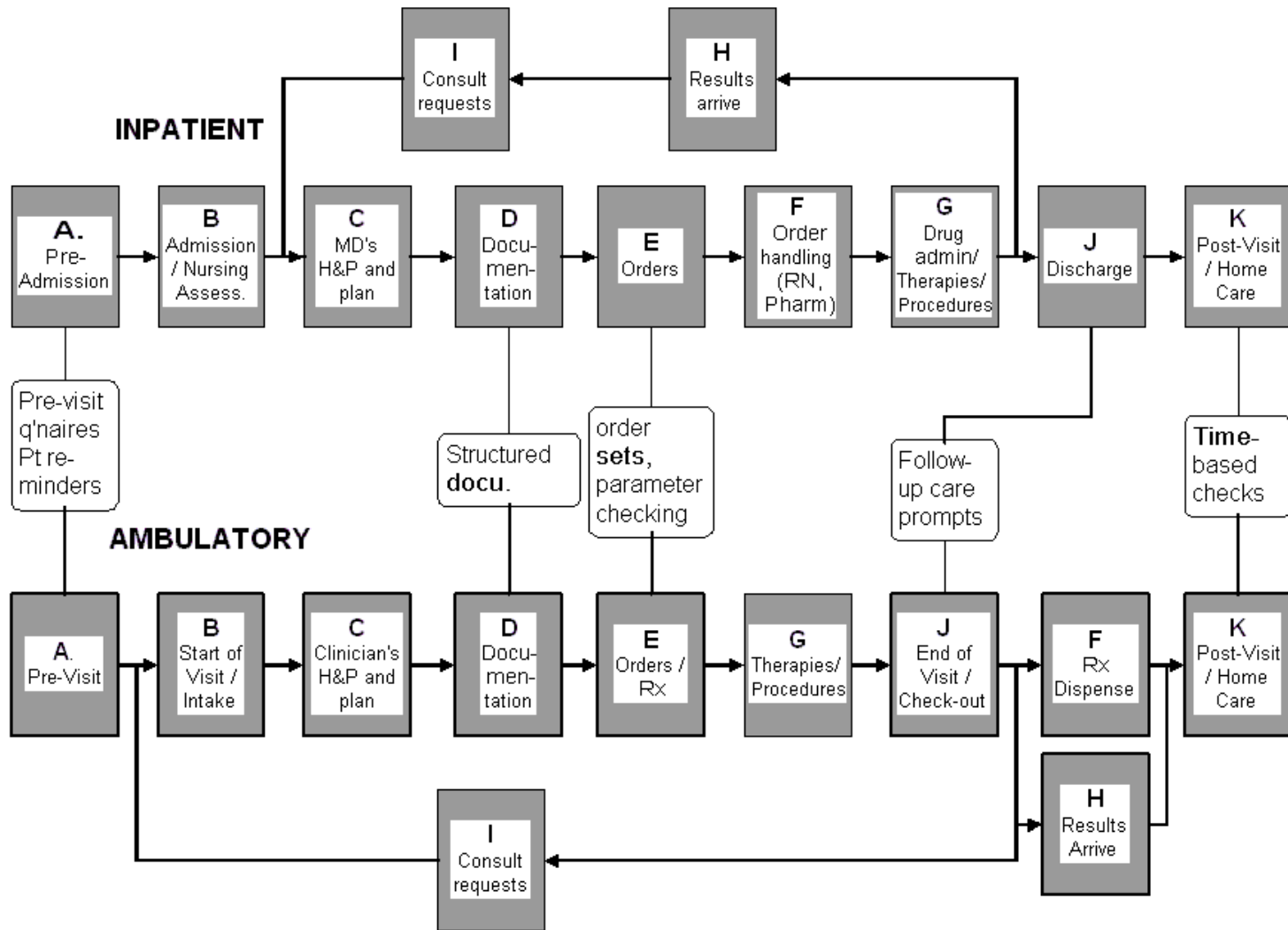


# Six Opportunities for CDS During an Ordering Session\*

- When the ordering session is initiated
- When selecting the patient from the census or list
- When opening the patient's chart
- When initiating orders
- When completing an order
- When signing an order

\* Miller RA, Waitman LR, Chen S, Rosenbloom ST. The anatomy of decision support during inpatient care provider order entry (CPOE): empirical observations from a decade of CPOE experience at Vanderbilt. J Biomed Inform. 2005 Dec;38(6):469-85.

# Examine the workflow





# Observe What Happens

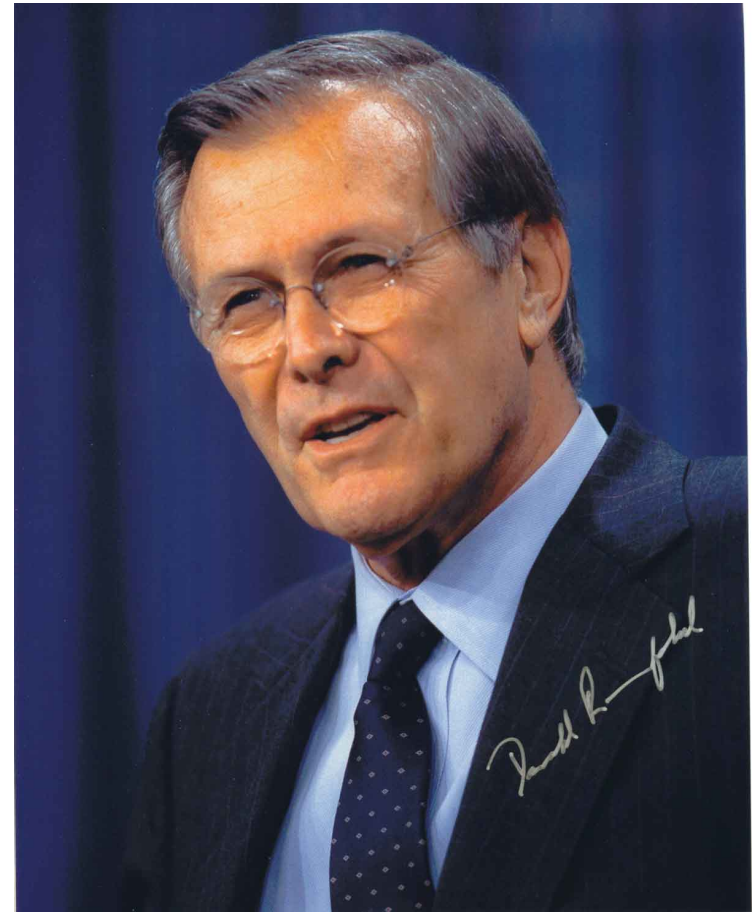
- "You can observe a lot by just watching."\*
- What sounds good in a meeting does not always work in the battlefield
- What works in a controlled environment does not work in one that is out of control



\* Yogi Berra, unknown date, about baseball

# Unintended Consequences

- “As we know, there are known knowns. There are things we know we know. We also know there are known unknowns. That is to say we know there are some things we do not know. But there are also unknown unknowns, the ones we don't know we don't know”\*
- You don't know what you don't know.



\* Donald Rumsfeld, Feb. 12, 2002, Department of Defense news briefing

# Unintended Consequences

- Seemingly good decisions can have unintended consequences:
  - Requiring allergy checking before med ordering
  - Requiring weights in pediatric patients
  - Duplicate medication checking
- Start slowly, test with volunteers in a controlled environment and build gradually



# Learnings: Referential Material

- Need to be in the workflow
- The fewer clicks the better
- Simple and fast is better than detailed and slow
- Don't underestimate the power of Google

The screenshot shows a Google search results page for the query "Elevated scapula". The browser window title is "Elevated scapula - Google Search". The search bar contains "Elevated scapula" and the search button is labeled "Search". The results show 1-30 of about 76,500 results in 0.22 seconds. The top results are:

- ELEVATED SCAPULA—TWO CASES**  
scapula elevated and so rotated that the lower angle is carried .... with an elevated scapula on the right side, and after having ...  
[www.ejbs.org/cgi/reprint/s1-15/1/18.pdf](http://www.ejbs.org/cgi/reprint/s1-15/1/18.pdf) - [Similar pages](#)  
by AJ STEELE - 1902 - [All 3 versions](#)
- CONGENITAL ELEVATION OF THE SCAPULA.--SPRENGEL'S DEFORMITY ...**  
The convexity of the curve is found toward the elevated scapula in 223 percent, and away from it in 15 frac12 percent. This curve must be regarded as of ...  
[www.ejbs.org/cgi/content/abstract/s2-6/2/260](http://www.ejbs.org/cgi/content/abstract/s2-6/2/260) - [Similar pages](#)  
by AE HORWITZ - 1908 - [Cited by 29](#) - [Related articles](#)  
[More results from www.ejbs.org »](#)
- Sprengel Deformity: eMedicine Orthopedic Surgery**  
Jan 16, 2008 ... Clinically, the affected scapula is usually elevated 2-10 cm and is adducted, and its inferior pole is medially rotated. ...  
[emedicine.medscape.com/article/1242896-overview-78k](http://emedicine.medscape.com/article/1242896-overview-78k) - [Cached](#) - [Similar pages](#)  
by D Feldman
- Translation elevated scapula in the Medical English-French dictionary**  
elevated scapula translation English - French : elevated scapula n élévation congénitale de l'omoplate f ... . English - French, medical dictionary, synonyms, ...  
[dictionary.reverso.net/medical-english-french/elevated%20scapula](http://dictionary.reverso.net/medical-english-french/elevated%20scapula) - [Similar pages](#)
- Translation elevated scapula in the French-English Collins dictionary**  
elevated scapula translation French - English : élevage nm [+animaux] breeding [+bovins] cattle breeding, cattle rearing faire de l'élevage to rear cattle ...  
[dictionary.reverso.net/french-english/elevated%20scapula](http://dictionary.reverso.net/french-english/elevated%20scapula) - [Similar pages](#)  
[More results from dictionary.reverso.net »](#)
- Relocation of congenitally elevated scapula.**  
Relocation of congenitally elevated scapula. Klisić P, Filipović M, Uzelac O, Milinković Z. In the treatment of Sprengel's deformity, ...  
[www.ncbi.nlm.nih.gov/pubmed/7341651](http://www.ncbi.nlm.nih.gov/pubmed/7341651) - [Similar pages](#)  
by P Klisić - 1981 - [Cited by 10](#) - [Related articles](#)

# Learnings: Governance

- Align with the top
  - Understand their needs
  - Educate them as to the possibilities
- Work with the troops
  - Understand how things work
  - Watch what happens



# Learnings: Building Order Sets

- Migrate to one formulary before the build
- Begin the cleanup of existing order sets
- Get control of the paper order sets
- Identify content owners
- Be aware that established expert groups are protective of their paper format
- What works on paper may not work on-line
- The first selection is the one most often selected
- Keep track of your decisions
- Establish a periodic review

# Learnings: Be Succinct

- Make sure important information is obvious
- Many do not read past the first line



# Learnings, Templated Documentation

- Nurses do not like to document at the bedside
  - Alerts in nursing documentation not real-time

The screenshot shows a medical software interface for a patient named PAUL KLEEBERG. The patient's age is 55, gender is M, and the attending physician is SACCOMAN. The diagnosis is (A) TESTING REPEATER. The interface includes a navigation menu with various clinical areas like Vitals, Pain/Healing Arts, ICU Graphics, etc. The main area displays a templated form for 'Admission Data' with fields for Admit Date/Time, Bands (ID Band, Allergy Band), Oriented to, Medical History, Reason/Admit, Pt perception, Anesthesia hx, Flu vaccine, Date, Pneumococcal, Recent Exposure, Recent Diagnosis, Other, TB Screening, Lst menstr period, Pregnancy poss, Post Menopausal, Medications, Disposition/meds, Takes meds, and Verbal/Sensory. The form is partially filled with dates and times, and has 'Save' and 'Cancel' buttons at the bottom.



# Learnings: Alerts

- We tend to over alert:
  - A desire to control behavior
  - A convenient way to fix a problem
  - Fear that something very bad will happen if we don't
  - Fear that we will be held accountable if we don't



# Too many alerts are counterproductive

- 90% override rate of drug-allergy and high severity drug interaction alerts (Weingart, 2003)
- Create a strong feelings in the end user (Sittig, 2005)
- Can distract the user from important information or completing an important task
- Complicates an already steep learning curve



# Learnings: Reports

- Reports take on a life of their own
- Make sure reports are still needed
- Identifying owners of reports that have run for years is challenging
- We were surprised how many we found



# The 10 Commandments of Clinical Decision Support\*

1. Speed is everything
2. Anticipate needs and deliver in real time
3. Fit into the user's workflow
4. Little things can make a big difference (usability matters)
5. Recognize that physicians will strongly resist stopping
6. Changing direction is easier than stopping
7. Simple interventions work best
8. Ask for additional information only when you really need it
9. Monitor impact, get feedback, and respond
10. Manage and maintain your knowledge-based systems



\* Bates DW, Kuperman GJ, Wang S, et al. Ten commandments for effective clinical decision support: Making the practice of evidence-based medicine a reality. J Am Med Inform Assoc. 2003;10:523-530.

# Our Responsibility

- Educate the community on the reality of CDS
- Manage expectations
- Tie into an existing governance structure or help to create one
- Go forward slowly and carefully
- Observe to see how things work
- Build relationships

# Successful Implementation of Clinical Decision Support

## Questions?

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