Using Clinical Decision Support to Improve Quality

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Conflict of Interest

- Dr. Kleeberg is the Clinical Director for the Minnesota - North Dakota Regional Extension Assistance Center for HIT (REACH) – An ONC REC
- Dr Kleeberg also serves on the Physician Advisory Board for Elsevier
- No other conflict of interest
Objectives

• Understand the expanded definition of Clinical Decision Support (CDS)
• Know how “Meaningful Use” provides the Foundation for CDS and quality improvement
• Identify the steps for putting theory into action
• Introduce a tool to organize your strategy
Outline

• Misconceptions about Clinical Decision Support (CDS)
• “Meaningful Use” as the foundation of CDS and quality improvement
• Expanding CDS beyond the provider and the EHR
• Putting theory into action
• A tool to organize your strategy
• Closing thoughts
REACH Experience with Small Clients

• Many:
  – Struggle to achieve EHR benefits
  – See MU as an external mandate, separate from effective use
  – Express concerns about Stage 2
  – Feel pressure: ACOs, quality reporting, pay for performance
  – Say “Just tell me what I have to do to meet the requirements”
Common misconceptions about Clinical Decision Support (CDS)

- The health care administrators:
  - 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
  - Disruptive
  - Done to save the system money
CDS Done Poorly

- Alerts which force a user to stop – disrupting their train of thought
- Imprecise alerts causing multiple false alarms
- Force choices with inappropriate options
- Seemingly important reminders of unnecessary information
- Can cause the user to miss important things
Computer Assisted Flying as CDS

Adopted from a presentation by Dr. Kevin Larsen, Medical Director of Meaningful Use at the ONC

It is winter, sometimes there is snow. Be careful! Press here to document you read this.

Scheduled maintenance due in 2 months. Mark here to accept

Bathroom water pressure is low!
Learnings: Alerts

• There is a tendency to over alert:
  – A desire to control behavior
  – A convenient way to fix a problem
  – Fear that something very bad might happen if we don’t
  – Fear that we will be held liable if we don’t

• Plenty of published literature on alert fatigue
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
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Bending the Curve Towards Transformed Health

Data capture and sharing

Advanced clinical processes

Improved outcomes

Stage 1
Stage 2
Stage 3

Source: Connecting for Health, Markle Foundation “Achieving the Health IT Objectives of the American Recovery and Reinvestment Act” April 2009

“Phased-in series of improved clinical data capture supporting more rigorous and robust quality measurement and improvement.”
CDS as it Relates to Meaningful Use

• Meaningful Use Definition of CDS:
  – HIT functionality that builds upon the foundation of an EHR to provide persons involved in care processes with general and person-specific information, intelligently filtered and organized, at appropriate times, to enhance health and health care.

• The Rule:
  – Implement one clinical decision support rule relevant to specialty or high clinical priority along with the ability to track compliance with that rule.

• Provider Centric
Building a CDS Foundation

• The EHR incentive is the foundation for Clinical Decision Support:
  – Demographics
  – Problems, medications, allergies
  – Labs and vital signs
  – Smoking status, family health history
  – Provider notes

• Freeing information from the confines of paper hidden in a chart room or somewhere in the hospital
The Promise of Meaningful Use and 2914 Certified Software

• Problems, medications, allergies, labs and clinical notes that can be shared with your staff, other providers and patients

• Will enable asynchronous and remote communication with your patients and colleagues

• Provide discrete locations for additional elements in the record: care plan, care team, functional status that can be exchanged with and parsed by other EHRs
What Tools would Satisfy the Rule?

- If triggered by patient specific information AND relevant to a quality measure, specialty or high clinical priority:
  - Documentation forms or templates
  - Situation-specific flow sheets
  - Relevant data presentation
  - Referential information
  - Interactive sequential advice
  - Order sets
  - Alerts and reminders
  - Protocols and Pathways
  - Automatic dose calculators

- Not
  - Drug-drug and Drug-allergy interactions
Provider-Centric CDS

• Benefits
  – A simple solution
  – Can be very effective
  – Targets the individual most likely to be able to respond

• Obstacles
  – Leaves all the work to the provider
  – With only one protective layer, the objective risks being missed
  – Does not leverage the health care team
  – Does not leverage the patient
  – The EHR may not be capable or you may not have the expertise or time
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

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Broadening the Definition of 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

* Improving Outcomes with Clinical Decision Support: An Implementer’s Guide
“CDS Five Rights”

• To improve targeted healthcare decisions and outcomes, information interventions (CDS) must provide:
  1. The right information
  2. To the right people
  3. Via the right channels
  4. In the right formats
  5. At the right times

• The “who, what, when, where, how”
Right Information ("What" Options)

• Provides information that is:
  – Evidence-based
  – Current
  – Responsive to clinical needs
  – At appropriate level (depth and breadth)
  – Useful for guiding action
Right People ("Who" Options)

- The “right people” to receive or provide information:
  - Providers
  - Nurses
  - Pharmacists
  - Front desk/admission staff
  - Other care team members
  - Patients and their caregivers
Right Channels ("Where" Options)

• How is the information getting to the “right people”?
  – EHR modules
  – Registries
  – Portals
  – Mobile devices
  – Smart home devices
  – Paper (e.g., patient handout)
  – E-Mail, text messages...
Right Formats (“How” Options)

How is the information presented?

• As an interruptive event
  – Alerts
• A gentle reminder
  – Highlighted material in the workflow
• In a digested format
  – Patient Lists/Provider Scorecards
  – Flow sheets and Graphs
  – Dashboards
• To provide guidance
  – Documentation Templates
  – Order sets
  – Reference information
Right Time ("When" Options)

INPATIENT

A. Pre-Admission

B. Admission/Nursing Assess.

C. MD's H&P and plan

D. Documentation

E. Orders

F. Order handling (RN, Pharm)

G. Drug admin/Therapies/Procedures

H. Results arrive

I. Consult requests

J. Discharge

K. Post-Visit/Home Care

Pre-visit q'naires Pt reminders

Structured docu.

order sets, parameter checking

Follow-up care prompts

AMBULATORY

A. Pre-Visit

B. Start of Visit/Intake

C. Clinician's H&P and plan

D. Documentation

E. Orders/Rx

F. Therapies/Procedures

G. End of Visit/Check-out

H. Results Arrive

I. Consult requests

J. Rx Dispense

K. Post-Visit/Home Care

Time-based checks

REACH - Achieving meaningful use of your EHR
The earlier in the workflow the better

- Multiple approaches to intervene are more likely to produce the desired outcome

- Be careful to not remind when unnecessary

- Carefully think of the potential interventions at each point of care
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Start With a Strong Foundation

• Identify key stakeholders and have “starter conversations”
• Within these conversations brainstorm goals
• Determine your cultural and organizational readiness for this initiative
• Create a game plan for working on the next set of activities
Building the Team

- Understand the roles required for successful implementation
- Recruit your team and cultivate champions
- Consider augmenting team with outside resources
- Convene and begin planning
Subdividing the work

• Governance
  – Final authority in selecting goals and approving interventions

• CDS (implementation) 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
  – Champion the changes with peers

In smaller facilities, individuals are likely to take on multiple roles
Work on What is Important

• Identify your clinical goals – that will guide the interventions
• Begin with smaller, compelling projects
  – Easy, likely to succeed, high impact
• Identify clinical, financial, operational measures and baselines
• Determine accountability
• Provide adequate resources
  • People to get the work done
  • Time to plan, meet and troubleshoot
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
• Gather baseline metrics
Workflow Analysis: Key to Getting “CDS 5 Rights” Right

• What are people currently doing?
  – Supposed to be doing (policy)
  – Think they’re doing (ask)
  – Actually doing (look)

• What’s working?
  – Problematic?
  – Ripe for improvement?
Educate and Manage Expectations

• Some can jump to early conclusions:
  – “We need to do better on our stroke scores! We need an alert!”

• Builders want to solve a problem the best they know how:
  – “To a man with a hammer, everything looks like a nail.”*

• EHR Envy:
  – “Our EHR won’t allow us to do the things we want”

• Sometimes the best interventions are simple workflow changes

*Commonly attributed to Mark Twain
Assure Their Value

• Keep track of the interventions you have initiated
• Have a system to keep your interventions current
• Take steps to assure their usability
Rolling it out

- Create a roll-out plan
  - Pilot
- Communicate plan to end users
- Train end users on the proper use of the intervention
- Role out with support structures in place
Observe What Happens

- “You can observe a lot by just watching.”*
- What sounds good in a meeting does not always work in reality
- Watch for unintended consequences
- Have the metrics improved?
- Use measurement results and feedback to refine interventions

* Yogi Berra, unknown date, about baseball
Refine Your Process

- PDSA: Plan, Do, Study, Adjust
- This is a dynamic process, not a static point
- Used widely (see IHI, How to Improve)*
- Works for many initiatives
- Helpful for CDS/QI work
- Complements CDS 5 Rights

*http://www.ihi.org/knowledge/Pages/HowtoImprove
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”*
- Unsaid was what can happen when the things we think we know, we didn’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 ED patients
  - Duplicate medication checking
- Start slowly, test with volunteers in a controlled environment and build gradually
The 10 Commandments of Clinical Decision Support*

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

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Clinical Decision Support / Quality Improvement Strategy Worksheet

- Help entire team with structured thought process
- Understand current information workflows producing results
- Brainstorm and implement enhancements (PDSA)

<table>
<thead>
<tr>
<th>Decision Support Opportunity</th>
<th>Care Activities</th>
<th>Examples of Care Activities</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check-in</td>
<td>Review/verify/update patient information</td>
<td>1. Review insurance information to help determine insurance co-pay and minimize patient out-of-pocket expenses and enhance adherence. 2. Verify clinical information (Allergies, Medications, Problem list), e.g., by providing patient a ‘pre-visit summary’ to review.</td>
<td>There are different tools, channels, workflows for handling this information flow, e.g., front desk staff gives electronic forms on tablet computer, patient returns tablet to rooming staff.</td>
</tr>
<tr>
<td>Waiting</td>
<td>Gather patient data, provide educational info</td>
<td>Patient completes pre-visit health form, reviews educational materials and clinical resources related to their health issues</td>
<td>Can be a continuation of activities started during check-in, e.g., reviewing pre-visit summary</td>
</tr>
<tr>
<td>Rooming</td>
<td>Clinical support staff documents/reviews key information with patient before provider encounter</td>
<td>1. Obtain and document vital signs (e.g., blood pressure [repeat if abnormal], height, weight, BMI), chief complaint in patient’s words and brief details. 2. Review and compare with EHR data patient-reported allergies (reaction/severity) and medications (dose, route, frequency, pharmacy), including non-prescription medications and supplements.</td>
<td>Clinician/practice-developed protocols help ensure data is collected and entered into EHR properly (e.g., appropriate technique for recording blood pressure, responding to abnormal values, and documenting results).</td>
</tr>
</tbody>
</table>
Clinical Decision Support / Quality Improvement Strategy Worksheet

- Help entire team with structured thought process
- Identifies all the opportunities for potential interventions
- The top rows deal with the individual patient
- The bottom row deals with the population in general

<table>
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<tbody>
<tr>
<td>Not Visit-related</td>
<td>Patient understands condition and treatment; follows care plan developed in collaboration with care team</td>
</tr>
<tr>
<td>Before Patient Comes to Office</td>
<td>Patient reviews/updates/submits pertinent health status data</td>
</tr>
<tr>
<td>Daily Care Team Huddle</td>
<td>List visit action items and preparations for each patient to be seen during the day</td>
</tr>
<tr>
<td>Check-in</td>
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<tr>
<td>During Office Visit</td>
<td>History and Physical</td>
</tr>
<tr>
<td>Provider Encounter</td>
<td>Documentation</td>
</tr>
<tr>
<td></td>
<td>Assessment/Diagnosis and Care Plan</td>
</tr>
<tr>
<td></td>
<td>Ordering</td>
</tr>
<tr>
<td></td>
<td>Procedures</td>
</tr>
<tr>
<td>Encounter Closing</td>
<td>Patient Education</td>
</tr>
<tr>
<td>After Patient Leaves Office</td>
<td>Additional education and Checkout</td>
</tr>
<tr>
<td>Outside Patient-specific Encounters</td>
<td>Ensure care plan is executed appropriately</td>
</tr>
<tr>
<td>Population-specific Encounters</td>
<td>Identify/address care gaps across the patient panel</td>
</tr>
</tbody>
</table>
Clinical Decision Support / Quality Improvement Strategy Worksheet

- Allows you to identify a target
- Document your current performance
- Provides examples of activities that you may consider

https://sites.google.com/site/cdsforpiimperativespublic/cds-for-pi-imperatives-users-guide/cds-configuration-template
Clinical Decision Support / Quality Improvement Strategy Worksheet

- Assists you in thinking of the 5 CDS Rights during each of the activities
- Document what is currently done
- Provides a framework of what could be done
- Helps you identify prerequisites

https://sites.google.com/site/cdsforpiimperativespublic/cds-for-pi-imperatives-users-guide/cds-configuration-template
Clinical Decision Support / Quality Improvement Strategy Worksheet

• It also contains cells where you can record desired EHR enhancements
• And cells for other notes to consider as future options to consider

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<td>Outside Patient-specific Encounters</td>
<td>Identify/address care gaps across the patient panel.</td>
<td>1. Use patient lists generated from registry to identify prevention and chronic care management gaps for individual patients 2. Address gaps, e.g., contact patients overdue for indicated visits/interventions and arrange appropriate action</td>
<td>Build needed capabilities for addressing gaps broadly across patients. For example: new/enhanced activities such as group visits for diabetes patients, more robust materials such as diet/exercise/BP/weight logs and plans for weight/HTN/DM management. Understand/address implications of Payer condition management outreach to patients.</td>
</tr>
</tbody>
</table>

- Finally, the bottom row can be used to think more broadly about this goal and this population
- Helps you to think how you might leverage the “CDS 5 Rights” to improve the outcomes of this population

https://sites.google.com/site/cdsforpiimperativespublic/cds-for-pi-imperatives-users-guide/cds-configuration-template
HealthIT.gov Resources

• Provides guides for:
  – Starting with a strong foundation
  – Assembling a team
  – Plan for development, design and deployment
  – Roll out
  – Measuring effects and refining

• Contains much of the information in the guidebook

• Free and open to the public

• [http://www.healthit.gov/policy-researchers-implementers/cds-implementation](http://www.healthit.gov/policy-researchers-implementers/cds-implementation)
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

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New closing thoughts

- Clinical Decision Support is a more than the bells and whistles in an EHR
- It is a team effort that requires close attention to workflow
- Start slowly, be willing to make mistakes and learn from them
  - “Fail fast, fail often, fail cheap”
  - Protect your users and patients
- Measure and observe impact
- Be prepared for the long haul: the job is never complete
- Well designed CDS is the “secret sauce” that allows health information technology help us achieve the triple aim of health care:
  - Improving the patient experience of care
  - Reducing the cost of care
  - Improving the health of populations
Resources

- HealthIT.gov resources on Clinical Decision Support
  - [http://www.healthit.gov/policy-researchers-implementers/cds-implementation](http://www.healthit.gov/policy-researchers-implementers/cds-implementation)


- CDS/Process Improvement site with draft CDS Template
  - [https://sites.google.com/site/cdsforpiimperativespublic/cds-for-pi-imperatives-users-guide](https://sites.google.com/site/cdsforpiimperativespublic/cds-for-pi-imperatives-users-guide)

- Stratis Health HIT Toolkits:

- “Meaningful Use” on the CMS web site:
  - [https://www.cms.gov/EHRIncentivePrograms/](https://www.cms.gov/EHRIncentivePrograms/)
Key Health Alliance—Stratis Health, Rural Health Resource Center, and The College of St. Scholastica.

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