Clinical Decision Support
Practice Module - February 2019

Improving Hypertension and Diabetes Care

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# TABLE OF CONTENTS

Purpose of Module ................................................................................................................................. 1
Practice Tools & Resources...................................................................................................................... 2
  For Practices that Currently Use Clinical Decision Support Tools...................................................... 2
  For Practices Interested in Implementing Clinical Decision Support................................................ 3
    CDC & Million Hearts: Hypertension Control Change Package for Clinicians............................... 3
    The Five “Rights” of Clinical Decision Support............................................................................... 3
    Common Types of CDS Tools ........................................................................................................... 6
    Clinical Decision Support Guidebook .............................................................................................. 8
White Papers........................................................................................................................................... 8
Stories from the Field............................................................................................................................... 9
Video ..................................................................................................................................................... 10
PURPOSE OF MODULE

The purpose of this module is to provide education to healthcare providers that will assist them with implementing, utilizing, and benefiting from the use of both clinical and patient reminders.

Clinical Reminders (Clinical Decision Support)

Clinical reminders are a type of alert triggered by a parameter such as time and date, high/low threshold, or clinical indication such as the need for an immunization. They are usually presented as color-coded or bolded text, or a pop-up that requires action. Reminders serve to cue clinicians that certain events should take place, but have not yet done so. Reminders are regularly used in primary care systems, particularly with respect to the management of patients with chronic conditions that require regularly scheduled repetitive tasks. Order sets and treatment protocols are even considered a form of clinical reminders (helping providers order the correct test based on patient’s health conditions). Clinical reminders are also called clinical decision support (CDS). CDS can potentially lower costs, improve efficiency, and reduce patient inconvenience. In fact, CDS can sometimes address all three of these areas at the same time—for example, by alerting clinicians about possible duplicate tests a patient may be about to receive. Many CDS prompts are tied directly to Clinical Quality Measures (CQMs). Responding appropriately to a clinical reminder will also help improve your CQM data.

Patient Reminders

Patient reminders are written (letter, postcard, email, portal message) or telephone messages advising people that they are due for preventative screening. Client reminders may be enhanced by:

- Follow-up printed or telephone reminders
- Additional text or discussion with information about indications for, benefits of, and ways to overcome barriers to screening
- Assistance in scheduling appointments

These interventions can be customized to address the overall target population or tailored with the intent to reach one specific person, based on characteristics unique to that person, related to the outcome of interest, and derived from an individual assessment.

AHRQ’s CDS Initiative includes a variety of research projects and outreach efforts to develop agreement in the healthcare field around the use of CDS to promote safe and effective health care. Each part of the initiative attempts to engage clinicians, provider organizations, guideline and quality measurement developers, and IT professionals to improve making healthcare decisions using CDS systems.

This module will:

- Explain different types of CDS
- Share examples of CDS currently used by ambulatory practices
- Share resources and tools to help your practice implement CDS
PRACTICE TOOLS & RESOURCES

For Practices that Currently Use Clinical Decision Support (CDS) Tools

As we move into a pay-for-value world, clinical quality measures will only become more important as a substantial portion of value based programs rely on these measures to evaluate a practice’s performance. Most electronic health record’s (EHR) current CDSs are set up to capture or check if these measures are being met. CDSs are a great way to evaluate if the practice is documenting clinical quality measures properly to get credit for the measures. If a measure was thought to be completed at a previous visit with a patient, but the CDS still triggers, then there is a possibility that the previous documentation was not recorded properly. If this occurs, then the provider will need to notify the EHR vendor to evaluate if the CDS triggered in error or if the proper documentation was not completed to meet the measure. Quality Insights can help you implement any workflow improvement related to hypertension and diabetes CDS documentation.

Alert fatigue is also a problem within practices as more reminders and alerts are found in each patient’s chart. The article below provides a few ideas on how to combat alert fatigue.

Making EHR Alerts Work for Your Practice – This informative article from Medical Economics offers ideas on how to avoid alert fatigue that may come from too many alerts, pop-ups, and reminders in patient charts. Read the article here.

CDS Starter Kit: Diabetes Follow-Up Care

The delivery of high quality diabetes care is a complex process that requires a provider to consider many pieces of patient information and treatment guidelines. Given that many recommendations for diabetes care are relatively well defined, diabetes follow-up care is a good opportunity to use clinical decision support (CDS) and begin combining different types of CDS to aid workflow transformation and improve patient care. While the examples provided in this short document are specific to Nextgen and Cerner, the concepts can be applied to any EHR. Click here to read more.
If you need assistance establishing CDS within your electronic health record (EHR), Quality Insights can assist you at no cost. Contact your Quality Insights Practice Transformation Specialist to learn more. A complete listing of all Quality Insights’ Practice Transformation Specialists is found at the bottom of the e-newsletter.

For Practices Interested in Implementing Clinical Decision Support

A Centers for Disease Control and Prevention (CDC) Best Practice Guide for Implementing Clinical Decision Support Systems (CDSS). CDSS are computer-based programs that analyze data within EHRs to provide prompts and reminders to assist health care providers in implementing evidence-based clinical guidelines at the point of care. Applied to cardiovascular (CVD) prevention, CDSS can be used to facilitate care in various ways—for example, by reminding providers to screen for CVD risk factors, flagging cases of hypertension or hyperlipidemia, providing information on treatment protocols, prompting questions on medication adherence, and providing tailored recommendations for health behavior changes. Click here to read more.

National Diabetes Education Program Encourages Use of CDS

A review article suggests that CDS systems provide clinicians with patient-specific assessments or recommendations to aid clinical decision making. Examples include manual or computer-based systems that attach care reminders to the charts of patients needing specific preventive care services and computerized physician order entry systems that provide patient-specific recommendations as part of the order entry process. Such systems have been shown to improve prescribing practices, reduce serious medication errors, enhance the delivery of preventive care services, and improve adherence to recommended care standards.

CDS provides a wide selection of resources and tools that support diabetes prevention and management. Read more.

CDC & Million Hearts: Hypertension Control Change Package for Clinicians

This toolkit includes “How-To Guides for Clinical Decision Support (CDS) Implementation.” The guides are intended for both clinical and technical staff that are defining CDS clinical goals; planning and leading CDS implementations; and maintaining and monitoring CDS interventions. To this end, Clinical Directors, Directors of Information Systems, Chief Medical Information Officers, and Directors of Medical Informatics, as well as other health care organization leaders, would benefit from reviewing the guides and associated resources. The Guides are presented as five separate documents covering five major stages or phases in implementing CDS. Click here to read more.

The Five “Rights” of Clinical Decision Support

With a firm understanding of clinical decision support, its various forms, and its relationship to meaningful use, the focus can turn to the five “rights” of CDS. These five rights can be used as a
framework when planning to implement CDS interventions within a facility or practice, or when creating an extensive CDS program.

The five rights include:

1. **The right information**
2. **To the right person**
3. **In the right intervention format**
4. **Through the right channel**
5. **At the right time in workflow**

These five rights are explained in more detail below.

**The Right Information** - The information presented to the end-user—or in some cases, the patient—should be evidence-based, derived from a set of recognized guidelines, or based on a national performance measure. In the case of the 60 year old patient, an alert is generated informing the physician that the patient needs to be screened for colon cancer. The alert is based on the performance measure NQF-0034, which is a national measure developed by the National Committee for Quality Assurance. Furthermore, this performance measure is based on a set of guidelines developed by the American Cancer Society that stipulates who, from the general population, should be screened for colon cancer on a regular basis.

The intervention, which in this instance is an alert, should contain only enough information for the end user to act on. If the end user is given too much information, this may induce cognitive overload and cause them to disregard the alert. In the current example, the physician is alerted to the fact that the patient has a family history of colon cancer and is within the threshold, patients age 50-75, of who should be screened for colon cancer. In instances where the physician would like to read the performance measure or the guidelines on which the alert is based, the channel (EHR) used to deliver the alert should make this information available via a URL or portable document format (PDF) file. As a result of the alert, the physician advises the patient to have a colonoscopy performed.

Some experts recommend that healthcare organizations and practitioners who find themselves in the early stages of CDS intervention development refrain from basing interventions solely on expert opinion. In some cases, expert opinion can be contentious because it may not be universally agreed upon as a best practice, and it may negatively influence whether an end user complies with the recommended actions forming the basis of the CDS intervention.

**The Right Person** - As healthcare becomes more of a team approach, it is important to make sure that the right information gets to the right person so that the appropriate action can take place. The right person can be a nurse, physician, physical therapist, or in some cases, a family member or significant other. In the example above, the right person is...
the physician who receives the alert and advises the patient to get a colonoscopy.

However, it is important to note that CDS interventions can sometimes change care team roles. For example, if the patient is resistant to take advice from their physician, the information (in the form of an alert) may be best conveyed by a significant other or sibling who can use persuasion to help gain patient compliance.

The important takeaway is to present information only to individuals who can take action. A common example in the health informatics literature is one where a nurse receives an order to adjust medication dosing for a patient. This type of information is problematic because the nurse has no way of knowing whether the medication dosing has already been adjusted.

**The Right Intervention Format** - As previously discussed, CDS may be implemented in various formats—alerts, order sets, protocols, patient monitoring systems, and info buttons. Consequently, it becomes important for implementers to identify the issues and problems they are trying to solve and choose the best format to resolve the problem at hand. Furthermore, when developing a CDS program, implementers should create an inventory of current systems to determine which CDS tools are available, which tools need to be developed in-house, and which tools need to be purchased through a vendor. In the opening example, a practice wishes to identify patients at risk for major illnesses, and get them to adopt preventive measures. The simplest solution is an alert that non-intrusively informs the physician of a patient’s predisposition to an illness—in this case colon cancer.

**The Right Channel** - In healthcare, CDS interventions can be delivered through an EHR, Personal Health Record (PHR), computerized physician order entry, an app running on a smartphone, and—if necessary—in paper form via flow-sheets, forms, and labels. In the example above, if the physician is the right person, then the electronic health record (EHR) may be the best platform for delivering the alert. However, if a significant other is the right person, then the right platform may be a text messaging app running on a smartphone. The alert would inform the individual of the patient’s need to have a colonoscopy performed.

**The Right Time in Workflow** - A common problem in health information management is the desire to overlay new technology onto current clinical processes. One negative outcome of this practice is that information may be delivered to a clinician at the wrong time, or it may not be available when it is needed. A common example of this problem occurs when a physician is treating a patient who is taking aspirin. The physician temporarily loses track of this fact and begins the process of prescribing Coumadin (a blood thinner) for the patient. After entering all the pertinent information for the prescription, the physician attempts to send the script to the pharmacy. An alert appears on the screen informing the
physician that the patient is already taking aspirin and prescribing Coumadin could generate an adverse outcome.

This is an example of where information is presented at the wrong time in the clinical workflow process. It would be more advantageous for the physician to be alerted when they began typing the word Coumadin at the very start of the prescription process, not after the prescription had been entered. This highlights a very fundamental fact in the CDS implementation process, that to successfully create an intervention, the clinical processes involved must be thoroughly understood and documented so that the right information is delivered to the right person at the right time.

Closing the loop in the example from above, workflow analysis performed on the clinical process of a physical examination may reveal that a passive alert found in the patient’s EHR informing the physician of the patient’s need for colon cancer screening may be the best intervention to employ. An alert appearing when the physician opens the patient’s health record, and requires the physician to actively acknowledge that they have seen the alert—which requires them to click on an alert window—may not be the best intervention. This could disrupt the physician’s current workflow and consequently may not be processed at all.

Passive alerts can appear in a prominent place on the health record—a decision based on the results of the workflow analysis—and can be processed once the physician completes the physical examination. An alternative method would be when the physician closes the patient record they are given a prompt informing them that they have five patient alerts that need to be processed.

Common Types of CDS Tools
Most CDS tools fall into one of five major categories:

1. Alerts & Reminders
2. Order Sets
3. Info Buttons
4. Data Displays
5. Documentation Templates as CDS

Each of the five categories is described in terms of what they are designed to do; what they look like, and examples of how they are applied.

**Alerts & Reminders**
*What are they?* — Alerts and reminders deliver information at the point of care in a way that gets the provider’s attention.

*What do they look like?* — Alerts and reminders can appear as pop-up boxes, strategically placed reminder lists, or changes in visual presentation such as font or color. The design of an alert or reminder will vary with the type of information being presented and its relative importance. For instance, an alert for a severe medication allergy would appear as a pop-up box,
and a less severe alert, such as an indicator for generic vs. name brand medications could appear as a change in font.

**How are they used?** — Alerts and reminders are commonly used to support prescribing and time-sensitive care like annual preventive care screenings.

**Order Sets**

**What are they?** — Order sets are pre-specified bundles of orders grouped by a clinical purpose. Order sets eliminate the need to specify each individual test, medication, etc., for a given situation. This makes the ordering process more efficient and can reduce human error.

**What do they look like?** — After an order set is created or specified, it may not appear to be different from any other order, with the exception that an order set will group multiple orders for a particular purpose as defined above.

**How are they used?** — Order sets are used to make the ordering process more efficient and to standardize a level of care across the practice. Providers should work together to identify which order sets are most relevant to their practice.

**Info Buttons**

**What are they?** — Info buttons provide clickable links to reference information for selected terms or phrases that appear in the EHR. Providers can seek out information using info buttons, as opposed to alerts and reminders, which automatically deliver information to the provider.

**What do they look like?** — Info buttons appear as a small button or icon next to key words in the EHR, such as problem statements or lab results. An info button icon may look something like this: ![Alert]

**How are they used?** — Info buttons can be used in any situation where more information might be needed. For instance, an info button might appear after the name of a condition or medication and link to more information on that topic.

**Data Displays**

**What are they?** — Data displays are reference, guidance or patient specific information provided at appropriate times during ordering or chart review. Unlike alerts and reminders, data displays are not triggered by specific user-action, but are triggered by information.

**What do they look like?** — A data displays health information for a particular disease, such as a diabetes flow sheet, or the display of allergy status when writing a new prescription. They may also appear as a dashboard or could even be a unit tracking system like an ED monitor.
How are they used? — A data display will support decision making, not by providing an alert/reminder or facilitating ordering, but by providing information which may guide the clinician toward making a more informed decision.

Documentation Templates as CDS
What are they? — Documentation templates are structured, electronic forms that collect clinical information. Documentation templates are considered a type of CDS if they are used to support general documentation purposes, other CDS tools later in the workflow, or other clinical purposes like quality measurement.

What do they look like? — Documentation templates look like an electronic form with areas where the provider can enter information. Depending on the template and its purpose, information can be entered in a variety of methods, including free text or from a drop-down menu.

How are they used? — Documentation templates can support any data collection effort that the practice wants to standardize.

For additional information on the CDS toolkit, please click here.

Clinical Decision Support Guidebook
The Healthcare Information and Management Systems Society (HIMSS) published a guidebook series on improving care delivery and outcomes with clinical decision support (CDS). These guidebooks can help you apply the CDS Five Rights framework to ensure that all the right people (including patients) get the right information in the right formats via the right channels at the right times to optimize health-related decisions and actions. The guidebooks help health care practices and their partners set up programs that reliably deliver outcome-improving CDS interventions. They also provide detailed guidance on successfully developing, launching, and monitoring such interventions so that all stakeholders benefit. Click here to read more.

Million Hearts: Treatment Protocols
This resource outlines standardized treatment protocols to improve blood pressure control by clarifying titration intervals revealing new treatment options and expanding the types of staff that can assist in timely follow-up with patients. When embedded in EHRs, treatment protocols can serve as CDS at the point of care so no opportunities are missed to achieve control. Click here for treatment protocol templates, elements of effective protocols, and numerous examples of hypertension evidence-based protocols used by healthcare leaders today.

White Papers
Clinical Decision Support Systems: State of the Art - This review presents a summary of the state of the art of electronic CDS for clinicians. It includes background information on the types of CDS and focuses on the outcomes of deploying these CDS interventions. It also discusses the major issues and challenges of CDS implementation and evaluation.
After reviewing what is known about implementing CDS, the impact from its use, and the knowledge gaps that remain, the review examines factors that can facilitate broader use of CDS, including the role of various stakeholders in influencing CDS adoption. This review uses both the peer-reviewed literature on implementation and outcomes of CDS and a variety of books, white papers, and recommendations put forth by national organizations in recent years. Click here to read more.

**Clinical Practice and Redesign: How Change in Workflow Can be Supported by CDS** - To better understand how CDS automation can fit within the multi-level healthcare system to support ambulatory care clinicians’ workflow, this white paper will:

1. Explore why CDS is important for ambulatory care
2. Review evidence for the effectiveness of CDS in ambulatory settings
3. Discuss the relationship between CDS and workflow
4. Provide a framework for thinking about CDS-workflow fit
5. Recommend steps for designing and implementing CDS to better fit the realities of clinical workflow

Click here to read more.

**Stories from the Field**

**The Agency for Healthcare Research and Quality (AHRQ) Funded Programs**
The national AHRQ has funded organizations across the country that are integrating CDS into the delivery of health care. Click here to learn more about efforts made across the country to use CDS to improve quality of care. Also look for the implementation checklist with documents to help you address potential barriers and challenges to implementation.

**Improving Blood Pressure Control for Patients with Diabetes in Four Community Health Centers**
Community Health Centers, Inc. (CHC, Inc.) is a medical practice comprised of four urban community health centers in Utah. CHC, Inc., via its four health centers, developed a plan to leverage its electronic health record (EHR) and Clinical Decision Support (CDS) approaches to improve care for diabetic patients and improve the blood pressure (BP) target. They focused on increasing the percent of all patients with Type 2 diabetes with BP<140/90 to 73 percent. Click here to learn more.
Use of EHR Associated with Improvements in Outcomes for Patients with Diabetes – An Evidence-based Study from Kaiser Permanente
Integrated healthcare organizations such as Kaiser Permanente (Kaiser) have developed clinical decision support systems (CDSS) that harness EHR data to improve provider adherence to guideline-based prescribing. Click here to see entire article and short video clip on the study.

Video
CDS - Cloud Based Decision Support
The Clinical Decision Support Consortium (CDSC) is one of two projects funded by AHRQ to demonstrate how clinical decision support (CDS) can be implemented effectively at scale to diverse locations.

This video shares the story of a small rural health care practice that participated in the CDSC project and helped show that CDS created at a large teaching hospital could be effectively disseminated to health care providers using different electronic health records (EHRs) anywhere in the country. Click here to view the video.