

Clinical Decision Support: More than Just 'Alerts'

Tipsheet

Last Updated: October 2014

What is Clinical Decision Support?

Clinical decision support (CDS) is a key functionality of health information technology that can contribute to improved care quality, enhanced health outcomes, error and adverse event avoidance, improved efficiency, reduced costs, and enhanced clinician and patient satisfaction.¹ Recognizing this potential to improve care, Congress included CDS as a centerpiece of the Medicare and Medicaid EHR Incentive Programs.

CDS is **not** simply an alert, notification, or explicit care suggestion. CDS encompasses a wide variety of tools including, but not limited to, the following: computerized alerts and reminders for providers and patients, actionable clinical guidelines, condition-specific order sets, focused patient data reports and summaries, documentation templates, diagnostic support, and contextually relevant reference information. These functionalities may be deployed on a variety of platforms (e.g., mobile, cloud-based, or locally installed).² CDS is not intended to replace clinician or patient judgment. Rather, CDS is a tool to assist care team members in making timely, informed, higher quality decisions. The “Five Rights” concept³ provides a best practice framework for CDS implementation. In order for CDS to be effective, it should provide:

- the right information (e.g., evidence-based guidance, response to clinical need);
- to the right people (entire care team – including the patient);
- through the right channels (e.g., EHR, mobile device, patient portal);
- in the right intervention formats (e.g., order sets, flow-sheets, dashboards, patient lists); and
- at the right points in workflow (for optimized decision making or action).

While many providers may associate CDS with pop-up alerts, this is not the only (or the most appropriate) method of providing decision support. A pop-up alert, for example, might only appear *after* an event has occurred (e.g., a provider has ordered a contraindicated medication and an alert appears after the order is complete). Providers may consider a wide range of CDS interventions and should choose those that work best within their care delivery setting. For example, upon opening an adolescent patient’s electronic record during a patient visit, the provider may be informed of a recommendation to conduct an age-appropriate depression screening. While interacting with a provider-chosen assessment tool, the patient’s positive findings also prompt a shared care plan tool and an option to order a referral to a mental health provider. This example includes several CDS interventions (e.g., depression screening recommendation, shared care plan tool prompt, option to order a referral) and supports clinical

¹ Food and Drug Administration. “FDASIA Health IT Report, Proposed Strategy and Recommendations for a Risk-Based Framework.” <http://www.fda.gov/downloads/AboutFDA/CentersOffices/OfficeofMedicalProductsandTobacco/CDRH/CDRHReports/UCM391521.pdf> (accessed 5/13/2014).

² FDASIA Health IT report

³ Osheroff, Teich, Levick et al., 2012. *Improving outcomes with CDS: an implementer's guide*, Second Edition.

workflow without interrupting the provider's thought process or contributing to alert fatigue, which has been identified as a key concern for implementers of CDS.⁴

What Does Meaningful Use Require for CDS?

In Stage 2, eligible providers must implement *five* clinical decision support interventions related to *four* or more clinical quality measures,⁵ if applicable, at a relevant point in patient care for the entire EHR reporting period, and have enabled the functionality for drug-drug and drug-allergy interaction checks for the entire EHR reporting period.⁶

The Stage 2 rule states: "CDS is not simply an alert, notification, or explicit care suggestion," and goes on to describe non-alert CDS examples including disease-specific order sets and documentation forms/templates.⁷ The rule also defines CDS as "[health IT] 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."⁸ Moreover, Stage 2 replaces the term "clinical decision support rule" with "clinical decision support intervention" in order to "better align with, and clearly allow for, the variety of decision support mechanisms available to help improve clinical performance and outcomes."⁹

CDS is frequently an integrated part of the provider's EHR, but may also be present in a variety of other technologies, including—but not limited to—pharmacy systems, patients' personal health records, or patient-facing portals. Further, some providers use CDS as a "service" by securely sending patient information to a registry, implementing "cloud" based CDS interventions, or using immunization forecaster programs that can provide a response back about what treatments or diagnostic testing might be appropriate for the patient.

What Kinds of Things Constitute CDS?

There is no definitive or comprehensive list of what can constitute CDS. ONC and CMS broadly interpret CDS, as is stated in the 2012 Final Rule, and understand that there are a wide array of innovative and effective decision support tools available to providers.

The 2012 Health Information Management Systems Society (HIMSS) publication, *Improving Outcomes with CDS: An Implementer's Guide* describes multiple CDS intervention types, including:

- Smart Documentation Forms, such as intelligent referral forms or templates that help ensure that the referring provider sends all necessary information;

⁴ "Alert fatigue" occurs when a provider, after receiving too many alerts or reminders (some of which may be irrelevant or unhelpful to that provider), begins to override or ignore further alerts without attending to them, which can decrease the care improvements expected from the tools (www.informatics-review.com/wiki/index.php/Alert_Fatigue).

⁵ Note: CDS interventions are not required to be related to the same clinical quality measures that an EP has chosen to report. While there is no formal definition of this relationship, in general, the CDS intervention should be aimed at prospectively advancing the same clinical goal or guideline promoted by the clinical quality measure.

⁶ Note that the Meaningful Use regulations specify that because these types of CDS are counted in their own separate objective measure, they do not count towards the five CDS interventions requirements.

⁷ 77 FR 53997

⁸ 75 FR 44350

⁹ 77 FR 13714

- Order Sets, Care Plans and Protocols;
- Parameter Guidance (e.g., displaying therapeutic ranges based on patient information on prescribing page, drug/dose pick-lists filtered by patient characteristics, and templates which require entry of all necessary documentation);
- Critiques and Warnings – “Immediate Alerts” (e.g., a pop-up warning if a provider enters a dangerous contra-indicated prescription order);
- Relevant Data Summaries (Single-patient);
- Multi-Patient Monitors;
- Predictive and Retrospective Analytics;
- Filtered Reference Information and Knowledge Resources;
- Expert Workup and Management Advisors; and
- Event-Driven Alerts (Data-triggered) and Reminders (time-triggered).

Similarly, the recent [FDASIA Health IT Report: Proposed Strategy and Recommendations for a Risk-Based Framework](#) co-published by FDA, ONC, and the FCC, lists types of CDS interventions consistent with HHS’ broad definition including, but not limited to:

- Evidence-based clinician order sets tailored for a particular condition, disease, or clinician preference;
- Drug-drug interaction and drug-allergy contraindication alerts to avert adverse drug events;
- Drug dosing calculations;
- Drug formulary guidelines;
- Reminders for preventative care (e.g. mammography, colonoscopy, immunizations, etc.);
- Facilitation of access to treatment guidelines and other reference material that can provide information relevant to particular patients;
- Calculation of prediction rules and severity of illness assessments (e.g., APACHE score, AHRQ Pneumonia Severity Index, Charlson Index);
- Duplicate testing alerts; and
- Suggestions for possible diagnoses based on patient-specific information retrieved from a patient’s EHR.

Other innovative types of CDS that would meet the definition include support for public health reporting and patient safety reporting. For instance, a CDS intervention could inform a provider that a patient has a reportable condition (e.g., after entering a diagnostic code for gonorrhea, a fall, or adverse drug event), and then could provide a template to ensure the capture of all the information necessary to complete reporting to the public health agency and/or could provide pre-populated forms needed to make the report.¹⁰ Note that in the above case, CDS may not necessarily occur at the point of care, nor must it target the provider for action. Rather, office staff may be responsible for populating and submitting report forms and the CDS could be directed toward them.

Similarly, CDS (such as documentation templates and order sets) can not only help providers remember to complete safety event reports, but also may help them more completely capture the data needed to do so. This CDS could be explicit, such as “here is a template for public health [or safety] reporting.” Alternatively, the CDS may simply be incorporated into general

¹⁰ In an excellent example of how CDS can drive improved treatment and public health, CDC conducted a pilot project with the Institute for Family Health, in which a link to information on active gastrointestinal public health alerts was added to provider displays when they documented certain symptoms or syndromes (<http://www.ncbi.nlm.nih.gov/pubmed/22473114>).

templates, perhaps by adding important safety data into high-risk order templates (e.g., anticoagulant orders or respirator use).

Evaluating Eligible Providers' Use of CDS for Meaningful Use

Auditors should consistently refer to the broad definition of CDS identified in the rule. The definition is as follows:

“CDS is an 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.”¹¹

HOW IS CDS DEFINED FOR PURPOSES OF THE MEANINGFUL USE PROGRAM?

The concept of CDS for Meaningful Use encompasses a wide range of information, which can be presented to providers, clinical/support staff, patients, and/or other caregivers at various points in time. Auditors should consider ONC and CMS' desire to encourage innovative efforts to use CDS to improve care quality, efficiency, and outcomes, and should use the Meaningful Use definition of CDS as an evaluation guide: “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.”¹²

HOW SHOULD AN AUDITOR EVALUATE NON-INTERRUPTIVE CDS?

In the realm of interruptive CDS (e.g., “pop-up alerts”), it can be relatively straightforward to view logs of how many times a given CDS intervention is presented to a user. However, auditors must be prepared to evaluate and accept other non-interruptive CDS, including CDS like those described in Sections I and II which may not be ‘triggered’ in an obvious, event-specific way. For instance, a standard documentation template for a diabetic patient visit that provides for a diabetic foot exam is a CDS intervention, as it guides the assessment and necessary data collection for that specific patient’s needs. Such a CDS intervention gives the provider implicit information that diabetic patients should receive a foot exam and—in some cases—explicit information regarding whether or not the patient has had one in the required period. In this example, the right information is provided at the right time, to the right person, in the right manner, and through the right channel.

MUST A CDS INTERVENTION BE “TRIGGERED” IN ORDER TO SATISFY THE MEANINGFUL USE CDS OBJECTIVE?

Although the “triggering” of CDS interventions based on problem lists, medication lists, allergies, etc. is a common form of implementation, it is not the only form that CDS interventions can take for purposes of meeting the CDS objective. As such, the mechanism of “triggering” is not required to satisfy the CDS objective because some CDS interventions (e.g., data displays or reference information) are activated using different implementation methods. Therefore, if EHR technology is capable of recording that a CDS intervention has occurred (even if the CDS is not

¹¹ 75 FR 44350

¹² 75 FR 44350

triggered) then the EHR technology will be capable of generating a report that expresses the CDS interventions that were used or enabled across a given time-frame such as during an EHR reporting period.

MUST THE CDS BE “FIRED” DURING THE REPORTING PERIOD?

No. It is also worth noting that while a given CDS intervention may be installed and activated in a provider’s practice, it may not ‘fire’ during a given period. For instance, if a provider has active CDS to improve tuberculosis antibiotic selection, but has not seen any tuberculosis patients since installing the CDS, the provider will still receive credit for that CDS intervention for purposes of the CDS objective. For purposes of demonstrating that a CDS intervention was active but not used because the applicable patient type was not seen during the reporting period, it may be helpful for providers to have printed or electronic screenshots of what the CDS looks like when it is exposed to the user.

CAN SCREENSHOTS BE USED TO DEMONSTRATE CDS?

Yes. Some providers may not have test environments or ‘dummy’ patients available to show CDS ‘in action’ to auditors. As noted above, providers may instead present screenshots or other documentation detailing what the CDS is and under what conditions it would be made available.

DOES CDS DIRECTED AT SUPPORT STAFF, PATIENTS, OR CAREGIVERS “COUNT” FOR PURPOSES OF THE MEANINGFUL USE PROGRAM?

Yes. CDS is not only for clinicians, but also for support staff, patients, and other caregivers. For instance, some practices have used ‘return to clinic’ reminders available in the practices’ EHRs to remind front desk staff to proactively call patients due for routine screenings to remind them of upcoming appointments and/or to explain pre-visit preparations such as fasting, outside lab work, etc. CDS delivered to patients could take the form of detailed medication instructions, home management tips, or dietary guidelines.

HAS HHS PRODUCED ADDITIONAL RESOURCES RELATED TO CDS?

Yes. Several federal entities have developed resources for providers and HIT developers, including but not limited to:

- [ONC’s CDS pages](#) (both for [providers](#) and for [researchers](#))
- [ONC’s Clinical Quality Framework](#)
- [Standards to structure shareable CDS interventions](#)
- AHRQ’s [Clinical Decision Support Initiative](#)
- The [FDASIA Health IT Report](#)