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Eight reasons why clinical decision support is more valuable than ever

Clinical decision support (CDS) assists care providers with knowledge that can enhance the health of their patients. Over the past several years, CDS has offered marginal value to healthcare organizations looking to improve patient safety and clinical care outcomes. But it has struggled to reach its full potential.

The good news? CDS is transforming into a higher value knowledge acquisition and clinical care tool. In fact, next-generation CDS is expected to take on increased significance in the days to come as it is poised to:

1. Provide greater guidance

"Several years ago, clinicians would be using an EMR [electronic medical record] and get pop-up alerts to tell them they shouldn't do something. CDS is becoming much more than interruptive alerts. It is incorporating a variety of care guidance tools such as medical reference databases, order sets, care plans and patient education," said Ken Stewart, RPh, clinical support executive at Elsevier. "CDS is transforming from a 'read this' solution into a tool that provides direct 'do this' guidance to clinicians at the point of care."

For example, when a physician is working with a newly diagnosed heart failure patient, the CDS system could provide evidence-based order sets that delineate the recommended treatments for the patient in electronic form – instead of merely alerting physicians when they are about to order a potentially harmful medication. Likewise, nurses could be presented with a care plan providing recommended guidance at each step of the care process.

Joyce Sensmeier, MS, RN-BC, vice president of informatics for HIMSS, agrees that CDS is moving beyond the early days of reactive one-off alerts to become more comprehensive and interactive. In fact, with next-generation CDS, clinicians will feel "like there is an expert at their side. So it's not just 'Stop, don't do that.' It's 'Here's what you should do. Here's what you should be thinking about,'" she said.

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Vice President, Clinical Executive
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2. Become more patient specific

A long-standing frustration with CDS emanates from the fact that recommendations are often generalized and not directly related to a particular patient. Healthcare organizations, however, are now looking to move beyond this broad-based medicine. In fact, nearly 70 percent of healthcare organizations that are planning precision medicine projects will begin to implement new strategies within the next 12 to 24 months.[1]

And, CDS is likely to come into play as it is capable of providing "information in the context of the specific patient at the specific time when it is needed with that patient," Sensmeier said. For example, a clinician who is working with a newly diagnosed cancer patient might receive a reminder that a breast cancer study is currently recruiting participants.

By leveraging specific genetic and medical history data about each patient, the CDS system can provide more relevant guidance," said Drew Furst, MD, vice president, clinical executive, Elsevier. "By including that information, a CDS system can generate more specific guidance relative to that context."

3. Play a role in the shared patient care experience

"We've evolved to a shared decision-making model where more of the responsibility and understanding of the decision process is shouldered by the patient in conjunction with their clinicians," Furst said. "CDS and shared decision making will no longer be separate concepts. Evidence-based content will help both the clinician and the patient in making informed decisions together."

4. Leverage integration standards

SMART on FHIR (Fast Healthcare Interoperability Resources) is a set of open specifications designed to integrate apps with EMRs, portals, health information exchanges and other systems. As such, organizations can develop and use CDS applications that are EMR agnostic, making it possible to fully leverage technology without significant human and capital investments.

"Traditionally, EMRs needed to have clinical decision support data deeply embedded within their structure. So, if there was a better source of information to drive CDS, they would have to essentially recode and integrate all that data. And, that took a lot of work, effort and expense. With SMART on FHIR, EMRs can deploy CDS as a service, which allows them to simply go out and call the service that is best suited to each situation," Stewart explained.

An effort related to the SMART on FHIR work, CDS Hooks, is a technology that enables third-party CDS systems to register with an electronic health record (EHR) system using a "hook" pattern. As such, the third-party CDS system is able to provide the EHR with information in the form of "cards" to show the user at appropriate times in the workflow. This is a key capability to streamline the workflow for clinicians and make it an integrated end-user experience.

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Clinical Executive
Elsevier

5. Incorporate artificial intelligence (AI) & knowledge graphs

Machine learning (ML) is a form of AI that enables computers to learn without being explicitly programmed. "As CDS includes more and more data, it will start to leverage that information through the process of machine learning and natural language processing (NLP). CDS will eventually include advanced suggestions or recommendations based on that particular patient's specifics and will then suggest guidance to both the clinician and the patient in context of the patient's specific situation," Furst said. "As a result, CDS will be driven by realistic expectations."

Knowledge graphs will be used as a graphical representation of the knowledge currently embedded in medical literature and patient data sets. Using ML and NLP, we can process these data sets at scale and generate the graphs and models for use in CDS. About 35 percent of healthcare organizations plan to leverage AI within two years — and more than half intend to do so within five, according to the *Healthcare IT News and HIMSS Analytics HIT Market Indicator: Artificial Intelligence*. The 85 healthcare organization C-level executives and information technology professionals who participated in the survey ranked CDS (20 percent) second only to population health (23.53 percent) as the area where AI would have the most substantial impact.[2]

6. Support ambulatory and longitudinal care

CDS is extending beyond the here and now. "The patient with a newly diagnosed condition will need additional screenings and preventive measures down the road. CDS can help to identify these to minimize the impact of the evolution of the physiology of the disease state," Furst said. As such, the clinician can plan for the expected follow-up care and target interventions and other preventive measures that the patient should be taking along that journey.

In addition, CDS will have to expand outside of just the acute-care setting into the ambulatory environment where most Americans receive their care. CDS should eventually include patient-owned wearable devices to provide "a real-time assessment of patient's status, not just the time they're in front of a clinician," he said.

7. Utilize non-clinical data

To get a better handle on patient needs, CDS will leverage a broad swath of data. "Often things like readmissions occur due to factors outside the hospital's control and are frequently related to the social determinants of a person's life, like financial issues, their lack of support systems or associated high stress," Furst said. To account for these factors, various types of socio-economic data will be incorporated into CDS in the future.

8. Strengthen all aspects of medication management

CDS is being woven into every step of the medication management process. "About 10 years ago, CDS was mostly seen in pharmacy order entry systems where pharmacists processed a physician handwritten order, and the pharmacist was provided with warnings about drug allergies and drug interactions and so forth," Stewart said.

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Joyce Sensmeier, MS, RN-BC
Vice President of Informatics
HIMSS

"But now," he pointed out, "CDS is embedded into all steps of the medication management process – from ordering CPOE (computerized physician order entry), to pharmacist verification of a physician order, to dispensing the drug, to the nurses' access to the drug through an automated dispensing cabinet on the patient care floor, to administration of the drug using barcode medication administration technology, and finally to monitoring for new patient data that may affect the dosing of the drug."

Overcoming CDS challenges

While next-generation CDS systems hold vast potential, many challenges loom. Adding more features and functionality to CDS, for example, will not make it usable. "The healthcare industry has widely implemented EMRs, but they are not as user-friendly as they should be. So, when we start adding on all these features to CDS, usability will still be a challenge," Sensmeier said. As such, organizations will need to consider how users receive CDS within the EMR, how the actual screens look and how they input information about patients – in order to make the technology usable in real situations.

In addition, impactful CDS initiatives will include patients into the shared decision-making process. "Moving forward, organizations will engage the patient and ensure that the patient is playing an active role in making decisions about the best possible treatment protocols for their situation," Stewart said. To accomplish this, care providers could actively involve patients in discussions about treatment options or deliver evidence-based education online.

In the final analysis, healthcare organizations must take a holistic view of the challenges and what needs to be done for CDS. Leaders need to consider the source of the CDS data, full transparency what evidence supports the CDS recommendation, the utilization and presentation of the information, and what type of oversight or governance that they will have in place. By doing so, healthcare organizations will reap the benefits of CDS and help them make more informed decisions to improve patient's care backed by all available evidence.

"At the end of the day, decision making will be improved for providers and patients will also benefit. Patient by patient, outcomes will be impacted in a positive way, because of this additional insight," Sensmeier said. "Ultimately we will be able to demonstrate that the health of a population is impacted as a result of the use of CDS at their organization. So, that impact will help organizations succeed in a value-based model where clinical care outcomes are tied to reimbursement."

[1] *Essentials Brief: 2017 Precision Medicine Study.* HIMSS Analytics. http://www.himssanalytics.org/essentials-brief/essentials-brief-2017-precision-medicine-study
[2] *Healthcare IT News and HIMSS Analytics HIT Market Indicator: Artificial Intelligence*. Healthcare IT News. http://www.healthcareitnews.com/news/half-hospitals-adopt-artificial-intelligence-within-5-years