What is Clinician Decision Support Systems?

Clinician decision support systems (often referred to as CDS or CDSS), are systems outside of and integrated into EHRs that leverage technology to provide guidance. CDSS is a large bucket that encompasses a variety of different tools embedded in clinical workflows, usually displayed through the EHR designed to enhance decision-making in the moment. These tools have become a core part of routine clinical practice.

**CDS provides knowledge and person-specific information, intelligently filtered or presented at appropriate times, all to enhance health and health care.** Examples of clinical decision support include computerized alerts and reminders, clinical guidelines, condition-specific order sets, focused patient data reports and summaries, documentation templates, diagnostic support, and contextually relevant reference information.

An EHR can provide embedded CDS through two primary mechanisms. We will call them “rule-based” and “Artificial Intelligence or AI-based.”

**Rule-Based Systems**

Rule-based systems are, at their core, complex decision trees in which an administrator has designed a series of specific checks or calculations based on expert knowledge. Patient data can then be fed through the decision tree in the moment with a subsequent recommended action (or inaction) presented to the user. This type of CDS is more common in EHRs as it is simpler to validate and implement.

**AI-Based Systems**

AI-based systems, currently less common, can “learn” from patient data and provide guidance based on patterns of data that have been discovered in large data sets of other patients. Hypothetically AI systems can be more flexible and personalized than a “rule-based” system and continue to improve over time.

While CDS is extremely helpful in improving efficiency and helping avoid errors, it isn’t perfect. Whether rule-based or AI-based, these systems may end up providing incorrect suggestions which need to be analyzed by a clinician before acting on them.

**Advantages**

- Improves patient safety, for example by helping to reduce medication errors such as drug-drug interactions.
- Provides guidance which improves workflow and efficiency.
Tips

Consider every alert and warning you receive and decide for yourself before acting.

Ask yourself the following questions to help you decide what to do with an alert:

Q1: What is the alert level and what is the potential consequence vs. benefit of overriding the alert?

Q2: Is the alert appearing because of human error? (ex. Data not entered or entered incorrectly)

Q3: Does this alert not apply to my patient because their “normal” is abnormal?