A CDS system is not simply an alert and notification system; CDS systems have evolved and now provide a variety of assistance tools such as diagnostic support, clinical guidelines, condition-specific order strategies, documentation templates, and automated patient and physician reminder alerts.

CDS systems are not intended to replace clinicians’ judgments. However, a CDS system should be used as a semi-automated system to assist and provide tools to all care team staff in making timely, informed, and robust decisions.

Types of CDS systems

There are two types of CDS systems. Each should be evaluated on individual merit and the needs of your medical operations.

- **Data mining systems.** These may be configured to facilitate an examination of an individual patient’s medical history, in combination with validated clinical research. This type of system might help physicians foresee potential incidents, which can range from drug interactions and adverse outcomes to illness and disease indicators.

- **Knowledge-based systems.** These systems apply reasoning standards to analyze clinical data. The input data is analyzed according to its rules, and the output of the

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**Clinical decision support (CDS) systems have been hailed for their potential to reduce adverse medical outcomes and increase healthcare quality and efficiency. So it is critical for physicians to consider implementing a CDS system at their practice.**

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program is a display of positive and/or negative outcomes.

Using a CDS system
Healthcare professionals may use a CDS system to focus on clinical needs, ensure accurate diagnoses, and provide timely and efficient screenings for preventable diseases and/or adverse drug events. CDS systems can (at least theoretically) lower costs, improve efficiency, and improve patient convenience—or they may address all areas simultaneously. For more complicated tasks, such as diagnostic decision-making, the purpose of a CDS system is to assist the clinician. The CDS system may offer suggestions, but the clinician must screen the information, review the suggestions, and decide whether to take action and then, determine what action to take.

Implementing a CDS system with your EHR
Integrating CDS systems into your electronic health record (EHR) system may be cumbersome and challenging. Facility workflow integrations may require organizational policy and procedure enhancements, including retraining all users on different data collection processes and how to work with additional data entry fields. EHR templates may need adjustments to accommodate the additional fields on which the CDS system can report. There may be some interoperability conflicts in software that could cause some data to be lost, overlooked, or altered to fit the parameters in your current software. For example, ICD-9 versus ICD-10, a simple code on one system, needs to match the other or include an automatic conversion table.

Do you already own a CDS?
Prior to purchasing a CDS system, consult your current EHR vendor; you may currently have the software built into your system. Or it may be offered at a lower price from your EHR vendor than what you could expect to pay by purchasing a standalone system.

CDS system cautions
CDS systems have been in use since the mid-1980s in hospitals, managed care organizations, medical groups, and standalone physician offices. As the CDS technology has expanded, so too has oversight by governmental agencies, quality assurance programs, insurance companies, and specialty review boards. Key questions still arise, such as whose decisions are being supported and what information is presented to the user, and how. Irrespective of the particular features of any CDS system, the delivery of information, the quality of the information, and the underlying evidence used to support it are the major determinants of the effect of CDS systems on patient safety and quality improvement.

Improperly using a CDS system may be more detrimental than not using one at all. Before widespread implementation of any CDS system, facilities must partake in a risk assessment of it to identify any problems. The CDS system must provide continuous feedback to users and signal errors when users override alerts that may affect patient outcomes. Also, it must be ascertained that no matter how many systems are used, the data must work bi-directionally—systems need to talk to each other in real time.

Challenges arise when implementing a CDS system in a way that safeguards all alerts, decision trees and outcomes but without causing user fatigue. Questions for CDS system implementation teams are which decision is being supported, what information is revealed and how is it presented to the user.

CMS and Meaningful Use
Utilization of CDSs has expanded in the wake of the passage of the Health Information Technology for Economic and Clinical Health Act, which requires that providers demonstrate “meaningful use” of health IT or face the possibility of diminished Medicare reimbursements. In addition, providers enrolled in the meaningful use incentive programs must implement a CDS rule including, at minimum, one for diagnostic-test ordering and the ability to track compliance with the rule. The rule must apply to a specific specialty or condition.

After the decision trees noted above and CDS systems are in place and appropriate user training has been accomplished, a practice may move safely toward an efficient automated system that makes possible for all physicians, nurses and other healthcare professionals more quality time with their patients.