Various terms have been offered to describe advanced clinical decision support, or advanced clinical management, systems. Basic descriptions of electronic medical records (EMRs) systems that use a strategy of requiring clinicians to enter orders into an electronic system are generally referred to as computerized physician order entry or computerized provider order entry (CPOE). In general, however, the term “order entry” is viewed negatively by most physicians, who typically relegate their entry of orders for medications or tests to a secretary or clerk.

Basic CPOE covers entry of orders, with simple checking for allergy or drug-to-drug interactions. Systems that provide basic CPOE eliminate some truly significant causes of errors and injury to patients, most notably illegible handwriting and inaccurate medication dosing.

Intermediate level CPOE adds some flexibility in displaying results, enabling user preferences to be expressed. It is not until the more advanced superset of advanced clinical order management, or ACOM, is implemented that guided ordering or even mentored ordering is available. With ACOM, efficacy and costs are optimized, formulary management is integrated, and patient safety is maximized.

Order management, from a clinician’s perspective, must be differentiated from that of the business model envisioned by most hospital administrators, who see these systems as helping their facility track orders through various processes as they are fulfilled. However, to clinicians, “managing orders” means ensuring the order for a patient is not only the correct one, but the optimal one based on the disease state, financial requirements imposed by third-party payers, for example, and so on.

The most advanced clinical management strategy is essentially one that uses artificial intelligence or a collective intelligence. By taking the collective knowledge and work of clinicians, consultants, vendor partners, and national standards of care, it is possible to bundle the knowledge and express it in forms, templates, order sets and pathways, actionable alerts, and workflow efficiency best practices as garnered from the experience of many individuals. These then can be collated into useable sets of knowledge and information segmented by user type: hospitals (academic, community or mixed); clinicians (physicians—in-hospital, ambulatory, private, and employed); other clinicians (mid-level practitioners and pharmacists); nurses, and so on.

Articulating how collection and collaboration is achieved is more important than listing the arcane tools that computer science has at its disposal. Recognition that users of the system will have varying degrees of

“The most advanced clinical management strategy is essentially one that uses artificial intelligence or a collective intelligence.”
need and desire for interruption, and the ability to accommodate those preferences, achieves the goal of fostering adoption by varying clinicians while maintaining patient safety.

Consider what the end-user actually wants to get out of a system. Esoterically, one can ruminate on lofty rationales, but in the end, it requires that the end-user actually uses an installed system to derive real benefits, whether those benefits accrue to the healthcare organization or the user. Private physicians, in particular, derive little of the direct benefits of an EMR or CPOE; it is the patient and the healthcare organization that receive the majority of gains.

Basic tenets of ACOM are that patient safety is inherently optimized; clinician basic needs are met or exceeded; and the system anticipates and provides clinician advanced needs, which differ with location of care. The emergency department and labor and delivery have different needs than the surgery suite and the intensive care unit, and speed is critical in high-volume settings, whether it’s the emergency department or ambulatory clinics.

The type of data that the individual likes, and the way that they can most easily interpret that data, drives the most efficient presentation of data for that individual. Sometimes, an individual’s needs are different from those of the general specialty as a result of that individual’s difference in processing information.

Relevant, customizable and prescient displays of lab results, documents, and orders in the manner that is most easily interpreted by that user speed clinician understanding of current conditions. Actionable alerts and an ability to integrate a variety of sources of knowledge, both internal and external, and display the data at the point of clinical decision-making further optimize clinical interactions and foster adoption. Automatic generation of documentation by interactions with the system, driven by orders, also can speed workflow.

An analogy may be in order to help compare the significance of the progression. In automobiles, lap-only seatbelts were the initial step in improving driver and passenger safety in a crash, roughly analogous to basic CPOE; however, they were resisted by many users for a variety of reasons (too difficult, wrinkles clothes, uncomfortable, and so on). To be effective, seatbelts required active use (except in the mid-1980s, when “passive seatbelts” were tried). Passive-use safety items, specifically air bags, then were introduced. Coupled with seatbelts, significant improvements in driver and passenger safety resulted.

Now, there are “smart” airbags, side-impact airbags, and again occupant safety has improved. New technologies are now also providing help with accident avoidance, with electronic controls integrated in the cars to help drivers better maintain control of their cars. These controls can, without driver intervention, prevent wheel spin (traction control), skids (antilock brakes), and spins (stability controls). The latest generation of safety devices, analogous to ACOM, offers significantly greater protection to the driver and passengers of current vehicles than did seatbelts in the 1960s.

Fostering User Adoption

What do end users want from a system? The answer, of course, depends to a large degree on the end user.

Physicians have differing needs, further split by their role in healthcare delivery, whether in an academic setting, private practice, or in training. Nurses have differing roles and interactions with a system, depending on their location within the healthcare organization, such as acute care, critical care, ambulatory care, or otherwise. The healthcare organization, as an end user, has its needs, including easily supported and deployed software that is well-accepted by its own customers, the clinical staff, and hospital employees.

All of the users want systems that are intuitive and easy to use. All want a system that is quick and responsive to input. All of the users want systems that are intuitive and easy to use. All want a system that is quick and responsive to input. All would like some help in filling out required fields on forms or ordering medications, but the help shouldn’t be too obtrusive. Just as “Microsoft Bob” met an early retirement, and “Jot,” the paperclip in Microsoft Office, is now able to be quieted, any intrusion into the clinician’s workflow should be a requested and welcomed one, rather than an obtrusive intrusion decried by all.

Clinicians want vendors, hospitals, and consultants to focus on enhancing the user experience, with the content authors cognizant of the degree of intrusion appropriate to the risks of harm to the patient or institution, thus including financial risks as well. The combination of an easy-to-use system with real intelligence behind it provides the value that users are seeking—improved patient outcomes.
without sacrificing clinicians’ productivity.

Most private physicians will not welcome massive intrusions into their daily workflow, particularly in the office setting. Taking an extra minute on each of the 60 patients being seen adds one hour of uncompensated time to their already busy days. Thus, the speed of any computerized medical records product and the ease of delivering quality care should be so good that the physicians are clamoring to be able to use those systems, rather than resisting the concept of an EMR, whether in hospital or office settings.

Most physicians—those in private practice and certainly those who are academically based—believe that they are providing high-quality patient care. Touting advanced clinical decision support in any way that makes physicians feel as though they are substandard will decrease the likelihood they’ll accept automation. Clinicians at community hospitals and academic hospitals alike will value workflows that help them without excessive intrusion or delay in accomplishing their daily tasks.

Discussing the desire for integration of content—as defined as the forms, templates, orders, pathways, alerts, actions on alerts, and so on—with workflow patterns, optimized for patient safety, location of care, financial impact and outcomes, expresses the deployable collective intelligence and certainly signifies a higher standard than simple CPOE. Participation in the group synergistically improves the whole, and an inclusive and partnering stance by clinicians and a healthcare organization that encourages such participation will result in higher clinician adoption and improved patient safety.

Conclusion

Advanced clinician order management is a superset of CPOE and deserves recognition as such. Clinicians and hospitals need to consider the impact that failure by clinicians to adopt systems that do not meet their needs will have on the overall return on investment. Vendors that have developed higher functionality and user-adaptable systems should be differentiated from vendors that meet only basic CPOE requirements.

About the Author

Michael J. McCoy, MD, an obstetrician/gynecologist by training, has a longstanding interest in workflow efficiencies and healthcare IT. In addition to operating a solo practice for more than 20 years, he served as the CMIO at a large IDN in metro-Atlanta, and was a vice president and medical director with a major HIT vendor before entering his current consulting position with ACS-HCS.