



- PAUL GERTMAN, MD -

The Role of Clinical Content

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While the Canadian Patient Safety Institute has recently initiated efforts to improve patient safety, advances in healthcare are generating an enormous amount of new knowledge. This ranges from information about diseases, to new treatments and a wide array of documented and suspected complications. Every patient encounter requires clinicians to apply the correct knowledge to make diagnostic and treatment decisions. Since 50 percent of healthcare knowledge now changes every five years, it is difficult for clinicians to keep up with every disease and every new development in diagnostic and treatment methodologies.

Since every healthcare organization is concerned with protecting its patients from medical errors, tools that can help improve the accuracy and timeliness of care delivery are ever-important. Additionally, fiscal restraints common to healthcare support the need to examine tools that can improve efficiency and operations.

When it comes to clinical information technology, validated content, workflow management, and world-class software applications are the cornerstones for building an enterprise solution that will support superior clinical performance, maximize patient safety, and assist the bottom line. These tools can deliver improved patient care, increase customer satisfaction, reduce the average length of stay, and improve staff recruitment and retention.

A clinical information solutions implementation is often one of the largest undertakings that an organization will undergo. This can be spread over many years based on several factors, including the support from within the organization as well as the experience and capabilities of the clinical system vendor chosen.

Clinical decision support is an important patient safety-enhancing aspect of clinical information technology. Today, healthcare organizations choosing to implement clinical information technology can incorporate pre-built (and maintained), codified national content catalogues. Based upon best-practice standards, these catalogues can provide a solid foundation for standardizing care across the organization. Clinical content solutions can be tailored to address the management of specific medical problems, and include such tools as order sets, order entry forms, and flowsheets. These are designed to facilitate increased data entry speed and ease of use, aided by filtering capabilities that improve efficiency, safety, and consistency of healthcare delivery.

By selecting pre-built content catalogues healthcare organizations can dramatically reduce the cost and time in achieving productive use of the system. Further, a healthcare organization can easily put to use the work of the numerous healthcare organizations that have put forth the effort to help build such valuable tools.

Incorporating this content - through the use of pre-built catalogues or building content from scratch - offers the opportunity to rethink, from the ground up, the overall workflow and processes of the organization. This includes an understanding of those processes that work well for the organization and recreating them within the clinical system. Either way, robust clinical content is crucial for assuring that a clinical system delivers value to clinicians and offers the return on investment for administrators.

Calgary Health Region (CHR) is one organization that has invested in information technology as a means to drive change. Just over a year ago, CHR - which serves more than 1 million Canadians and employs over 20,000 healthcare professionals - launched close to \$100 million in projects in less than 12 months relating to its electronic health record (EHR) initiative (see HCIM & C, 2nd-quarter 2004). Content stands to play a large part of its effort.

This article will discuss several elements that comprise clinical content within a clinical information system. These include:

- Orders
- Order sets (or groups of orders)
- Rules & alerts
- Observation terms
- Charting & documentation templates
- Online references/knowledge access
- Patient education/communication

These different content categories can be defined and maintained to support current medical knowledge and best-practice standards. Content can then be interlinked and organized by medical condition to optimize workflow across the care-delivery team.

In general, content may come from a variety of sources, including information services companies specializing in cataloguing textbooks, drug references and healthcare databases; companies that specializes in developing evidence-based treatment guidelines to standardize care; hospitals participating in initiatives to develop these standards; and elsewhere.

Orders

An order is an electronic communication for a single request made during the process of patient care. Orders are often placed by physicians, but can also be placed by other clinicians within the healthcare setting. Examples include medication orders, radiology or lab, admit, discharge, transfer, etc. Automating orders and, specifically, ensuring that physicians place orders has been determined to be a major factor in reducing adverse medical events. Orders are often grouped together based on treatment plans to form order sets.

Order Sets

Order Sets are a clinically rational group of orders (orderable items/services) related to a specific topic or problem and stage in the care process. Orders can be categorized into groups, including medications, laboratory tests, procedures (such as radiologic tests), dietary orders, nursing orders and referrals.

Order Sets support decision making through intelligently presented narrative and linking to the other clinical content (such as a patient's allergies, drug interactions, previous diagnostic test results, etc.) in a precise and granular manner to provide evidence-based decision support that is comprehensive and unobtrusive. Such decision support embedded within order sets helps resolve uncertainties such as, "Which of these medication choices should I choose for my patient, and why?"

Types of order sets include:

Flat Order Sets, consisting of all appropriate orders for a specified clinical situation, with minimal or no decision support.

Structured Order Sets, which go beyond Flat Order Sets by providing prescriptive decision support as described above. The amount and type of decision support is flexible and can be customized.

Dynamic Order Sets are tailored to a patient-specific clinical context when such information is available to the system in which the Order Sets are integrated. Dynamic Order Sets offer the best potential to enhance care delivery because they incorporate more comprehensive and context-specific treatment information. Pre-built and dynamically configured order sets offer the ability to be "one click" away from physician documentation, the alert or the reference.

Customized Order Sets afford the opportunity to customize plans for the individual and/or standardize treatment plans for like illnesses. Personal order sets can be created to help enlist physician buy-in and ensure the system meets the varying needs of users. These typically must be maintained by the healthcare organization's own information technology analysts and must be carefully documented to ensure that they are accounted for and transported properly during system upgrades.

Customized Order Sets can play an important role in certain situations. They are particularly beneficial when pre-built techniques don't match the individual needs of an organization or patient population. Additionally, Customized Order Sets can be created to allow for variations in practice that are within acceptable care standards, or can be created for a particularly complex patient treatment plan and re-used each time the patient is admitted. Use of Customized Order Sets in this manner supports early interventions and can help assure that the patient's treatment plan is adhered to from one admission to the next.

Best-practice Order Sets are standardized, diagnosis-specific order sets that reflect best-treatment practice based upon national research and benchmarking. With orders immediately available to the entire medical staff, adoption of new treatment protocols can occur faster and more cohesively across the organization. In the past, the design, review, edits, and printing of the paper counterpart could take months. Changes to order sets easily can be achieved electronically, whereas pre-printed orders typically occur infrequently because of associated time, effort and printing costs.

Evidence-based Order Sets delivered and maintained through a clinical systems vendor provide a unique opportunity for healthcare organizations to speed up the realization of the system's value. This places the onus on the IT vendor to provide up-to-date, clinically relevant information that follows the latest care standards. Vendors find this content from customers, clinical information specialists, and from the clinicians and information specialists they employ. Eclipsys, for example, works with one such information specialist company — Wolters Kluwer Health, a leading multi-national information services company based in Chicago.

Information provided by Wolters Kluwer Health is developed from highly respected textbooks, drug references and healthcare databases. The company reports that it covers 90% of inpatient and ambulatory conditions in medicine and pediatrics, spanning more than 350 acute and ambulatory medical and pediatric order sets that are validated for clinical best practice and supported by on-line references delivered in context. This method provides a process for fast installation and ongoing version-based update and delivers significant reductions in the cost of building order sets and time to productive use. In addition, it can provide a structure for supporting content authoring at both the local and national level for other areas of medical specialty.

Order Entry Forms can be designed to default to facilitate order entry for the most commonly used choices. Configuring commonly used orders in this fashion can increase the speed of the order-entry process while maintaining necessary form standards and safety.

Rules & alerts

Designed to reduce variation in practice, increase efficiency and optimize workflow, rules and alerts are part of real-time clinical decision support. They are ways to guide care and help control costs. Real-time clinical decision support (CDS) monitors the validity of clinical data entered and issues on-line alerts and warnings if data falls outside of developed clinical parameters. As physicians enter orders, CDS can monitor new data and automatically check medication orders for drug interactions and allergies, as well as for dose ranges and duplicate requests. Duplicate checking attempts to make matches on the basis of the item or the orders that are related to it. For example, when the user orders a hemogram and there is also an order for a complete blood count, an alert fires indicating that a duplicate test has been requested. All information from the hemogram will be included with the CBC result.

The system can flag potential health or procedural problems, alerting the clinician and decreasing the risk of avoidable mistakes. Medical logic modules (MLMs) contain clinically relevant rules intended to ensure patient safety. One example is when certain antibiotics are ordered, the system searches for the results of a test that shows whether or not the patient's kidneys are functioning well enough to handle the dose. If no test is available, it prompts the physician to order one. This one rule can mean the difference between a patient's swift recovery and kidney failure requiring dialysis treatment. Another decision support feature assures that medication doses are appropriate for a patient's age and weight.

With CDS, communication is simpler. Clinicians can be paged, notifying them of orders or consults. For example, if a patient's pre-albumin is low, indicating possible malnutrition, a rule can automatically alert a dietician to immediately see the patient. Alerts can be set to contact via a predefined method of the clinician's preference (e-mail, pager, cell phone) to inform the clinician when a patient's condition changes, when test results are made available within the system, or when a STAT order is placed.

CPM Guidelines - Web Page Dialog

Guidelines - Spinal Cord Injury

Spinal Cord Injury

GOALS/OUTCOME

- Signs and symptoms of listed potential physical problems will be absent or manageable.
- Person/family will verbalize an understanding of spinal cord injury and its impact on present/future lifestyle and health status.

- Define level of injury and the impact on neurological function.
- State the signs and symptoms of common potential complications and the appropriate action to be taken.
- State the name, purpose, dosage, route, scheduling, potential food/drug interactions, major side effects, importance of taking medications and impact of missing medications.

Spinal Cord Injury

INTERVENTIONS/PROCESS

- Collaborate with resources for the continuum of care (e.g., Neuro Rehab Coord., RT, OT, PT; Social Work, Dietitian, family).
- Assess, Monitor, and Detect:**
 - The impact of other pre-existing health problems.
 - The impact of common diagnostic studies/lab values (e.g., ABGs, WBC, cultures).
 - Baseline vital signs, neuro signs, and trends.
 - Baseline vital signs, neuro signs, and trends.
- Assess, Monitor, Detect, Prevent and/or Modify:

GENERAL INFORMATION: SPINAL CORD INJURY

GENERAL STATEMENT: Spinal cord trauma results from injury which causes edema, hemorrhage, cord severance, or cord compression. Most SCTs are r/t MVA's, diving accidents and falls; sometimes caused

Select Close

⊕ Add Guideline...

Patient Records Date: Tuesday, October 8, 2002 Time: 10:40 Anderson, Karen (RN)

There are many different types of alerts, including: allergy, dose rage checking, drug interaction, duplicate order, duplicate task, venipuncture consolidation, conflicting medications and more. Alerts can even be set to help ensure that patients receive medication information and other educational materials.

This is one element of clinical decision support that requires ongoing maintenance from within the organization. Consistency is key; it's important to develop a manageable number of alerts - not too few to negatively impact safety and not too many (referred to as nuisance alerts) so that physicians and other clinicians ignore them. The use of rules and alerts should be routinely tracked to ensure their continued effectiveness. System-reporting tools can help track which alerts are used consistently and which are not to ensure that this valuable tool truly aids clinicians.

Clinical documentation content

Clinical documentation is the process of charting the progress of a patient by updating observation parameters and documenting nursing, physician, and allied healthcare provider notes within the electronic patient record.

Observation parameters

An **observation parameter** is a single clinical measurement or reading of a medical aspect of a patient as part of the clinical documentation process.

Flowsheets and **structured note documents** are collections of clinical observation parameters that are repeated on a regular basis and are displayed in a specific format. Structured note documents and flowsheets are used to chart, monitor, and review patient care clinical data via observation parameter rows. Flowsheets, structured notes, free-text notes, lists, graphs, and growth charts are used as a means to report and review clinical aspects of patient progress. With the ability to look at patient care documentation in multiple layout and display views, clinicians have the ability to review a specific or overall picture of patient progress. Like order sets, these can be built or purchased in preconfigured sets from the system vendor.

Charting and documentation templates

Charting and documentation templates enhance clinician productivity by providing a standardized method for recording, storing, and retrieving patient information as part of the patient's electronic health record. These are a crucial element in the conversion to a paperless hospital and serve as an important

method to support continuity of care. Automating patient evaluation, plan of care, and discharge templates - in addition to other physician, nursing and other clinician documentation tasks - supports consistency of information capture and sharing across the organization. It ensures that information can flow easily between clinicians from the Emergency Department to Labor and Delivery, Intensive Care Units and beyond. Using these tools is an effective method for supporting truly collaborative processes among clinicians and other healthcare professionals in day-to-day practice.

Clinical practice guidelines

Clinical practice guidelines can be incorporated to support integrated clinical care management and documentation. Guidelines are defined to support care management based on scope of practice. Each guideline includes treatment protocols, observations, and evidence reference sources that define standards of care. As an example of these evidence-based guidelines, figure 1 documents the standardized treatment plan for a spinal cord injury. These guidelines and more than 180 others were developed by the Clinical Practice Model Resource Center (CPMRC), a subsidiary of Eclipsys Corporation. Guidelines provide the benefits of standardized and proven techniques and are incorporated into Eclipsys' clinical documentation technology and are offered as paper-based references for customers that do not use clinical documentation technology.

Over the past 20 years, CPMRC has worked with thousands of healthcare colleagues and patients to determine the fundamental elements that create and sustain cultures that assure quality, safety, and satisfaction. CPMRC designed a system around a professional practice framework that supports the practice and workflow of all practitioners at the point of service.

In the article "Intentionally Designed Automation Creates the Best Places to Work and Receive Care," published by Montgomery Research in July 2004, Bonnie Wesorick, RN, MSN, president and founder of CPMRC, discusses the role of clinical-based practice guidelines in creating the best places to work and receive care. "Evidence-based practice proposes to support the key quality indicators of competency, safety, consistency of care, and individualization of care. Because omissions in care are less likely to occur with evidence-based decision making, there is a direct correlation to improved patient safety. With clinical practice guidelines providing key assessment skills and information to help the nurse recognize common complications of this disease, the nurse can deliver the best care possible. This optimizes the nurse's ability to practice independently as well as interdependently with the healthcare team. It also improves the nurse's ability to use her or his intellect to treat patients. In turn, having this information available reduces stress and increases job satisfaction."

Online references/knowledge access

To help clinicians stay informed of developments in their respective fields, clinical information technology should provide extensive reference information. This includes access to standards of care, best-practice protocols, policies and procedures, patient education, drug formularies, cancer-staging manuals, antibiotics, biograms, a complete medical library including the latest journals, and a myriad of additional medical information. The ability to access and drill down through information sources should be based on caregiver role.

The types of information that can be made available include:

- Dynamic access to a catalogue of internationally recognized reference sources

- Reference resources from internationally recognized sources
- Professional clinical reference sources and basic patient education documents
- Reference content served in context at the point of care from inside the clinical information system itself.
- Information about the variable costs of most diagnostic and pharmacy items can be made available to provide clinicians the opportunity to select options that are of less cost but equal efficacy.

Having immediate access to this type information is crucial to staying up-to-date on ever-changing clinical knowledge and to controlling costs. This offers significant benefits caregivers and patients alike. In the past, it might be hours or days before a physician would have the opportunity to make the trip to the library to perform the same research. With on-line reference information available at their fingertips, clinicians are empowered to make decisions based on information they know to include the latest knowledge.

Patient education and communication

The ability to access reference materials provides caregivers with instant access to patient education information. This information can be provided to patients and their families as a part of routine care, to answer questions about their treatment and provide discharge and follow-up instructions. This is an important safeguard for ensuring patients comprehend what is required of them to aid in their own recovery.

Today's patient is typically highly involved in his or her own care, and is likely to be Internet-savvy. The ability for patients to view their own medical information and communicate with their physician from a secure connection is becoming more important.

Healthcare organizations are increasingly embracing methods to communicate with their patients electronically, by offering an Internet-based solution for patient and family clinical knowledge exchange. By combining elements of secure Internet messaging, focused disease-specific clinical education resources and personal health information management tools, clinicians and patients benefit from enhanced communication. Doing so can help improve clinical outcomes, reduce the length of stay and improve patient/family satisfaction.

The value of each of clinical content sets increases exponentially when content and data is able to be interlinked across function and workflow categories. For example, when a physician is evaluating a heart failure patient, the Reference module is "aware" of this fact, has access to the results of the patient's echo-cardiogram and can bring up the references directly relevant to the physician's needs.

Transforming care delivery

Linking content in this manner is one way to maximize the value of a clinical information system and transform care delivery. Finding the balance between what content will be incorporated from the system vendor and what content will be built and maintained in-house is an important part of an organization's health information technology strategy. Making this content available to all clinicians makes a significant difference in an organization's efforts to provide the best care possible to its patients.

