

Harnessing the Power of Clinical Decision Support to Improve Healthcare Outcomes

a report by

Jerome A Osheroff, MD, FACP, FACMI

Chief Clinical Informatics Officer, Thomson Micromedex, Adjunct Assistant Professor of Medicine, University of Pennsylvania, Chair, HIMSS Clinical Decision Support Task Force

The Drive for Improvement

As many as 98,000 people will die each year in US hospitals as the result of preventable medical errors.¹ Of those admitted to hospitals, 10% or more will be harmed,² and as many as half with certain common conditions will receive sub-optimal treatment,³ because care is not based on appropriate information. This quality crisis results in incalculable human suffering, millions of extra hospital days² and billions of dollars of unnecessary costs.^{4,5}

Experts agree that the root of the problem is not ‘faulty’ clinicians. Rather, obstacles to applying available knowledge about safe and effective clinical practices are a major cause of the quality chasm in healthcare.¹ State and federal agencies, accreditors, coalitions of insurers, payers, healthcare purchasers, professional associations, and advocacy groups are establishing a new, quality-centric environment in which healthcare providers’ financial success will increasingly be dictated by their performance against specific, standardized quality and safety measures.

Closing the quality gap and delivering the safest, highest quality care requires better mechanisms to ensure that all participants (including patients) can access and apply pertinent medical information when, where, and how it will be most useful.⁶⁻⁸ Clinical decision support (CDS) promises to provide those mechanisms by effectively delivering critical information to both clinicians and patients at precisely the right time and place. Successfully implementing CDS requires a thorough understanding of clinical information needs and workflow, and robust strategies for information delivery.

The informatics community has been diligently working for several decades to build this understanding⁹⁻¹² and develop models of successful CDS implementations.^{6,13} Several forces are increasing attention on this work and on the urgency to find better solutions and implement them more widely. These include:

- heightened public awareness and concern about the gaps in quality and safety;
- spiraling healthcare costs hurting the federal government, employers, and patients/consumers; and

- a rapidly expanding and increasingly complex body of medical knowledge.

A host of high profile, national initiatives are emerging in response to these forces, and are helping to drive the focus on CDS solutions:

- Executive order establishing the Office of the National Coordinator for Health Information Technology (ONCHIT). This office is charged with helping develop a healthcare information technology infrastructure that delivers information needed to address quality, safety and cost issues.¹⁴
- Legislation, such as the Medicare Modernization Act of 2003, which includes provisions related to electronic prescribing and decision support functionality.¹⁵
- Heightened attention to measuring and improving clinical quality by those who accredit healthcare organizations and pay for care.^{16,17}
- Strong and growing interest among payers to tie healthcare payments to high quality care through ‘pay for performance’ programs.¹⁸

Health System Challenges

These environmental drivers translate into daily challenges for healthcare systems, which are grappling with patient safety, care quality, regulatory requirements, and staffing, cost, and revenue pressures. Successfully addressing these challenges requires hospitals to embrace significant organizational change, and process redesign and investments in information systems.

Surveys from organizations such as the Healthcare Information and Management Systems Society (HIMSS) indicate that most health systems are either making these major investments or planning to do so soon. Hospital executives are seeking innovative solutions that streamline staff workflow, harmonize care processes and workflow across the enterprise, improve utilization of CDS, and differentiate their hospital from competitors based on quality and cost-effectiveness.

Similarly, clinicians, patients, and other stakeholders in care delivery experience major difficulties related to



sub-optimal clinical knowledge management. Well-executed CDS solutions are widely seen as a key enabler for individuals and organizations to successfully meet a broad array of healthcare challenges and opportunities.

From Challenges to Industry-leading Solutions

Because medical knowledge evolves rapidly, as does the technology through which it can enter clinical operations, industrial strength clinical content vendors will play a critical role in CDS solutions. These companies focus on developing, delivering, and maintaining the knowledge bases that provide CDS systems with the clinical intelligence that will result in better outcomes for both patient and provider. CDS content vendors with a deep understanding of clinical information needs, workflow, CDS technology, and implementation are in a position to provide not just 'content' but effective solutions to clinical challenges.

Thomson Micromedex is a CDS content provider focusing intensively on these tasks, and responding to the demand for widely disseminated, next-generation CDS solutions that deliver improved outcomes. Micromedex is part of The Thomson Corporation, a global integrated information solutions company serving the needs of 20 million customers throughout the world. Thomson Corporation's extensive resources and range of competencies allow Micromedex to provide solutions with a strength, depth, and longevity unmatched by competitors.

Micromedex understands the information needs and workflow of each member of the healthcare team, which includes nurses, pharmacists, physicians, and patients. Micromedex understands how to effectively deliver clinical knowledge to this team across a range of delivery settings, in ways that will drive better decisions and outcomes at each point in the continuum of care. The company plays an active role in research to help define clinical information needs,¹⁰ devise better strategies for meeting them,¹¹ develop best practices for CDS implementation⁶ and promote federal policies to support effective CDS deployment.¹⁵ Micromedex user-centered approach to product design and close collaborations with clinical information system vendors further deepens its insights into solution needs and constraints.

Micromedex has been a trusted source of clinical knowledge products for 30 years – its clinical databases are relied upon in over 3,200 healthcare organizations in the US and Canada, and are used in 93 countries throughout the world. Building on this strong foundation, Micromedex has been employing

insights gleaned from guiding industry-leading CDS initiatives to evolve into a premier provider of clinical knowledge solutions for healthcare organizations.

Supporting this evolution are major enhancements in how Micromedex creates and delivers CDS content and supports its deployment. These include:

- Refined and thoroughly documented editorial practices, leveraging the strengths of more than 100 clinician writers, editors, and medical librarians on staff; each clinical writer receives advanced training in evidence-based content development.
- Continuous review, analysis, and synthesis of medical literature, evidence and peer-reviewed research literature is supplemented with authoritative clinical practice guidelines, expert opinion, and the perspective of clinical practitioners to provide evidence-based, practical, and authoritative answers and recommendations.
- Grading of both the quality of evidence and the strength of major clinical recommendations adds additional support for implementing evidence-based medical practices.
- Rapid, accurate turn-around from publication of new, practice-changing studies and events (e.g. drug withdrawals) to incorporation in Micromedex content; process is evolving toward realtime updating and dissemination.
- A leading-edge, enterprise class technology infrastructure facilitates development of standards-based, patient-oriented content that is clinically consistent, internally integrated, and highly granular; flexible delivery components enable content to be disseminated through a wide range of technology platforms, including EMRs, CPOE, hand-held devices, and other clinical information systems.
- A multi-tiered implementation support team ensures that Micromedex solutions are deployed effectively to yield maximum results and drive expected outcomes.

Utilizing its detailed understanding of CDS best practices and its robust organizational capabilities, Micromedex provides powerful knowledge solutions for meeting healthcare organizations' needs to optimize care processes and outcomes.

Solution – Consistent, Efficient and Integrated Clinical References

A consistent and integrated repository for developing and maintaining content ensures consistency of information across content areas including drugs, diseases, laboratory tests, and patient education. All members of the care team from patients to pharmacists, nurses, physicians, and others make decisions based on the same high quality information.

Micromedex – Solutions for Healthcare Organizations

Medication Safety

- Avoid inappropriate drug selection (contraindication, interaction, not cost-effective, better option).
- Ensure appropriate medication administration (avoid wrong route, dose), monitoring, adverse events.
- Facilitate compliance with Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and Institute for Safe Medication Practices (ISMP) guidelines.

Disease and Condition Management

- Deliver comprehensive, current, evidence-based, best-practice management protocols.
- Establish ‘quality guardrails and safety net’ for care planning.
- Provide interpretation of results and management for unfamiliar laboratory tests.
- Facilitate compliance with JCAHO and Centers for Medicare and Medicaid Services (CMS) Guidelines.

Patient Empowerment, Engagement, and Education

- Empower patient understanding of their conditions, evaluation, treatment, and self-management.
- Enable patient comprehension of medication instructions and identification, and how to take them and monitor their effects.
- Engage consumer and patient community with healthcare organization as a trusted source of information.
- Facilitate compliance of JCAHO guidelines for patient education requirements.

Solution – Patient-specific Answers and Recommendations

Micromedex is building patient-specific factors such as age and concomitant diseases that influence care decisions into its clinical recommendations and patient education material. This highly focused information more directly and efficiently meets clinicians’ needs for patient-specific recommendations.

Solution – Streamlined and Standardized Care with Order Sets

Micromedex is developing standardized clinical orders sets that build on its evidence-based and patient-specific content. These order sets will make it easier for clinicians to order the proper tests, drugs, and other interventions for different clinical conditions. As a result, Micromedex order sets will facilitate the consistent use of best clinical practices, promote safer ordering, and reduce treatment costs.

Solution – Alerts as a Safety Net and Quality Guardrail

Many of the quality, safety, and cost-effectiveness problems in patient care result from clinicians not asking pertinent questions. The proactive alerts or reminders generated by a healthcare information system (HIS) application can help prevent such problems. Micromedex offers solutions that provide such alerts when an inappropriate medication is prescribed, and will soon provide alerts when key performance measures or other ‘must-do’ or ‘never-do’ clinical imperatives are violated.

Solution – Flexible Integration Technology

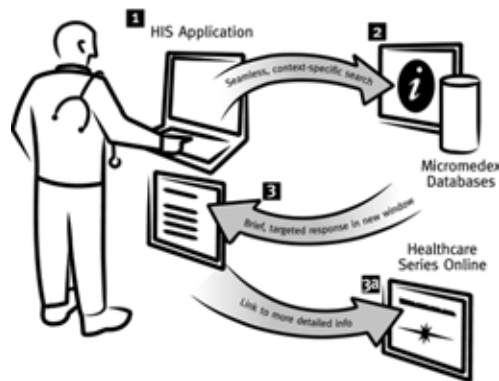
Micromedex provides a variety of approaches to ensure that answers are available when and where they are needed most – directly in each clinician’s workflow. Several powerful delivery and integration mechanisms offer flexible options for incorporating Micromedex content into a healthcare organization’s information system infrastructure. These options are suited to organizations with very sophisticated as well as basic systems.

Micromedex provides anywhere, anytime access to clinical knowledge through HIS-integrated systems, intranets, the Internet and mobile (PDA) platforms. Integrated options include flat-files and pre-loaded logic-based software that issues alerts and medication screening. These options can work with CPOE, EMR and other departmental systems.

Micromedex InfoButton Access serves as an example of an innovative integration approach that brings critical information seamlessly into clinical workflow by creating fast, context-sensitive access from key points (e.g. patient medication and problem lists) in HIS applications. *Figure 1* illustrates Micromedex InfoButton Access, a pioneering infobutton product.

The click of an InfoButton Access-powered link within an HIS application delivers context-specific information with high-quality, relevant, consistent information to support decisions that optimize care. Earlier versions of this solution have been in use at several leading facilities in the US. In a study of its effects at one institution,¹⁹ a wide range of clinicians found the

Figure 1



Micromedex information delivered via infobuttons to have influenced clinical decisions in a significant portion of uses. By making it easier to access key information needed for decision making, InfoButton Access has the potential to reduce medication errors, practice variation, and serious adverse events.

Solution – Building Partnerships for Success

Professional integration services and training expertise are key to ensuring successful implementation and adoption of clinical decision support solutions. Employing workflow analysts, technical specialists and other experts, Micromedex works hand-in-hand with healthcare providers to maximize the ROI of customer solutions and build long-lasting partnerships.

Conclusion

The traditional Micromedex emphasis on authoritative evidence-based, practical applicability, and fast access is being intensified and expanded. Going forward, the focus is not just on providing suites of products, but rather on using detailed knowledge about current health customers and their challenges to address clinical and business needs optimally.

Industry-leading initiatives underpin the Micromedex transition into the premier provider of next-generation clinical knowledge solutions. Micromedex is conducting rigorous research into clinical information needs and workflow; creating patient-specific, evidence-based content that meets these needs; and using cutting-edge mechanisms to integrate this data into clinical information systems and deliver it to end-users. Plus, expanding already-strong partnerships with leading healthcare IT organizations to support state-of-the-art clinical knowledge deployment.

The stakes in healthcare delivery are high – the life and death, sickness and health of patients; and the success or failure of healthcare organizations in providing safe, quality care. Micromedex is committed to helping healthcare providers meet these challenges head on by playing a critical role in solving healthcare's most pressing problems. ■

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