

Improving Patient Outcomes Using Evidence-based Clinical Decision Support at the Point of Care



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Chapter 1

Why more clinicians should practice EBM at the point of care

Evidence-based medicine is

“the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients.

The practice of evidence-based medicine means integrating individual clinical expertise with the best available clinical evidence from systematic research.”[1]

While practicing evidence-based medicine at the point of care is desirable, **physicians face a number of obstacles including:**

- 1 [Difficulty staying current with the latest medical literature](#)
- 2 [Lack of ability to interpret and apply new medical research](#)
- 3 [Challenges retaining knowledge over time](#)
- 4 [Difficulty acquiring new knowledge through continuing medical education](#)
- 5 [Limited time and availability to review appropriate resources](#)

1 Difficulty staying current with the latest medical literature

Physicians are unable to keep up with the volume of literature being published, estimated at **7,000 articles per specialty, per month**. And this **number doubles every 10-15 years** [2].

Surveys of physicians, as early as 1989, identified the large volume of literature to be problematic. In one survey, two-thirds of physicians in office-based practices, and 100 physician opinion leaders, stated that **the volume of medical literature was “unmanageable”** [3].

2 Lack of ability to interpret and apply medical literature

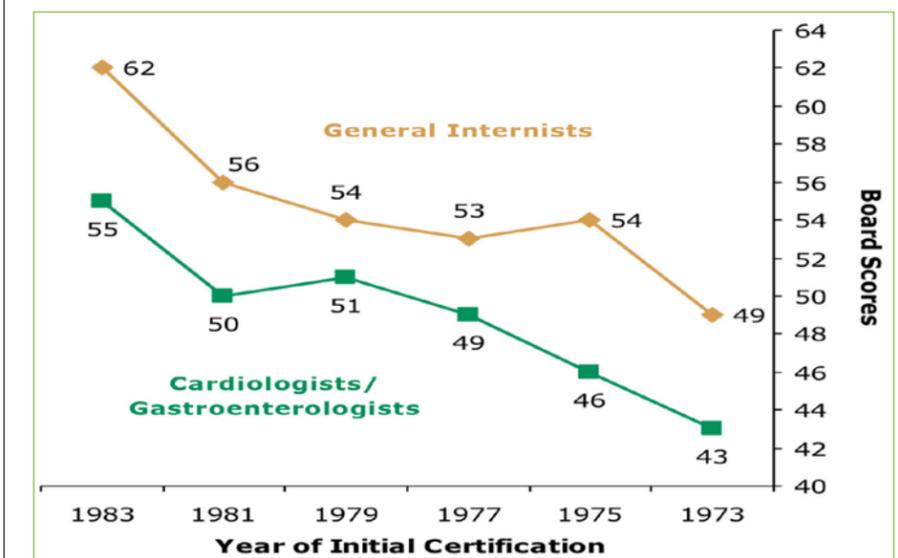
It is often difficult, and at times impossible, for clinicians to understand how a new study should be applied to their clinical practice. **Interpretation of new evidence needs to be considered in the context of the preceding body of literature and clinical observations.** Ongoing evaluation of the evidence requires time and expertise and is simply not feasible for the average physician.

Physicians require succinct, searchable text for key answers to their clinical questions at the point of care.



3 Challenges retaining knowledge over time

Physician's knowledge base decreases with time, as they are further out of training. In a study published in the Journal of the American Medical Association, researchers found that knowledge declines over time, with a significant inverse correlation between examination scores and the number of years elapsed since American Board of Internal Medicine (ABIM) certification [4].

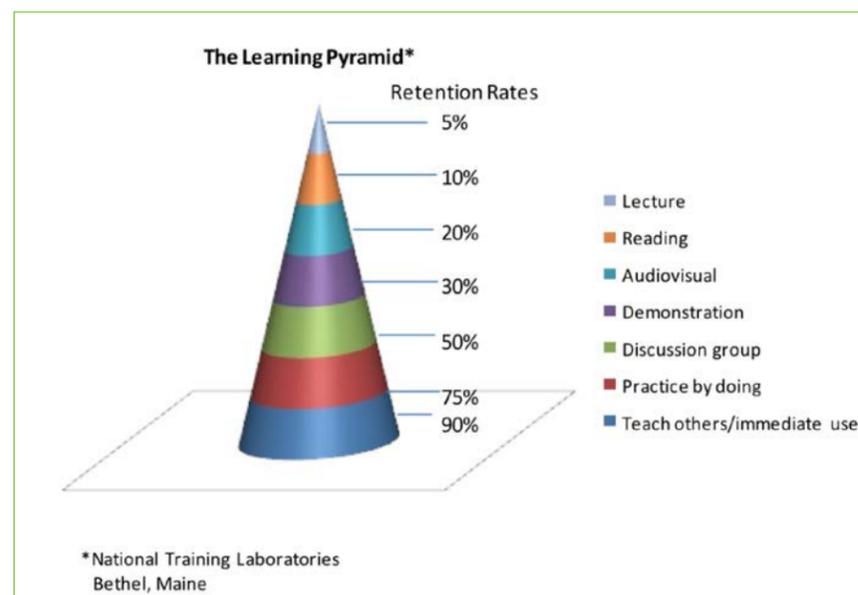


Ramsey, P.G., et al., *Changes over time in the knowledge base of practicing internists.* JAMA, 1991. 266(8): p. 1103-7.

4 Difficulty acquiring knowledge through continuing medical education

Studies show **retention rates were less than 10%** for physicians who attended CME conferences or read biomedical literature on their own. Traditional types of CME lectures **do not change physician performance or improve patient care** [5].

Resources used at the point of care provide opportunities for sustained learning and improve quality of care.



Interactive learning and learning that is sequenced or reinforced in multiple sessions improves retention and has the potential to improve quality of care [6].

Earning CME/CE/CPD Credit with UpToDate

The volume of medical knowledge is ever-increasing, but the time to keep up with changing and evolving information is not. **Studies have shown** that researching clinical information in UpToDate helps clinicians stay current with changes in their specialty and recommended treatments. Clinicians can be confident that content in UpToDate has been developed based on documented practice needs and based on evidence based literature.

That's why UpToDate is recognized and accredited as a continuing education resource by many organizations including colleges, associations, and authorities from around the world.

Use the time you already spend researching clinical questions with UpToDate toward your continuing professional development requirements at no extra cost, with no additional testing.



Using UpToDate for professional development



Fulfill CME/CE/CPD requirements of many countries and specialties



CME/CE/CPD tracking with UpToDate



CME/CE/CPD frequently asked questions

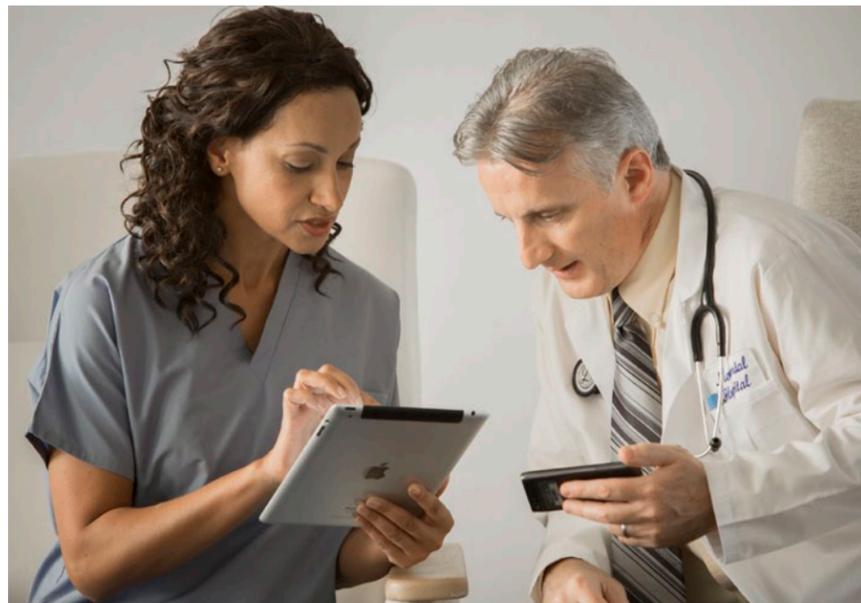
**Find out about
continual learning
with UpToDate**

5 Limited time and availability to review appropriate resources

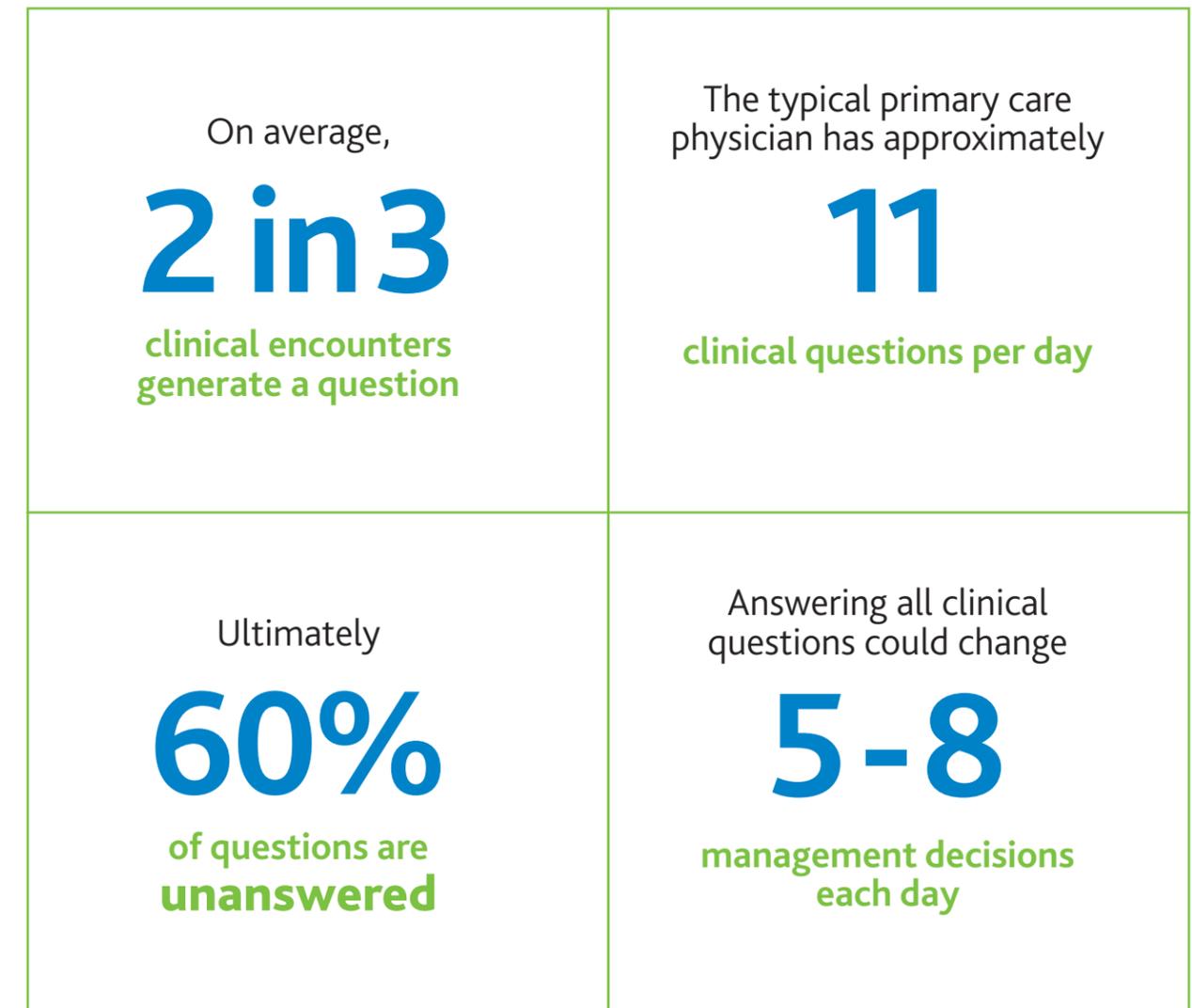
Studies have identified several barriers to information-seeking behavior by clinicians [7].

- Excessive time spent finding a clinical answer in a resource
- Navigating an overwhelming body of literature
- Failing to directly answer questions using literature search technology
- Lacking evidence to address the questions that arise in practice

As a result, doctors often leave clinical questions unanswered.



Multiple studies have evaluated clinical questions that arise in practice [8-11].



Chapter 2

Unanswered clinical questions do not mean that clinicians do not treat their patients. Clinicians continue to make decisions despite the potentially serious gaps in knowledge, possibly **jeopardizing patient safety and leading to inefficient and poor-quality care.**

To **achieve optimal medical care**, clinicians need to apply the best available evidence to clinical decision-making at the point of care.



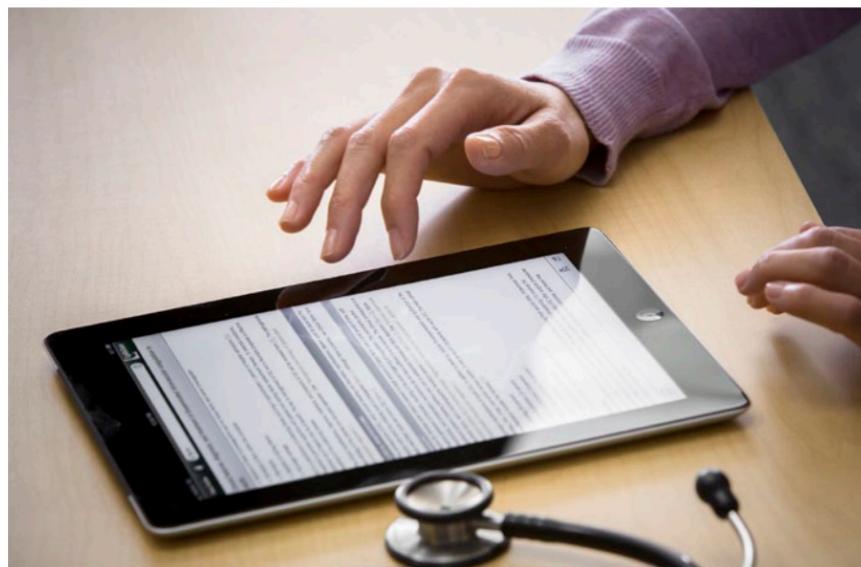
Why use pre-appraised CDS at the point of care?

Medical literature in a searchable, electronic form (e.g. Medline) is widely available to clinicians.

However, most are not able to help the clinician answer questions at the point of care.

Clinicians are often required to sort through multiple sources of information and distill them into an answer upon which they can confidently take action.

The benefits of a clinical decision support resource compare favorably to other quality of care initiatives. Compared with other forms of health information technology (such as electronic medical records systems, computerized physician order entry, and alerts and reminders embedded into such systems), **clinical decisions support resources are relatively inexpensive, easy to implement, and well-liked by clinicians**. Thus, these resources should be included in efforts to improve patient safety and quality of care.



Clinicians often have difficulty understanding how a new study should be applied when considering previous studies and clinical experience.

As an example, the ACCOMPLISH trial was a study of 11,506 patients with hypertension who were at high risk for cardiovascular events [9]. Most clinicians can easily understand the results of the ACCOMPLISH trial. However, the trial raised a number of questions that require an understanding of the preceding literature on hypertension therapy — an expertise that most clinicians do not possess — and research time that most clinicians do not have at the point of care.

[View an example of pre-appraised CDS content.](#)

UpToDate provides pre-appraised medical content that critically evaluates the medical literature, combines it with deep clinical domain expertise, and summarizes recommendations in a succinct, searchable format.

Clinicians can easily interpret and apply this information at the point of care.

Chapter 3

With a pre-appraised CDS solution, clinicians can answer more clinical questions with confidence.

Some data suggests that **pre-appraised resources are more effective** than alternatives for answering clinical questions [12].

A study of 32 second- and third-year residents were randomly assigned to one of two different protocols for finding methodologically sound studies to answer clinical questions [12].

In protocol A, residents were instructed to search Medline first followed by a pre-appraised resource.

In protocol B, the pre-appraised resource search preceded the Medline search.

Both pre-appraised resources and Medline were needed to answer questions. However, **protocol B (pre-appraised resource first) answered significantly more questions in under five minutes than protocol A.**

How does CDS at the point of care change decisions and improve outcomes?

Successful implementation of a pre-appraised CDS resource improves outcomes, clinical efficiency and quality of care.

In [Chapters 1](#) and [2](#) we discussed some of the common challenges that prevent clinicians from answering a majority of clinical questions at the point of care.

If your clinicians could answer 50% more questions than they currently do, what would that mean for your institution in terms of increased efficiencies, cost savings as a result of improved patient management decisions, and overall quality of care?

With a CDS solution, your clinicians could **fundamentally change decisions that have an impact on patient safety and quality of care, ultimately delivering improved outcomes**. As we discussed in [Chapter 1](#), only 40% of questions are ultimately answered daily, and answering all questions could change 5 to 8 management decisions each day per clinician.

Several studies demonstrate that including evidence-based recommendations in the workflow can improve clinical decision-making [13-19]. A study by researchers at Harvard University found the use of UpToDate was associated with improved outcomes and improved quality:

Saving Time and Lives

According to researchers at Harvard, hospital adoption of UpToDate is directly associated with saving:

11,500 Lives
(over a three-year period)

372,500
hospital days (per year)

[Download](#)
the Harvard
research study

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New Study by Researchers at Harvard Reveals Hospital Adoption of UpToDate Directly Associated with Saving Lives

Research supports criticality of having UpToDate at the point of care.

UpToDate hospitals demonstrated:

- **Lower mortality** - 11,500 lives saved over a three-year period
- **Shorter lengths of stay** - 372,500 hospital days saved per year
- **Improved hospital quality** - better quality performance for every condition on the Hospital Quality Alliance metrics

UpToDate leadership and customers, including Dr. John Halamka, CIO and CMIO at Beth Israel Deaconess Medical Center, discuss the results of the study. Watch the video.

Denise S. Basow, MD
President & Editorial Director
Wolters | Kluwer Health | UpToDate

"The data suggests the use of computerized tools such as UpToDate enable better decisions, better outcomes and better care."
- Ashish Jha, M.D., M.P.H., Harvard, and Study Author

Download a copy of "Use of UpToDate and Outcomes in US Hospitals"

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Would you like more

Extrapolating the findings of this study, **16,650 additional lives** could have been saved over 3 years **if all of the hospitals in the study had used UpToDate.**

The following examples illustrate the profound impact of providing physicians with answers to clinical questions at the point of care.

Clinicians changed 18% of their patient treatment decisions after reviewing evidence applicable to their patients' condition. Most of these changed decisions improved patient care.

In a study conducted at Cook County Hospital, Chicago, authors examined the impact of evidence-based knowledge (provided mainly from UpToDate) on attending physicians' treatment decisions for hospitalized patients. Before being provided information, most attending physicians believed that they had made evidence-based decisions [18]. Critical decisions were assessed before and after providing clinical decision support.

Problem	Original Decision	New Decision	Possible Impact
Nonfunctioning AV graft	Place temporary vascular access	Fibrinolytic therapy	Restore graft function Avoid new procedure
Severe labile HTN	Diltiazem	Stop diltiazem add atenolol	Improved blood pressure control
Community acquired pneumonia	IV antibiotics	Oral antibiotics	Inpatient stay avoided
Diastolic heart failure	Furosemide, isosorbide, hydralazine	Stop hydralazine, add atenolol	Improved symptom control
Inoperable hepatocellular cancer with ascites	Transarterial chemo-embolization	Palliative care only	Complications avoided Decreased cost Improved system control

As you can see, physicians significantly changed their clinical decisions when using a CDS solution. The study's authors determined that most changed decisions improved patient care and that the routine use of an evidence-based clinical decision support resource **would improve care for 2,700 of their patients annually.**

Various research studies document that clinicians, patients and institutions see many benefits upon implementing CDS at the point of care.

These benefits fall into 6 general categories:

- 1 [Quality Metrics](#)
- 2 [Efficiency/Cost Reduction](#)
- 3 [Physician Satisfaction](#)
- 4 [Medical Education](#)
- 5 [Physician Recruitment/Retention](#)
- 6 [Customer/Patient Satisfaction](#)

1 Quality Metrics

Clinical decision support can improve outcomes across the following areas:

- **Quality**
- **Length of stay**
- **Patient safety**
- **Mortality**

These improvements can translate into **millions of dollars of savings** for healthcare institutions.

See [Chapter 4](#) to learn how UpToDate has specifically met a number of these quality metrics.

Other quality indicators include:

- Compliance with accreditation and regulatory requirements
- Improved dissemination of expert knowledge from government and professional bodies to clinicians and patients
- Improved hospital quality performance
- Shorter length of stay
- Standardization of care
- Reduced prescribing errors

2 Efficiency/Cost Reduction

A clinical decision support solution helps institutions standardize care across multi-site healthcare facilities, thus improving the consistency and quality of care provided. Clinicians' accuracy is increased when using a CDS solution at the point of the care.

- Better reporting and follow-up of adverse events
- Improved dissemination of knowledge to clinicians and patients
- Improved compliance with accreditation and regulatory requirements
- Reduced number of unnecessary referrals

The clinical decisions made by your physicians have cost control and quality metric implications.

3 Physician Satisfaction

See the
10 questions
you should ask
a CDS vendor
in the [CDS
buyer's guide](#)

Your institution is obligated to provide the tools your doctors need to:

- Make the best possible decisions
- Stay current
- Support continual learning

Pre-appraised CDS = physician satisfaction

Research demonstrates that clinicians will use CDS resources if they are quick and easy to use, frequently provide the answers they need, and provide trusted information.

CDS resources change physicians decisions; these changes improve outcomes; improved outcomes increase physicians confidence in the care they are providing to their patients.

4 Medical Education

A doctor's mission is to provide his or her patients with the best possible care while handling the time constraints and pressures of daily practice; a CDS solution makes this feasible. Resources that provide recommendations at the point of care facilitate continual learning for even experienced doctors. As discussed in [Chapter 1](#), a clinician's ability to retain medical information diminishes over time, and an experienced clinician has difficulty staying current on the latest evidence and knowing how and when to put that into practice.

Moreover, inexperienced doctors-in-training benefit from CDS since it provides the latest evidence in the context of the body of evidence and the clinical experience/practice that they do not yet have. The Mayo Clinic studied the impact of the use of UpToDate for 20 minutes a day by internal medicine residents. The impact of UpToDate on medical knowledge acquisition was then measured by the residents' scores on the Internal Medicine In-Training Examination (IM-ITE). The researchers found that **use of UpToDate for 20 minutes per day resulted in knowledge acquisition equivalent to the benefit of a year of residency training** [20].

5 Physician Recruitment/Retention

Clinicians want quick and easy access to evidence-based medical information at the point of care. Organizations often use CDS as a compelling incentive to attract and retain key clinical personnel.



6 Customer/Patient Satisfaction

Institutions that use CDS at the point of care typically **provide better care to their patients**.

With a renewed focus on improving patient satisfaction and providing the most efficient care; clinicians and hospitals use CDS at the point of care to **minimize unnecessary complications and provide their patients with optimal care**.

Other benefits for patients include:

- Reduced medication errors and adverse medical events
- Improved management of specific acute and chronic conditions
- Best clinical practices consistent with medical evidence
- Reduction in unnecessary tests
- Effective patient education

Chapter 4

Not all CDS vendor solutions are created equal

There are several commercially available resources that attempt to address clinical knowledge-gaps and provide evidence-based information at the point of care. As discussed in [Chapter 2](#), not all CDS solutions are pre-appraised or demonstrate a clear link to improved outcomes.

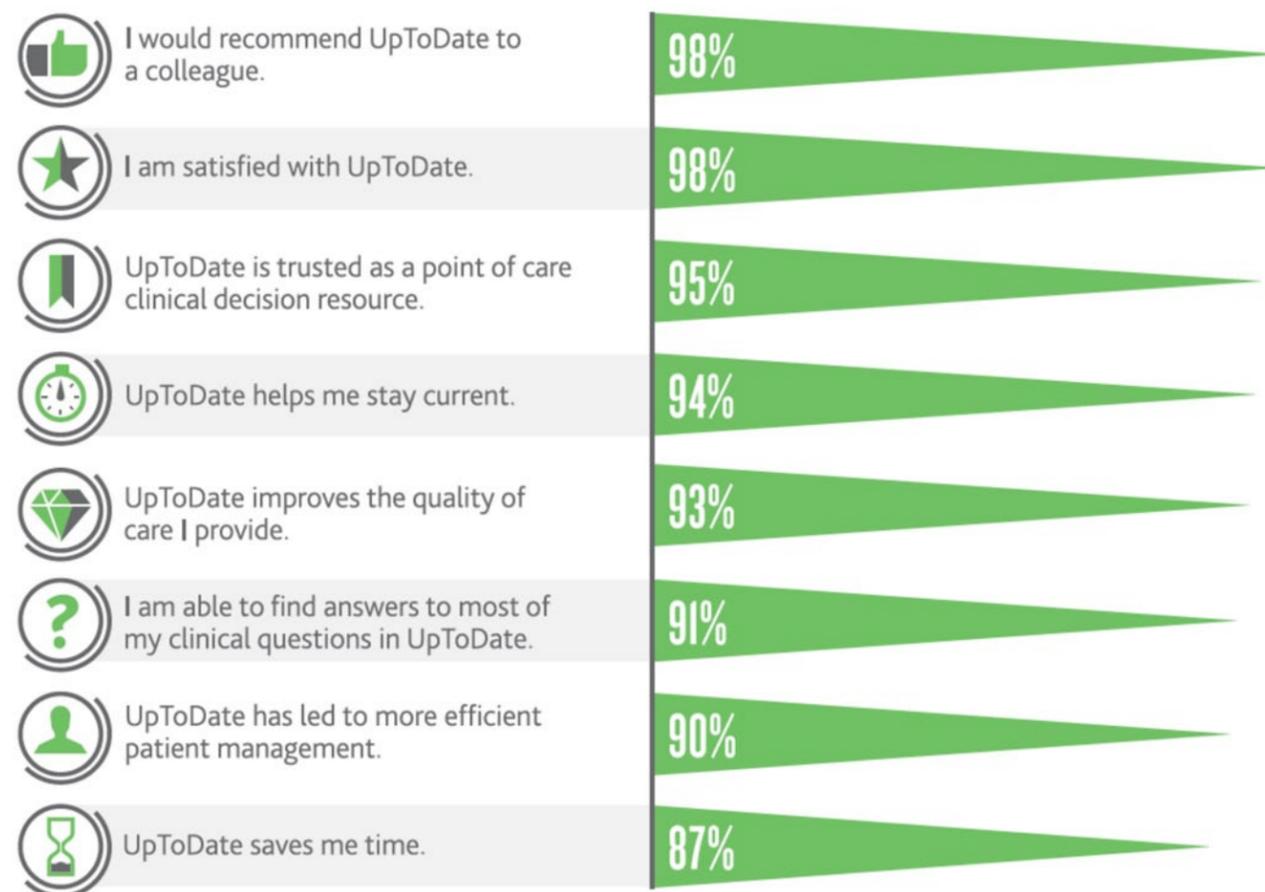
UpToDate is the *only* physician-authored, evidence-based clinical decision support resource associated with **improved outcomes** that helps healthcare practitioners **improve quality and efficiency** and make the **best decisions at the point of care**.

UpToDate is the most widely studied clinical knowledge resource, included in more than 30 studies.

The results of these 30+ studies fall into four categories:

- 1 Use of UpToDate changes clinical decisions.
- 2 UpToDate is associated with improved outcomes in quality, length of stay, patient safety and mortality — the only clinical knowledge resource associated with improved outcomes.
- 3 UpToDate plays an important role in medical education.
- 4 UpToDate is the most trusted and used clinical decision support resource.

Survey data suggests that clinicians use UpToDate to inform diagnostic and management decisions and to promote better patient care. In a recent survey, subscribers reported the following benefits [21]:



In addition to improving quality of care, (UpToDate) is proven to be an independent predictor of performance on a standardized test of medical knowledge among residents at the Mayo Clinic. **Use of UpToDate for only 20 minutes per day during routine patient care had the same effect on test performance as an entire year of residency** [6].

Researchers at Singapore's National University Hospital report that bedside use of UpToDate led to changes in patient care decisions more than one-third of the time [22].

“Physicians find that it (UpToDate) is such a valuable service. We even have physicians emailing us in administration letting us know how appreciative they are of UpToDate... It changes the way you practice medicine.”

— Pam Wetzel, MD

Chief Medical Information Officer, Swedish American Hospital, Rockford, IL

Although practicing EBM at the point of care is challenging, pre-appraised CDS resources enable healthcare providers to easily use the best available evidence to drive improved patient outcomes. Many such resources exist, but **UpToDate is the most widely used and trusted.**

You can also learn more about UpToDate at <http://www.uptodate.com>.

Request a
free trial of
UpToDate



If you're interested in improving patient outcomes, contact us for a free trial or demo of UpToDate.

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