

# TECHNOLOGY

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## SPECIAL REPORT

# GOOD DECISION

## TECHNOLOGY

Clinical decision support systems have the potential to both improve outcomes and cut costs. *HSJ* gathered experts for a webinar to debate how they can be best used in the NHS. By Alison Moore

Trusts need every weapon in their armoury if they are to meet the quality, innovation, productivity and prevention challenge over the next few years.

The decisions clinicians make lead to a big proportion of hospital costs – but are trusts doing all they can to help ensure they are keeping costs down while also giving patients the best evidence-based care?

An *HSJ* webinar, sponsored by UpToDate, looked at the role that clinical decision support software can play by informing

To watch the webinar visit  
[www.hsj.co.uk/hsj-tv](http://www.hsj.co.uk/hsj-tv)

doctors' decisions on diagnosis and treatment – and how that can lead to better treatment and better use of resources, in line with the QIPP agenda.

*HSJ* editor Alastair McLellan framed the presentation by talking about the challenges hospitals face now and in the future. The need to meet these went beyond back office savings and extended into the decisions that clinicians made. It had sometimes been hard to get doctors involved in QIPP because of a perception that it was all about cost-cutting. But decision support software, with its focus on improving care, might offer a way to engage. Both patients and organisations

could benefit from this.

Dr Rhidian Bramley, chief clinical information officer and director of radiology at The Christie Foundation Trust in Manchester, set the scene. The use of digital media had become widespread with music downloads overtaking CD sales and ebooks outselling print books on Amazon. This transformation had extended into medicine with the increasing use of electronic versions of medical journals. There was also evidence that, given the choice, clinicians preferred to use premium products. The royal colleges were taking part in this and his own institution – the Royal College of Radiologists – now recognised the importance of electronically available information.

“The key challenge for the NHS is: how do we make the most of this cultural and technical transition to realise the opportunities and benefits, and avoid the pitfalls?” he said.

QIPP offered a framework to look at this, he suggested. Starting with quality, he said: “As a clinician it seems fairly clear to me that if we have a point-of-care decision support solution you will help them make the right decision – and more importantly help them avoid making the wrong decision. You will get improved

**‘You will get improved outcomes for patients. It is a no-brainer’**

outcomes for patients.” It was a “no-brainer”, he added, that was supported by a body of evidence.

The real innovation came when these solutions were used so they contributed to clinical practice and service redesign, he said. An example of this was the widely used Map of Medicine.

### Evidence of effectiveness

But in terms of productivity, there was strong support for clinical decision support solutions. A Harvard University study, published in the *Journal of Hospital Medicine* in 2011, of the use of UpToDate showed an association with a drop in length of stay in hospitals. Although small for an individual, across all patients and hospitals it became substantial. There was evidence decision support could also help with medicines management, Dr Bramley added.

But QIPP was also about prevention and safety, he said. There was direct evidence that these digital products could enhance safety – for example, electronic prescribing led to fewer mistakes and clinical decision support solutions could flag up lethal doses and combinations of medicines.

“As well as using the premium services, it has been shown that clinicians do use Wikipedia and Google... the reason they do that is those services are very convenient. As a national health

### THE PANEL

**John Addison** library manager, Pennine Acute Hospitals Trust  
**Denise Basow MD** president and editor-in-chief, Wolters Kluwer Health's UpToDate  
**Dr Rhidian Bramley** chief clinical information officer and director of radiology, The Christie Foundation Trust, Manchester  
**Alastair McLellan** editor of *HSJ* and event chair

**Support at your fingertips: clinicians of the future will consult computer software as well as their colleagues to aid diagnosis**

service we need to recognise that change and think about how best we assess that and mitigate that risk. One of the ways is making sure that premium products are available.”

Moving on from QIPP, Dr Bramley said it was important to look at change management to make the most of investment in such products and how clinicians used them. This could ensure products were well used.

For example, some of the clinicians in his own hospital had been unaware that the trust subscribed to UpToDate and were therefore not making the most of the benefits. Tools such as this needed to move out of the library. “They are point-of-care clinical tools and that is where they should be used,” he said. Integration of decision support other systems such as electronic health records offered the opportunity to do this, he said. For example, including a button in the electronic patient record increased use fivefold.

### Pop up support

The Christie had been working to include such support in patient records and offers clinicians “pop ups” for particular information such as the need to stop using some drugs before tests, for example.

Summing up, he said: “There is very strong evidence to show that point of care decision support tools do support the QIPP agenda and improve patient outcomes.” But how change was managed and such tools integrated was important to deliver all the benefits.

There was further evidence to support this from John Addison, library manager at the Pennine Acute Hospitals Trust. His own

trust had subscribed to UpToDate after trialling both it and other systems and finding clinicians had a clear preference for UpToDate. They were far more likely to make use of it two or three times a week or more compared with other systems, and it had far more impact on their diagnostic and management decisions.

But he was aware of the need to show the utility of such systems once they were up and running and had carried out a survey of clinicians in his trusts and others in the north west to look at the use of UpToDate and how it had impacted on decisions they had made in practice. This research had recently been published in the *Health Information and Libraries Journal*.

“We wanted insightful qualitative details of how UpToDate was being used by doctors in practice,” he said. Nearly 200 consultants responded, along with other clinicians. The results suggested that UpToDate was second only to asking colleagues for advice and was ahead of the use of professional journals.

But doctors were also asked about the scenarios in which they used UpToDate. The results were striking: in some cases, the use of UpToDate had avoided actions which could have resulted in the patient’s death. One doctor said that they had seen a patient on a number of medications with what they suspected could be serotonin syndrome but it was the detailed information about clinical presentation on UpToDate which allowed them to diagnose the condition correctly and start treatment. Not only had



UpToDate speeded up diagnosis, it had enabled the doctor to take action that avoided a potential fatality. In another case, UpToDate had enabled a doctor to avoid giving nimodipine intravenously rather than orally, which can result in death.

Other cases clinicians mentioned enabled them to get additional information which avoided referral to another specialist and to avoid unnecessary diagnostic tests – for example in Ehlers-Danlos syndrome, where a diagnosis was made with the help of UpToDate without extra tests – or to narrow down diagnosis and enable them to carry out the right tests to then confirm it.

Mr Addison suggested that avoiding unnecessary

consultations with senior doctors was important. “We felt that often junior doctors were postponing decisions or were reluctant to consult senior staff and time was being wasted,” he said. In many cases, the junior doctor would be able to find the information they wanted on UpToDate and proceed with treatment without delay.

Doctors also used UpToDate to confirm their diagnosis and to rule out other possible causes, or as an accessible reference tool for, for example, checking cancer staging.

And there were excellent examples of how it could produce significant cost savings – such as avoiding CT scans where a particular diagnosis was ruled out, which had led to



## ‘Evidence shows doctors would change between five and eight decisions a day if they had access to more information’

was used. These decisions included changing drugs, changing the method of administration of drugs, and avoiding invasive procedures. These were likely to lead to decreased length of stay and may have avoided adverse effects – which directly coincided with the QIPP agenda, she said.

“We are not talking about trivial questions. We are talking about very important patient care decisions,” Dr Basow said.

There were other studies which backed up these points. For example, a 2008 study showed that patients in hospitals which used UpToDate had significantly shorter lengths of stay, significantly lower complication rates and significantly improved patient safety outcomes compared with hospitals without it. These benefits increased with increased use of UpToDate within a hospital, she said.

The 2011 Harvard *Journal of Hospital Medicine* study had looked at 1,000 hospitals which used UpToDate and compared outcomes with hospitals that did not use it. This found for those hospitals using UpToDate there were around 372,000 fewer bed days over one year and 11,000 fewer deaths over three years.

Dr Basow ended by explaining the breadth of UpToDate with 9,500 clinical topics covered and about 88-90 per cent of clinical questions answered. The process used to vet information draws on 5,500 contributors, with multiple levels of peer review before information is included. Answers can typically be found within three minutes and around 17 million topics are viewed each month. ●

changes in how a hospital approached some patients, and more than 50 CT scans being avoided.

Doctors also used UpToDate to get information about new treatments. In 2011, nearly 30,000 individual downloads of information from UpToDate had been made at Pennine Acute Hospitals Trust, Mr Addison said.

Denise Basow MD, president and editor-in-chief of Wolters Kluwer Health’s UpToDate, highlighted the growth in the number of clinical papers available to doctors. In 1965 there were just 39 published random trials; in 2011 there were over 21,000, posing a major challenge for doctors who wanted to keep up with relevant

information. “The volume of literature is just too large for the average clinician to master,” she said. Even if they could master everything which had been published relating to their own specialism, there would still be an enormous challenge in keeping up with new information and making decisions about how it impacted on practice.

In addition, two thirds of consultations raised questions to which the clinicians did not immediately know the answer, Dr Basow said. Evidence showed doctors would change between five and eight decisions a day if they had access to more information.

There had been more than 30 studies looking at UpToDate and

these had shown that it allowed more questions to be answered, was used more often, and there was greater confidence in it than other systems and it was also used as a training resource.

She highlighted a study in Singapore which looked at using UpToDate in bedside rounds. This found that 37 per cent of the time it led to changes in investigations, diagnosis or treatment and concluded that it was feasible and useful when incorporated into daily bedside rounds.

### Clinical impact

Another study at Cook County Hospital, Chicago, found that clinicians changed their decisions for 18 per cent of patients once decision support

## CASE STUDY

# A TOOL FOR EVERYONE

A Nottingham professor says he is now 'addicted' to his decision support system – and believes it can also help professionals who are not doctors. By Alison Moore

Professor Harish Vyas has 30 years of experience in paediatric respiratory medicine and paediatric intensive care – but he still finds UpToDate invaluable.

Professor Vyas, who is based at Nottingham University Hospitals Trust, has been using UpToDate for around a decade and has a personal licence to use it. At the moment he and colleagues are looking at how it could be used throughout the trust – possibly with charitable funding.

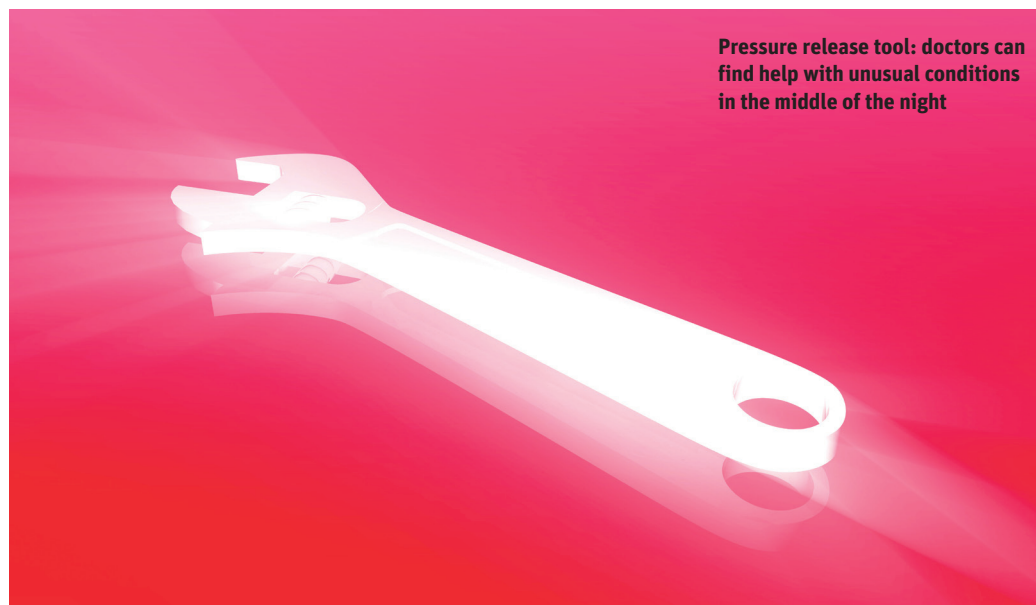
“It is a fantastic learning tool. I’m completely hooked on it,” he says. “It’s easy reading.”

Even at his level, he will sometimes come across a condition which is interesting but which he is not terribly familiar with. Carrying out a literature search with PubMed would be one way of tackling this but would probably throw up a large number of papers, some published in journals he might not be familiar with, he says.

“It can be difficult to tell what is the quality of the papers. I’m in intensive care so I know if something is in the *Critical Care* journal it’s going to be okay. But there are a lot of other journals.”

But he prefers the alternative of using UpToDate. “They have sifted and condensed it for you,” he says. “Having something that is so robust makes a huge amount of difference. I can’t help but become addicted to it.”

He sees UpToDate as particularly useful for more junior doctors working in pressurised and time-dependent environments. He sometimes prints out information for his trainees. “It’s not raw data which they have to analyse... It’s



Pressure release tool: doctors can find help with unusual conditions in the middle of the night

## ‘It can be difficult to tell what is the quality of journal papers’

actually been looked at by someone who is an authority on the subject,” he says.

He gives the example of acute disseminated encephalomyelitis, which he is familiar with but many of his senior trainees may not have seen. There are probably hundreds of research articles on the subject – but looking at them all would be very time-consuming and, in intensive care, there can be enormous pressure on clinicians’ time and a need for swift decisions.

And even a senior clinician such as Professor Vyas – an expert in paediatric respiratory medicine and paediatric intensive care who has published

many papers – feels the need to check facts. “It’s very useful for someone like me who can’t be a repository of all data,” he says. “I had a child with a very rare infection and I did not know all the complications. I went to the Center for Disease Control site but then I decided to use UpToDate.”

### Differential diagnoses

Using UpToDate also makes clinicians aware of potential differential diagnoses, he says: “That is very important. Everybody becomes blinkered and thinks it must be that condition. Common things happen commonly. And inevitably uncommon things happen in the middle of the night.”

He sees one advantage of using UpToDate as ensuring that the right tests are ordered and that time and money is not wasted on ordering ones which won’t help in diagnosis and

treatment. “A lot of investigations are done willy-nilly. This reduces the unnecessary ones and focuses on the investigations which will make a difference.”

He is hopeful the system can be used more widely throughout the hospital and says he and other clinicians have put together a robust business case for it. He envisages it being used by many health professionals in the trust – not just doctors – and points out there are also patient information leaflets available through UpToDate which could be adjusted to suit local circumstances.

UpToDate also has 135 medical calculators which are useful for complex areas such as oxygen requirements.

Professor Vyas has also contributed articles to the system. And he says that, were he ever on the *Desert Island Discs* island, his luxury would be a copy of UpToDate. ●