

# Revolutionizing Care

4 advances exemplify trends in diagnosis and treatment

By Anthony J. Montagnolo

In the early '90s, who could have imagined that today I would be walking around with a mini super computer and video camera in my pocket. In health care, we have seen similar amazing technological advances over time, and, of course, we know many more advances are sure to come.

So, to help organizations innovate and improve patient care, ECRI Institute each year publishes its annual "Top 10 Hospital C-suite Watch List" of emerging technologies we believe health care executives and trustees should have on their radar. While no one truly knows the future, and predicting the specific path of any particular technology often proves elusive, boards should keep abreast of technology developments and trends simply because health care strategic planning cannot take place without an understanding of health care technology trends.

In our list this year, we see many technological advances that are amazing in their own right, but we also see some continuing trends. For example, we continue to see excitement and investment surrounding precision medicine, as well as in the area of connecting technology, caregivers and patients. Precision medicine will revolutionize care, but so will communication technologies. With that as our backdrop, here is a peek at a few of the advances on our list that help show these trends in action.

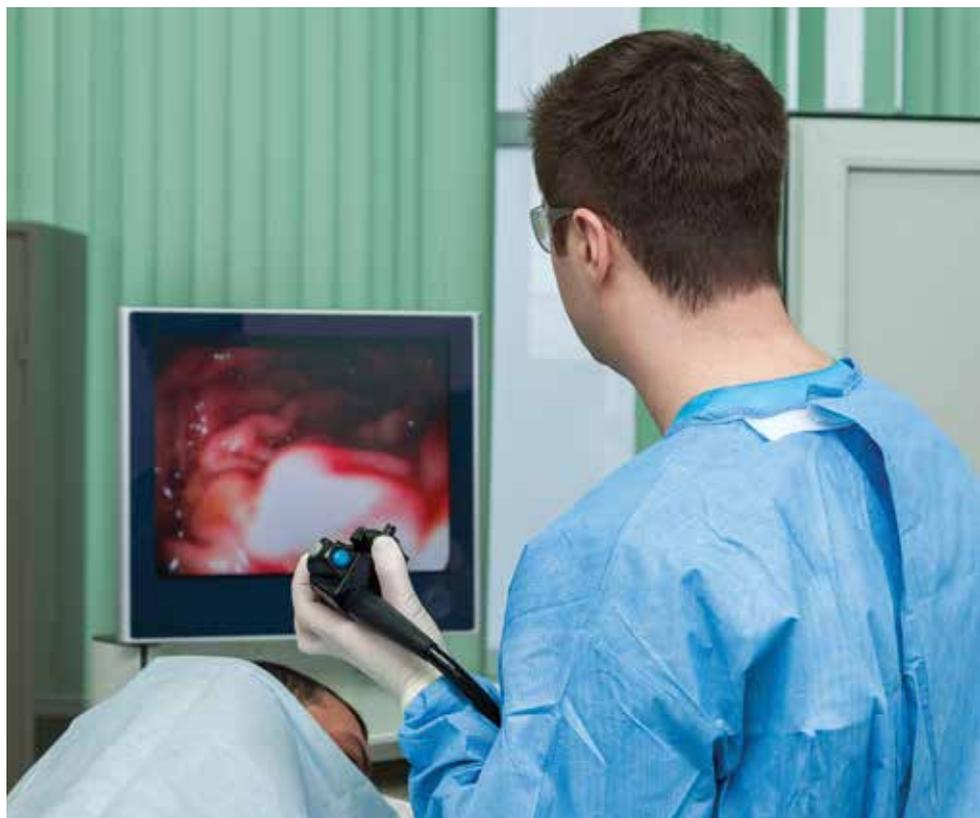


IMAGE FROM SHUTTERSTOCK

## LIQUID BIOPSIES

Liquid biopsies reflect the process of gathering patient blood, plasma, serum or urine rather than a biopsied tissue and using that liquid as a means of testing for genetic markers indicative of some clinically significant finding. In our research, we identified more than 40 companies and laboratories developing and marketing these tests. If successful, these tests' benefit would come from the relative ease of being able to get a urine or blood sample as compared with a tissue biopsy. Getting a liquid sample is faster and less risky, so it

could make diagnosis and treatment faster and more effective.

Of course, many of these tests have yet to prove themselves, but the interest and potential are there. As an action step, every health care institution should not only monitor developments in such precision medicine, but they should ensure they have a sound genetic test utilization management process in place to make sure utilization of these new methods is appropriate.

## PRESURGERY PREP

Major surgery such as abdominal surgery stresses the body greatly, and

patients with less than optimal health going into surgery tend to suffer higher complication rates and poorer outcomes. Those poorer outcomes lead directly to longer hospital stays and increased costs. In an effort to improve surgical quality and outcomes, the University of Michigan conducted a successful pilot project named the Michigan Surgical and Health Optimization Program. The program used modern communication methods, and it combined advanced, web-based risk-assessment algorithms with interactive patient coaching encouraging exercise, healthy diet and ways to improve lung function to prepare patients for major surgery.

Moreover, the project appears to have made a real difference. Published results indicate the pilot program achieved a reduction in length of stay from six days to four days for abdominal surgery and a lower cost of \$2,300 per major abdominal surgery patient. The pilot's success led to a \$6.4 million grant from the Centers for Medicare & Medicaid Services to determine whether results might be similar across the state.

A handful of other health systems in the country have also picked up on this project and instituted similar pre-surgery conditioning programs — not only for abdominal surgery but for other types of surgery as well. Board action steps in this instance should be to ensure surgery department heads are aware of these results and actively assess if this or a similar program could work in their department.

## ENDOSCOPY ADVANCES

Endoscopy has proven to be an incredibly valuable diagnostic tool despite the challenges of peering at complicated video images and cutting tissue precisely through a narrow tube. Now, several advances may help improve en-

doscopy accuracy and bring better outcomes.

For many years, ophthalmologists have used fluorescence imaging to better see retinal blood vessels. Now, endoscopists have developed techniques using indocyanine green fluorescence to help physicians better visualize malignant tissue and distinguish it from healthy tissue. This new, near-infrared technique is now being used in breast cancer sentinel lymph node mapping to improve detection over the more conventional method and may also help improve outcomes in detecting gastrointestinal cancer lymph node involvement.

In addition to fluorescence imaging, the introduction of 3-D imaging and 4K resolution has arrived. 3-D imaging purportedly improves visualizing certain angles not previously viewable, and 4K ultrahigh resolution offers potentially improved image sharpness on a larger screen. In this case, boards should check in to ensure endoscopy services and technology might benefit from these advances.

## PEPPER THE ROBOT

As robotics and smart technology march forward, we now have Pepper, a robot claimed to be the first humanoid robot that interprets human body language to judge emotions and react in kind. Two Belgian hospitals deployed Pepper in their reception areas to help staff greet people and answer questions.

Developed by Aldebaran Robotics, a SoftBank Robotics company, Pepper recognizes faces, speaks in different languages and reads the emotions of those it encounters so it can adjust its conversation appropriately. In a hospital reception area, it could

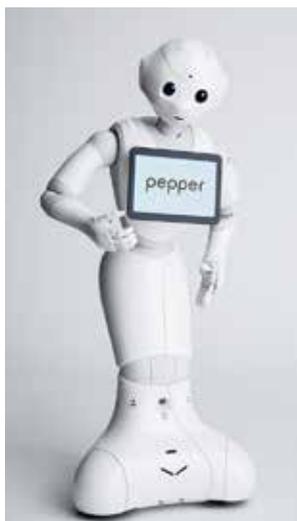


IMAGE COURTESY OF SOFTBANK ROBOTICS AMERICA

## The Complete List

To read ECRI Institute's "2017 Top 10 Hospital C-suite Watch List," visit [www.ecri.org/2017watchlist](http://www.ecri.org/2017watchlist).

help answer questions and improve communication and patient satisfaction. Somewhat surprisingly, the base cost of the robot is only \$2,000, although in the case of one of the Belgian hospitals, software

customization increased the cost to \$34,000.

As we seek to improve the patient experience, better communication should be a priority to alleviate the possible frustration of feeling disconnected from care. Trustees should consider piloting new technologies such as this to help improve patient and family experiences in the reception area.

## BOARD VIGILANCE

Health care technology developments such as those on our top 10 list always make us dream of a future where disease and disability become less prevalent and where life gets better with each passing year. Of course, not all advances pan out, and the world presents new disease and disability problems even as we tackle the existing ills we face. We should all be optimistic, however, that on balance, health care improves with time and does make life better.

Trustees who help create an institutional environment that promotes the adoption of true advances as quickly as possible while not falling prey to investments in newfangled dead-ends do us all a great service. It's not an easy task, but it's doable if we plan smartly, invest carefully, and experiment boldly with new ideas and technology.

And perhaps one day I will use my smartphone to send Pepper to my house to draw blood for a computer to check for colon cancer. That would signify a revolution in my on-going care. **T**

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