

Cardinal Health Specialty Solutions

# Oncology Insights:

## June 2019

Views on the Impact of Emerging Technologies  
from Specialty Physicians Nationwide

  
CardinalHealth™



**A message from the President**

## Joe DePinto

Welcome to the fifth edition of ***Oncology Insights***, the latest in our series of research-based reports providing insights on issues of importance to specialty care providers, biopharma companies and other healthcare stakeholders.

This edition focuses on a topic that's been impossible to miss in recent months – the growing role of technology in healthcare. From the recent announcement by CMS<sup>1</sup> of a \$1.65 million contest to develop an artificial intelligence (AI) tool that can predict patient outcomes and adverse events to a report in *Forbes*<sup>2</sup> that the public and private investment in healthcare AI is expected to reach \$6.6 billion by 2021, it is clear that the focus on using technology to advance patient outcomes and lower healthcare costs has never been greater.

Oncology care is at the center of many of these discussions. We read about new tools and technologies being hailed for their potential to improve cancer detection and treatment on a daily basis. Yet many experts wonder whether the reality will live up to the hype.

We were curious to understand how healthcare providers view the growing role of technology in oncology care and what impact they believe it will have on their practices, so we surveyed more than 180 oncologists in concurrence with three Cardinal Health Specialty Solutions Oncology Summits earlier this year. The responses were both surprising and insightful – and they suggest this may be only the beginning of the digital medicine movement.

We hope you find the report valuable and look forward to hearing your feedback.

Sincerely,

Joe DePinto  
*President, Cardinal Health Specialty Solutions*





# Technology and Its Promise for the Future of Cancer Care

# Emerging technologies including AI, machine learning, wearables, and microchipped drug capsules — once deemed science fiction — are promising to transform the future of healthcare.

The potential benefit is evident: By enabling machines to collect and analyze the mountains of data that are created by patients, healthcare providers and payers, AI-enabled technologies may be able to discover patterns or connections to prevent, diagnose, intervene and treat disease in ways not previously thought possible.

The benefits of digital technology are currently being explored in everything from diabetes to Alzheimer's disease, but the work in cancer detection and treatment is particularly exciting given the prevalence of the disease. A handful of recent developments include:

- A study by Imperial College London and the University of Melbourne<sup>3</sup> that has demonstrated the effective use of AI-software to predict the prognosis of ovarian cancer patients and also forecast what treatment would be most effective for patients following diagnosis.
- An AI program<sup>4</sup>, developed by researchers at New York University's Langone Medical Center, that can read slides of tissue samples to diagnose two of the most common types of lung cancer with 97 percent accuracy.
- The development of a wearable probe<sup>5</sup>, conceived by Boston University researchers, that can monitor, in real-time, if chemotherapy is working in breast cancer patients.

Some of these tools are still in early phases of development and more evidence is needed to know if they will deliver a long-term benefit, but the preliminary data are encouraging.

## ONCOLOGY TRENDS

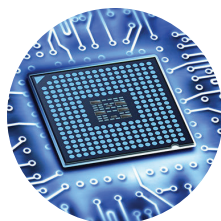
Beyond the opportunity to directly improve the quality of detection and care, digital tools have also shown potential to free up physicians to spend more time on patient care. Technologies such as natural language processing (NLP) are being used to reduce the amount of time physicians spend entering data into electronic medical records (EMRs), which studies show<sup>6</sup> now consumes more than half of doctors' time in the office.

Elegant solutions are also emerging in web-based software apps that use text reminders and prompts to encourage patients to engage in healthy behavior such as diet and exercise, as well as increase patients' compliance with medication and appointments. The newest development in this emerging field of interactive health technology is gamification, in which patients compete with themselves or others in positive health behaviors and are rewarded when they succeed.

While enthusiasm for data-driven medicine is growing, it is balanced by a healthy dose of skepticism. Early disappointments, such as the failure of IBM Watson<sup>7</sup> to accurately detect cancer in a trial with MD Anderson Cancer Center, have left some wondering whether these technological innovations can live up to their hype.

Even if successful, serious questions have been raised about how privacy of patient data will be managed. Today, studies using patient data depend on the researchers' ability to gain patient consent. However, as data-driven tools become more widely used, there will be a growing need to scale data consent at a national or global level while ensuring that private health information doesn't fall into the wrong hands. In addition, the process of establishing data governance could delay uptake of new technologies.

With all of these issues in mind, Cardinal Health Specialty Solutions sought to better understand the perspectives of healthcare providers. Our survey of more than 180 oncologists from across the country is designed to gauge their attitudes about digital technologies and assess their views on how these tools may be used by oncology practices in the future. Their openness to adopting new systems and working in new ways may be a strong indicator of how quickly digital medicine will become widely embraced.





## Artificial intelligence: exciting potential to enhance care and efficiency



### OUR VIEWPOINT

## Bruce Feinberg, DO

*Vice President and Chief Medical Officer*

Among the shiniest new objects in healthcare innovation is artificial intelligence (AI). Broadly defined, AI is the use of machine learning and data algorithms to emulate human decision making, generally at a speed and scale that exceeds human capability. Proponents suggest AI has the potential to dramatically improve the quality and efficiency of healthcare while also lowering the cost of care. But skeptics question if the promise of the technology can be translated into reality.

With many AI pilot programs already underway in oncology, we surveyed a group of more than 180 oncologists to better understand how they view this emerging trend. We found participating oncologists to have an optimistic view of AI. While 53 percent were not very familiar with AI technology, one-third (36 percent) believed it will have a significant impact on oncology care over the next few years, and 53 percent said they are “excited” to see what role AI may play in supporting care and enhancing practice efficiency. More than 50 percent said it is “likely” or “very likely” AI will have a positive influence on quality of care, operational efficiencies, clinical outcomes and cost of care in three years and beyond.

Oncologists’ rankings of the greatest opportunities for AI to improve care reflect an urgency to solve for the increasing complexity of clinical decision-making. The top answer was “helping to determine best treatment paths” followed by “identify patients most likely to develop complications” and “improve accuracy of diagnostics.” All of these responses are clinically relevant and meaningful aspirations for AI in an era of increasingly complex genomic-influenced precision healthcare.

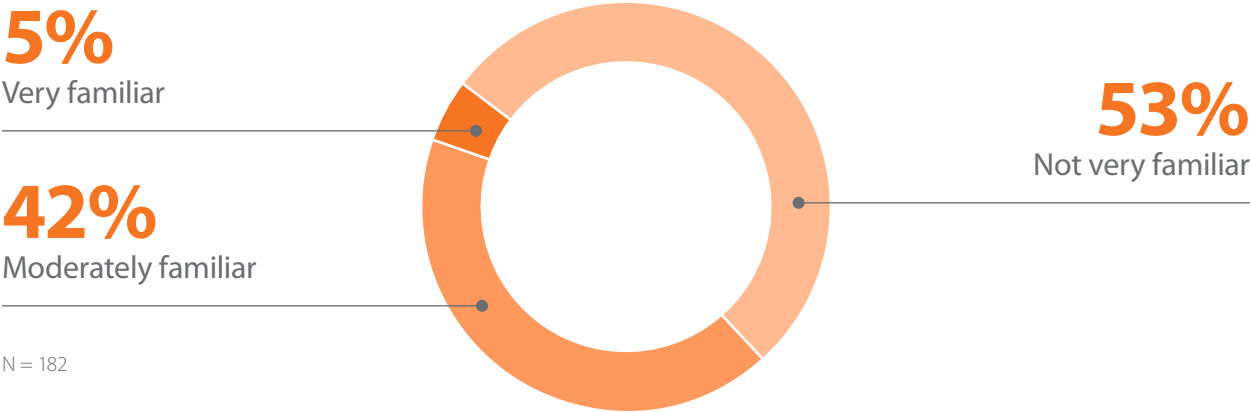
While the survey participants are optimistic, they also cite concerns including the lack of clinical data about effectiveness (29 percent), potential bias within AI algorithms (27 percent), and providers’ own lack of familiarity with the tools (27 percent). Alleviating these concerns will not only require oncologists to have greater exposure to AI, but also require the industry to better define the role that AI should play in care.

At its core, AI is merely a tool. Like all tools, it is better deployed for some tasks than for others. Defining the right tasks and right data for AI in healthcare and establishing evidence standards to demonstrate improved outcomes will be critical to extracting AI’s true value.

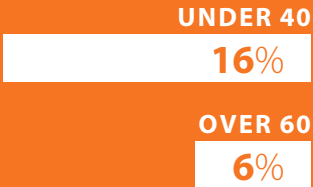
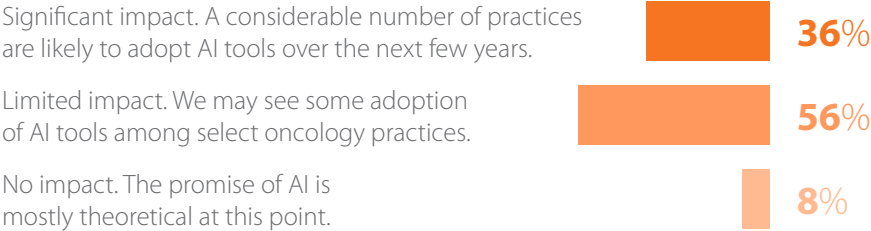


**While more than half of oncologists are not very familiar with AI, one-third think it will have a significant impact on oncology care over the next few years.**

How familiar are you with the use of artificial intelligence/machine learning in healthcare?



What impact do you expect AI to have on oncology care over the next few years?



**PARTICIPATING ONCOLOGISTS UNDER AGE 40 WERE MOST LIKELY TO PREDICT “NO IMPACT” OVER THE NEXT FEW YEARS COMPARED TO ONCOLOGISTS OVER AGE 60.**

## ARTIFICIAL INTELLIGENCE

### Looking beyond three years, more than half said AI will help improve quality of care and clinical outcomes while enhancing operational efficiencies.

Thinking beyond three years from now, how likely is it that AI tools will help oncology practices improve quality of care, improve clinical outcomes for patients, drive operational efficiencies for oncology practices, or lower total healthcare costs?\*

	Improve Quality of Care	Improve Clinical Outcomes	Drive Operational Efficiencies	Lower Healthcare Costs
Very likely	15%	20%	20%	15%
Likely	38%	<b>37%</b>	<b>38%</b>	<b>32%</b>
Somewhat likely	<b>39%</b>	34%	<b>38%</b>	30%
Unlikely	8%	9%	4%	19%
Very unlikely	0%	0%	0%	4%

\*Questions combined for the purpose of this report.

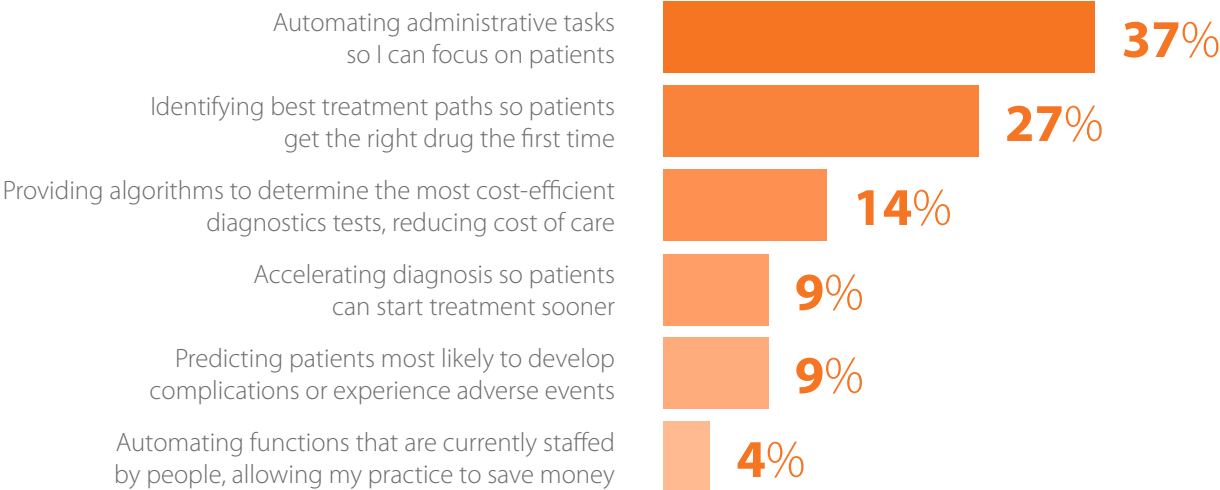
N = 182



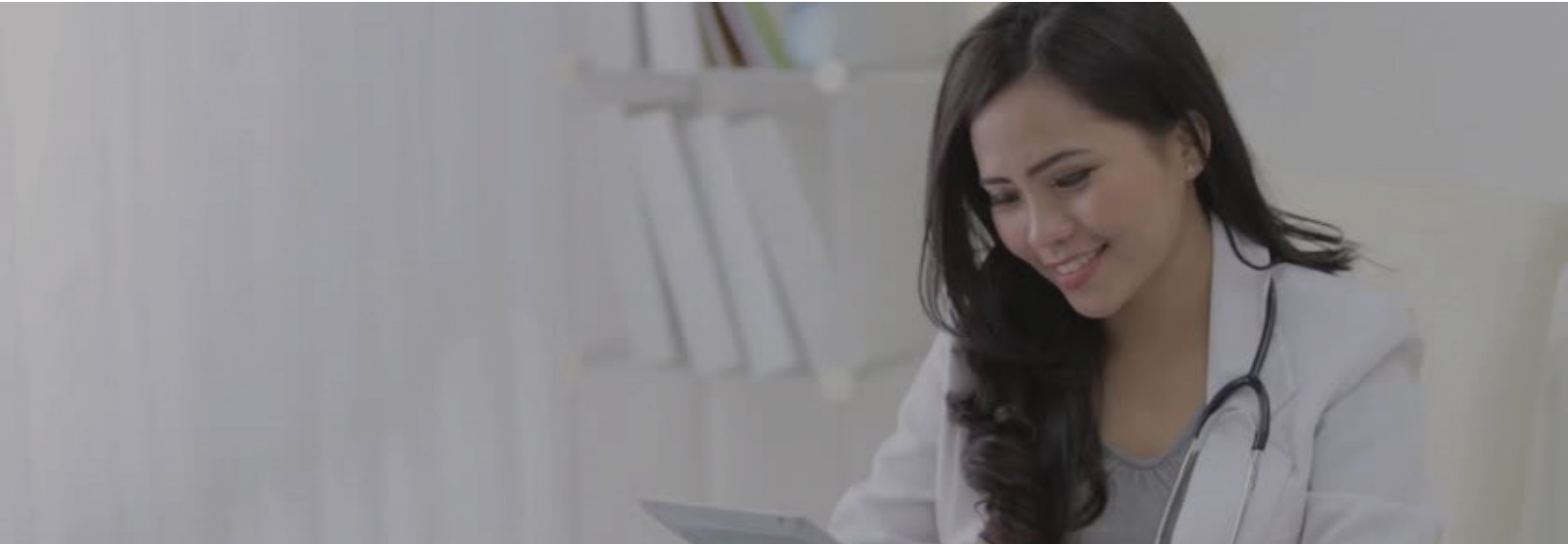
PARTICIPATING ONCOLOGISTS UNDER THE AGE OF **40** ARE MORE OPTIMISTIC THAT AI WILL LOWER HEALTHCARE COSTS THAN ONCOLOGISTS OVER THE AGE OF 50 (58% VS. 44%).

### Automating administrative tasks and identifying best treatment paths were the top-rated benefits of AI by participating oncologists.

Which of the following would be the most valuable benefit that AI could deliver to your practice?



N = 182



>AGE 60  
<AGE 40

PARTICIPATING ONCOLOGISTS 60+ SEE AI'S GREATEST BENEFIT AS IDENTIFYING THE BEST TREATMENT PATH FOR PATIENTS

WHILE THOSE UNDER THE AGE OF 40 SEE THE AUTOMATION OF ADMINISTRATIVE TASKS AS THE GREATEST BENEFIT FOR IMPROVING CARE FOR ONCOLOGY PATIENTS.

## ARTIFICIAL INTELLIGENCE

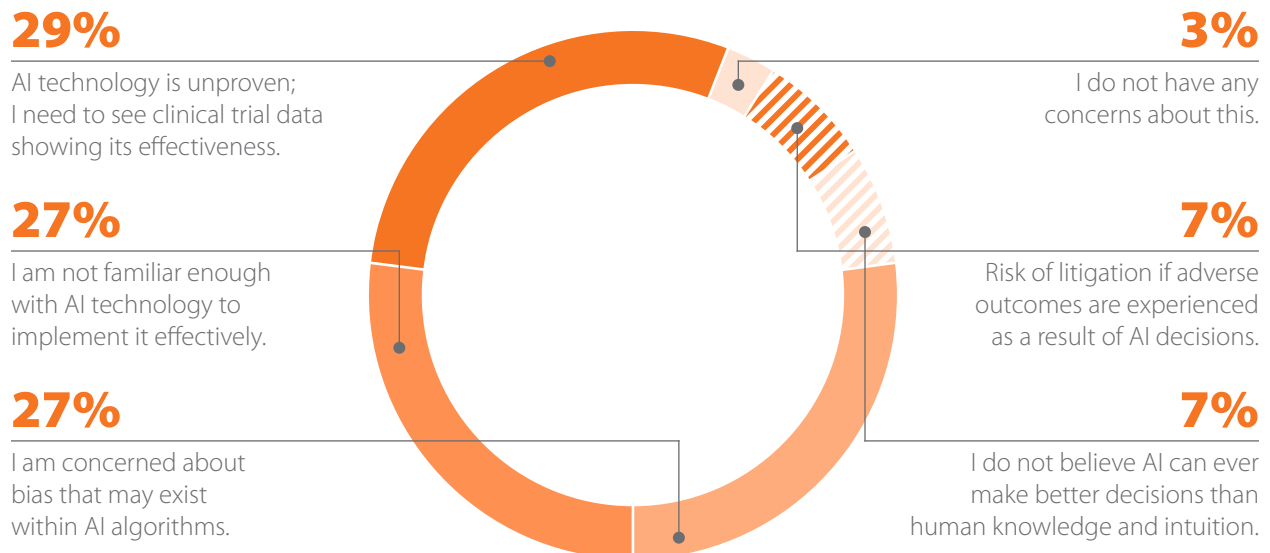
**The opportunities for AI to most improve patient care include identifying best treatment paths, predicting patients at risk of complications, and improving diagnostic tools.**

Where do you see the greatest opportunities for AI to improve care for oncology patients? (Choose up to three and rank in order with 1 being the most valuable.)

	Rank 1	Rank 2	Rank 3
Helping to determine best treatment paths	26%	20%	15%
Predicting the patients most likely to develop complications and/or experience adverse events	23%	12%	20%
Improving accuracy of diagnostics (including reading scans)	22%	16%	20%
Automating administrative tasks so physicians can focus on patients	13%	27%	26%
Helping physicians stay up to date on the latest clinical practice guidelines	16%	23%	15%
Helping to improve end-of-life planning and care	0%	2%	4%
N =	182	178	173

**Top concerns in adopting AI focused on the need for clinical trial data, the potential for bias in algorithms and lack of familiarity with the technology.**

When it comes to using AI in practice, what is your top concern?



**More than half of participating oncologists say they are “excited” about the future impact of AI on the oncology field.**

Overall, how would you characterize your perspective on the future of AI and its potential to impact the oncology industry?

53%

I am excited to see what role AI may play in supporting care and enhancing practice efficiency.

43%

I am neutral on the future of AI. I need to learn more before I can form an opinion.

4%

I am skeptical that AI will provide much information that is not already available today through EHR and decision-support tools.

N = 182



## Clinical evidence is key to wider adoption of gamification



### OUR VIEWPOINT

Eli Phillips Jr., PharmD, JD

*Vice President of Insights and Engagement*

Throughout modern history, some of the most remarkable innovations have resulted from the blending of two or more technologies, such as the combination of the computer and cellular phone to create the smartphone. Today, we are now entering an age of “smart healthcare” in which consumer digital technologies are being combined with therapeutic principles to create new medical solutions. Wearable devices are being used to monitor vital signs and healthy behavior, and in some cases, to detect physiological abnormalities such as atypical heart rhythms. At the same time, video game concepts are being applied to motivate patients to engage in healthy behaviors. The blending of these technologies may have a profound impact on the way we think about disease and our approach to clinical therapeutics.

In oncology, the use of wearables and gamified tools in patient care is still in its infancy, but there is potential to use these technologies to provide social support to reduce episodes of depression or to drive desired behavioral modifications to encourage wellness during and after treatment. When asked about their views on these tools, 79 percent of surveyed oncologists said they were not very familiar with the use of gamification in healthcare today, but 61 percent can foresee the value of using gamified tools and wearables to encourage patients to live healthier lives, such as through diet and exercise. Although nearly one-third (31 percent) said that lack of clinical evidence was a top concern, 70 percent of participating oncologists would be either “likely” or “very likely” to encourage their patients to use gamification tools if clinical trials demonstrated a positive impact on patient behaviors. Additionally, 45 percent are hopeful that wearables and gamification tools may be used to improve medication use and drive better adherence to treatment regimens.

It is not surprising that some skepticism exists around the use of gamified tools, as this is generally the case with new technologies. However, the survey results suggest that most practitioners are receptive to new solutions and willing to try new technologies to advance patient care if it is backed by evidence. While clinical trials may be cost prohibitive for many game developers, alternative approaches to research, including less expensive real-world evidence studies, may provide sufficient support to justify their use. As clinical evidence mounts, the development of clinical guidelines may be necessary to help healthcare providers ensure the right tools are matched with the right patients.



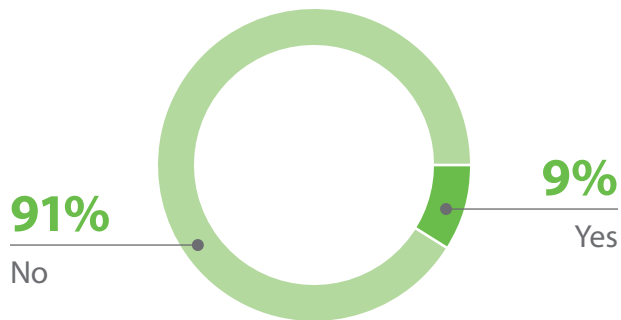
### Participating oncologists report limited familiarity with gamification in healthcare, and few have recommended the tools to patients.

How familiar are you with the use of gamification in healthcare to modify patient behaviors?



N = 182

Have you ever recommended gamification tools to patients?



N = 182



**1 in 10** }

PARTICIPATING ONCOLOGISTS SAID THEY HAVE RECOMMENDED GAMIFICATION TOOLS TO PATIENTS.

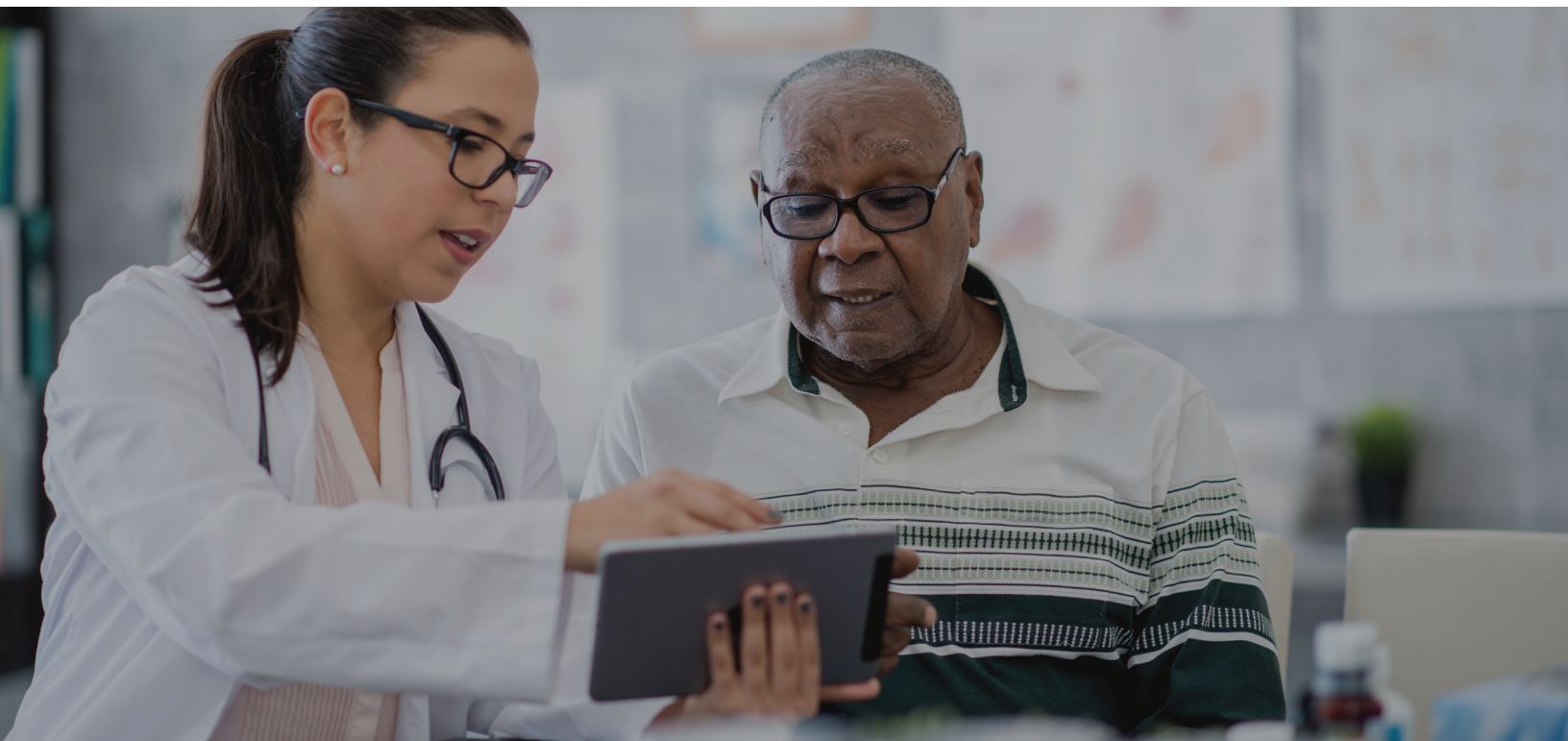
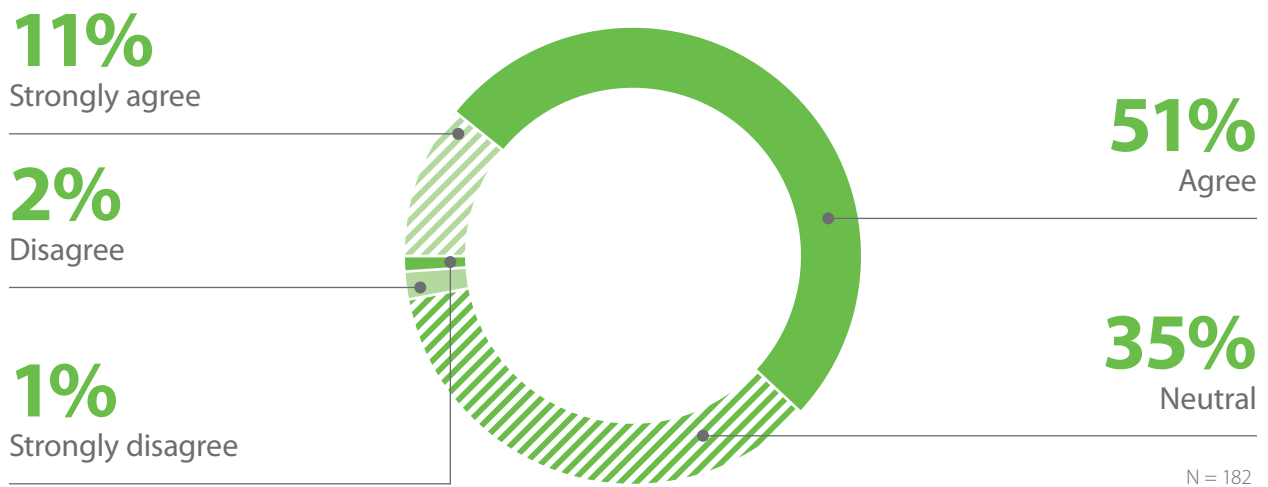


## GAMIFICATION

**More than half of participating oncologists see the value of using gamification tools and wearables to encourage cancer survivors to engage in healthy behaviors.**

To what extent do you agree with the following statement?

*As oncology practices manage larger numbers of cancer survivors, I can see value to using gamification tools and wearables to encourage patients to have healthy behaviors (diet, exercise, etc.).*





Where do you see the greatest opportunity for gamification to improve patient care?



N = 182



ONCOLOGISTS SAID THE GREATEST OPPORTUNITIES FOR GAMIFICATION TO IMPROVE PATIENT CARE ARE **DRIVING HEALTHY LIFESTYLE CHOICES AND SUPPORTING MEDICATION ADHERENCE.**





## Top concerns about gamification focused on lack of clinical research and their unfamiliarity with the tools.

What is your top concern about using gamification tools as part of patient care?



N = 182

## Oncologists' views on gamification shift significantly based on availability of clinical evidence.

If in clinical trials, gamification tools were shown to have a positive impact on patient behavior, how likely would you be to encourage your patients to use them?



N = 182

more than **95%**

OF PARTICIPATING ONCOLOGISTS SAID THEY WOULD BE LIKELY\* TO RECOMMEND GAMIFICATION TOOLS IF CLINICAL TRIALS SHOWED THEM HAVING A POSITIVE IMPACT ON PATIENT BEHAVIOR.

\*Includes "very likely," "likely" and "somewhat likely"

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## Contributors

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### Gamification

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  - 7 "IBM pitched its Watson supercomputer as a revolution in cancer care. It's nowhere close," STAT News, Sept 5 2017
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## Want to learn more?

Let's explore how we can help.

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## Methodology

The research was fielded in concurrence with three live summit events, hosted by Cardinal Health Specialty Solutions, in February, March and April 2019, using web-based surveys. More than 180 oncologists from a mix of community- and hospital-based practices participated in the research.

## About Cardinal Health Specialty Solutions

Cardinal Health Specialty Solutions is an experienced team of trusted advisors developing solutions for the opportunities and challenges facing biopharma companies and healthcare providers. We enhance product success on the path to approval, launch and commercialization with configurable, integrated offers to meet unique needs. We also deliver knowledge, scale and proven technology to enable providers to deliver high-quality and efficient patient care.