Can Algorithms Nudge Oncologists to Have Better Conversations?

Machine-learning prompts could encourage oncologists to help patients with high-risk cancers make informed decisions.

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Oncology clinicians may initiate structured “serious illness conversations” (SICs) with people with high-risk cancers in order to guide treatment decisions. By helping cancer patients understand their prognosis, SICs can reduce feelings of depression and anxiety and improve quality of life, research shows.

Yet despite their many benefits, such conversations remain one of the most sorely underutilized weapons in the medical arsenal. One 2007 study found that only 11% of clinicians raised the subject of end-of-life care. More than a decade later, cancer researchers at the University of Pennsylvania might have finally hit upon a tool to increase the frequency of SICs: machine-learning technology that provides oncologists with behavioral nudges.

Led by Christopher R. Manz, MD, the researchers developed an algorithm designed to increase SIC rates and conducted a randomized controlled trial within a large academic health system in Pennsylvania. By distinguishing between people with cancer at low risk of dying and people with cancer at high risk of dying (defined as having a 10% or greater chance of mortality within 180 days), the algorithm made implicit recommendations for SIC candidates. Their results were published in the October issue of JAMA Oncology.

For the study, the researchers recruited 78 physicians, physician assistants and nurse practitioners employed by nine different oncology practices. They randomly assigned half to participate in an “intervention integrating machine-learning mortality predictions with behavioral nudges.” These nudges took three forms: weekly emails about personal SIC performance, a list of up to six patients the algorithm had identified as high-risk, and text-message reminders about SICs prior to appointments with those patients.

More than 15%—304 out of 1,999—of the high-risk patients of the clinicians who participated in the intervention reported having a serious illness conversation with their oncologist. By comparison, only 3.6%—77 out of 2,125—of the high-risk patients of the clinicians who practiced as usual reported having an SIC with their oncologist.

There was also a slight increase in the proportion of non-high-risk patients who reported having an SIC with an oncologist participating in the intervention. “This suggests that our intervention had a ‘spillover’ effect by encouraging doctors to think about having SICs with patients not on the high-risk list,” coauthor Ravi Parikh, MD, MPP, wrote in a post on Health Policy$ense, the official blog of the University of Pennsylvania’s Leonard Davis Institute of Health Economics.

The fourfold increase in SICs the intervention facilitated, Parikh wrote, demonstrated that machine-learning technology has significant applications to cancer care.

“Our intervention, which integrates health technology with behavioral nudges, could be a generalizable process to increase advance care planning among general populations with cancer,” he wrote.

To read about another technological advance in cancer care, click here. To read about how palliative care can improve quality of life for people with terminal cancer, click here.

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