

Tailoring Treatments

DEVELOPING A HIGH-TECH TOOL TO CUSTOMIZE DIABETES CARE
BY ANDREW CURRY

research

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One of the gold standards for understanding diabetes care is the United Kingdom Prospective Diabetes Study, or UKPDS. Between 1977 and 1991, researchers at the University of Oxford followed more than 5,000 people with type 2 diabetes to see if tight blood glucose control could help reduce or avoid diabetes complications like cardiovascular disease and kidney disease.

The answer was a resounding yes. For the patients in the UKPDS trial—the biggest, longest study to date on people with type 2 diabetes—tight glucose control helped stave off eye problems, kidney failure, heart disease, and the need for amputations.

But are the UKPDS findings a universal road map to diabetes management? Elbert Huang, a physician and demographer at the University of Chicago, says that when it comes to treating patients 65 and over, America's fastest-growing group of people with type 2 diabetes, the study has a crucial flaw. "UKPDS is made up entirely of middle-aged patients," he says.

In fact, with older patients, Huang says the most recent research indicates that tight glucose control may not actually be the best choice at all: One major experimental study had to be stopped in 2008 because those in the group aggressively treated with tight blood glucose control were dying at higher rates; two other studies showed no clear benefits for tight control in seniors.

The research has prompted clinicians and scientists to take a closer look at the needs of older people with diabetes, a group that is expected to grow significantly in the decades to come. A double-whammy combination of increasing obesity rates and aging baby boomers means the number of people with diabetes in America may double by 2035. "The older you are, the higher the incidence of diabetes," Huang says. "One of the questions clinicians should be asking is whether the

diabetes care we deliver to the elderly should be different from what we do for younger patients.”

With the help of an ADA grant, Huang is working on a computerized, Web-based tool to help doctors and patients customize their diabetes treatments. The idea is to enable individuals to make informed decisions about their treatment. Think of a digital version of the long forms you fill out in a doctor’s waiting room; except instead of checking boxes on a sheet of paper to summarize your medical history, you’d plug the information into a computer program.

Huang and his team are loading data from the latest research studies into the program; the goal is for the Web tool to instantly compare your information to what’s known about the results that people with similar profiles have had with different treatment options. “Put information into the Web site, and the Web site will spit out predictions for the doctor and the patient,” Huang says. “What comes out is the likelihood of various complications under different glucose control targets.”


Such computer models aren’t new. The ADA’s Web site has a similar tool, called Diabetes PhD, that helps people estimate their risk of developing diabetes or complications; Diabetes PhD can be found at diabetes.org/phd. That tool is designed as an informal way to evaluate lifestyle choices, with no real data collected on how the information is used.

Huang’s model, on the other hand, is intended to be a practical tool to help doctors and patients confront some difficult realities. Treatments designed for 40-year-olds may be wrong for people twice that age. Difficult and complicated treatments designed to prevent long-term diabetes complications may not be the best choice for people already near the end of their lives. “Patients with a life expectancy of less than five years might not benefit from tight glucose control,” says Huang. “The question is: Is it worthwhile putting them on insulin? Is it going to benefit them?”

Ultimately, Huang hopes the computer model will give patients more information and a voice in designing treatments that are right for them. “It’s important to involve the patient in the decision,” Huang says. “If treatments create a quality-of-life burden on the patient, we’ve defeated the purpose.”

Huang is in the first phase of a three-year ADA grant, working first on constructing the model and gathering comparison data. The next phase is to ask 75 University of Chicago Hospital patients to use the program, together with their doctors, and interview them before and after to see if the information they received from the computer changed their minds about what treatment options to pursue. “If we find there is some movement, the next step is a larger randomized controlled trial,” Huang says.

The project is, in part, a nod to the fact that doctors have a very tough time making calculations about things like life expectancy in a normal office visit. Huang hopes access to the information in his model will help doctors create personalized plans that recognize the differences not just between elderly diabetes patients and middle-aged people, but also between individuals with different circumstances and preferences in terms of care. “Clearly, one of the directions diabetes care is moving in is the individualization of glucose control targets and treatments,” Huang says. As Americans age and the number of type 2 diabetes cases grows, coming up with solutions cut to fit will be ever more important. ▲



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