Methods to Assess the Effect of Dynamic Treatment Regimens Using Electronic Health Records

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What was the research about?

Patients with chronic health problems, such as diabetes, often need to change treatment plans over time to improve their health. To help with this process, doctors can monitor patients' health through follow-up clinic visits and lab tests. Doctors may also suggest changing a treatment plan in response to visits or lab test results. When a treatment plan changes in this way, it's called a dynamic treatment plan.

In this study, the research team developed and tested new statistical methods to learn how dynamic treatment plans and choices about follow-up care affect patients' health. These methods use electronic health records, or EHRs. Using EHRs is helpful because they have data on

- What treatments patients have received over time
- How treatments have affected patients' health
- Follow-up information such as lab test results

But the data may differ for patients based on when and why they go to the doctor. These differences make it hard for researchers to accurately know the effect of dynamic treatment plans across many patients.

What were the results?

The research team developed the mathematical basis for creating new methods to address these problems in using EHR data. Then they developed and tested the methods. The team showed these methods could accurately measure the effect of dynamic treatment

plans on patients' health. They also created computer programs to help other researchers use the methods.

What did the research team do?

The research team used data created by computer programs to see how the methods worked. The team used the methods to analyze real EHRs from patients with diabetes. The analysis looked at how dynamic treatment plans and choices about follow-up care affect patients' health.

The research team worked with patients with diabetes, doctors, and patient advocates to develop and test the methods with health topics that are important to patients and doctors.

What were the limits of the study?

The methods may not work if the EHRs don't have data on certain patient traits, such as smoking or past illness, that affect treatment or follow-up choices and patients' health.

Future research could develop statistical approaches to check how results from these methods change if data on patients' traits are missing from EHRs.

How can people use the results?

Researchers could use the methods to give doctors and patients data about how different ways to treat and follow up with patients can affect their health.

To learn more about this project, visit www.pcori.org/Neugebauer249.