Developing an Interactive Online Guide to Support the Use of Causal Inference Methods in Comparative Effectiveness Research

What was the research about?
Comparative effectiveness research compares two or more treatments to see which one works better for which patients. One type of research study is a randomized controlled trial, or an RCT. In an RCT, the research team assigns patients to a treatment by chance.

Other types of studies use information from health records and registries. Registries store data about patients with a specific health problem. They often include information on how each patient responds to a treatment. Because researchers don't assign treatments by chance in such studies, differences in how patients respond to a treatment may be from the treatment or something else, such as a patient's age or the severity of their illness. In studies using registries and health records, researchers apply statistical approaches, called causal inference methods, to estimate how treatments work. At the same time, they look at other things that could affect results, like a patient's age.

Researchers can choose among many different causal inference methods. But they may have a hard time knowing which methods to use or how to use complex methods correctly. In this study, the research team made an interactive online guide for researchers. The guide, called CERBOT, helps researchers design studies and select these methods.

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What were the results?
The research team created an online guide called CERBOT, which has five sections. Researchers enter information about the study they would like to do on the CERBOT website. Then CERBOT creates a report with information on how to design studies using information from health records and registries. It suggests what statistical methods to use and how to use them.

What did the research team do?
To design CERBOT, the research team asked for input from researchers, statisticians, and patients. The group suggested what the guide should do, how it should work, and how to make it easy to use. The research team also looked at other research studies designed using methods like those considered by CERBOT. With this information, the team created CERBOT and then tested how well it worked.

What were the limits of the study?
Researchers can use CERBOT for some study designs, but not for others.

Future research could improve CERBOT. For example, researchers could add more features to it. The creators of CERBOT could improve the guide so that it works for additional study designs.
How can people use the results?
Researchers can use CERBOT to design comparative effectiveness studies based on information from health registries and health records. Studies designed using these methods could provide information to doctors and patients about treatments.

To learn more about this project, visit www.pcori.org/Zhang157.