Evidence Synthesis Initiative

Patients and those who care for them frequently face a choice between two or more diagnostic, treatment, or other healthcare options. Often, there is a lack of evidence about which option would work best. The comparative clinical effectiveness research (CER) studies that PCORI funds are striving to fill in these gaps. In other cases, evidence already exists but may be of varying quality or even contradictory, or may not sufficiently examine how treatment risks and benefits vary among people.

Recognizing the urgent need for timely, evidence-based information to help patients and other stakeholders make informed decisions, we are launching a new PCORI Evidence Synthesis Initiative to take advantage of previous research studies.

Evidence synthesis evaluates all relevant completed studies on a particular clinical question or topic to clarify what is known and what evidence gaps still exist. It builds on previous research, reusing already gathered data, to provide results quickly and efficiently. Evidence synthesis can yield useful information within a year or two, instead of the three to five years typically required for a new research study.

PCORI'S FIRST SYSTEMATIC REVIEWS

Based on input we have received from stakeholders, our initial efforts include systematic reviews of treatment options for:

- Atrial fibrillation
- Post-traumatic stress disorder
- Rheumatoid arthritis
- Urinary incontinence

You may read these reports at pcori.org/reviews**.**

Our goal is to produce up-to-date, actionable evidence to inform important healthcare choices. We're implementing this initial effort in coordination with the Agency for Healthcare Research and Quality.

Types of Evidence Synthesis

Systematic reviews
The most common type of evidence synthesis is the systematic review. According to the National Academy of Medicine (formerly the Institute of Medicine) and PCORI, a systematic review features a set of clearly specified, rigorous, reproducible, and transparent methods. These reviews provide answers to specific clinical questions by analyzing published and unpublished results from all relevant studies on a given topic. They identify, select, and summarize findings of available research to make clear what is known about a topic—and what is still not known.

Meta-analysis
This approach uses statistical methods to combine published or unpublished study findings to produce estimates of an intervention's effect and to illustrate how consistent and strong the effect is across the research. Meta-analyses typically summarizes the average treatment effect for the entire study population.

Individual patient-level data (IPD) meta-analysis
This approach obtains and synthesizes all of the relevant measured characteristics of each participant in multiple related studies. It is a powerful method to identify the ways in which treatments may have varying benefits and risks for people with different characteristics. It is a way to see whether treatments should be targeted for use in specific groups of individuals. It is also an important method to reconcile differences between studies examining the same treatments that have found conflicting results.

Other secondary data reuse opportunities
Besides IPD meta-analyses, a statistical approach called predictive analytics can be applied to previous trials or other research data to provide more personalized results that can optimize the use of specific treatments. This approach can be helpful in studies with a diverse group of people and a wide range in individual responses to an intervention. PCORI's recently funded study on who benefits from diabetes prevention efforts is a good example (see box).

STUDY SPOTLIGHTS

A Deep Dive into Diabetes Research

In a randomized clinical trial, the randomization ensures the comparability of treatment groups. But there remain important differences between individuals in each treatment group that can dramatically affect the likelihood of any one individual benefiting from or being harmed by a therapy. A major diabetes prevention study, including thousands of participants, had found that the drug metformin reduced the progression from prediabetes to diabetes. But when PCORI-funded researchers reanalyzed the study data, classifying participants more selectively according to how likely they were to develop diabetes, they found that the highest-risk participants received the greatest benefit and participants at lowest risk didn't benefit at all (while still facing potential side effects from the drug).

Project: Assessing and Reporting Heterogeneity of Treatment Effect in Clinical Trials
Principal investigator: David M. Kent, MD, MS, Tufts Medical Center Inc.

Meta-analysis of Lupus Treatment Options

If not treated early with strong medications, kidney disease caused by lupus can lead to kidney failure and the need for dialysis. Through a meta-analysis of 65 previously conducted studies, a PCORI-funded project has determined that immunosuppressive drugs are better than corticosteroids for treating kidney inflammation in patients with lupus. This meta-analysis finding can inform discussions between patients and physicians about medication use. The project team is now testing a decision aid that it developed incorporating the meta-analysis findings.

Project: Individualized Patient Decision Making for Treatment Choices among Minorities with Lupus
Principal investigator: Jasvinder Singh, MBBS, MPH, University of Alabama at Birmingham