Welcome to the Identifying Study Designs section of the EBM Express course. EBM Express is designed to build your understanding of evidence-based practice in short, manageable blocks of content. In this module, we will describe the types of studies found in medical literature and list other article types that are not studies.

The basic types of studies include Case reports/case studies, trials, systematic reviews, and meta-analyses. Opinions, editorials, and responses to opinions or editorials get a mention here, as well. These are articles put forth by experts in the field, and while these are not study types, you will see them in the medical literature.

There are two types of studies: Descriptive or Observational AND Evaluative or Interventional. IN observation studies, individuals are observed, and certain outcomes are measured with no attempt to affect the outcome. Examples include case reports or case studies, case series, cohort studies, and case-control studies. On the other hand, interventional studies test interventions, which might be a potential drug, an activity, a procedure, or a medical device. Clinical Trials, controlled clinical trials, and randomized controlled trials are all examples of interventional studies.

Systematic reviews and meta-analyses are not typical study types. They evaluate or critically assess studies.

Let’s look at Case reports and case studies. Both case reports and case studies have detailed descriptions of a single case. They may consist of an unusual presentation of a disease or disorder, an adverse or unexpected response to a treatment, an atypical combination of health conditions, or a proposed theory or practice based on a clinical situation. This is an image of the top of a research article that shows the title, authors, and abstract sections of a case report. It describes a patient with tubercular meningoencephalitis with transverse myelitis, which is rare.

A case series is similar to a case study or case report but involves a group of individuals with a similar diagnosis or undergoing the same procedure over a certain period. Case series are appropriate for describing new treatments, previously unknown medication adverse events, or rare diseases.

Next, let’s look at the cohort study. Cohorts are defined populations that are followed to find distinguishing subgroup characteristics. A cohort study follows people with a certain condition or who are receiving a particular treatment over time. It compares the study group with another group unaffected by the condition. This image shows the title, authors, and abstract of a research article describing a cohort study. The defined population in this study is women with endometriosis.

A Case-control study does not follow people over time; it begins with the outcome. Researchers choose people with a particular result and either interview the groups or check their records to ascertain their different experiences. Then, they compare the odds of having the experience with the outcome to the odds of having the experience without the outcome. This image shows the beginning of an article that includes the title, authors, and abstract of a case-control study. In this study, researchers tested a tool to predict the risk of falls in older people.

Now, let’s move on to Trials. Clinical trials report on the results of a clinical study in which participants are assigned to receive one or more interventions, which are evaluated on biomedical or health-related outcomes. The assignments are determined by study protocol, and the trial tests how well new medical approaches work in people. These can be screening or prevention, diagnosis, or treatment. This image shows a clinical trial research article's title, author, and abstract. This clinical trial tested a treatment for COVID-19 patients by giving either the medication or a placebo to vaccinated and unvaccinated patients.

A controlled clinical trial has one or more test treatments and one control treatment. It contains specified outcome measures for evaluating the intervention and a bias-free method for assigning patients to the treatment. The types of treatment may include drugs, devices, or procedures studied for diagnostic, therapeutic, or prophylactic effectiveness. The control measures may consist of placebos, active medicine, no treatment, dosage forms or regimens, historical comparisons, and more. This image of the beginning of a controlled clinical trial research article shows the title, authors, and abstract. In this controlled trial, the treatment was exercise compared to the control measure of no exercise in both cannabis users and nonusers before a meal tolerance test.

A randomized controlled trial is similar to a controlled trial in that it has at least one test treatment and one control treatment. It includes concurrent enrollment and follow-up of test- and control-treated groups. The main difference from a controlled trial is that the treatments to be administered are selected by a random process. This image of the beginning of a randomized controlled trial research article shows the title, authors, and abstract. In this RCT, clinics were randomly assigned to usual care or a health literacy-directed lifestyle intervention.

Lastly, we will look at evidence synthesis. Systematic reviews and meta-analyses evaluate or critically assess studies. Unlike a traditional literature review, A systematic review is an assessment and evaluation of ALL studies that address an issue. A systematic review starts with a clearly articulated question and uses explicit and rigorous methods. It includes a description of how primary data sources and articles are found and selected for inclusion. It critically appraises the found evidence by assessing their validity, reliability, and other measures of quality. Finally, a systematic review combines and analyzes the results of this evidence to synthesize it into an evidence-based review. This image shows the title, authors, and abstract of a systematic review article. In this systematic review, all of the Randomized controlled trials on Vitamin D and insulin-dependent diabetes up to a specific date were assessed for evidence that vitamin D supplementation has lasting effects on beta-cell preservation or glycemic control.

Finally, a Meta-analysis is similar to a systematic review but provides an evidence-based overview of multiple studies with combined quantitative analysis. It includes specific methodological and statistical techniques to combine quantitative data. This is an image showing the title, authors, and abstract of a meta-analysis article. This meta-analysis investigated the size of the relationship between anxiety sensitivity and PTSD symptoms among trauma exposed adults.

While this module provided an overview of trials and evidence synthesis; upcoming modules will delve deeper into clinical trials, systematic reviews, and meta-analyses.