

# Evidence-Based Practice (EBP) and PRI

## *Why we should care*

“Within the PT profession, the call for a commitment to EBP has gradually become more strident and has corresponded with similar ongoing efforts in other health care professions. Many PT professional organizations have identified EBP as a priority. Numerous authors have stated that physical therapists have a moral, professional, and ethical obligation as professionals to provide evidence based service and to move away from interventions based solely on anecdotal testimonies, expert opinion, or physiologic rationale. The ultimate goal of this increased emphasis on using evidence to guide practice is to build a body of knowledge that supports the effectiveness of that practice. As Harris noted, ‘It is high time for physical therapists to ensure that the treatments they are endorsing and providing for their clients are based on the strictest rules of experimental design and scientific evidence.’”<sup>1</sup>

**The most common definition of EBP has 3 components: “Integration of the best research evidence with clinical expertise and patient values”.**<sup>2</sup>

## Regarding patient values

- Patients appreciate less frequent therapy visits, having the cause of their issue resolved, avoiding surgery or medications, and potentially preventing future health problems.

## Regarding clinical expertise

- The clinical expertise component should be strongly tied to patient outcomes because experience does not necessary equate with efficacy.

## Regarding research evidence<sup>3-8</sup>

- This is only ONE of three components of EBP.
- Randomized controlled trials (RCTs) are regarded as high quality evidence. An RCT is a study in which patients are assigned to groups that do or do not receive an intervention.
  - *Internal validity* is the degree to which a causal relationship between the independent and dependent variables has been established. The internal validity of a study is related to the researcher's control of extraneous variables.
    - Although the RCT design attempts to control threats to validity with random selection of subjects, random assignment to groups, blinding, and use of control and intervention groups with similar baseline characteristics, RCTs for physical therapy interventions are full of confounding factors that weaken internal validity.
    - A major threat to internal validity is the underlying pattern of neuromuscular imbalance of the study subjects, an uncontrolled variable.
    - Internal validity would be strengthened if all participants were in a neutral position.
    - Furthermore, researchers might be interested to know that some interventions may be more effective if patients are first repositioned to better receive them.
  - *External validity* is the degree to which results of a study can be generalized to patients outside the experimental situation.
    - Never is there a group of subjects studied who are all exactly like the patient being treated.
- Consider how researchers who conduct RCTs strive to enroll a homogeneous population of subjects with as little variability as possible by following stringent inclusion and exclusion criteria so that the study findings will be high on the hierarchy of levels of evidence with statistically significant results. Unfortunately, this study design limits external validity so that it is often more difficult to generalize the results to the specific patients that clinicians treat. This is a methodological weakness that diminishes the quality of much of the published research for

physical therapy interventions. In contrast, **PRI is an approach that is effective for a heterogeneous population of patients.** The fact that PRI principles and techniques can be applied to a wide variety of conditions in patients of all ages is what makes the science of PRI so powerful.

- PRI therapists frequently use the **A-B-A single subject experimental design** (also called a withdrawal design or within-subject comparison) not only to inform patients but also to build upon their own clinical expertise. All three components of EBP are incorporated.
  - Although there is only one subject being studied at a time, this design is different from a case report or case series design in which the management of a patient is described without controls that minimize the possibility of the influence of variables other than the intervention on the results.
  - In an A-B-A design a treatment variable is introduced and then withdrawn. During the first “A” phase a baseline measurement of the dependent variable(s) is obtained through PRI testing. In the “B” phase an intervention is introduced, the patient is retested, and any changes in the dependent measure are noted. The strength of this type of research design lies in the second “A” phase, when the intervention is withdrawn. If the intervention leads to improvement with a return to the baseline level after it is withdrawn, one can conclude with a high degree of certainty that the intervention was the factor causing the change during the “B” phase, especially if the change is large and immediate.
  - Importantly, the best control subject for each individual patient is the patient himself or herself.
  - The internal validity of this design is strong because it is highly unlikely that confounding factors would coincidentally occur at both the onset and the cessation of the intervention.
  - Since therapy sessions typically end with an intervention phase, the process would be considered an A-B-A-B design if the dependent measure is tested again after the final intervention. If the second intervention is not the same as the first one, it would be labeled alphabetically and sequentially, i.e. A-B-A-C.
  - Ideally, adherence to a home exercise program that replicates the intent of the intervention would result in a more persistent carryover effect.
- The A-B-A design as a **clinical decision-making tool** allows for systematic, objective testing and retesting to be conducted during daily clinical PRI practice in order to rule in and rule out causes of pain and dysfunctional movement because the results can be immediately applied to direct the treatment plan.
- **Are there any other physical therapy approaches for which A-B-A experiments can be routinely conducted with every patient to guide clinical decisions?**

#### References

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