

Evidence-based physiotherapy: what, why and how?

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OVERVIEW

Evidence-based physiotherapy is physiotherapy informed by relevant, high-quality clinical research. The *practice* of evidence-based physiotherapy should involve integration of evidence (high-quality clinical research) with patient preferences and practice knowledge. This chapter provides a brief outline of the history of evidence-based health care and argues that clinical practice should be evidence-based wherever high-quality clinical research is available. A five-step process for practising evidence-based physiotherapy is described. This process provides a framework for the rest of the book.

What is 'evidence-based physiotherapy'?

The aim of this book is to provide physiotherapists with a practical guide to evidence-based physiotherapy. What is 'evidence-based physiotherapy'?

Evidence-based physiotherapy is physiotherapy informed by relevant, high-quality clinical research.

This implies that when we refer to 'evidence' we mean high-quality clinical research.

Our definition of evidence-based physiotherapy differs from earlier definitions of evidence-based physiotherapy and evidence-based health care. Previous authors considered that practice was evidence based when it involved the use of the *best available* evidence (Bury & Mead 1998, Sackett et al 2000). The best available evidence might be high-quality

clinical research, but where high-quality clinical research is not available the best available evidence could consist of poor-quality clinical research, consensus views or clinical experience. That is, according to earlier definitions, evidence-based practice could be practice based on poor-quality clinical research, consensus views or clinical experience. We recognize that there is often insufficient relevant, high-quality research to inform clinical decisions and that, when this is the case, decisions still need to be made. Sometimes best practice can be informed only by poor-quality clinical research, consensus views or clinical experience. However, in our view, such practices cannot be considered to be evidence based. The term 'evidence-based physiotherapy' should be reserved for physiotherapy that is based on high-quality clinical research.

A premise of this book is that, wherever possible, clinical decisions should be informed by high-quality clinical research. This does not mean that clinical decisions should be informed *only* by high-quality clinical research. Good decisions must take into account patients' expectations, desires and values (patient 'preferences'; Haynes et al 2002). In addition, experienced health professionals can use past experiences and procedural knowledge ('practice knowledge'; Higgs et al 2004) to inform clinical decision-making.

Wherever possible, clinical decisions should be informed by high-quality clinical research, but never just by clinical research. Good clinical decisions, whether evidence based or not, should involve consideration of patient preferences and therapists' practice knowledge.

What do we mean by 'high-quality clinical research'?

The term clinical research is usually used to mean research conducted on patients in clinical settings.¹ Clinical research is empirical in nature, which means that it uses experiment or observation rather than theory to generate knowledge.

¹Clinical research may not always be carried out on patients. It could include in-depth interviews with carers, for example. Similarly, the setting may not always be clinical – the research may be conducted in patients' homes or other community environments, or it may involve public health activities such as community-based health promotion programmes.

An enormous amount of clinical research has been conducted, but not all clinical research is of high quality. High-quality clinical research distinguishes itself from low-quality research by being designed, conducted and reported in a way that allows us to trust the results. That is, high-quality research is that which can be expected to have a low risk of bias.² In reality, much clinical research is of neither a very high nor a very low quality; most research is of high quality in some respects and of low quality in others. A degree of judgement is needed to determine whether a particular piece of research is of sufficiently high quality to inform clinical decision-making.

What do we mean by 'patient preferences'?

The traditional model of clinical decision-making has been one in which physiotherapists make decisions about therapy for their patients. In recent years there has been greater consumer involvement in decision-making and now many patients expect to be given an opportunity to contribute to, and share, decisions involving their health (Edwards & Elwyn 2001). In contemporary models of clinical decision-making, patients are encouraged to contribute information about their experiences and values – what it is that matters most to them. In this way patient 'preferences' can inform decision-making. There has been a move away from the situation in which the physiotherapist or doctor alone makes decisions for the patient, towards a situation in which the patient and the physiotherapist or doctor make shared decisions. Some patients do not like intervention and would consider intervention to be worthwhile only if it conferred very large beneficial effects, whereas other patients would like to have intervention even if the effects were very small. Therefore decisions about the acceptability of an intervention need to be negotiated with each individual patient. Each patient needs to be told of the expected effect of intervention and asked whether they feel that effect is large enough that they would choose to have the intervention. This is an important cultural change. It requires that physiotherapists exercise communication skills, empathy and flexibility needed to communicate to patients the risks and benefits of alternative actions.

²One definition of bias is a systematic deviation from the truth.

What do we mean by ‘practice knowledge’?

Practice knowledge is knowledge arising from professional practice and experience (Higgs & Titchen 2001). Consciously or subconsciously, physiotherapists add to their personal knowledge base during each patient encounter. This knowledge is used on a day-to-day basis, along with other sources of information such as high-quality clinical research, to inform practice. Practice knowledge ‘underpins the practitioner’s rapid and fluent response to a situation’ (Titchen & Ersser 2001). It is what differentiates well-educated new graduates and experienced physiotherapists.

Practice knowledge is not ‘evidence’ as we have defined it. Nonetheless, practice knowledge should always be brought to the decision-making process, and sometimes practice knowledge should dominate evidence. For example, there is some evidence that upper extremity casting can increase the quality and range of upper extremity movement for children with cerebral palsy (Law et al 1991). However, an experienced physiotherapist might suggest alternative interventions for a particular child if his or her practice knowledge suggested that casting would cause that child distress, or if the child or the child’s parents were unlikely to tolerate the intervention well.

Additional factors influencing clinical decisions

We have discussed how good clinical decision-making involves integration of high-quality clinical research, patient preferences and practice knowledge. But other factors can also influence decisions. Good practice is responsive to a range of contextual factors.

The availability of resources often influences clinical decisions. For example, the most effective intervention for a particular problem could require large amounts of staff time or an expensive piece of equipment that is not available, in which case a less effective intervention might have to be used. Another resource to be considered may be the skills of the physiotherapist. In making shared decisions about an appropriate intervention, physiotherapists need to judge whether they have the skills and competence needed to provide treatment safely and effectively. If not, it might be appropriate to refer the

patient to another physiotherapist who does have the necessary skills and expertise. Consideration might also need to be given to whether services are available in other settings (for example, in the community instead of a hospital) and, if there is a choice, which setting would provide the greater benefit for the patient.

If we look at physiotherapy from a global perspective we can see huge variations in the spectrum of conditions that are treated and in the resources provided for health care. Global comparisons of mortality and disability (Murray & Lopez 1997, World Health Organization 2004), perceptions of disability (Üstün et al 1999) and the level of physiotherapy services, clearly show how important these factors are. These regional factors have huge implications for what kinds of patient and problem physiotherapists should be concerned with, and how clinical decisions are made.

In addition, there are important cultural influences that shape how physiotherapy should be practised. Culture affects patient and physiotherapist expectations, attitudes to illness, the provision of health care, communication and patient–physiotherapist interaction, and the ways in which interventions are administered. This means that it might be quite appropriate for physiotherapy to be practised very differently in different countries. We acknowledge that some cultures, particularly those with strong social hierarchies, provide contexts that are less conducive to evidence-based practice or shared decision-making. In multicultural societies physiotherapists may need to be able to accommodate the range of cultural backgrounds of their patients.

The process of clinical decision-making

At the heart of the practice of evidence-based physiotherapy is the process of clinical decision-making. Clinical decision-making brings together information from high-quality clinical research, information from patients about their preferences, and information from physiotherapists within a particular cultural, economic and political context.

Clinical decision-making is complex. Clinical reasoning must be used to analyse, synthesize and interpret relevant information. Evidence, information from patients and practice knowledge must be integrated using professional judgement. ‘Clinical reasoning needs to be

seen as a pivotal point of knowledge management in practice, utilizing the principles of evidence-based practice and the findings of research, but also using professional judgement to interpret and make research relevant to the specific patient and the current clinical situation' (Higgs et al 2004: 193). Only when physiotherapy is practised in this way can we 'claim to be adopting credible practice that is not only evidence-based, but also client-centred and context-relevant' (Higgs et al 2004: 194).

While acknowledging the importance of clinical reasoning and the development of practice knowledge, the focus of this book is narrower – we aim to help physiotherapists inform their practice with relevant, high-quality clinical research. Readers who are specifically interested in clinical reasoning and development of practice knowledge could consult Higgs & Jones (2000) and Higgs et al (2004).

Why is evidence-based physiotherapy important?

For patients

A premise of evidence-based practice, though one that is hard to demonstrate empirically, is that practice that is informed by high-quality research is likely to be safer and more effective than practice that is not based on high-quality research. The expectation is that physiotherapy will produce the best possible clinical outcomes when it is evidence based.

Patients are increasingly demanding information about their disease or clinical problem and the options available for treatment. Many patients have access to a wide range of information sources, but not all of these sources provide reliable information. The most widely used source of information is the internet, but the internet provides the full spectrum of information quality. If patients are to make informed contributions to decisions about the management of their conditions, they will need assistance to identify high-quality clinical research.

In some countries, such as the UK, patients' demands for information have been nurtured and encouraged. A number of high-priority government programmes have promoted shared decision-making and choice by providing consumers of health care services access to reliable evidence (Coulter et al 1999, National Institute for Health and Clinical Excellence), and by supporting patients to help each

other understand about disease processes (NHS Executive 2001).

For physiotherapists and the profession

Physiotherapists assert that they are 'professionals'. Koehn (1994) argues that a particularly unique characteristic of being a professional is trustworthiness, by which is meant that professionals can be expected to strive to do good, have the patient's best interests at heart and have high ethical standards. A tangible demonstration of a profession's interests in the welfare of its patients is its preparedness to act on the basis of objective evidence about good practice, regardless of how unpalatable the evidence might be. A prerequisite is that the profession must be aware of what the evidence says. Practitioners who don't know whether the evidence indicates that the interventions they offer are effective may have a questionable claim to being 'professionals'. Physiotherapy qualifies as a profession in so far as practice is informed by evidence. And in so far as it is not, there is a risk that physiotherapists will lose the respect and trust of patients and the public at large.

The profession of physiotherapy has changed enormously in the last 60 years. There has been a transition from a role in which physiotherapists did what doctors told them to do to the current role in which, in many countries, physiotherapists act as autonomous or semi-autonomous health professionals. This new-found professional autonomy should be exercised responsibly. With autonomy comes responsibility for ensuring that patients are given accurate diagnoses and prognoses, and are well informed about benefits, harms and risks of intervention.

For funders of physiotherapy services

Physiotherapy should do more good than harm. This is true whether physiotherapy services are funded by the public, through taxes, or by individuals in a fee-for-service or insurance payment. Policy-makers, managers and purchasers of health services have an interest in ensuring value for money and health benefits in situations where health resources are always scarce. Decisions have to be made about where and how to invest to benefit the health of the population

as a whole. Where possible, decisions on investment of health services should be based on evidence (Gray 1997).

History of evidence-based health care

The term 'evidence-based medicine' was first introduced in 1992 by a team at McMaster University, Canada, led by Gordon Guyatt (Evidence-Based Medicine Working Group 1992). They produced a series of highly influential guides to help those teaching medicine to introduce the notion of finding, appraising and using high-quality evidence to improve the effectiveness of the care given to patients (Guyatt et al 1994, Jaeschke et al 1994, Oxman et al 1993).

Why did the term evolve? What were the drivers? There had been growing concern in some countries that the gap between research and practice was too great. In 1991, the Director of Research and Development for the Department of Health in England noted that 'strongly held views based on belief rather than sound information still exert too much influence in health care' (Department of Health 1991). High-quality medical research was not being used in practice even though evidence showed the potential to save many lives and prevent disability. For example, by 1980 there were sufficient studies to demonstrate that prescription of clot-busting drugs (thrombolytic therapy) for people who had suffered heart attacks would produce a significant reduction in mortality. But in the 1990s thrombolytic therapy was still not recommended as a routine treatment except in a minority of medical textbooks (Antman 1992). Similarly, despite high-quality evidence that showed bed rest to be ineffective in the treatment of acute back pain, physicians were still advising patients to take to their beds (Cherkin et al 1995).

Another driver was the rapidly increasing volume of literature. New research was being produced too quickly for doctors to cope with it. At the same time, there was a recognition that much of the published research was of poor quality. Doctors had a daily need for reliable information about diagnosis, prognosis, therapy and prevention (Sackett et al 2000).

One way of dealing with the growing volume of literature has been the development of systematic reviews, or systematically developed summaries of high-quality evidence. Systematic reviews will be

discussed in several chapters in this book. In 1992, the Cochrane Collaboration³ was established. The Cochrane Collaboration's purpose is the development of high-quality systematic reviews, which are now conducted by 52 Cochrane Review Groups, supported by 26 Cochrane Centres around the world. The Collaboration has had a huge impact on making high-quality evidence more accessible to large numbers of people.

One of the early drivers of evidence-based physiotherapy was the Department of Epidemiology at the University of Maastricht in the Netherlands. Since the early 1990s this department has trained several 'generations' of excellent researchers who have produced an enormous volume of high-quality clinical research relevant to physiotherapy. In 1998, the precursor to this book, *Evidence-Based Healthcare: A Practical Guide for Therapists* (Bury & Mead 1998), was published, providing a basic text to help therapists understand what evidence-based practice was and what it meant in relation to their clinical practice. And from 1999 PEDro, a database of randomized trials, has given physiotherapists easy access to high-quality evidence about effects of intervention.

Today, most physiotherapists have heard of evidence-based practice, and evidence-based practice has initiated much discussion and also some skepticism. Some feel the concept threatens the importance of skills, experience and practice knowledge and the pre-eminence of interaction with individual patients. We will discuss these issues further in this book.

How will this book help you to practise evidence-based physiotherapy?

This book provides a step-by-step guide to the practice of evidence-based physiotherapy. The focus is on using evidence to support decision-making that pertains to individual patients or small groups of patients, but much of what is presented applies equally to decision-making about physiotherapy policy and public health issues.

³The Cochrane Collaboration was named after Archie Cochrane, a distinguished British epidemiologist who assessed the effectiveness of medical treatments and procedures. More information about Archie Cochrane and the Cochrane Collaboration can be found at <http://www.cochrane.org/index0.htm>

Steps for practising evidence-based physiotherapy

Evidence-based practice involves the following steps (Sackett et al 2000):

Step 1 Converting information needs into answerable questions.

Step 2 Tracking down the best evidence with which to answer those questions.

Step 3 Critically appraising the evidence for its validity impact and applicability.

Step 4 Integrating the evidence with clinical expertise and with patients' unique biologies, values and circumstances.

Step 5 Evaluating the effectiveness and efficiency in executing steps 1–4 and seeking ways to improve them both for next time.

These steps form the basis for the outline of this book, which is structured as follows.

Chapter 2: What do I need to know?

Evidence-based physiotherapy will occur only when two conditions are met: there has to be a sense of uncertainty about the best course of action, and there has to be recognition that high-quality clinical research could resolve some of the uncertainty. Once these conditions are met, the first step in delivering evidence-based physiotherapy is to identify, possibly with the patient, what the clinical problem is. Framing the problem or question in a structured way makes it easier to identify information needs. Chapter 2 is designed to help you to frame answerable questions. We focus on four types of clinical question: those about the effects of intervention, attitudes and experiences, prognosis, and the accuracy of diagnostic tests.

Chapter 3: What constitutes evidence?

Each type of clinical question is best answered with a particular type of research. Chapter 3 considers the types of research that best answer each of the four types of clinical question raised in Chapter 2.

Chapter 4: Finding the evidence

You will need to do a search of relevant databases to find evidence to answer your clinical questions. Chapter 4 makes recommendations about which databases to search, and how to search in a way that

will be most likely to give you the information you need in an efficient way.

Chapter 5: Can I trust this evidence?

Not all research is of sufficient quality to be used for clinical decision-making. Once you have accessed the research evidence, you need to be able to assess whether or not it can be believed. Chapter 5 describes a process for appraising the trustworthiness or validity of clinical research.

Chapter 6: What does this evidence mean for my practice?

If the research is of high quality, you will need to decide whether it is relevant to the particular clinical circumstances of your patient or patients, and, if so, what the evidence means for clinical practice. Chapter 6 considers how to assess the relevance of clinical research and how to interpret research findings.

Chapter 7: Clinical practice guidelines

Properly developed clinical guidelines provide recommendations for practice that are informed, wherever possible, by high-quality research evidence. Chapter 7 describes how to decide whether clinical practice guidelines are sufficiently trustworthy to apply in practice.

Chapter 8: When and how should new therapies be introduced into clinical practice?

This chapter describes a protocol that should be followed before new therapies are introduced into clinical practice.

Chapter 9: Making it happen

It can be hard to get high-quality clinical research into practice. Chapter 9 discusses barriers to changing practice and ways of improving professional practice.

Chapter 10: Am I on the right track?

Lifelong learning requires self-reflection and self-evaluation. In Chapter 10 we discuss self-evaluation, both of how well evidence is used to inform practice and of how well evidence-based practices are implemented. In addition, we consider clinical evaluation of the effects of intervention on individual patients.

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