# ABC of Evidence-Based Healthcare

Edited by John Frain


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# Preface

I am writing this book not as a researcher but as an end user of evidence-based healthcare. What does this mean? It means I am a frontline clinician, in primary care, working to provide patients with care and management according to the best available evidence, helping them to interpret what they have seen, most commonly now, online but also in newspapers, on TV or simply by word of mouth from family and friends. I need to know how to retrieve and interpret evidence quickly and accurately. I need evidence to collaborate with my patients and to share decision-making with them in line with their own preferences and values. Practising in primary care is often about the management of uncertainty – not only the patient's but also mine and my team's. The prospect of making our work more evidence-based to assist our clinical judgement is certainly an attractive one. Healthcare is a team-based activity, and the well-being of patients is dependent on the well-being of the staff. During the recent Covid-19 pandemic, my practice continued to see our patients face-to-face whenever necessary. In a previously unknown and rapidly evolving situation, the availability of high-quality evidence was essential in keeping our patients and staff safe.

The full implementation of evidence in healthcare is not a fixed endpoint nor even a destination to which we are yet close. Humankind has always sought to interpret the causes of disease and the benefits of available treatments. Though the quality of evidence for healthcare has improved immeasurably over the past 30 years, there remain challenges. These involve greater implementation of evidence into healthcare policy, everyday practice and the lives of patients, staff and healthcare providers. Amazingly, the 'evidence cart' can now be held in the hand and stored in the pocket. The technological revolution of the information age enables rapid retrieval of evidence to aid bedside decision-making with just a few clicks. Yet not all available evidence is published, not every trial is well conducted and not every healthcare professional and policymaker is skilled in the appraisal of evidence. Still too often, historically underserved and marginalised individuals and communities remain outside the remit of mainstream research, reinforcing their often-poorer health outcomes. This must change, and we have the tools to do this.

As an educator, I am aware of the great volume of knowledge and assessment with which healthcare students must contend. Evidence-based healthcare can seem abstract and lacking relevance if it is only placed alongside other learning themes rather than embedded across the whole curriculum, informing the choice of what is to be taught to future healthcare professionals. Students need to become familiar with the skills and the benefits of evidence-based healthcare right from the beginning of their training rather than seeing it as an 'add-on' for a later date.

It is not within the scope of this book to cover everything in evidence-based healthcare. I have tried to address the important domains across the skill set as well as to provoke thought for the reader of implementation and future challenges. Underpinning this, I have added details of suitable further resources readers may also wish to review.

Finally, I would like to thank everyone who has contributed to this book and to Wiley who have supported it from concept to publication. I hope it is useful and helps to provide the reader with an overview of this important topic in healthcare and provides direction to other resources and further study.

John Frain
August 2024

CHAPTER 1

# What Is Evidence-Based Healthcare?

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**OVERVIEW**

- Evidence is the available information or facts which indicate whether a belief or proposition is true.
- Evidence in healthcare is linked to quality, patient safety and improved clinical outcomes.
- The concept of justifying practice through the use of evidence can be found from the earliest times.
- Modern evidence-based practice has its roots in the development of critical appraisal and modern research methods.
- The ethical dimension is essential in determining the quality and application of evidence.

## Introduction

On explaining to a fellow new student on another university course that I was studying evidence-based healthcare and how to bring evidence into our clinical practice, the alarmed response I received was, 'You mean healthcare isn't already evidence-based?' It seems obvious that something as important as healthcare should proceed only on the basis of the evidence, given the possible consequences of poor practice. The answer to my colleague's concern is, of course, both 'Yes, it is' and 'No, it isn't or rather 'There is evidence, but it could be better, both in terms of the knowledge and how the knowledge is applied to patient care'. It is always this tension between where practice is now and where it could be in the future, which should motivate both scientists and clinicians to always develop the scope of evidence further in our practice.

Evidence is not only static but also dynamic in the sense our depth of understanding should always be evolving. An example is finger clubbing, first described by Hippocrates in a patient with empyema in the sixth century BCE. Our understanding of clubbing is different from 2500 years ago (Box 1.1).

Therefore, observation is crucial in healthcare because it raises curiosity about the origin of the data, and in this case a physical sign clinicians see in their patients. Hippocrates' initial observation of a patient's fingers and his curiosity about a relationship (coincidence, association or causation?) with their empyema has evolved into an evidence-based physical sign which remains important in physical diagnosis. These clinical questions are vital in clinical reasoning and decision-making about a patient's management. They divide into questions about general knowledge of a condition, disease or process (background questions) and specific questions to facilitate clinical decision about the patient in front of us (foreground questions) (Chapter 2) (Box 1.2).

The volume of medical knowledge and belief has evolved immensely. Currently, Medline is adding over a million new records to its database every year. Hippocrates alone wrote around 60 treatises (the *Hippocratic Corpus*) describing theories of disease, ethical dimensions and approaches to observation and physical examination. Now every busy clinician appreciates the need to access high-quality information quickly and efficiently for the immediate benefit of patients. The need to summarise evidence and manage changing medical knowledge has been recognised since the seventeenth century with the publication of an abstracting journal in 1682 and the first medical journal in England, *Medicina Curiosa,* in 1684 (1). The development of indexing, databases and computerisation in the twentieth century has provided the automated databases and evidence retrieval we enjoy now, particularly in the last 30 years. These have facilitated an explosion in the opportunities for a more systematic and rigorous consideration of scientific evidence, which informs clinical practice today (Chapter 3). Many of us will remember the previous challenges of retrieving references for our student essays from the hefty volumes of the *Index Medicus*, followed by a search of the dusty shelves of a medical library stack room.

Comparing similar groups whose baseline characteristics are similar is particularly important in evaluating a new intervention and is the basis of the randomised controlled trial (RCT). Again, the concept has a long history, with the poet Francisco Petrarch proposing in the fourteenth century that the effects of then-current treatments for conditions in one group be compared with a similar group of patients in which the natural history of the condition was allowed to proceed unchecked. A famous example is James Lind's intervention in sailors with scurvy in 1747 (Box 1.3). The first recognised RCT is of the use of streptomycin in the treatment of pulmonary tuberculosis (2). Given the inherent variability of biological systems both individually and in populations, the precise comparison of groups required in accurately evaluating the effectiveness of interventions

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