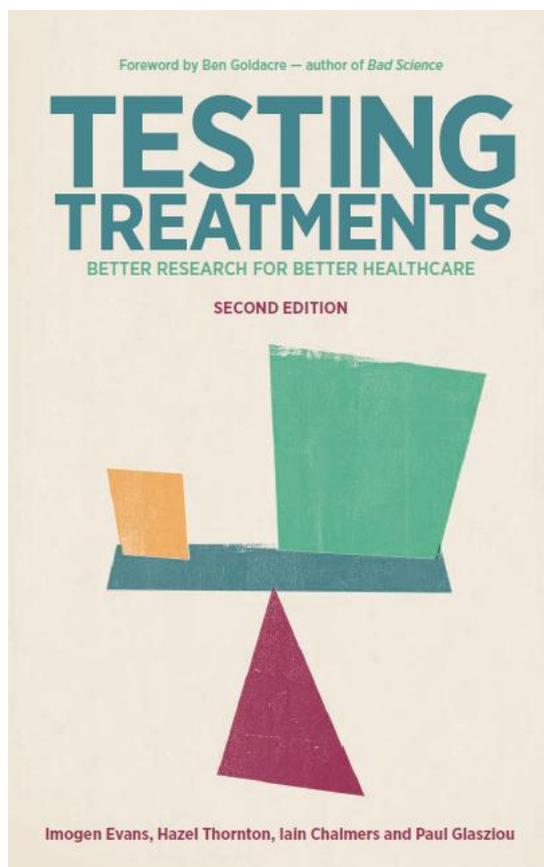


Testing Treatments – Better Research for Better Health Care, Imogen Evans, Hazel Thornton & Iain Chalmers, Pinter and Martin Ltd, London, 2010.

“Best popular science book on evidence-based medicine ever” – Ben Goldacre

This is an excellent and important book; every biology teacher (and other science teachers) should read it. The central tenet of the book is that medical treatments and the choice of medical treatment should be based on sound research evidence. Furthermore the authors suggest that patients should receive good quality information about the efficacy of treatments and be involved in making decisions about their treatment with their medical practitioner rather than be passive recipients of care. The authors take the view that too often pharmaceutical companies and academic researchers economise with the truth by distorting or embellishing their research results. Such clinical trials of doubtful quality produce unreliable evidence which can lead to medical treatments of dubious value rather than sound medical practice based on rigorous and unbiased evidence from the systematic review of randomised controlled clinical trials.



The book is well written in a clear and scientific manner making it readily accessible by and appropriate for senior school students. It is a relatively short book, well structured with each chapter providing progression to the next making it an easy cover to cover read. Progression from chapter to chapter is further supported by a summary of key points at the end of each chapter and a brief résumé of what has gone before at the beginning of each chapter. It is clearly referenced providing the potential for teachers to develop learning materials for specific lessons or for research activity by students. Teachers may benefit from reading the seven action points in the ‘Blueprint for a Revolution in the Testing of Treatments’ in the last chapter (8) first to obtain an overview of the book’s approach. As well as being available in paperback and e-book formats the book is also available as a free pdf download from the *testing treatments* web site [1]. This book has clearly had a significant influence on Ben Goldacre (who provides a foreword) in writing his books ‘Bad Science’ and ‘Bad Pharma’ which are the subject of other reviews in this series.

The first two chapters of the book examine the dangers of treatments that have harmful effects, treatments that do not work and treatments whose effectiveness has not been evaluated properly. The examples in these chapters pave the way for a consideration of the weakness of theory or professional opinion on its own to determine effective treatment; and the need for randomised control trials and systematic reviews of existing evidence as reliable guides to safe and effective treatments. Any of the examples in these chapters are suitable case studies for understanding the principles of experimental design and clinical field trials. Historical studies, such as James Lind’s research on scurvy in sailors from 1745 may be suitable to introduce younger students to the idea of randomised control trials. In selecting

examples teachers will want to exercise sensitivity where students may have personal experience of the medical conditions being considered.

This book is relevant to the Higher Human Biology Units *Immunology and Public Health* (clinical trials) and *Physiology and Health* (ante and post natal screening), the Higher Biology Unit *Sustainability and Interdependence* Unit (field trials) and the Advanced Higher Biology Unit *Investigative Biology*. Chapter 3 deals with the fair testing of treatments, the validity of trials (does the evidence support the claims made) and the reliability of results (does bias and/or chance distort the results). It covers the randomisation of treatments, controls, the placebo effect, blind and double blind trials, the effect of sample size, tests of statistical significance and the meta-analysis of data. All of this is done in an accessible way using clinical examples.

Chapter 4 considers the philosophy and ethics of clinical trials – ‘I don’t know which treatment is appropriate but I know how to find out’. In comparing medical treatments in controlled trials the questions to be asked are: does the treatment have a positive outcome; is one treatment better than another or no treatment at all (some patients recover with no treatment and there can be a placebo effect); or are there harmful side effects making the treatment potentially worse than the condition to be treated? The potential for harm as well as positive outcomes in medical screening is also considered including chorionic villus sampling as an example (relevant to Higher Human Biology). All of this leads to a consideration of ethics – where the effects of treatments are uncertain is it better that patients should be involved in randomised controlled clinical trials to establish the best treatment rather than prescribing on a theoretical basis or opinion as to which treatment *might* be best for the patient?

Chapters 5 and 6 provide examples and case studies of good, bad and unnecessary medical research that illustrate the design principles of clinical trials including serving the needs of patients rather than the needs of pharmaceutical companies or academic researchers. Chapter 7 makes the case for patients being better informed about medical conditions and how treatments are evaluated scientifically so that they can be part of the decision making process about their own health treatment. The final chapter suggests a blueprint for how this could be brought about including the importance of school education in providing the relevant scientific knowledge and skills that underpin understanding evidence-based medicine decision making.

The associated Testing Treatments website [1] provides useful links to other informative websites on evidence based medicine; in particular NHS Choices *Behind the Headlines* [2] which provides a scientific analysis of health issues reported in the media and Cochrane Summaries [3] which provides a searchable data base of summaries of medical research. These are both useful in coming up with scientific comment on media reports and responding to student questions.

References:

1. <http://www.testingtreatments.org/> accessed 11 July 2014.
2. <http://www.nhs.uk/News/Pages/NewsIndex.aspx> accessed 11 July 2014.
3. <http://summaries.cochrane.org/> accessed 11 July 2014.