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Christine Bond, **Evidence-Based Pharmacy**

London: Pharmaceutical Press, 2000, 226 pages
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Reviewed by Professor Nick Barber, Professor of the Practice of Pharmacy, The School of Pharmacy, London

The relationship between evidence and policy has always been that of chicken and egg. Policy is some definition of what is the right thing to do; it is therefore a statement of values. Evidence is a statement of fact, or at least some attempt to nuzzle up close to the truth. The two are, however, mutually dependent. To convince you what we should do in the future I have to give you some evidence that what we are doing at present is causing problems, and that what we plan to do will work. The problem is that, as we have not done it yet, we can not be sure it will work. In these cases we use weaker evidence, such as parallels in different fields, or smaller pilot studies. Pharmacy policy has, in the past, had a weak relationship with evidence – not so much chicken and egg, more embryo and ovum – however this book hopes to make that stronger. As the blurb on the back explains, the book complements the Royal Pharmaceutical Society of Great Britain's 'Pharmacy in the New Age' (PIANA) policy initiative by discussing the role of community pharmacists and presenting research evidence to support its goals.

Evidence-based Pharmacy is edited by Professor Christine Bond, a respected academic, much of whose research has been into community pharmacy. The book (which should not be confused with 'Evidence-based Pharmacy' by Phil Wiffen) has two different aims. The first is to illustrate some of the new pharmacy services in the community and provide evidence of their effects. The second is to illustrate health services research methodology with examples from community pharmacy; the author rightly points out that there are few books which do this.

The book opens with a good overview of health services research methodology by Professor Bond; the range of techniques, and their strengths and weaknesses, come over clearly. There then follows eight chapters, each of which describe research into aspects of a role for community pharmacy in PIANA. The final chapter reviews the evidence, between 1997 and 1999, for the five PIANA key roles and briefly reviews the issues for the future.

Seven of the ten chapters are from authors at the University of Aberdeen. Of the eight chapters relating to roles in PIANA, six consist of brief introductions to an area and then a detailed description of a research study conducted by the author. One of the chapters, on the economic aspects of reclassifying medicines, is likely to bring work to a pharmacy audience that might otherwise have missed it; I enjoyed this chapter the most.

The other chapters tend to introduce their area over 2–3 pages, then clarify the research issues and describe the research in depth. There are benefits in this, everyone who has had a large research project has been frustrated at fracturing it into bite-sized papers, and felt the whole more than the sum of its parts. What is more, the authors are honest about the methodological limitations and resultant effect on the strength of evidence. Young researchers can learn from these expositions, and they certainly fulfil the book's second aim, of illustrating health services research methodology. My criticism would be that these chapters tend to solipsism. Some authors reference little more than their own work in their discussions; consequently their work is not set against the literature. This diminishes the value of the book for those in practice.

The book is attractive and well presented by the Pharmaceutical Press. It marks an important right of passage for pharmacy practice research, showing how more complex health services research methodologies have been introduced, and how research has gone from accounts of the experiences of a few enthusiastic practitioners to well structured work marked by greater

internal and external validity. It is a useful document of record, and should be held by university libraries and pharmacy practice research groups. I would recommend this to my PhD students as they can learn from the detailed accounts of research, but I am not sure of its utility to someone in primary care who has responsibility for the development of community pharmacy services. Anyone seeking an evidence base would still need to search the literature. It is certainly of some use, but the continued strengthening of the quality of pharmacy practice research, the rapid growth of published literature, and changes in NHS policy, make it an interesting, but not essential, source.

Xian Ming Zeng, Gary P. Martin and Christopher Marriott, *Particulate Interactions in Dry Powder Inhaler Formulations for Inhalation*

London: Taylor & Francis, 2001, 253 pages hardback.
£85 ISBN 0-7484-0960-2

Reviewed by Dr M. J. Tobyn, Head of Fine Particle Science at Vectura Limited, Bath

The humble (and in its original incarnations it was very humble) dry powder inhaler (DPI) originally found clinical and geographical (to this day they are not widely used in the United States) niches, but was not regarded as being at the cutting edge of technology or patient need. Low efficiency and high variability limited its use to compounds with a low therapeutic index and/or value or alternatively as mildly advantageous for those with particular co-ordination issues. However in recent years, developments have been such that the DPI appears to be a viable vehicle for the reproducible delivery of precision doses of localised therapy as well as high value systemic compounds. Other compounds are being tested which cannot be delivered by any alternative route, leading to the development of orphan therapies for untreated patient groups.

Whilst the phasing out of CFCs in metered dose inhalers, and the subsequent doubts about their HFA replacements, may have driven research in the direction of DPIs it is interesting – as a formulator – to note that this successful transition from technology afterthought to leading discipline took place as less

attention was placed to the plastic delivery device, a crowded and often unproductive field, and more to the formulations that went in them. It is therefore timely and welcome that a book which concentrates on an introduction to the latter is now available.

The trouble in gaining an appreciation of the science involved is that it is a highly multidisciplinary endeavour. The scientist, particularly one of the many new scientists who have entered the fray in recent years, must try to master long forgotten theories in Physical Chemistry (e.g. van der Waals forces and crystallisation theory) along with complex and largely opaque disciplines such as electrostatics and material milling and then apply them to practical techniques such as the minefield of powder mixing. These areas have often been illuminated in this field by obscure experimental methods, which must also be recounted in depth for sufficient understanding by the outsider or newcomer.

In this light it is a brave and commendable decision that this book has been authored rather than edited. Thankfully for the reader the undoubted pressure on the authors has been rewarded by clarity in thought and purpose, combined with a consistent and readable style.

The book is broken up into seven sections. The book opens with a lucid theoretical discourse on interparticulate forces, which is then followed up with a chapter on how these can rationally be applied to DPI formulations. This dual approach is necessary and allows a better understanding of the fields involved.

Subsequent chapters act as general introductions to medicinal aerosols and the techniques used to characterise them. The latter is particularly valuable, as these are not readily compiled in other areas. A particularly valuable chapter for this reviewer was one on the interaction of particles with airstreams, which illuminated cogently the area of aggregation and deaggregation of particles. This kind of review has not been so clearly written elsewhere. There is a further chapter on material characterisation, which introduces a range of techniques which can then be investigated by the reader in more detail elsewhere.

A number of deficiencies are apparent, mainly caused by the fast moving nature of the field. There are few references (other than those of the authors) from beyond the mid-1990s. This unfortunately covers the period during which DPIs underwent a resurgence of interest and research, so there are some significant omissions. This also means that, for instance, the chapter on characterisation repeats some unfortunate canards in the area of centrifuge techniques but does not mention some of the more valuable recent advances. The same is true on the subject of primary particle production

(supercritical fluid production techniques are mentioned only fleetingly and others are not noted) and how this influences particle interactions. However this is an inevitable consequence of the explosion of interest in the field.

The value of this text as an introduction to the field for a wide range of scientists is high. Although there are some other texts which skirt the area none are as well directed or relevant as this one.

Delivery of drugs via a dry powder inhaler has some similarities with the game of golf. In each one is trying to direct a small object into an only slightly larger orifice some distance away. Many hazards, wet and dry, come into play in the intervening distance. Whilst many

advances in the clubs (the device) and ball (the particles) have led to huge improvements for the top professionals many others are left hacking away. This book represents a useful instructional manual for the high handicapper and may help the more experienced player to greater things.

Dr Mike Toba was a Lecturer in Pharmaceutical Technology at the University of Bath for 7 years from 1994 to 2001. He is now Head of Fine Particle Science at Vectura Limited, a Bath based drug delivery company which specialises in inhalation delivery systems and formulations.