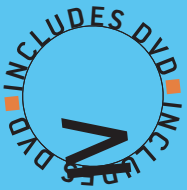
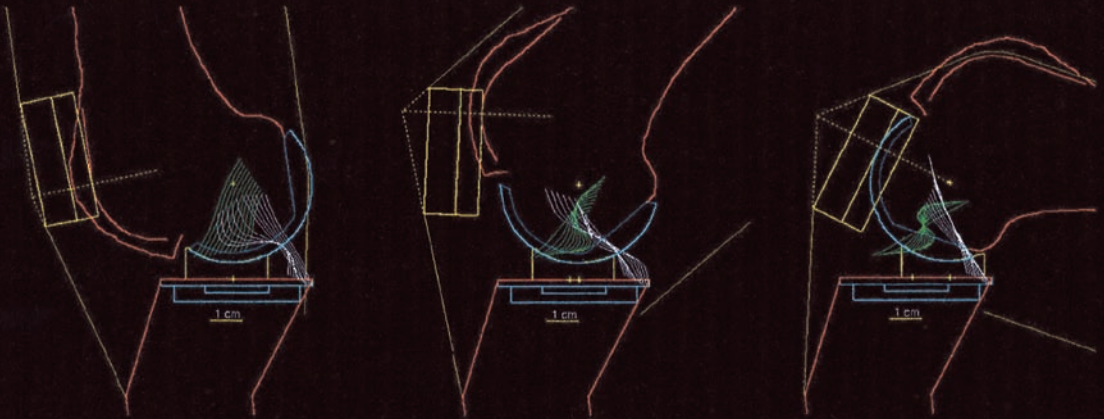
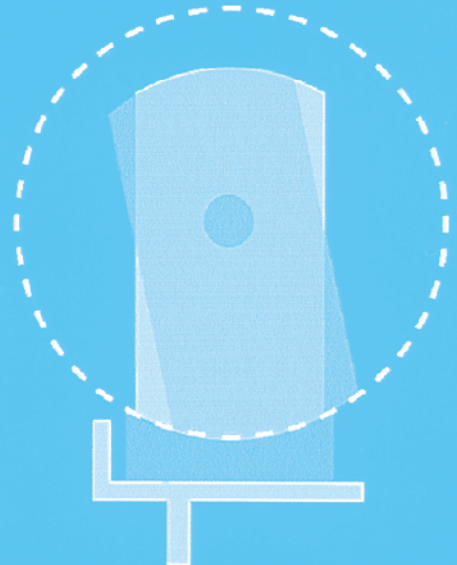


UNICOMPARTMENTAL ARTHROPLASTY WITH THE OXFORD KNEE



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Preface

A whole book, about one knee prosthesis! And only half a knee prosthesis at that!

The scope of this book is, actually, a little wider than the exclamations above suggest, but some excuse is surely required. We have written, in fact, about unicompartmental arthroplasty, an intellectually exciting and technically demanding subject for which the authors have a shared enthusiasm. However, since surgical expertise is gained slowly, most practitioners learn only one way of dealing with a particular clinical problem, and we are no exceptions. Our experience of treating unicompartmental arthritis over the last 25 years has been almost exclusively with our own invention, the Oxford Unicompartmental Knee, and we can only write with first-hand authority about that. We have, of course, tried to make good this deficiency from the published reports of other surgeons (whose experience, although different, is usually similarly limited); but, as with other history books, the realistic reader will expect only an *attempt* at a balanced view, and not necessarily an unbiased attempt.

Until very recently, unicompartmental arthroplasty itself was something of a niche activity. Most orthopaedic surgeons in the world did not use the method at all, and even its champions thought it appropriate for no more than a small proportion of arthritic knees in need of surgery. As will appear, we believe that as many as one-third of those who currently undergo total knee replacement may be better treated by unicompartmental arthroplasty. Soon, a million total knee arthroplasties will be performed in the world each year, and so this book is offered for the consideration of all practising knee surgeons.

The challenge of unicompartmental replacement is nothing less than to replace the deformed surfaces of one compartment of the knee so effectively that the soft tissues of the whole joint, and the retained articular surfaces of the other compartments, can all resume their physiological functions. This is a more difficult task than that confronted by total knee replacement, and it is anomalous that most prosthetic designs and methods of implantation for unicompartmental replacement have remained so unsophisticated during the three decades in which the technology of total replacement has (perhaps unsteadily) advanced.

The undertaking of a unicompartmental arthroplasty requires knowledge of the mechanics of the normal knee, and of the pathological anatomy of the arthritic knee. The prosthesis used must impose no unphysiological limits on the function of the retained structures and therefore it must be implanted in a unique relationship to the ligaments of the individual knee. This may only be consistently achieved if the instruments allow measured intraoperative adjustment of the components to match the particular anatomy. The components need to be sufficiently wear resistant to function for the expected lifetime of the patient, which is usually much longer than 10 years.

Lastly, the surgeon needs to have gained the *appropriate* skills and experience. Even long familiarity with other procedures on the knee does not, it seems, suffice to avoid the consequences of the 'learning curve' for unicompartmental arthroplasty.

John Goodfellow
John O'Connor
Christopher Dodd
David Murray

Preface to the second edition

Since the publication of the first edition, several things have happened. We have greatly missed the contribution of John Goodfellow who died in August 2011. He was the main driving force behind the writing of the first edition, as indeed he was behind the original development of the Oxford Knee. We have retained his name as first author because, although there are substantial additions of new material, quite a lot has remained unchanged. Readers will be able to detect the points at which the smooth flow of John's writing stops and another hand takes over.

Also, there have been further developments in the instrumentation, the introduction of cementless components and of components specifically designed for use in the lateral compartment. Finally, a substantial body of new clinical and scientific evidence has been gathered, evidence which further encourages us to recommend the use of the Oxford Knee to our surgeon colleagues.

We dedicate this edition to the memory of John Goodfellow.

John O'Connor
Hemant Pandit
Christopher Dodd
David Murray



John Goodfellow, FRCS, M.S. (1927-2011).

Photograph of John when he was President of the British Orthopaedic Association. In his presidential address, he repeated his view that engineering is the basic science of orthopaedic surgery, a view which had led to the start of his collaboration with John O'Connor, Department of Engineering Science, in 1966.

Acknowledgements

Many people have assisted us with the work on which the book is based and deserve our thanks. In particular Barbara Marks without whose endeavours the book and its second edition would not have happened. We would like to acknowledge the contribution of Cathy Jenkins and Jo Brown who expertly gather the clinical data that underpins our research.

We acknowledge the help and support of our surgeon colleagues and, in particular, Andrew Price, William Jackson and Max Gibbons, who continue to participate actively in our instructional courses. We are also grateful to Peter McLardy-Smith, Roger Gundle, David Beard and Karen Barker for their contributions over the years.

We are grateful for the help and support of all the following research fellows who have gained, or are working on, a thesis around the Oxford knee: Russell Miller, Adrian Weale, Brett Robinson, Jonathan Rees, David Isaac, Paul Monk, Aashish Gulati, Ben Kendrick, Luke Jones, Nick Bottomley, Alexander Liddle, Abtin Alvand, and Thomas Hamilton.

We thank our anaesthetist colleagues Mansukh Popat, Matthew Sainsbury, Peter Hambly and Graham Burt for their contributions both in the operating theatre and with optimising early discharge. None of the clinical work would have been possible without the help of the nurses, physiotherapists, radiographers and the other staff of the Nuffield Orthopaedic Centre and we are grateful to them all, particularly Vicky Flanagan, Heather Topf, Yvonne Attwood and Paul Cooper.

The theoretical modelling of the human knee and associated experimental work has been improved by several 'generations' of engineers and their work is frequently cited in this book. Particular mention is made of Amy Zavatsky, David FitzPatrick, Richie Gill, David Wilson, Jennifer Feikes, Danielle Toutungi, Tung-Wu Lu, and Ahmed Imran. We are also grateful to Ben van Duren, David Simpson, Stephen Mellon and Elise Pegg for their invaluable engineering input.

Since 1984, the technical skills to make the implants and instruments we describe were provided by the engineers and craftsmen of Biomet. We especially record the contributions of Russell Lloyd and the late Ron Bateman. David Moorse, Kit Pitman and especially Keith Thomas have helped in innumerable ways, as did Amanda Rogers. We are also grateful for the contribution of the following Biomet development engineers – Mona Alinejad, Duncan Ridley, Tim Lawes and Jim Truscott.

In the past forty years, very many professional colleagues have contributed to our studies at Oxford, as consultants, surgical trainees or engineering students, and several of their names appear as authors of papers referred to in this book. We are also grateful to the many surgeons worldwide who have shared their insights on the Oxford Knee with us.

John Goodfellow
John O'Connor
Hemant Pandit
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Additional material to accompany this book, including animated computer models and surgical videos, can be found at: www.oxfordpartialknee.com.

