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# The Osteoporosis Manual

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Reiner Bartl • Christoph Bartl

# The Osteoporosis Manual

Prevention, Diagnosis  
and Management

With a contribution by  
Andrea Baur-Melnyk and Tobias Geith

 Springer

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## Preface



**Fig. 1** Osteoporosis: a worldwide challenge! Osteoporosis is now identified as one of the 10 most important conditions affecting the entire human race!

With the dawn of the twenty-first century has come the realisation that bone and joint diseases are the major cause of pain and physical disability worldwide. Moreover, according to the WHO Scientific Group, there are more than 150 diseases and syndromes of musculoskeletal conditions, usually associated with pain and loss of function. It is undoubtedly these insights that prompted the WHO to declare the first 10 years of the new century as “The Bone and Joint Decade 2000–2010”. This declaration obviously made a highly significant impact on international, national and medical authorities, as well as on physicians, scientists and citizens worldwide as evidenced by an overwhelming flood (a regular tsunami) of articles, studies and books on the subject in the last few years alone! Not to mention the coverage in newspapers and journals, on the radio and television, and of course all the up-to-date information freely available on the Internet. The number of people suffering from these diseases—already many millions in the developed and underdeveloped countries in the world—is expected to double within the next 20 years. In many countries, this increase will be even greater due to the longer survival and consequently larger numbers of older people in the population. It is therefore inevitable that the already astronomical costs of health care will rise proportionally. According to the International Osteoporosis Foundation (NOF), the worldwide incidence of hip fracture is projected to increase by 240% in women and 310% in men by 2050, unless appropriate preventive measures will be taken on sufficiently large national and international scales, for which, hopefully, this book will provide a stimulus!

On the positive side, the enormous amount of work, research and study of disorders of bone over the past 10–20 years or so has contributed greatly to our understanding of the causes, treatment and prevention of osteoporosis and other bone disorders. Most importantly, perhaps, the skeleton is now regarded in a new light, as a dynamic organ undergoing constant renewal throughout life from start to finish, from the cradle to the grave. And what is more: it is now abundantly clear that the skeleton participates, usually not to its advantage, in almost every condition that may affect the organs and tissues in the body! This applies especially to **osteoporosis**, which is now under control!

How did this come about?



**Fig. 2** Osteoporosis: a silent thief! Osteoporosis slowly but surely nibbles away at the bones, possibly unnoticed for years, until finally it is exposed by the occurrence of a fracture almost without cause!

- Because of the elucidation of many of the factors involved in osseous remodelling.
- Because of the development of simple, fast, reliable and non-invasive methods for measurement of bone density, and for testing other factors such as mineralisation, trabecular architecture, cortical thickness and the bone cells themselves.
- Because of the identification of general and individual risk factors, so that appropriate measures can be taken to prevent development of osteoporosis and/or its progression, if and when fractures have already occurred.
- And finally, because effective medication for prevention and therapy is now readily available worldwide.

The efficacy of the classes of compounds known as “bisphosphonates” as well as of the “selective oestrogen receptor modulators” (SERMs) and more recently of the anabolic parathyroid hormones (e.g. abaloparatide), denosumab and romosozumab has now been unequivocally established by numerous large multicentre trials involving literally millions of patients. In addition, simple methods such as a healthy lifestyle, adequate nutrition, sufficient physical activity, vitamin D and calcium supplements, as required, can be recommended and adopted on a large scale, beginning with the responsible authorities and reaching to the individual citizens.

Introduction and acceptance of these methods require public awareness and support and the realisation that every individual is the guardian and care-



**Fig. 3** Be active and be happy! The five main steps to preserve bone health are: (1) Don't smoke, (2) Be active, (3) Eat well, (4) Think positive, and (5) Take vitamin D!



**Fig. 4** “Osteoporosis-related” fractures: focussing not only on prevention and treatment but also on ways to deal with the personal and social consequences of the disease such as pain, depression, loss of self-esteem and social isolation!

taker of his/her own bones and responsible for their structural and functional integrity. Fortunately, some progress has been made, as shown by the numerous articles recently published from the “four corners of the globe” which unequivocally establish the epidemic proportions of the problem. Well-founded diagnostic techniques and effective therapies—both antiresorptive and osteoanabolic—are now available for the prevention, diagnosis and treatment of osteoporosis and many other bone disorders. It should be emphasised that the treatments recommended in this text are all founded on “evidence-based medicine” (unless otherwise stated) for which the appropriate references are given in the books at the end of the text.

The aim of this book is to demonstrate that **“Bone is Everybody’s Business”**, and especially every patient’s and doctor’s, and to provide guidelines for the diagnosis, therapy and prevention of osteoporosis—from paediatrics to geriatrics. It is hoped and anticipated that this book will raise awareness and provide information to anyone seeking it, and especially to doctors across all disciplines concerned with various “bone problems”. Clinical osteology is now an independent specialty that nevertheless encompasses all branches of medicine and affects each and every one of us.

Consequently, we have adhered stringently to simplicity, comprehensiveness, and to practicality of approach to examinations, methods and implementation of up-to-date testing, to strategies for prevention, to criteria for diagnosis, and to presentation of therapeutic possibilities, as well as to our own particular goal which is to keep this text as “user-friendly” as possible, so that any doctor seeking information on a particular topic in osteoporosis has uncomplicated and time-saving access to it.

We wish all our readers success in their endeavours to help patients and to reduce suffering in this strife-ridden, beautiful planet of ours!

Munich, Germany  
Munich, Germany

Reiner Bartl  
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