Primer on the Metabolic Bone Diseases and Disorders of Mineral Metabolism

Eighth Edition
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Welcome to the eighth edition of the Primer on the Metabolic Bone Diseases and Disorders of Mineral Metabolism! Loyal readers of previous editions will find the same up-to-date summaries of clinical diseases of the skeleton as well as overviews of skeletal growth, remodeling, and pathophysiological disorders that they have seen in the past. As always, calcium, phosphorus, and vitamin D are reviewed extensively and updated. New visitors to the Primer will find a potpourri of information that can assist readers at the bench and at the bedside. The many tables, references, figures, and illustrations are certain to be helpful. In fact, many figures and illustrations appear in full color for the first time in this edition.

Importantly, the eighth edition has expanded by one-third, adding new chapters principally related to how the skeleton interacts with other systems and tissues, including hematopoietic, muscular, metabolic, and neuropsychiatric. A basic, but comprehensive, overview on bone as an organ system is updated. As with previous editions, it is the contributing authors, who are at the top in their respective fields, who make the Primer so valuable.

And as a real treat, our cover is an artistic image of bone painted by Mr. Toby Kahn. His creation reminds us that, since the last edition, the osteocyte has emerged as a major regulator of skeletal remodeling as well as mineral homeostasis.

The eighth edition is dedicated to the memory of Dr. Larry Raisz, a giant in our field who led and inspired all of us, and who particularly found the Primer to be the premier textbook of bone.

Clifford J. Rosen, MD
The American Society for Bone and Mineral Research (ASBMR) is home to the world’s foremost bone and mineral researchers and clinicians. Our 4,000 members work in more than 60 countries and are experts in a diverse range of specialties, including endocrinology, cell biology, orthopedics, rheumatology, internal medicine, physiology, epidemiology, biomechanics and more.

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ASBMR’s work is guided by the following key strategic objectives:

• **GENERATING AWARENESS** about bone diseases and the importance of bone research by serving as the leading authority on bone health and disease for health professionals and the public

• **PROMOTING CUTTING-EDGE RESEARCH** by fostering multidisciplinary connections among our investigators, awarding grants and advocating for funding for bone and mineral research

• **COMMUNICATING WITH THE NATIONAL INSTITUTES OF HEALTH** to both discover and influence the latest directions in basic, clinical and translational research

• **SUPPORTING YOUNG INVESTIGATORS** through continuing education, grant funding, professional networking and mentoring opportunities

Learn more about ASBMR and the vast learning and networking opportunities it offers by visiting [www.asbmr.org](http://www.asbmr.org) today.
The American Society for Bone and Mineral Research is pleased and excited to present this fully revised, updated and expanded eighth edition of the Primer on the Metabolic Bone Diseases and Disorders of Mineral Metabolism. Dr. Clifford Rosen returns as Editor-in-Chief, overseeing even greater coverage of the field to include the addition of a completely new section on “The Skeleton and Its Integration with Other Tissues.” In addition to new content, many new reader-friendly features have been incorporated into the design of the book.

This eighth edition presents numerous full-color figures for the first time, and the layout has been updated to make accessing information easier. Dr. Rosen and the editorial team have maintained the rigorous high standards of scientific content that have long been the trademark feature of the book, ensuring the Primer maintains its reputation as an essential reference in the field of bone health.

Along with these changes, a new companion site has been developed at www.asbmrprimer.com to provide researchers, instructors, clinicians, and students with valuable supplementary materials that support and expand the content of the book.

The eighth edition of our Primer maintains the strong tradition developed by its predecessors while continuing to evolve to serve the changing needs of the communities it serves. We thank and commend all those involved in making this new edition a reality.

Lynda F. Bonewald, PhD
President, ASBMR
About the Companion Website

This book is accompanied by a companion website:
www.asbmrprimer.com

The website includes:

- Videos
- Editors’ biographies
- PowerPoints of all figures from the book for downloading
- Useful website links
Section I

Molecular, Cellular, and Genetic Determinants of Bone Structure and Formation

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