### Contents

**Part I  Anatomy and Physiology of the Parathyroid Glands**

1. **The History: From Ivar Sandström to the Sequence of Parathyroid Hormone**  
   Michael Mannstadt and John T. Potts Jr.  
   3

2. **Embryology of the Parathyroid Glands**  
   Nancy R. Manley  
   11

3. **PTH and PTH-Related Peptides**  
   Giancarlo Isaia and Margherita Marchetti  
   19

4. **PTH Assays and Their Clinical Significance**  
   Pierre D’Amour  
   25

5. **Control of Parathyroid Hormone Secretion by Extracellular Ca²⁺**  
   Edward M. Brown  
   33

6. **Phosphate Control of PTH Secretion**  
   Piergiorgio Messa  
   49

7. **Role of Magnesium in Parathyroid Physiology**  
   Oren Steen and Aliya Khan  
   61

8. **The PTH/Vitamin D/FGF23 Axis**  
   David Goltzman and Andrew C. Karaplis  
   69

9. **The PTH Receptorsome and Transduction Pathways**  
   Thomas J. Gardella  
   81

10. **G Protein Gsα and GNAS Imprinting**  
    Murat Bastepe  
    89

11. **Parathyroid Hormone Actions on Bone and Kidney**  
    Paola Divieti Pajevic, Marc N. Wein, and Henry M. Kronenberg  
    99

12. **PTH and PTHrP: Nonclassical Targets**  
    Luisella Cianferotti  
    111

13. **In Vitro Cellular Models of Parathyroid Cells**  
    Ana Rita Gomez, Sergio Fabbri, and Maria Luisa Brandi  
    127
Part II  Conditions of Hypoparathyroidism

14 Epidemiology of Hypoparathyroidism ................................. 139
Bart L. Clarke

15 Clinical Presentation of Hypoparathyroidism .......................... 155
Amber L. Wheeler and Dolores M. Shoback

16 Familial Isolated Hypoparathyroidism ................................. 167
Geoffrey N. Hendy and David E.C. Cole

17 Autoimmune Hypoparathyroidism .......................... 177
E. Helen Kemp and Anthony P. Weetman

18 DiGeorge Syndrome .................................................. 189
Marina Tarsitano, Andrea Vitale, and Francesco Tarsitano

19 Hypoparathyroidism, Deafness, and Renal Anomaly Syndrome ........................................... 199
M. Andrew Nesbit

20 Hypoparathyroidism, Dwarfism, Medullary Stenosis of Long Bones, and Eye Abnormalities (Kenny-Caffey Syndrome) and Hypoparathyroidism, Retardation, and Dysmorphism (Sanjad-Sakati) Syndrome .......................... 215
Eli Hershkovitz and Ruti Parvari

21 Hypoparathyroidism in Mitochondrial Disorders ............... 225
Daniele Orsucci, Gabriele Siciliano, and Michelangelo Mancuso

22 Postoperative Hypoparathyroidism ................................. 231
Francesco Tonelli and Francesco Giudici

23 Hypoparathyroidism During Pregnancy, Lactation, and Fetal/Neonatal Development .................. 249
Christopher S. Kovacs

24 Rare Causes of Acquired Hypoparathyroidism .................... 271
Jean-Louis Wémeau

25 Refractory Hypoparathyroidism .................................. 279
Laura Masi

26 Bone Histomorphometry in Hypoparathyroidism ............. 287
David W. Dempster

27 Management of Acute Hypocalcemia .............................. 297
Mark Stuart Cooper and Katherine Benson

28 Conventional Treatment of Chronic Hypoparathyroidism ........................................... 303
Lars Rejnmark

29 Follow-up in Chronic Hypoparathyroidism ....................... 313
Michael Mannstadt and Deborah M. Mitchell
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Treatment of Hypoparathyroidism with Parathyroid Hormone 1–34</td>
<td>319</td>
</tr>
<tr>
<td></td>
<td>Karen K. Winer and Gordon B. Cutler Jr.</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Replacement Therapy with PTH(1–84)</td>
<td>333</td>
</tr>
<tr>
<td></td>
<td>Mishaela R. Rubin, Natalie E. Cusano, and John P. Bilezikian</td>
<td></td>
</tr>
<tr>
<td>Part III</td>
<td>Functional Hypoparathyroidism</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Classification of Pseudohypoparathyroidism and Differential Diagnosis</td>
<td>345</td>
</tr>
<tr>
<td></td>
<td>Giovanna Mantovani and Francesca M. Elli</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Pseudohypoparathyroidism Type 1a, Pseudopseudohypoparathyroidism, and Albright Hereditary Osteodystrophy</td>
<td>355</td>
</tr>
<tr>
<td></td>
<td>Lee S. Weinstein</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Pseudohypoparathyroidism Type Ib (PHP-Ib): PTH-Resistant Hypocalcemia and Hyperphosphatemia Due to Abnormal GNAS Methylation</td>
<td>363</td>
</tr>
<tr>
<td></td>
<td>Harald Jüppner</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Genetic Testing in Pseudohypoparathyroidism</td>
<td>373</td>
</tr>
<tr>
<td></td>
<td>Agnès Linglart and Susanne Thiele</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Blomstrand’s Chondrodysplasia</td>
<td>389</td>
</tr>
<tr>
<td></td>
<td>Francesca Giusti, Luisella Cianferotti, Laura Masi, and Maria Luisa Brandi</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Hypoparathyroidism During Magnesium Deficiency or Excess</td>
<td>397</td>
</tr>
<tr>
<td></td>
<td>René Rizzoli</td>
<td></td>
</tr>
<tr>
<td>Part IV</td>
<td>Advocating for Hypoparathyroidism</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Advocacy and Hypoparathyroidism in the Twenty-First Century</td>
<td>407</td>
</tr>
<tr>
<td></td>
<td>James E. Sanders and Jim Sliney Jr.</td>
<td></td>
</tr>
<tr>
<td>Index</td>
<td></td>
<td>415</td>
</tr>
</tbody>
</table>
Hypoparathyroidism
Brandi, M.L.; Brown, E.M. (Eds.)
2015, XVII, 429 p. 67 illus., 37 illus. in color., Hardcover