## Contents

### Part I  Why Focal Therapy?

1  Evolution in the Concept of Focal Therapy:
   **The Story of Breast Cancer and Prostate Cancer** ............. 3
   Isabel García-Fleury, Chi-hang Yee, Marco Antonio López-Tovar,
   Adriana Pesci-Feltri, Arjun Sivaraman, and Rafael Sanchez-Salas

2  Targeted Therapy for Localized Kidney Cancer .................. 21
   Zhamshid Okhunov, Roshan M. Patel, and Jaime Landman

3  Focal Therapy for Prostate Cancer: A Guide for Patients ...... 39
   Kae Jack Tay and Thomas J. Polascik, MD

### Part II  Global Perspective of Active Surveillance
and Focal Therapy

4  Low-Risk Prostate Cancer in North America:
   **Rationale, Uptake, and Limitations of Active Surveillance
   and Opportunities for Focal Therapy** .......................... 51
   Raj Satkunasivam and Laurence Klotz

5  Focal Therapy and Active Surveillance in Europe .............. 57
   Jan Philipp Radtke, Angelo Territo, Markus Hohenfellner,
   and Alberto Breda

6  Focal Therapy and Active Surveillance of Prostate Cancer
   in East and Southeast Asia .......................................... 75
   Masaki Kimura, Kae Jack Tay, Satoru Muto, and Shigeo Horie

### Part III  Scientific Foundation for the Focal Therapy Concept

7  Pathologic Rationale for Focal Therapy of Prostate Cancer:
   **Elucidating Tumor Characteristics and Biology** ............... 85
   Vladimir Mouraviev, Arnauld Villers, Thomas M. Wheeler,
   Rodolfo Montironi, Pierre Nevoux, Ariel Schulman,
   and Thomas J. Polascik, MD
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Identifying and Characterizing the Index Lesion</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td>Lina Maria Carmona Echeverria, Hayley Whitaker, and Hashim U. Ahmed</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Utilizing Biopsy-Based Genomic Assays to Risk-Stratify Patients</td>
<td>115</td>
</tr>
<tr>
<td></td>
<td>Robert Qi, Stephen J. Freedland, and Judd W. Moul</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Patient Selection for Focal Therapy of Prostate Cancer</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>Arjun Sivaraman and Rafael Sanchez-Salas</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Prostate Focal Therapy: Definitions and Common Terminology</td>
<td>139</td>
</tr>
<tr>
<td></td>
<td>John F. Ward</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Part IV</strong> Multiparametric MRI and ARFI Imaging of the Prostate</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Reading and Reporting Standards: The Prostate Imaging Reporting and Data System—What Is It and What Can It Do?</td>
<td>147</td>
</tr>
<tr>
<td></td>
<td>Wulphert Venderink and Jurgen J. Fütterer</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Role of Magnetic Resonance Imaging in Prostate Cancer Assessment</td>
<td>161</td>
</tr>
<tr>
<td></td>
<td>Sonia Gaur, Sherif Mehralivand, Baris Turkbey, and Peter L. Choyke</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Optimizing Multiparametric Magnetic Resonance Imaging for a Focal Therapy Practice: Quality Improvement</td>
<td>177</td>
</tr>
<tr>
<td></td>
<td>Jamie N. Holtz and Rajan T. Gupta</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Acoustic Radiation Force Impulse Imaging for Targeting: Correlation with Histology</td>
<td>193</td>
</tr>
<tr>
<td></td>
<td>Mark L. Palmeri and Kathryn R. Nightingale</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Part V</strong> Prostate Biopsy Techniques</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>In-Bore Magnetic Resonance Imaging-Targeted Prostate Biopsy</td>
<td>205</td>
</tr>
<tr>
<td></td>
<td>Igor Trilisky, Aytekin Oto, and Scott Eggener</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Multiparametric MRI/TRUS Fusion Biopsy, Outcomes, and Commercial Systems</td>
<td>219</td>
</tr>
<tr>
<td></td>
<td>Akhil Muthigi, Ardeshir R. Rastinehad, Arvin K. George, Masakatsu Oishi, Osamu Ukimura, and Peter A. Pinto</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Detecting, Localizing, and Treating the Multiparametric Magnetic Resonance Imaging Invisible Lesion: Utilizing Three-Dimensional Transperineal Mapping</td>
<td>239</td>
</tr>
<tr>
<td></td>
<td>Nelson N. Stone and E. David Crawford</td>
<td></td>
</tr>
</tbody>
</table>
19 Multiparametric Transrectal Ultrasound Biopsy ...................... 251
    Arnoud W. Postema, Jochen Walz, and Hessel Wijkstra

20 Robotic Magnetic Resonance Imaging Targeting
    for Biopsy and Therapy ........................................... 265
    Wesley W. Ludwig, Mohamad E. Allaf, and Dan Stoianovici

Part VI Technologies for Focal Therapy: Transperineal Approach

21 In-Bore Transperineal Magnetic Resonance
    Imaging-Guided Laser Ablation .................................. 277
    Nathan Perlis, John Trachtenberg, and Sangeet Ghai

22 Focal Cryotherapy ................................................................ 283
    Kae Jack Tay, Efrat Tsivian, and Thomas J. Polascik, MD

23 Photodynamic Therapy for Early Prostate Cancer ............ 293
    Caroline M. Moore and Mark Emberton

Part VII Technologies for Focal Therapy: Transrectal Approach

24 High-Intensity Focused Ultrasound ..................................... 309
    Paolo Capogrosso and Eric Barret

25 Transrectal Laser Focal Therapy of Prostate Cancer .......... 325
    John F. Feller, Bernadette M. Greenwood, and R. Jason Stafford

Part VIII New Approaches and Applications of Focal Therapy

26 Focal Therapy for Prostate Cancer: A Molecular
    Biology Approach with TRAIL ....................................... 347
    Vikram Narayan, Badrinath R. Konety, and Thomas S. Griffith

27 Focal Brachytherapy and Intensity-Modulated
    Radiation Therapy ......................................................... 355
    R. Alex Hsi

28 Focal Therapy for Anterior Cancers
    (Originated from Transition Zone) ............................... 373
    Arnauld Villers and Kae Jack Tay

Part IX Manipulating the Microenvironment for Optimization

29 The Story of Adjuvants to Boost the Performance
    of Cryoablation ......................................................... 385
    Kimberly L. Santucci, John M. Baust, Kristi K. Snyder,
    Anthony Robilotto, Robert G. VanBuskirk, and John G. Baust

30 5-Alpha-Reducercetase Inhibition as a Secondary
    Preventive Strategy ...................................................... 399
    Nathan Perlis and Antonio Finelli
Part X  Determining Outcomes of Focal Therapy

31 Measuring Patient-Based Outcomes: Setting Realistic Expectations When Balancing Functional Outcomes with Cancer Control ................................................................. 409
   Behfar Ehdaie and Arjun Sivaraman

32 Pathologic Assessment and Implications Following Focal Therapy of Prostate Cancer ................................................................. 417
   Rafael E. Jimenez, Andrew Evans, James Kench, Rodolfo Montironi, and Mahul B. Amin

33 Posttreatment Surveillance Using Multiparametric Magnetic Resonance Imaging ................................................................. 431
   Alex Kirkham

34 Determining Focal Therapy Failure and Salvage Options .......... 443
   Theo M. de Reijke, Arnoud W. Postema, and J. Stephen Jones

35 Positioning Focal Therapy from Consensus to Guidelines ....... 447
   Matthijs J.V. Scheltema, Anouk E. Hentschel, and Jean J.M.C.H. de la Rosette

Index ....................................................................................................... 465