Contents

Foreword Chairman of BATAN & Director-General of NM v
Preface ix
Aziz Nather

List of Contributors xvii

Part I TERMINAL STERILIZATION OF TISSUE GRAFTS 1

Chapter 1 Types of Terminal Sterilization of Tissue Grafts 3
Aziz Nather, Jocelyn L. L. Chew and Zameer Aziz

Chapter 2 Need for Radiation Sterilization of Tissue Grafts 11
Norimah Yusof and Nazly Hilmy

Part II TISSUE BANKING 23

Chapter 3 Tissue Banking in the Asia-Pacific Region — Past, Present, and Future 25
Aziz Nather, Kamarul Ariffin Khalid and Eileen Sim

Chapter 4 Ethical, Religious, Legal, and Cultural Issues in Tissue Banking 55
Aziz Nather, Ahmad Hafiz Zulkifly and Eileen Sim

Chapter 5 Setting Up a Tissue Bank 67
Aziz Nather and Chris C. W. Lee

Chapter 6 A Comprehensive Training System for Tissue Bank Operators — 10 Years of Experience 83
Aziz Nather, S. H. Neo and Chris C. W. Lee
Contents

Part III BASIC SCIENCE OF RADIATION 97

Chapter 7 Interaction of Radiation with Tissues
Norimah Yusof 99

Chapter 8 Types of Radiation and Irradiation Facilities for Sterilization of Tissue Grafts
Norimah Yusof, Noriah Mod Ali and Nazly Hilmy 109

Chapter 9 Radiation Killing Effects on Bacteria and Fungi
Norimah Yusof 121

Chapter 10 New Emerging Infectious Diseases Caused by Viruses and Prions, and How Radiation Can Overcome Them
Nazly Hilmy and Paramita Pandansari 133

Chapter 11 Effects of Gamma Irradiation on the Biomechanics of Bone
Aziz Nather, Ahmad Hafiz Zulkifly and Shu-Hui Neo 147

Chapter 12 Physical and Mechanical Properties of Radiation-Sterilized Amnion
Norimah Yusof and Nazly Hilmy 155

Part IV PROCESSING AND QUALITY CONTROL 169

Chapter 13 Dosimetry and Requirements for Process Qualification
Noriah Mod Ali 171

Chapter 14 Validation of Radiation Dose Distribution in Boxes for Frozen and Nonfrozen Tissue Grafts
Norimah Yusof 187

Chapter 15 Importance of Microbiological Analysis in Tissue Banking
Norimah Yusof and Asnah Hassan 201

Chapter 16 Validation for Processing and Irradiation of Freeze-Dried Bone Grafts
Nazly Hilmy, Basril Abbas and Febrida Anas 219
## Contents

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Validation for Processing and Irradiation of Amnion Grafts</td>
<td>237</td>
</tr>
<tr>
<td></td>
<td><em>Nazly Hilmy, Basril Abbas and Febrida Anas</em></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Validating Pasteurization Cycle Time for Femoral Head</td>
<td>249</td>
</tr>
<tr>
<td></td>
<td><em>Norimah Yusof and Selamat S. Nadir</em></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Radiation Sterilization Dose Establishment for Tissue Grafts — Dose Setting and Dose Validation</td>
<td>259</td>
</tr>
<tr>
<td></td>
<td><em>Norimah Yusof</em></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Quality System in Radiation Sterilization of Tissue Grafts</td>
<td>275</td>
</tr>
<tr>
<td></td>
<td><em>Nazly Hilmy</em></td>
<td></td>
</tr>
</tbody>
</table>

**Part V**  
**CLINICAL APPLICATIONS OF IRRADIATED BONE GRAFTS**  

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>Clinical Applications of Gamma-Irradiated Deep-Frozen and Lyophilized Bone Allografts — The NUH Tissue Bank Experience</td>
<td>305</td>
</tr>
<tr>
<td></td>
<td><em>Aziz Nather, Kamarul Ariffin Khalid and Zameer Aziz</em></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Use of Freeze-Dried Irradiated Bones in Orthopedic Surgery</td>
<td>317</td>
</tr>
<tr>
<td></td>
<td><em>Ferdiansyah</em></td>
<td></td>
</tr>
</tbody>
</table>

**Part VI**  
**CLINICAL APPLICATIONS OF IRRADIATED AMNION GRAFTS**  

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>The Use of Irradiated Amnion Grafts in Wound Healing</td>
<td>329</td>
</tr>
<tr>
<td></td>
<td><em>Menkher Manjas, Petrus Tarasaraya and Nazly Hilmy</em></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Amnion for Treatment of Burns</td>
<td>343</td>
</tr>
<tr>
<td></td>
<td><em>Hasim Mohamad</em></td>
<td></td>
</tr>
</tbody>
</table>
Contents

Chapter 25  Use of Freeze-Dried Irradiated Amnion in Ophthalmologic Practices 355
Nazly Hilmy, Paramita Pandansari, Getry Sukmawati Ibrahim, S. Indira, S. Bambang, Radiah Sunarti and Susi Heryati

Chapter 26  Clinical Applications of Irradiated Amnion Grafts: Use of Amnion in Plastic Surgery 365
Ahmad Sukari Halim, Aik-Ming Leow, Aravazhi Ananda Dorai and Wan Azman Wan Sulaiman

APPENDICES 381

Appendix 1  Asia Pacific Association of Surgical Tissue Banks (APASTB) Standards for Tissue Banking 383
Aziz Nather, Norimah Yusof, Nazly Hilmy, Yong-Koo Kang, Astrid L. Gajiwala, Lyn Ireland, Shekhar Kumta and Chang-Joon Yim


Appendix 3  The IAEA Program on Radiation and Tissue Banking — Public Awareness Strategies for Tissue Banks (2002) 501

Index 545