Blood Disorders in the Elderly

The developed world has an increasingly aging population, with approximately 10% of the population aged over 65 years. As the incidence and prevalence of blood disorders increases with age, these conditions are a heavy burden on healthcare systems.

Blood Disorders in the Elderly will provide hematologists, geriatricians, and all clinicians involved in the care of patients with blood disorders with clear clinical advice on the diagnosis and management of these conditions.

The introductory section reviews the epidemiology of aging and anemia, and provides a comprehensive approach to the management of cancer in the aging patient. This is followed by a full discussion of hematopoiesis and the changes it undergoes in aging. The remaining sections cover the diagnosis and management of all major disorders: anemia, malignancy, and hemostasis disorders, including hemophilia. A detailed chapter on antithrombotic therapies is also included.

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Blood Disorders
in the Elderly

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Every effort has been made in preparing this book to provide accurate and up-to-date information which is in accord with accepted standards and practice at the time of publication. Although case histories are drawn from actual cases, every effort has been made to disguise the identities of the individuals involved. Nevertheless, the authors, editors and publishers can make no warranties that the information contained herein is totally free from error, not least because clinical standards are constantly changing through research and regulation. The authors, editors and publishers therefore disclaim all liability for direct or consequential damages resulting from the use of material contained in this book. Readers are strongly advised to pay careful attention to information provided by the manufacturer of any drugs or equipment that they plan to use.
# Contents

## List of contributors  page vii

## Preface  page xi

## Part I  Epidemiology  

1 Epidemiology of aging 3  
Lodovico Balducci, William B. Ershler

2 Epidemiology of anemia in older adults 11  
Kushang V. Patel, Jack M. Guralnik

3 Cancer in the older person: a comprehensive approach 21  
Oscar A. Cepeda, Julie K. Gammack, John E. Morley

4 From fitness to frailty: toward a nosologic classification of the older aged person 39  
Lodovico Balducci, Claudia Beghe

## Part II  Hematopoiesis  

5 Stem cell exhaustion and aging 57  
Jeffrey Yates, Gary Van Zant

6 Hematopoietic microenvironment and age 71  
David N. Haylock, Susan K. Nilsson

7 Replicative senescence, aging, and cancer 84  
Rita B. Effros
## Contents

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Qualitative changes of hematopoiesis</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>France Laurencet</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Aging and hematopoietic stress</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>Lodovico Balducci, Cheryl L. Hardy</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Immunoglobulin response and aging</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>Yuping Deng, Stefan Gravenstein</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Biological and clinical significance of monoclonal gammopathy</td>
<td>138</td>
</tr>
<tr>
<td></td>
<td>Arati V. Rao, Harvey Jay Cohen</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Part III  Anemia of aging</strong></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Erythropoietin and aging</td>
<td>157</td>
</tr>
<tr>
<td></td>
<td>Andrew S. Artz</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Iron and aging</td>
<td>171</td>
</tr>
<tr>
<td></td>
<td>Elizabeta Nemeth, Tomas Ganz</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Prevalence and mechanisms of B₁₂ deficiency</td>
<td>181</td>
</tr>
<tr>
<td></td>
<td>Sally P. Stabler</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Consequences of chronic anemia in the older person</td>
<td>192</td>
</tr>
<tr>
<td></td>
<td>Lodovico Balducci</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>The pathogenesis of late-life anemia</td>
<td>203</td>
</tr>
<tr>
<td></td>
<td>Bindu Kanapuru, William B. Ershler</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Treatment of late-life anemia</td>
<td>214</td>
</tr>
<tr>
<td></td>
<td>William B. Ershler</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Part IV  Hematologic malignancies and aging</strong></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Cancer chemotherapy in the older person</td>
<td>225</td>
</tr>
<tr>
<td></td>
<td>Lodovico Balducci</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Acute myeloid leukemia in the elderly</td>
<td>237</td>
</tr>
<tr>
<td></td>
<td>Magda Melchert, Jeffrey Lancet</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Acute lymphoblastic leukemia in the elderly patient: diagnosis and therapy</td>
<td>256</td>
</tr>
<tr>
<td></td>
<td>Salvador Bruno, Fermina Mazzella, Oscar Ballester</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Multiple myeloma</td>
<td>272</td>
</tr>
<tr>
<td></td>
<td>Todd J. Alekshun, Melissa Alsina</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Non-Hodgkin lymphoma</td>
<td>290</td>
</tr>
<tr>
<td></td>
<td>Nicole Jacobi, Bruce A. Peterson</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Unusual lymphomas in the elderly</td>
<td>311</td>
</tr>
<tr>
<td></td>
<td>Youssef Gamal, Samuel Kerr, Thomas P. Loughran</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Chronic lymphocytic leukemia in the elderly</td>
<td>342</td>
</tr>
<tr>
<td></td>
<td>Alexander S. D. Spiers</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Polycythemia vera and idiopathic myelofibrosis in the elderly</td>
<td>370</td>
</tr>
<tr>
<td></td>
<td>Jerry L. Spivak</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Part V  Disorders of hemostasis in the elderly</strong></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Acquired hemophilia in the elderly</td>
<td>387</td>
</tr>
<tr>
<td></td>
<td>Francesco Budo, Francesco de Cataldo</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Blood coagulation and aging</td>
<td>406</td>
</tr>
<tr>
<td></td>
<td>Jozef Vemlyn, Marc F. Hoylaerts</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Platelet disorders in the elderly</td>
<td>420</td>
</tr>
<tr>
<td></td>
<td>Laura Terranova, Giancara Gerli, Marco Cattaneo</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Gene–environment interactions and vascular risk in the elderly</td>
<td>434</td>
</tr>
<tr>
<td></td>
<td>Daniela Mari</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Antithrombotic therapy: guidelines for the elderly</td>
<td>448</td>
</tr>
<tr>
<td></td>
<td>Chiara Cerletti, Holger Schunemann, Giovanni de Gaetano</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Index</strong></td>
<td>467</td>
</tr>
<tr>
<td></td>
<td><em>Color plate section appears between pages 236 and 237</em></td>
<td></td>
</tr>
</tbody>
</table>
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The aging of the population is the most consequential epidemiologic event of our times. The whole societal organization, including medicine and public health, needs to accommodate the evolving demographic landscape, and to focus on the management of chronic diseases, disability, and functional dependence, as well as on the most effective utilization of limited resources.

The management of an aging society is based on the twofold hypothesis that death cannot be indefinitely postponed, but disease and functional decline may be delayed until the latest stages of life. “Compression of morbidity” is the main goal of geriatric medicine, and it involves rehabilitation and provision of a supportive environment where the elder is able to thrive, in addition to medical care and disease prevention. The achievement of this goal implies the ability to define aging, and to estimate the risk of aging-related events such as death, disease, and disability, as well as the reversibility of this risk.

Perhaps the most complete definition holds aging as “loss of entropy” and “loss of fractality.” Loss of entropy implies a progressive decline in functional reserve of multiple organs and systems, and consequently reduced tolerance of stress, loss of fractality a progressive decline in the ability to coordinate different activities and to negotiate the environment. In the absence of precise measurements of entropy and fractality, aging is best assessed by its consequences, including progressive loss of function, emerging comorbidities, and the degree of chronic inflammation, reflected in the concentrations of inflammatory markers in the circulations. Chronology reflects very
poorly the physiologic age of each individual, which can only be estimated on the basis of individual assessment.

In *Blood Disorders of the Elderly* we propose a novel look at aging. By identifying the influence of aging on the development of blood disorders, and the influence of these disorders on the progression of aging, we acknowledge the dynamic, and to some extent circular, aspect of aging. Recognizing that the incidence and prevalence of blood disorders increases with age, we explore the possibility that the study of the blood may reveal an individual's age, and that the correction of blood disorders may limit the risk of aging-related events, including death, disease, and disability.

We elected to study blood disorders in the aged, because blood disorders are our area of expertise. Luckily, hematopoiesis and hemostasis are also a common crossroads of diseases and environmental stresses. So, it is not far-fetched to expect that the different events that contribute to individual aging leave their fingerprints on that individual's blood. It is well known, for example, that aging is associated with a progressive reduction of marrow cellularity, a progressive increase in the prevalence of myeloid dysplasia, and increased concentration of coagulation markers, such as the D-dimer, in the circulation. It is also well known that the hemoglobin levels and levels of circulating coagulation markers are related to the risk of death, disability, and cognitive decline.

Given the rapid accumulation of new information related both to blood disorders and to aging, and given the dynamic nature of aging, this book is conceived as a new clinical paradigm for physicians involved in the management of older patients, as a springboard for scientists interested in the biology of aging and its clinical consequences, and as an operating system able to organize incoming knowledge for students of biological, clinical, and social sciences.

The reception of this book will represent the best measure of our success in pursuing our goals. Irrespective of our personal success, however, we hope to have inspired other clinicians and scientists to take a new and novel look at aging that will be translated into new publications, new research projects, and new approaches to clinical practice.

We wish to thank Cambridge University Press for supporting this project, our coauthors for their hard work, and especially Anita Klamo for the difficult task of coordinating the different contributions.