This is a handbook of neonatal endocrinology. Our aim is to aid those caring for newborn babies in the diagnosis and management of suspected endocrine pathology. Interpretation of endocrine function in the newborn period can be difficult, because of the transition following hormonal influences of the mother and placenta. The situation is even more complex in infants born prematurely.

The unique format is clinically orientated from presentation, diagnosis, and management, including immediate, medium and long term. It clearly explains and describes how and when the samples should be taken, order of priority, sample volume required, length of time one can expect before results are available and normal values. This book gives guidance as to what to tell parents, providing addresses of support groups. This is very much a practical ‘hands-on, how-to’ approach with flow charts. It also provides a formula and investigation methodology section and a brief description of physiology.

Amanda Ogilvy-Stuart trained in paediatrics in Nottingham, Oxford, the Hospital for Sick Children Great Ormond Street, New Zealand, and Manchester, and trained in paediatric endocrinology in Manchester while studying for her DM thesis on the late effects of childhood cancer. This was followed by a post as a Clinical Lecturer in Paediatrics at the University of Oxford (based in the Neonatal Unit) where she commenced her research into the endocrinology of the newborn. She has been a Consultant Neonatologist in Cambridge since 1998.

Paula Midgley is Senior Lecturer at the University of Edinburgh where she combines Neonatology at the Simpson Centre for Reproductive Health with Outpatient Endocrinology at The Royal Hospital for Sick Children. She is researching perinatal adrenal function. Within the University of Edinburgh she has a major remit in planning and assessment in the undergraduate curriculum. She is also Associate Dean at the Royal College of Physicians of Edinburgh where she has been responsible for setting up, and now running a web-based programme in Continuing Medical Education.
Contents

Acknowledgements vii
Introduction ix

1 Hyperglycaemia 1
2 Hypoglycaemia 7
3 Management of hyperinsulinism 17
4 Hypoglycaemia in infant of a diabetic mother 27
5 Dysmorphic features 31
6 Micropenis 41
7 Hypopituitarism 45
8 Ambiguous genitalia (male): XY disorders of sex development 53
9 Cryptorchidism 63
10 Ambiguous genitalia (female): XX disorders of sex development 69
11 Pigmented scrotum 79
12 Adrenal failure 83
13 Collapse 93
14 Hypotension 95
15 Hyponatraemia 99
16 Hyperkalaemia 105
17 Hypernatraemia 111
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 Maternal steroid excess</td>
<td>121</td>
<td></td>
</tr>
<tr>
<td>19 Hypercalcaemia</td>
<td>127</td>
<td></td>
</tr>
<tr>
<td>20 Hypocalcaemia</td>
<td>133</td>
<td></td>
</tr>
<tr>
<td>21 Investigation and management of babies of mothers with thyroid disease</td>
<td>143</td>
<td></td>
</tr>
<tr>
<td>22 Maternal and familial thyroid disease</td>
<td>147</td>
<td></td>
</tr>
<tr>
<td>23 Goitre</td>
<td>157</td>
<td></td>
</tr>
<tr>
<td>24 Abnormal neonatal thyroid function tests</td>
<td>163</td>
<td></td>
</tr>
<tr>
<td>25 Hypothyroxinaemia in preterm infants</td>
<td>171</td>
<td></td>
</tr>
</tbody>
</table>

Appendix 1. Calculation of glucose infusion rate 177
Appendix 2. Dynamic tests 179
Appendix 3. Normal ranges 191
Appendix 4. Biochemistry samples 202
Appendix 5. Formulary 205
Index 213
Acknowledgements

We would like to thank those who have read through and commented on various parts of the manuscript including, Jeremy Allgrove, Gusztav Belteki, Jennifer Carson, Anna Curley, David Dunger, Ieuan Hughes, Khalid Hussain, Wayne Lam, Santosh Pattanayak, Madan Samuel, and Sudhin Thayyil. Thanks also to Anthony Norden, David Halsall and Patricia Crofton for advice on the samples.
Endocrine disease in the neonate is uncommon, but may be life threatening or have profound long-term consequences if not promptly recognized and treated. In addition, interpretation of endocrine function in the newborn period can be difficult, because of the transition following the hormonal influences of the mother and placenta. The situation is even more complex in infants born prematurely.

The aim of this handbook is to aid those caring for newborn babies in the diagnosis and management of suspected endocrine pathology. A number of flow charts are provided to clarify the diagnostic process. This book is designed to guide clinicians in the diagnostic process, but an endocrine specialist should be involved at an early stage, where an endocrine abnormality is strongly suspected.

We have given a guide to how and when samples should be taken, and provided a guide as to sample volumes, length of time one can expect before the results are available and normative values. However, these will vary between hospitals, methodology used, and whether samples need to be sent elsewhere for analysis. We have also provided a formulary of drugs used in neonatal endocrinology.

Amanda Ogilvy-Stuart
Paula Midgley