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Edited by Mark D. Kilby, Dick Oepkes and Anthony Johnson
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To those patients and families who entrust us with their most precious possession, their developing child and those that have been our teachers and mentors over the years. A special thank you to each of our families for their support, tolerance and understanding?
Mark Kilby, Anthony Johnston and Dick Oepkes.

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Frontmatter
[More information](#)

Contents

List of contributors ix
Foreword Charles Rodeck xiii
Preface xv

Section 1. General principles

1. **The rationale for fetal therapy** 1
Kenneth J. Moise Jr.

2. **Insights into pathogenesis of adult cardiovascular disease from fetal animal studies** 12
Lucy R. Green and Mark A. Hanson

3. **Human embryology: molecular mechanisms of embryonic disease** 24
Philippa Francis-West and Sana Zakaria

4. **Ethics of fetal therapy** 39
Frank A. Chervenak and Laurence B. McCullough

5. **Fetal therapy choices: about risks, emotions, and the doctor’s role in the decision-making process** 45
Danielle R. M. Timmermans

Section 2. Fetal disease: pathogenesis and principles

6. **Red cell alloimmunization** 55
Janet Brennand and Alan Cameron

7. **Fetal and neonatal alloimmune thrombocytopenia** 67
Khadija Madani and Dick Oepkes

8.1. **Fetal dysrhythmias: the effects of antiarrhythmic therapy on the immature heart** 78
Edgar Jaeggi, Nico A. Blom, and Tara Bharucha

8.2. **Fetal dysrhythmias: clinical management** 87
Julene S. Carvalho

9.1. **Structural heart disease: embryology** 100
Adriana C. Gittenberger-de Groot, Monique R. M. Jongbloed, Robert E. Poelmann, and Margot M. Bartelings

9.2. **Structural heart disease: genetic influences** 113
Catherine L. Mercer and David I. Wilson

9.3. **Structural heart disease: fetal cardiac interventions** 123
Wayne Tworetzky and Louise E. Wilkins-Haug

10.1. **Manipulation of amniotic fluid volume: homeostasis of fluid volumes in the amniotic cavity** 128
Marie H. Beall and Michael G. Ross

10.2. **Manipulation of amniotic fluid volume: oligohydramnios and polyhydramnios** 137
Tak Yeung Leung and Stephen Sik Hung Suen

11.1. **Twin-to-twin transfusion syndrome: scientific basis** 145
Caroline E. Fox, Enrico Lopriore, and Mark D. Kilby

11.2. **Twin-to-twin transfusion syndrome: placental circulation** 156
Geoffrey A. Machin

11.3. **Twin-to-twin transfusion syndrome: cardiovascular manifestations** 166
Shari L. Wellen and Jack Rychik

11.4. **Twin-to-twin transfusion syndrome: treatment by fetoscopic laser ablation** 173
Gihad E. Chalouhi, Abdullah Al Ibrahim, Mohammed Essaoui, and Yves Ville

11.5. **Twin-to-twin transfusion syndrome: management of stage I disease** 184
Ramesha Papanna and Kenneth J. Moise Jr.

12.1. **Twin reversed arterial perfusion (TRAP) sequence: pathophysiology** 187
Martin A. Weber and Neil J. Sebire

12.2. **Twin reversed arterial perfusion (TRAP) sequence: in-utero treatment** 193
Diana L. Farmer and Katrine M. Løfberg

Contents

13.1. Fetal infections: immune responses to congenital infections 200 Ariane Huygens and Arnaud Marchant	18.2. Intrauterine growth restriction: differential diagnosis and management 355 Fergus P. McCarthy and John Kingdom
13.2. Fetal infections: clinical management 208 Guillaume Benoist, Marianne Leruez-Ville, François Jacquemard, and Yves Ville	19.1. Congenital diaphragmatic hernia: pathophysiology 370 Nicola A. Lewis and Philip L. Glick
14.1. Fetal urinary tract obstruction: pathophysiology 238 Robert L. Chevalier	19.2. Congenital diaphragmatic hernia: clinical antenatal management 376 Jan Deprest, Jaan Toelen, Philip De Koninck, Jute Richter, Alexander Engels, Paul Brady, Kypros Nicolaides, Eduard Gratacos, Filip Claus, Dick Tibboel, and Roland Devlieger
14.2. Fetal urinary tract obstruction: prenatal assessment and prognosis 246 Nahla Khalek and Mark P. Johnson	20.1. Fetal stem cell transplantation: stem cell biology basics 389 Jon Frampton
14.3. Fetal urinary tract obstruction: fetal cystoscopy 253 Rodrigo Ruano, Anthony Johnson, and Mark D. Kilby	20.2. Fetal stem cell transplantation: clinical potential 397 Magnus Westgren and Cecilia Götherström
14.4. Fetal urinary tract obstruction: in-utero intervention 261 R. Katie Morris and Mark D. Kilby	20.3. Fetal stem cell transplantation: fetal tissue engineering 407 Fabienne L. Gray and Dario O. Fauza
15.1. Fetal lung growth, development, and lung fluid: physiology and pathophysiology 271 Richard Harding, Foula Sozo, Takushi Hanita, and Cheryl Albuquerque	21. Gene therapy: physiological principles and clinical potential 417 Vedanta Mehta and Anna L. David
15.2. Fetal lung growth, development, and lung fluid: clinical management of pleural effusion and pulmonary pathology 282 Kirsten Grabowska and R. Douglas Wilson	22. The future: fetal therapy and translational studies: global alignment, coordination, and collaboration in perinatal research: The Global Obstetrics Network (GONet) initiative 433 Ben W. Mol (on behalf of the GONet collaborators) and Mark D. Kilby
16.1. Neural tube defects: pathophysiology and prevention 301 Sarah Clements, Daniel Challis, and Debra Kennedy	
16.2. Neural tube defects: clinical management 311 Leslie N. Sutton	
17.1. Fetal tumors: pathophysiology 320 Martin A. Weber and Neil J. Sebire	
17.2. Fetal tumors: clinical management 329 Sundeep G. Keswani and Timothy M. Crombleholme	
18.1. Intrauterine growth restriction: placental basis and implications for clinical practice 341 John Kingdom, Melissa Walker, Sascha Drewlo, and Sarah Keating	

Glossary 440
Index 442
The videos referred to in Chapters 6 and 11.4 can be found at www.cambridge.org/9781107012134.

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Foreword

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The history of fetal medicine has run a disorderly course, lacking in synchronicity. A landmark date is 1963, when William Liley published the first example of direct fetal therapy, intra-peritoneal blood transfusion for rhesus alloimmunization. This was long before the ultrasound technology that we regard as a *sine qua non*, and that we take for granted, was available. How much safer and more effective would the procedure have been with ultrasound guidance, at a time when hemolytic disease of the fetus was fairly common. Not long afterwards, rhesus prophylaxis was introduced and the condition became less frequent, just as its treatment with intravascular transfusion improved. It has now become so rare that it is difficult to provide training and to maintain skills.

Since then, there have been revolutions not only in ultrasound, but also in the laboratory sciences of biochemistry, cell culture, genetics, and molecular biology. These were embraced by fetal medicine, first for diagnosis and then for population screening and prevention of fetal conditions. Overwhelmingly, these are the main pre-occupations of fetal medicine and take place in all hospitals in the context of antenatal care. Fetal therapy has represented a far smaller area of activity (although the love affair of the media for fetal surgery might make one think otherwise!). The reasons for this include the complexity and formidable nature of some of the interventions, the relatively rare indications and opportunities for performing them, and

the limited availability of the necessary skills and facilities. The accumulation of knowledge and experience has therefore been slow and rightly has been restricted to highly specialized centers. There is, as yet, no definitive treatment for genetic disease, pre- or postnatally, and the understanding of the molecular basis for malformations is insufficiently advanced to design preventive strategies.

This volume comprehensively surveys the current status of fetal therapy. The words in the title "Scientific Basis and Critical Appraisal" are reflected in the contents, with greater emphasis on scientific methodology, systematic reviews, and randomized controlled trials than in the past. The editors are to be congratulated on the planning and organization of their book and on eliciting outstanding contributions from their authors. They will be essential companions for fetal medicine practitioners and trainees for some years to come.

In an ideal world, every child is a wanted child, and for parents the arrival of a healthy baby is a wonderful event. For those less fortunate, the detection of a fetal abnormality is a massive challenge. The goal of fetal medicine is to help parents decide which is the best option for them, often the least bad option. Parents who willingly continue a pregnancy with an affected fetus, and especially if the pathology has been cured or ameliorated by therapeutic intervention, are a triumph for the practitioners caring for them.

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Preface

This textbook is intended to draw together key aspects of the ever-advancing field of fetal therapy and has contributions from specialists in a range of related disciplines. It is directed at postgraduate trainees as well as designated specialists and subspecialists.

Fetal Medicine has continued to advance as a subspecialty over the last twenty years and has embraced methods of fetal assessment and treatment ranging from non-invasive techniques to direct in-utero intervention (including ultrasound directed “needle placement” techniques and direct visualization of the fetus, allowing minimally invasive therapy).

Ever since the widespread introduction and use of ultrasound in obstetrics, clinicians have been able to visualize their second patient, the fetus. This has allowed Fetal Medicine to develop so that increasingly ambitious and intricate interventions can be applied. However, in some areas our understanding of the pathogenesis of fetal disease has lagged behind our ability to intervene and attempt to ameliorate the life-threatening effects of congenital disease.

This volume has chapters from international experts in the field and focuses on aspects of transplacental therapy and both ultrasound and fetoscopic-directed interventions all utilized to treat a range of fetal disease. Case cohort studies provide an increasing body of literature and systematic reviews have allowed critical appraisal of fetal therapy, yet at the beginning of the twenty-first century, there remains a paucity of evidence from randomized controlled trials. Such data would provide an essential contribution directing evidence-based management.

This textbook sub-divides into chapters describing the pathogenesis of disease processes, treatment involving transplacental drug therapy, invasive procedures and fetal surgery. Its aim is to emphasize those treatments which have become established in clinical practice, reviewing the reasons why some therapy has failed to live up to its promise and, where possible, to review the literature systematically. Defining the boundaries of fetal therapy will always be controversial and, of course, its efficacy has to be judged in the light of the potential effects on maternal health. As a generalization, this statement is true, but it is particularly so when considering the use of ever more ambitious fetoscopic techniques. There is an important section on the ethics of in-utero therapy, a rapidly changing and highly important field, which must be considered by specialists intending to practice fetal therapy.

The text is written by authors who are all working at the “cutting edge” of their respective fields. Fetal therapy is complex and the techniques should be delivered in designated centres where the quantity of cases allows the development of a skill base. Audit and research must fuel momentum and progress within this field.

I am personally very grateful to my co-editors, Dr. Dick Oepkes and Dr. Tony Johnson and indeed all contributors to this textbook. I hope that these articles aid education and progress in this fascinating and rewarding medical specialty.

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