

Williams

OBSTETRICS

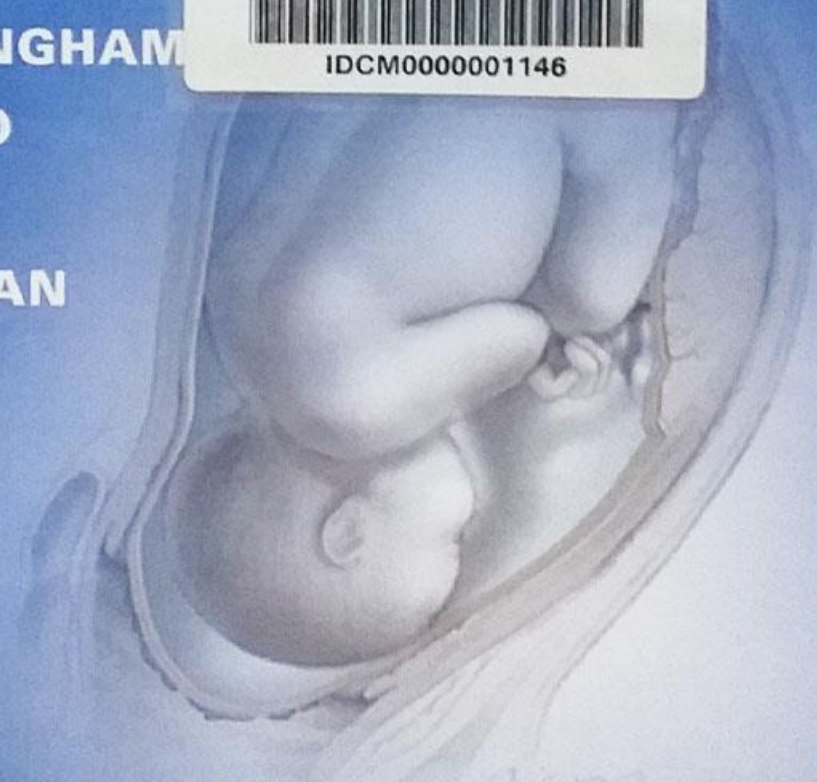
INTERNATIONAL EDITION

CUNNINGHAM
LEVENO
DASHE
HOFFMAN
SPONG
CASEY

ILOILO DOCTORS' COLLEGE
Library



IDCM0000001146



**Mc
Graw
Hill**

26TH EDITION

Williams
OBSTETRICS

NOTICE

Medicine is an ever-changing science. As new research and clinical experience broaden our knowledge, changes in treatment and drug therapy are required. The authors and the publisher of this work have checked with sources believed to be reliable in their efforts to provide information that is complete and generally in accord with the standards accepted at the time of publication. However, in view of the possibility of human error or changes in medical sciences, neither the authors nor the publisher nor any other party who has been involved in the preparation or publication of this work warrants that the information contained herein is in every respect accurate or complete, and they disclaim all responsibility for any errors or omissions or for the results obtained from use of the information contained in this work. Readers are encouraged to confirm the information contained herein with other sources. For example and in particular, readers are advised to check the product information sheet included in the package of each drug they plan to administer to be certain that the information contained in this work is accurate and that changes have not been made in the recommended dose or in the contraindications for administration. This recommendation is of particular importance in connection with new or infrequently used drugs.

Williams Obstetrics, Twenty-Sixth Edition

Copyright © 2022 by McGraw Hill. All rights reserved. Printed in the United States of America. Except as permitted under the United States Copyright Act of 1979, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a data base or retrieval system, without the prior written permission of the publisher.

Copyright © 2018 by McGraw-Hill Education.
Copyright © 2014 by McGraw-Hill Education.
Copyright © 2010, 2005, 2001 by the McGraw-Hill Companies, Inc.
Copyright © 1997, 1993, 1989 by Appleton & Lange
Copyright © 1985 by Appleton-Century-Crofts
Copyright © 1971 by Meredith Corporation
Copyright © 1961, 1956, 1950 by Appleton-Century-Crofts, Inc.
Copyright © 1946, 1941, 1936 by D. Appleton-Century-Co., Inc.
Copyright © 1930, 1923, 1917, 1912, 1909, 1907, 1904, 1903, 1902 by D. Appleton and Company.
Copyright © 1964 by Florence C. Stander
Copyright © 1951 by Anne W. Niles
Copyright © 1935, 1940 by Caroline W. Williams
Copyright © 1930, 1931, 1932 by J. Whitridge Williams

1 2 3 4 5 6 7 8 9 LWI 27 26 25 24 23 22

MHID: 1-264-59843-2
ISBN: 978-1-264-59843-4

The book was set in Adobe Garamond by Aptara, Inc.
The editors were Jason Malley and Christie Naglieri.
The production supervisor was Richard Ruzyczka.
Project management was provided by Indu Jawwad, Aptara, Inc.
The designer was Alan Barnett.
The cover designer was W2 Design.

Library of Congress Cataloging-in-Publication Data

Names: Cunningham, F. Gary, editor.
Title: Williams obstetrics / editors, F. Gary Cunningham, Kenneth J. Leveno, Jodi S. Dashe, Barbara L. Hoffman, Catherine Y. Spong, Brian M. Casey.
Description: Twenty-sixth edition. | New York : McGraw Hill, [2022] | Includes bibliographical references and index. | Summary: "This landmark text begins with fundamental discussions of reproductive anatomy and physiology. These dovetail into clinical chapters covering obstetrical complications such as preterm labor, pregnancy-related infection, hemorrhage, and hypertension, among others. Representing the culmination of a century of clinical thought, the new twenty-sixth edition is enhanced by more than 1,000 full-color illustrations plus an increased emphasis on the fast-growing subspecialty of maternal-fetal medicine"— Provided by publisher.
Identifiers: LCCN 2021039955 | ISBN 9781260462739 (hardcover) | ISBN 9781260462746 (ebook)
Subjects: MESH: Obstetrics—methods
Classification: LCC RG525 | NLM WQ 100 | DDC 618.2—dc23
LC record available at <https://lcn.loc.gov/2021039955>

McGraw Hill books are available at special quantity discounts to use as premiums and sales promotions or for use in corporate training programs. To contact a representative, please visit the Contact Us pages at www.mhprofessional.com.

EDITORS

F. Gary Cunningham, MD

Professor, Department of Obstetrics and Gynecology
University of Texas Southwestern Medical Center
Parkland Health and Hospital System
Dallas, Texas

Kenneth J. Leveno, MD

Professor, Department of Obstetrics and Gynecology
University of Texas Southwestern Medical Center
Parkland Health and Hospital System
Dallas, Texas

Jodi S. Dashe, MD

Professor, Department of Obstetrics and Gynecology
University of Texas Southwestern Medical Center
Medical Director of Prenatal Diagnosis
Parkland Health and Hospital System
Dallas, Texas

Barbara L. Hoffman, MD

Distinguished Professor in Obstetrics and Gynecology,
in Honor of F. Gary Cunningham, M.D.
University of Texas Southwestern Medical Center
Parkland Health and Hospital System
Dallas, Texas

Catherine Y. Spong, MD

Paul C. MacDonald Distinguished Chair in Obstetrics and
Gynecology
Professor and Chair, Department of Obstetrics and Gynecology
Chief, Division of Maternal-Fetal Medicine
University of Texas Southwestern Medical Center
Parkland Health and Hospital System
Dallas, Texas

Brian M. Casey, MD

Professor, Department of Obstetrics and Gynecology
Vice Chair, Obstetrics
Director, Division of Maternal-Fetal Medicine
University of Alabama at Birmingham

DR. F. GARY CUNNINGHAM



Editor of *Williams Obstetrics* 18th through 26th Editions

In the early 1970s, as I was finishing my residency at Charity Hospital of New Orleans, the 14th edition of *Williams Obstetrics* was published. The residents in our program were totally enamored with the textbook because it was a clinical manual derived from the editors' personal experiences and from contemporary, evidence-based literature.

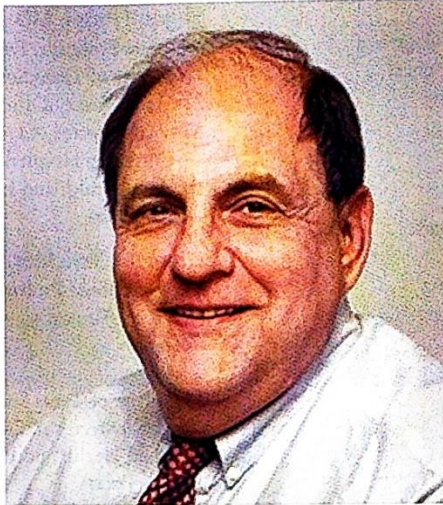
During my last year, my chairman, Dr. Abe Mickal, invited me to attend a national meeting where I first met four obstetricians who would have an immeasurable impact on my life—Drs. Jack Pritchard, Paul MacDonald, Norman Gant, and Peggy Whalley. Following that, I was invited to Dallas to spend time at the University of Texas Southwestern and Parkland Hospital. As I followed Dr. Pritchard through Labor & Delivery and his clinical research laboratory, I became hooked on “Parkland Obstetrics” and later that year began a fellowship that was the nascent subspecialty of Maternal-Fetal Medicine. It also began a lifelong friendship with Jack Pritchard that I will always treasure.

Beginning with the 15th edition of *Williams Obstetrics*, the author-editors were Drs. Pritchard, MacDonald, and Gant.

After publication of the 17th edition, these mentors asked me to assume the senior editor role. I was immediately struck by the awesome responsibility of shepherding the book that many people called “the bible of obstetrics.”

Over the years, and now as we publish this 26th edition, I reflect on the evolution of obstetrics, and hence the complexity of sustaining a textbook designed to cover the breadth of obstetrics. As essential fields such as sonography, genetics, and fetal medicine were developed, we enlisted the help of extremely talented leaders in their respective fields to ensure that the book adequately presented these innovations. As for my role in this and other editions, I can only promise the readers that the quality of the book has been foremost in my mind and led me to spend literally tens of thousands of hours to help prepare the past nine editions. To this end, the editors have always strived to put the best product forward because of the tremendous responsibility that we shoulder regarding the care of women and their unborn children. The textbook has been one of the great passions in my life, and I will miss the challenge.

DEDICATION



KENNETH LEVENO, MD

1941–2020

Dr. Kenneth Leveno was a vocal and stalwart defender of evidence-based obstetrics. Sadly, he passed away in May 2020. Ken joined the Department of Obstetrics & Gynecology at the University of Texas Southwestern after completing a Maternal–Fetal Medicine fellowship in 1978. In 1984, he was appointed Chief of Obstetrics at Parkland Memorial Hospital—a role in which he served for the next 20 years. During that time and afterwards, he worked tirelessly to achieve a level of excellence in obstetrical care for indigent women of Dallas County. His inspiring leadership and innovations raised the quality of care at the community obstetrics clinics, the high-risk prenatal clinics at Parkland, and the inpatient units, which include the Obstetrical Triage Unit, Labor & Delivery, postpartum wards, and the High-Risk Pregnancy Unit. Early on, he also designed a computerized database to measure quality indicators and provide an underpinning for clinical research.

Indeed, his contributions to these programs were reverently referred to by us as *Parkland Obstetrics*.

Ken Leveno's leadership extended well beyond the hospital that he loved. He was a leader in American obstetrics by his defining of clinical research. Through his hundreds of peer-reviewed publications, his clinical opinions, and his willingness to engage in national debates, he helped shape obstetrical practices worldwide. In 1993, Ken began serving as an editor for *Williams Obstetrics*—a task that he regarded as a privilege and a responsibility. He co-authored the 19th through the current 26th editions. Last and importantly, he mentored the careers of many Maternal–Fetal Medicine fellows and young faculty who have gone on to achieve national reputations in the care of women. Ken will be greatly missed.

The Editors

ASSOCIATE EDITORS

Mala S. Mahendroo, PhD

Professor, Department of Obstetrics and Gynecology and
Green Center for Reproductive Biological Sciences
University of Texas Southwestern Medical Center
Dallas, Texas

David B. Nelson, MD

Dedman Family Scholar in Clinical Care
Associate Professor, Department of Obstetrics and
Gynecology
University of Texas Southwestern Medical Center
Chief of Obstetrics
Parkland Health and Hospital System
Dallas, Texas

Shivani Patel, MD

Associate Professor, Department of Obstetrics and Gynecology
University of Texas Southwestern Medical Center
Assistant Quality Officer, Health Systems Affairs
Medical Director of Obstetrics, William P. Clements Jr.
University Hospital
Parkland Health and Hospital System
Dallas, Texas

Diane M. Twickler, MD, FACR

Dr. Fred Bonte Professorship in Radiology
Professor, Department of Radiology and of Obstetrics and
Gynecology
Vice Chairman at Large for Radiology
University of Texas Southwestern Medical Center
Medical Director of Obstetrics and Gynecology Ultrasonography
Parkland Health and Hospital System
Dallas, Texas

CONTRIBUTING AUTHORS

Emily H. Adhikari, MD

Assistant Professor, Department of Obstetrics and Gynecology
University of Texas Southwestern Medical Center
Medical Director of Perinatal Infectious Diseases
Parkland Hospital and Hospital System
Dallas, Texas

Donald D. McIntire, PhD

Biostatistician
Professor, Department of Obstetrics and Gynecology
University of Texas Southwestern Medical Center
Dallas, Texas

Wilmer Moreno, MD

Assistant Professor, Department of Obstetrics and Gynecology
University of Texas Southwestern Medical Center
Parkland Health and Hospital System
Dallas, Texas

David M. Owen, MD, PhD

Assistant Professor, Department of Obstetrics and Gynecology
University of Texas Southwestern Medical Center
Parkland Health and Hospital System
Dallas, Texas

Weike Tao, MD

Professor, Department of Anesthesiology and Pain Management
University of Texas Southwestern Medical Center
Parkland Health and Hospital System
Dallas, Texas

C. Edward Wells, MD

Professor, Department of Obstetrics and Gynecology
University of Texas Southwestern Medical Center
Parkland Health and Hospital System
Dallas, Texas

Myra H. Wyckoff, MD

Professor, Department of Pediatrics
University of Texas Southwestern Medical Center
Director, Newborn Resuscitation Services
Parkland Health and Hospital System
Dallas, Texas

CONTENTS

Preface	xiii
Acknowledgments	xv

SECTION 1

OVERVIEW

1. Overview of Obstetrics.....	2
--------------------------------	---

SECTION 2

MATERNAL ANATOMY AND PHYSIOLOGY

2. Maternal Anatomy.....	12	4. Maternal Physiology.....	51
3. Congenital Genitourinary Abnormalities	31		

SECTION 3

PLACENTATION, EMBRYOGENESIS, AND FETAL DEVELOPMENT

5. Implantation and Placental Development.....	82	7. Embryogenesis and Fetal Development.....	121
6. Placental Abnormalities.....	107		

SECTION 4

PRECONCEPTIONAL AND PRENATAL CARE

- | | | | |
|---|-----|-------------------------|-----|
| 8. Teratology, Teratogens, and Fetotoxic Agents | 144 | 10. Prenatal Care | 175 |
| 9. Preconceptional Counseling | 164 | | |

SECTION 5

FIRST- AND SECOND-TRIMESTER PREGNANCY LOSS

- | | | | |
|--|-----|---|-----|
| 11. First- and Second-Trimester Pregnancy Loss | 198 | 13. Gestational Trophoblastic Disease | 235 |
| 12. Ectopic Pregnancy | 220 | | |

SECTION 6

THE FETAL PATIENT

- | | | | |
|---|-----|---------------------------------------|-----|
| 14. Obstetrical Imaging | 246 | 17. Prenatal Diagnosis | 332 |
| 15. Normal and Abnormal Fetal Anatomy | 272 | 18. Fetal Disorders | 352 |
| 16. Genetics | 308 | 19. Fetal Therapy | 367 |
| | | 20. Antepartum Fetal Assessment | 383 |

SECTION 7

LABOR

21. Physiology of Labor.....	398	24. Intrapartum Assessment.....	446
22. Normal Labor.....	417	25. Obstetrical Analgesia and Anesthesia ...	467
23. Abnormal Labor.....	433	26. Induction and Augmentation of Labor ..	486

SECTION 8

DELIVERY

27. Vaginal Delivery.....	498	30. Cesarean Delivery and Peripartum Hysterectomy.....	547
28. Singleton Breech Delivery.....	518	31. Prior Cesarean Delivery.....	571
29. Operative Vaginal Delivery.....	533		

SECTION 9

THE NEWBORN

32. The Newborn.....	586	34. The Preterm Newborn.....	615
33. Complications of the Term Newborn....	599	35. Stillbirth.....	624

SECTION 10

THE PUERPERIUM

36. The Puerperium.....	634	38. Contraception.....	664
37. Puerperal Infection.....	649	39. Sterilization.....	681

SECTION 11

OBSTETRICAL COMPLICATIONS

40. Preeclampsia Syndrome	688	45. Preterm Birth	783
41. Clinical Management of the Preeclampsia Syndrome	711	46. Postterm Pregnancy	815
42. Causes of Obstetrical Hemorrhage	731	47. Fetal-Growth Disorders	823
43. Hemorrhagic Placental Disorders.....	749	48. Multifetal Pregnancy.....	838
44. Management of Obstetrical Hemorrhage.....	770		

SECTION 12

MEDICAL AND SURGICAL COMPLICATIONS

49. General Considerations and Maternal Evaluation	866	59. Hematological Disorders.....	1048
50. Critical Care and Trauma.....	881	60. Diabetes Mellitus	1068
51. Obesity.....	902	61. Endocrine Disorders	1089
52. Cardiovascular Disorders.....	915	62. Connective Tissue Disorders	1109
53. Chronic Hypertension.....	944	63. Neurological Disorders.....	1126
54. Pulmonary Disorders.....	956	64. Psychiatric Disorders.....	1142
55. Thromboembolic Disorders	975	65. Dermatological Disorders.....	1154
56. Renal and Urinary Tract Disorders	994	66. Neoplastic Disorders.....	1162
57. Gastrointestinal Disorders.....	1012	67. Infectious Diseases	1182
58. Hepatic, Biliary, and Pancreatic Disorders.....	1030	68. Sexually Transmitted Infections	1206

APPENDIX

Serum and Blood Constituents	1127	Sonographic Measurements of the Embryo and Fetus	1234
Maternal Echocardiographic Measurements.....	1233	Index.....	1245

PREFACE

Over its 26 editions, *Williams Obstetrics* has aimed to serve practicing obstetricians and midwives in the bedside care of their patients. With its detailed explanations of disease pathophysiology and treatment fundamentals, it provides a bedrock text for residents who are training in Obstetrics or in Family Medicine specialties. Fellows in Maternal–Fetal Medicine will benefit from its additional discussions of complicated pathology and management. Last, *Williams Obstetrics* can aid specialists who act as consultants for gravidas with non-pregnancy-related disorders. Specifically, each chapter in Section 12 focuses on a specific organ system, the normal physiological changes and frequent disorders of that system in pregnancy, and suitable treatment options.

For this 26th edition, we continue to present the detailed staples of basic obstetrics such as maternal anatomy and physiology, preconceptional and prenatal care, labor, delivery, and the puerperium. These accompany detailed discussions of obstetrical complications exemplified by preterm labor, hemorrhage, hypertension, and many more. To emphasize the “M” in Maternal–Fetal Medicine, we continue to instruct on the many medical and surgical disorders that can complicate pregnancy. And, our second patient—the fetus—has accrued especial attention with an entire section devoted to diagnosis and treatment of fetal disorders. For all of these, we once again emphasize the science-based practice of clinical obstetrics. Expert clinical pearls add depth to these discussions and are written for busy practitioners—those “in the trenches.” To integrate all our content, the reader of one chapter may be referred to a different chapter that contains complementary content. This offers a more global understanding of a given topic.

To accomplish our teaching goals, the text has been updated with more than 3000 new literature citations through 2021. Many of the nearly 900 figures are new, and these graphs, sonograms, magnetic resonance images, photographs, photomicrographs, and data graphs are all in vivid color. Much of the original artwork was rendered by our own medical illustrators.

As before, we continue to incorporate contemporaneous guidelines from professional and academic organizations such as the American College of Obstetricians and Gynecologists, the Society for Maternal–Fetal Medicine, the Centers for Disease Control and Prevention, the National Institutes of Health, and other authoritative sources. Many of these data are distilled into nearly 100 tables, in which information has been arranged in an easy read-and-use format. In addition, several diagnostic and management algorithms are available to quickly guide practitioners. Although we strive to cite numerous sources and provide multiple evidence-based options for such management schemes, we also include our own clinical experiences drawn from the large obstetrical service at Parkland Hospital. We are convinced that these are disciplined examples of evidence-based obstetrics but quickly acknowledge that they do not constitute the sole method of management.

F. Gary Cunningham
Kenneth J. Leveno
Jodi S. Dashe
Barbara L. Hoffman
Catherine Y. Spong
Brian M. Casey

ACKNOWLEDGMENTS

In the creation and production of this textbook, we were fortunate to have the assistance and support of countless talented professionals both within and outside the Department of Obstetrics and Gynecology. To begin, we acknowledge that an undertaking of this magnitude would not be possible without the unwavering support provided by our recent Chairman Dr. Steven Bloom and Vice-Chairman Dr. Barry Schwarz, whose financial and academic endorsement has been essential. Dr. Bloom has served as an editor for the 22nd through 25th editions but now has assumed the important role of Associate Dean of Clinical Sciences at the University of Texas Southwestern Medical Center.

In constructing such an expansive academic compilation, the expertise of many colleagues was needed to add vital, evidence-based content. It was indeed fortuitous for us to have access to a trove of collaborators from our medical center. From our own Department of Obstetrics and Gynecology, Dr. Shivani Patel was essential to the production of our book and is an invaluable addition to our team. We benefitted from her obstetrical expertise, writing talent, and ability to translate difficult concepts into teaching pearls. Faculty with specific expertise included Dr. Claudia Werner, who lent valuable insight into the management of cervical dysplasia. Our nationally known pelvic anatomist, Dr. Marlene Corton, prepared graphic masterpieces for the anatomy chapter with artist Lew Calver. We also are grateful to the numerous faculty and residents who added seminal clinical photographs to our text.

In addition to these contributors, we relied heavily on our colleagues in the Division of Maternal–Fetal Medicine. These professionals, in addition to providing expert consultation, graciously assisted us by covering clinical duties when writing and editing were especially time consuming. These include Drs. Scott Roberts, Oscar Andujo, Vanessa Rogers, Charles Brown, Julie Lo, Robyn Horsager, Patricia Santiago-Muñoz, Mark Peters, Elaine Duryea, Jamie Morgan, Morris Bryant, Shena Dillon, Anne Ambia, Robert Martin, Robert Stewart, Stephan Shivvers, Ashley Zink, Sarah Happe, and Christina Herrera.

We also emphasize that production of *Williams Obstetrics* would not be feasible without the help of our Maternal–Fetal Medicine fellows and our residents in Obstetrics and Gynecology. Their insatiable curiosity serves to energize us to find new and effective ways to convey age-old truths, new data, and cutting-edge concepts. Their logical and critical questions lead us to weaknesses in the text, and thereby always help us to improve our work. In addition, we sincerely thank them for their vigilance in capturing photographs of spectacular examples of both obstetrical pathology and normal findings.

This edition is heavily populated with seminal examples of sonographic findings. We are grateful for the efforts of Mary Gibbs, RDMS; Rafael Levy, RDMS; Michael Davidson,

RDMS; and the many talented sonographers at Parkland Hospital.

Thanks to generous funding from the McGraw-Hill Companies, this 26th edition now contains more than 200 color illustrations. Most of these were crafted by several skilled medical illustrators who include Ms. Marie Sena, Ms. Erin Frederickson, and Ms. SangEun Cha. All of these talented artists trained here at UT Southwestern under the instruction of Mr. Lewis Calver. Additional artistic support came from Mr. Joseph Varghese, Ms. Shreya Tiwari, Dr. Sudhi Singh, and Mr. Manoj Kumar Choudhry. Their work at Thomson Digital provided the full-color graphs and line art used to enhance this edition. Their team tirelessly coordinated efforts between author and artist and graciously accommodated our numerous changes and tweaks.

Production of the 5000-page manuscript would not have been possible without a dedicated team. Once again, we are deeply indebted to Ms. Dawn Wilson and Ms. Melinda Epstein for their untiring efforts with manuscript production. Ms. Regina Williams also provided excellent, cheerful, conscientious manuscript assistance. Mr. Charles Richards offered knowledgeable and responsive information technology support. For these and many more that go unnamed, we could not have done our job without their expertise.

It again has been a privilege to work with the dedicated professionals from McGraw-Hill Education. We have had the pleasure to work with Executive Editor Mr. Jason Malley in production of our textbook and are grateful for his support of *Williams Obstetrics*. Senior Project Development Editor Ms. Christie Naglieri has again brought her considerable knowledge to this edition of our book. Her dedication to creating the best textbook supported our efforts, and we appreciate her productive, gracious style. We thank Ms. Leah Carton, who provided professional, timely, and ever-sunny aid. Mr. Richard Ruzicka served as production supervisor for this edition of the textbook, and our book benefits from his years of experience.

Our text took its final shape under the watchful care of our composers at Aptara, Inc. We thank Ms. Indu Jawwad for her talents in graciously and masterfully coordinating and overseeing composition. Her dedicated attention to detail and organization were vital to completion of our project. She has created many editions with us, and we consider her an essential team member. At Aptara, Mr. Mahender Singh carried out the crucial task of quality control. He also assisted, along with Mr. Rajesh Chander, Mr. Kamlesh Bhatt, and Mr. Anil Varghese, in creating beautiful chapter layouts to highlight our content aesthetically and informatively. This edition's chapters were also posted and available online for use prior to print publication. We thank Mr. Braj Bhushan and Mr. Ashish Kumar Sharma for preparing this content so brilliantly. Special thanks go to Mr. Greg Feldman. As copyeditor, Greg added

xvi Acknowledgments

precision and clarity to our efforts. His endurance and pleasant professionalism through many challenging chapters has made our text better.

Last, we acknowledge our significant debt to the women who have entrusted themselves and their unborn children to us for obstetrical care. The clinical expertise and many images provided in this text would not have been possible without their collaborative spirit to help us advance obstetrical knowledge. We also offer enthusiastic and heartfelt appreciation to our families and friends. Without their

patience, generosity, love, and encouragement, this task would have been impossible.

F. Gary Cunningham
Kenneth J. Leveno
Jodi S. Dashe
Barbara L. Hoffman
Catherine Y. Spong
Brian M. Casey

SECTION 1
OVERVIEW



CHAPTER 1

Overview of Obstetrics

VITAL STATISTICS	2
PREGNANCY RATES IN THE UNITED STATES	3
OBSTETRICAL CARE MEASURES	4
TIMELY TOPICS IN OBSTETRICS	6
REFERENCES	8

The science and clinical practice of obstetrics focuses on human reproduction. The specialty promotes the health and well-being of the pregnant woman and her fetus through quality perinatal care. Such care entails recognition and treatment of complications, supervision of labor and delivery, initial care of the newborn, and management of the puerperium. Postpartum care promotes health and provides family planning options.

Evidence-based medicine dominates the modern practice of obstetrics. As described by Williams in this textbook's first edition, we too strive to present the scientific evidence for current obstetrical care. Still, high-quality data do not support most recommendations (Brock, 2021). Thus, much of our practice stems from expert-based opinions and historical experiences (Society for Maternal-Fetal Medicine, 2021). To help bridge knowledge gaps, we also rely on authoritative sources such as the American College of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine, as well as agencies such as the Centers for Disease Control and Prevention (CDC) and National Institutes of Health (NIH).

VITAL STATISTICS

The importance of obstetrics is demonstrated by the use of maternal and neonatal outcomes as an index of health and

life quality among nations. Intuitively, indices showing poor obstetrical and perinatal outcomes could be assumed to reflect medical care deficiencies for the entire population.

The National Vital Statistics System of the United States collects statistics on births and deaths, including fetal deaths. Legal authority for collection resides individually with the 50 states; two regions—the District of Columbia and New York City; and five territories—American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, and the Virgin Islands. The standard birth certificate includes information on medical and lifestyle risks, labor and delivery factors, and newborn characteristics. Importantly, the current death certificate contains a pregnancy checkbox (Hoyert, 2020).

■ Definitions

Standard definitions are encouraged by the World Health Organization as well as the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists (2019a). Uniformity allows data comparison between states or regions and between countries. Still, not all definitions are uniformly applied. For example, uniformity is incomplete among states regarding birthweight and gestational age criteria for reporting fetal deaths (American College of Obstetricians and Gynecologists, 2020a). Not all states follow this recommendation. Specifically, 28 states stipulate that losses beginning at 20 weeks' gestation should be recorded as fetal deaths; eight states report all products of conception as fetal deaths; and still others use a minimum birthweight of 350 g, 400 g, or 500 g to define fetal death. To further the confusion, the National Vital Statistics Reports tabulates fetal deaths from pregnancies that are 20 weeks' gestation or older (Centers for Disease Control and Prevention, 2020a). This is problematic because the 50th percentile for fetal weight at 20 weeks approximates 325 to 350 g—considerably less than the 500-g definition. In fact, a birthweight of 500 g corresponds closely with the 50th percentile for 22 weeks' gestation.