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Williams OBSTETRICS

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Williams OBSTETRICS

24TH EDITION

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



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Williams Obstetrics, Twenty-Fourth Edition

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DEDICATION

These are trying times for academic medicine. They are especially vexing for departments of obstetrics and gynecology. Combined with draconian funding shortages, there is burdensome oversight with sometimes meaningless regulations as well as myriad forms and paperwork foisted upon us by an ever-increasing but already bloated bureaucracy. Despite these seemingly overwhelming challenges, the chairs of academic departments and the directors of residency training programs resiliently continue to emphasize the basics that are fundamental to academic training. It is to these stalwart individuals that we dedicate this 24th edition of *Williams Obstetrics*.

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16

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115

PREFACE

This 24th edition of *Williams Obstetrics* has been extensively and strategically reorganized. Primarily writing for the busy practitioner—those “in the trenches”—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, along with detailed discussions of obstetrical complications exemplified by preterm labor, hemorrhage, hypertension, and many more. Once again, we emphasize the scientific-based underpinnings of clinical obstetrics with special emphasis on biochemical and physiological principles of female reproduction. And, as was the hallmark of previous editions, these dovetail with descriptions of evidence-based practices. The reorganized format allows a greater emphasis on the fetus as a patient along with expanded coverage of fetal diagnosis and therapy. These changes are complemented by more than 100 new sonographic and magnetic resonance images that display normal fetal anatomy and common fetal anomalies. Finally, to emphasize the “M” in maternal–fetal medicine, we continue to iterate the myriad medical and surgical disorders that can complicate pregnancy.

To accomplish these goals, the text has been updated with more than 3000 new literature citations through 2014. Moreover, there are nearly 900 figures that include sonograms, MR images, photographs, micrographs, and data graphs, most in vivid color. Much of the original artwork was rendered by our own medical illustrators.

In this edition, 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 National Institutes of Health, and the Centers for Disease Control and Prevention, among others. Many of these data are distilled into almost 100 newly constructed tables, in which information has been arranged in a format that is easy to read and use. In addition, several diagnostic and management algorithms have been added to guide practitioners. While we strive to cite numerous sources to provide multiple evidence-based options for such management schemes, we also include our own clinical experiences drawn from a large obstetrical service. As usual, while we are convinced that these are disciplined examples of evidence-based obstetrics, we quickly acknowledge that they do not constitute the sole method of management.

This 24th edition shows a notable absence of four colleagues who provided valuable editorial assistance for prior volumes of *Williams Obstetrics*. From the University of Alabama at Birmingham, Dr. John Hauth, who served as an editor for the 21st through 23rd editions, has now directed his efforts to research endeavors. Dr. Dwight Rouse, an associate editor of the 22nd and an editor of the 23rd edition, has assumed a clinical and research role at Brown University. We will cer-

tainly miss their insightful wisdom concerning the vicissitudes of randomized controlled trials and their true meanings! Colleagues leaving us from the University of Texas Southwestern Medical Center include Dr. George Wendel, Jr.—associate editor for the 22nd and 23rd editions—who has now assumed the important role of overseeing development of Maintenance of Certification for the American Board of Obstetrics and Gynecology. And leaving for practice in Montana is Dr. Jim Alexander, who served as a contributing editor for the 23rd edition. These talented clinicians provided valuable knowledge, both evidence-based and from the bedside.

To fill the shoes of these departing stalwart colleagues, we have enlisted four new editors—all from UT Southwestern Medical Center—each of whom has expertise in important areas of contemporaneous obstetrics and maternal–fetal medicine. Dr. Jodi Dashe—who contributed extensively to the 21st through 23rd editions—joins us as editor and brings her extensive experiences and incredible skills with obstetrical sonography, fetal diagnosis, and prenatal genetics. Dr. Barbara Hoffman brings widespread clinical knowledge regarding general obstetrics and contraception as well as embryology, anatomy, and placental pathology. Dr. Brian Casey adds his in-depth obstetrical and research experience, with special interests in diabetes, fetal-growth disorders, and thyroid physiology. Dr. Jeanne Sheffield joins us with her knowledge and clinical acumen and research interests in maternal medical disorders, critical care, and obstetrical and perinatal infections.

There are also two returning associate editors who continue to add considerable depth to this textbook. Dr. Diane Twickler uses her fantastic experiences and knowledge regarding clinical and technological advances related to fetal and maternal imaging with ultrasonography as well as with x-ray and magnetic resonance techniques. Dr. Mala Mahendroo is a talented basic scientist who continues to perform a magnificent job of providing a coherent translational version of basic science aspects of human reproduction. Finally, four new contributing editors round out the editorial team that make this book possible. Drs. Kevin Worley and Seth Hawkins bring additional strengths to the areas of clinical and academic maternal–fetal medicine. Dr. Don McIntire provided much of the data garnered from the extensive database that chronicles the large obstetrical service at Parkland Hospital and UT Southwestern Medical Center. Mr. Lewis Calver continues to do an impeccable job of supervising and rendering new artwork for this and prior editions. In toto, the strength of each contributor has added to create the sum total of our academic endeavor.

F. Gary Cunningham
Kenneth J. Leveno
Steven L. Bloom

ACKNOWLEDGMENTS

During 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 Dr. Barry Schwarz, whose financial and academic endorsement has been essential.

In constructing such an expansive academic compilation, the expertise of many colleagues was needed to add vital and contemporaneous information. It was indeed fortuitous for us to have access to a pantheon of contributors here as well as from other academic medical centers. From the University of Texas Southwestern Medical Center, Dr. April Bailey of the Departments of Radiology and Obstetrics and Gynecology added insights and provided illustrative maternal and fetal magnetic resonance images. These were further complimented by other visual contributions from Drs. Elysia Moschos, Michael Landay, Jeffrey Pruitt, and Douglas Sims. From the Department of Pathology, Drs. Kelley Carrick and Brian Levenson generously donated exemplary photomicrographs. From the Department of Dermatology, Dr. Amit Pandya provided a number of classic figures. From the Division of Urogynecology, our nationally known pelvic anatomist, Dr. Marlene Corton, prepared graphic masterpieces for the anatomy chapter. Drs. Claudia Werner and William Griffith lent valuable insight into the management of cervical dysplasia. Much of the Appendix of this textbook was originally compiled by Drs. Mina Abbassi-Ghanavati and Laura Greer. Finally, clinical photographs were contributed by many current and former faculty and fellows, including Drs. Patricia Santiago-Muñoz, Julie Lo, Lisa Halvorson, Kevin Doody, Michael Zaretsky, Judith Head, David Rogers, Sunil Balgobin, Manisha Sharma, Michael Hnat, Rigoberto Santos-Ramos, Shayzreen Roshanravan, April Bleich, and Roxane Holt.

Several contributions were made by our national and international colleagues. Experts in placental pathology who shared their expertise and images include Drs. Kurt Benirschke, Ona Marie Faye-Petersen, Mandolin Ziadie, Michael Conner, Jaya George, and Erika Fong. Input for hypertensive disorders was provided by Drs. Marshall Lindheimer and Gerda Zeeman and for operative vaginal delivery by Dr. Edward Yeomans. Seminal images were contributed by Drs. Timothy Crombleholme, Togas Tulandi, Edward Lammer, Charles Read, and Frederick Elder.

In addition to these contributors, we relied heavily on numerous other colleagues and coworkers for their intellectual and clinical input. Specifically, we cite the entire Division of Maternal–Fetal Medicine, whose faculty, in addition to providing expert content, graciously assisted us to cover clinical duties when writing and editing were especially time consuming. These include Drs. Scott Roberts, Oscar Andujo, Vanessa Rogers, Morris Bryant, Stephan Shivvers, Stephanie Chang, Robyn Horsager, Patricia Santiago-Muñoz, Julie Lo, Ashley Zink, Ed Wells, and Mark Peters.

We also note that production of *Williams Obstetrics* would not be feasible without the help of our maternal–fetal medicine fellows and 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. For example, included in this edition are photographs contributed by Drs. Elaine Duryea, Stacey Thomas, Jonathan Willms, Kara Ehlers, Nidhi Shah, Abel Moron, Kyler Elwell, Rebecca Stone, Angela Fields, Emily Adhikari, and Elizabeth Mosier.

Thanks to generous funding from the McGraw-Hill Companies, this 24th edition now contains more than 200 color illustrations. Most of these were crafted by several skilled medical illustrators, including Ms. Marie Sena, Ms. Erin Frederikson, Ms. Mollie Gove, Mr. Jordan Pietz, Ms. SangEun Cha, and Ms. Jennifer Hulsey. All of these talented artists trained here at UT Southwestern under the tutelage of Mr. Lewis Calver. Additional artistic support came from Mr. Joseph Varghese, Ms. Dharmesh Thakur, and their team at Thomson Digital, who provided the full-color graphs and line art used to enhance this edition. They were aided by medical-content expert Dr. Shetoli Zhimomi, who precisely translated our academic vision to each image. 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 to bring these efforts together. Once again, we are deeply indebted to Ms. Connie Utterback for her untiring efforts as production coordinator. She received able assistance with manuscript production from the Dallas group that included Ms. Melinda Epstein, Ms. Dawn Wilson, Ms. Marsha Zint, Ms. Minnie Tregaskis, Ms. Dina Trujillano, and Ms. Ellen Watkins. Information technology support was provided by the very knowledgeable and responsive Mr. Charles Richards and Mr. Thomas Ames. For these and many more that go unnamed, we could not have done our job without their expertise.

It again has been a privilege and a pleasure to work with the dedicated professionals from McGraw-Hill Education. Ms. Alyssa Fried has brought her considerable intelligence, energetic work ethic, and creativity to this edition of *Williams Obstetrics*. Her dedication to creating the best textbook possible equaled our efforts, and we are in awe of her unflappable, productive, and gracious style. Mr. Peter Boyle shepherded our book through production. We greatly appreciate his calm and efficient efforts. Mr. Richard Ruzycka served as production supervisor for this edition of the textbook. He skillfully kept our project on track through an array of potential hurdles. Last, we have had the pleasure to work with Mr. Armen Ovsepyan

in coordinating the artwork for many of our editions. His organization and efficiency are unrivaled.

Our text took its final shape under the watchful care of our compositors at Aptara, Inc. We thank Ms. Indu Jawwad for her talents in skillfully coordinating and overseeing composition. Her dedicated attention to detail and organization were vital to completion of our project. Also at Aptara, Mr. Mahender Singh served a crucial task of quality control and assisted in creating beautiful chapter layouts to highlight our content aesthetically and informatively.

Finally—but certainly not last—we acknowledge our significant debt to the women who have allowed us to participate in their care. The clinical expertise and many graphic illustrations presented 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, and encouragement, this task would have been impossible.

The Editors

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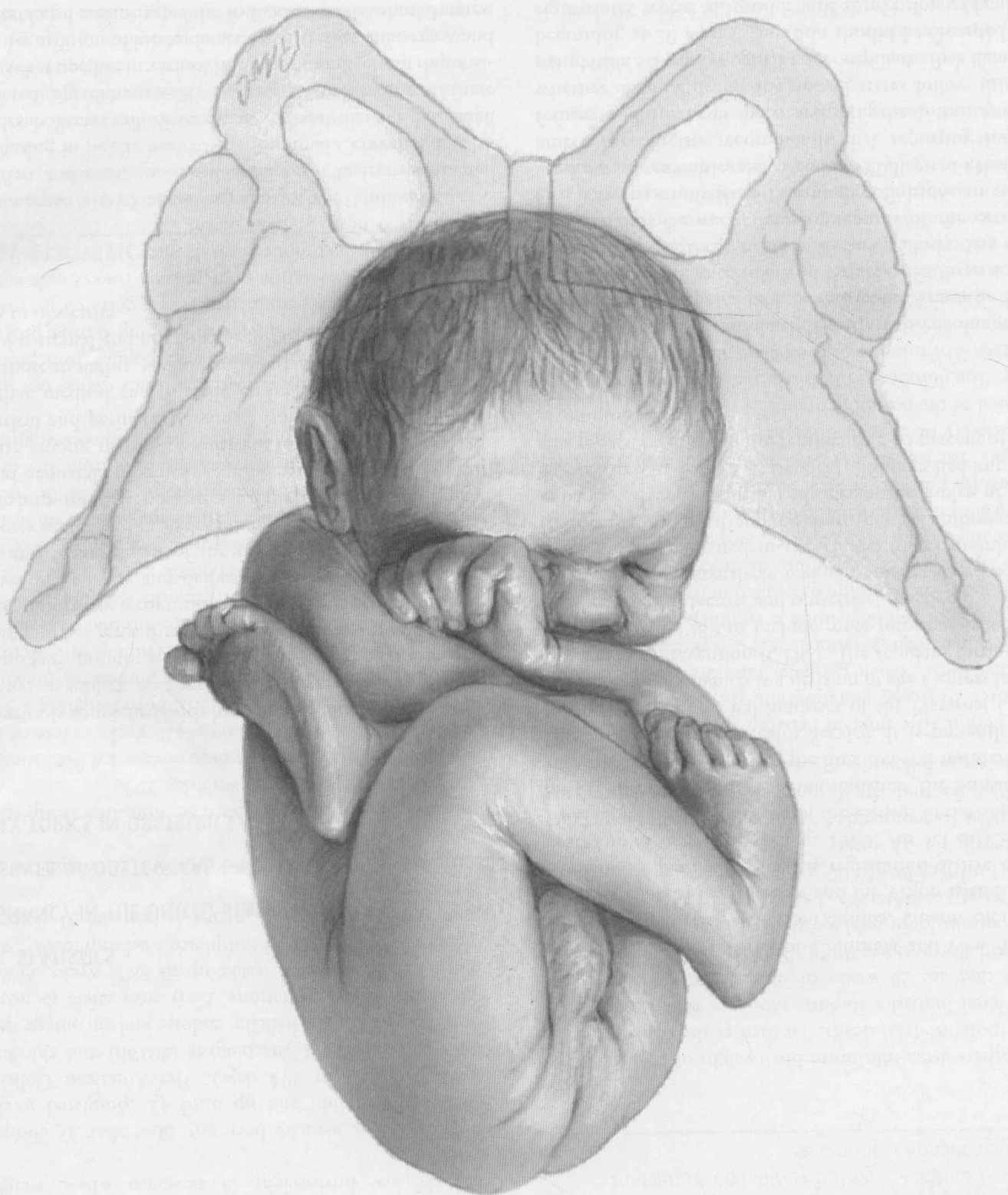
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OVERVIEW

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