EVIDENCE-BASED HANDBOOK OF NEONATOLOGY

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editor

William Oh

*The Warren Alpert Medical School
of Brown University, USA*

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*This book is dedicated to
my wife, Mary,
who enthusiastically supported my career over the years;
and, to
my children and grandchildren, Ken, Amy, Laurie, Travis,
Katie, Kristen, Matthew, Thomas, Malia, and Tyler.*

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Foreword

In 1975, the American Board of Pediatrics established the first sub-board certification for neonatology. Prior to that, our field was largely the purview of boutique clinical services in prestigious universities where pediatric, obstetric and related disciplines had a special interest in the care of high-risk and critically ill newborns. Our discipline has grown substantially in both its academic impact and the scope of research conducted. We have witnessed extraordinary advances in the care of our patients and families. There may be four epochs or four major “sea of changes” in our discipline. The first would surely be the creation of the subspecialty certification itself, while the second, I would argue was the licencing and clinical use of surfactant. The third is the widespread use of antenatal steroids, motivated by the NIH Consensus Conference. The final “sea of change” may well be the widespread adoption of the single-family model of newborn intensive care. While we have all experienced extraordinary improvements in the survival of ever-smaller and more delicate infants, their neurodevelopmental outcomes leave room for improvement. This new model of care may in fact be the next “sea of change” to have the greatest impact.

As our specialty has grown, it has also matured academically. We have come to pride ourselves on the widespread use of evidence-based practice. In our clinical and teaching roles, we strive to guide current care into new and better approaches of caring for our patients and their families using an evidence basis for decision making. In this handbook, Dr. William Oh, one of the pioneers of our discipline, has brought together

expertise from a large number of colleagues to outline current evidence-based practice. By choosing topics that are important, contemporary and yes, even controversial, and outlining the rationale for care, they are helping us to move our discipline forward. We look forward to exciting future developments, to additional controversies, to continuing opportunities to interact with the trainees and the students who have given us so much inspiration and to improving the care and the lives of our patients and families.

James F. Padbury, MD

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Preface

For the past six decades, neonatology has emerged as a vibrant subspecialty of pediatrics. Basic science and translational research in Perinatal Biology, and their application to clinical trials have generated a large amount of data that allow for implementation of evidence-based interventions for various neonatal ailments. The result is a significant improvement in survival rates among high-risk infants, particularly the very low birth weight infants. In fact, during this time period, the neonatal mortality rates in the United States have declined from approximately 20/1000 in the 1950s to the current estimate of 7/1000 in live births. Similar declines in neonatal mortality rate have also occurred in many developed and developing countries around the world.

The downside of this phenomenon is that while survival rates have improved markedly among the very low birth weight infants, their late morbidities and neurodevelopmental outcomes have not been as favorably affected. This is in part due to the application of interventions that have not been thoroughly tested for their efficacy and the adverse effects resulting in the lack of improvement of the illness; in the worse scenarios they produced injuries to various organ systems including the lung and central nervous systems. The delay in recovery accounts for the prolonged hospital stay associated with inadequate nutrition and, in the absence of family-centered care, deprivation of parental bonding. Injury to central nervous systems, inadequate nutrition, and lack of parental bonding result in neurodevelopmental impairment among survivors. This observation clearly illustrates the importance of practicing evidence-based

medicine, using intervention and management that have been tested in appropriately designed clinical trials. The purpose of this handbook is to present evidence-based management strategies for various common clinical problems in the newborn infants.

By nature of being a handbook, this publication is not meant to be all-inclusive as in a textbook of neonatology. There are several well-respected textbooks of neonatal and perinatal medicine that the readers can use. The main goal of this handbook is to present pathophysiology and management of common ailments affecting the newborn. I selected topics based on three guiding principles: (1) the ailments affect a large number of newborn infants; (2) the topics have new developments; and (3) the subject is somewhat controversial, particularly with reference to management. I have assembled a group of authors who were former fellows or close colleagues at Brown Medical School and in other major academic institutions to write the 21 chapters in this handbook. Each of the authors is expert in his/her field who can provide specific and authoritative comments on the subject. They thrive to use as much available evidence in the literature as possible which in part accounts for the lengthy reference list.

I hope that this handbook will provide useful information to the clinicians and other care providers in the field of neonatology in our quest to continue the trends of improving outcomes both in terms of survival and quality of survivors.

William Oh, MD

Editor

2010

Contents

Foreword	vii
Preface	ix
List of Contributors	xv
Part I The Fetus	1
Chapter 1: Prenatal Diagnosis <i>Barbara M. O'Brien and Katharine D. Wenstrom</i>	3
Chapter 2: Effects of Maternal Medication on the Fetus and Newborn <i>Donald R. Coustan and Roman Starikov</i>	25
Part II Transitional Period	41
Chapter 3: Delivery Room Management of the Newborn Infant <i>Maximo Vento</i>	43
Chapter 4: Transitional Care of the Newborn <i>Mara G. Coyle</i>	73

Part III	Diseases of the Newborn	93
Chapter 5:	Acute Respiratory Disorders in the Neonates <i>Yuh-Jyh Lin and Tsu-Fuh Yeh</i>	95
Chapter 6:	Bronchopulmonary Dysplasia: Present Knowledge and Future Directions <i>Ilene R. S. Sosenko and Eduardo Bancalari</i>	119
Chapter 7:	Respiratory Care of the Newborn <i>John Kelleher and Waldemar A. Carlo</i>	145
Chapter 8:	Congenital Heart Diseases in the Newborn <i>Lloyd R. Feit and Sara R. Ford</i>	171
Chapter 9:	Patent Ductus Arteriosus in Preterm Infant <i>Ronald I. Clyman</i>	201
Chapter 10:	Common Gastrointestinal Disorders <i>Rajan Wadhawan</i>	219
Chapter 11:	Blood Disorders of the Newborn <i>Ted Rosenkrantz</i>	241
Chapter 12:	Fluid and Electrolyte Management of Very Low Birth Weight Infants <i>Stephen Baumgart</i>	267
Chapter 13:	Nutritional Support of the High-Risk Infant <i>Jae H. Kim and Richard J. Schanler</i>	291
Chapter 14:	Neonatal Hypocalcemia and Neonatal Hypercalcemia <i>Ran Namgung and Reginald C. Tsang</i>	317
Chapter 15:	Neonatal Jaundice <i>Thor Willy Ruud Hansen</i>	339
Chapter 16:	Neonatal Infectious Diseases <i>Ira Adams-Chapman and Barbara J. Stoll</i>	373
Chapter 17:	Brain Injury in Preterm and Term Infants <i>Seetha Shankaran</i>	397

Chapter 18:	Retinopathy of Prematurity: Current Concepts in Pathogenesis and Treatment <i>Joseph M. Bliss</i>	419
Chapter 19:	Neonatal Surgery <i>François I. Luks</i>	439
Part IV	Follow-Up Care of High-Risk Infants	465
Chapter 20:	Follow-Up Assessment of High-Risk Infants <i>Betty R. Vohr and Bonnie E. Stephens</i>	467
Chapter 21:	Medical Care of NICU (Neonatal Intensive Care Unit) Graduates <i>Bonnie E. Stephens, Leslie T. McKinley and Betty R. Vohr</i>	489
<i>Index</i>		513

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