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Neonatal Anesthesia. Edited by Jerrold Lerman, M.D. New York, Springer, 2015. Pages: 458. Price: $129.00.

Like a well-executed anesthetic, a new textbook should be timely, relevant, expert, and elegant, informed by history with an eye toward the future. *Neonatal Anesthesia*, edited by Jerrold Lerman, with contributions from a distinguished expert international group of specialists in pediatric anesthesia, neonatology, critical care, and surgery, is just that. In an exhaustive but approachable 458 pages, the text wonderfully balances theory and practice, providing perspectives from history and contemporary inquiry.

Timely

Advancing the state of knowledge from its 1988 predecessor of the same title by Cook and Marcy, Lerman's book stands alone as an up-to-date text dedicated exclusively to the practice of anesthesia in neonates, a topic frequently relegated to a chapter in a larger book on the general practice of pediatric anesthesia. As such, it bears a heavy burden and carries it well. Despite some unchanging physiologic and anatomic factors contributing to morbidity and mortality of the neonate, advances in technology, understanding of pharmacology, and anesthetic care may improve patient safety and reduce morbidity as we push the boundaries of viability in the premature infant. Lerman's text nicely highlights the complexities and advancements influencing neonatal care and equips the anesthesiologist with strategies for managing even the smallest preemie. And with the relatively recent implementation of pediatric anesthesiology as a board-certified subspecialty, the book takes on an additional layer of timeliness for those seeking expert review in preparation for certification demonstrating expertise in the care of our youngest and most uniquely vulnerable patients. To its credit, for all readers, from traditionalists to millennials, the text reads well on both paper and an e-reader format.

Relevant

Understanding that some of the greatest burden of risk is borne by those who care for neonates in the operating room, our meticulous practice must be informed by a balance of historical wisdom and current literature. *Neonatal Anesthesia* presents a robust blend of theory and practice with respect to the care of the neonate: practical approaches to management balanced with physiology and ongoing research. The chapter on anesthesia outside of the operating room acknowledges the growing demand for off-site surgical, diagnostic, and interventional procedures and provides strategies for management of neonates in this newer frontier filled with unique challenges. With procedures in the neonatal intensive care unit becoming more commonplace, the authors' discussion of surgery while on extracorporeal membrane oxygenation is a welcome one, as the anesthesiologist may find himself or herself comanaging an extracorporeal membrane oxygenation circuit during congenital diaphragmatic hernia repair for the most unstable neonate. The text does not shy away from approaching sensitive and unresolved topics head on such as neurotoxicity. Like an expert teacher, Lerman's text is not afraid to identify that which we do not fully know and entices the reader to follow current literature in the quest for understanding complex phenomena such as anesthesia and the developing brain.

Expert

With an impressive cast of contributing authors, among its 17 chapters, several stand out. The introductory chapter by the incomparable David Steward offers a vibrant summary of the history of pediatric anesthesia, with an immediacy that stems from his personal relationships with some of the key actors in clinical advances in the 20th century, such as Jackson Rees and Digby Leigh, as well as his personal knowledge gleaned from practice during the evolution of intubation, ventilator, anesthesia machine, and monitoring technology. Equally outstanding are the pharmacology chapter and the neonatal airway management chapter. The latter two are distinguished by clear and thorough coverage of developmental pharmacology and anatomy with the airway chapter affording specific practice strategies for safe and effective management of both routine and difficult neonatal airways. Innovations such as high-frequency oscillatory ventilation are explained clearly in the chapter on neonatal ventilation, which might still benefit from the addition of flow-volume loops to clarify the nuances of these newer modes of ventilation. The midsection of the book offers chapters on anesthesia related to specific organ systems and provides well-informed approaches for the most common procedures. *Neonatal Anesthesia*'s references throughout are extensive and recent, inviting the reader to continue his or her own inquiry. Instead of its remarkably expert authors digressing into the abyss of the esoteric, the text is far from self-indulgent—it presents material with clarity and purpose in both knowledge and practice.

Elegant

The text covers its subject matter in extraordinary breadth and depth. Topics range from the concrete to the philosophical, from the science of physiology and pharmacology to the delights of history of the discipline and its ethical considerations. Of particular note are the clear and beautiful cardiovascular illustrations of congenital heart disease, which elegantly distill complex physiology and anatomy to stunning visuals that would catch the eye of even the most exhausted trainee. Throughout the book there are illustrative and clinically relevant diagrams, nicely supporting and summarizing relevant text for the more visual learner. *Neonatal Anesthesia* also elegantly anticipates what the reader most wants to

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know with a logical flow, opening with a strong foundation of history, physiology, and pharmacology, on which is built a structure of soundly informed clinical practice.

Future Directions

There are a number of topics not covered in *Neonatal Anesthesia* that might be worth adding in future editions. Missing from the text are in-depth discussions of neonatal resuscitation, fetal anesthesia and EXIT procedures, and the care of conjoined twins, who may require anesthesia in the neonatal period in preparation for separation. A more robust discussion of regional anesthesia with regard to test dosing and lipid rescue would be welcomed in subsequent editions, as would consideration of the implications of residual morbidity in the formerly premature infant on future anesthetic care. A few audiovisual complements to the text may be of value, as increasingly popular enhanced online materials such as videos of regional anesthetic techniques or airway management may benefit some readers. The addition of an electronic test bank would be greatly appreciated by those practitioners preparing for subspecialty board examination.

All in all, Lerman's *Neonatal Anesthesia* is a sophisticated but approachable text that offers its readers theory-based practical approaches to understanding and managing anesthesia in our youngest, most fragile patient population. And almost no one can argue against ensuring the very best care for those who hold the future in their hands.

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Smartphone Application Review: The Airway Assessment App (V. 4.0.0). Created by Monica Galindo Palazuelos and Carlos Marente Tamayo. Last Update June 4, 2015. Software Application for Google Android Devices with Version 2.3 and Up. Price: $1.87.

The past few years have brought about a considerable and dramatic increase in the number of mobile medical applications. We are practicing in an exciting time for technology and innovation to impact the way we care for patients. The ubiquitous presence of smartphones in today's healthcare arena means that providers can have instantaneous access to a wealth of information including electronic health records, clinical references, educational materials, and medical journals. The *Airway Assessment App (V. 4.0.0)* is a smartphone application developed to help healthcare providers rate the difficulty of an airway. While this may sound like a useful application, a review of the app demonstrates that it is flawed and further underscores the call for more rigorous oversight before using apps in clinical practice.

The *Airway Assessment App* is a software application designed for the Google Android device. As of the time of this article, there was no version available for Apple devices such as the iPhone or iPad. This is an interesting choice in application development since many surveys claim that more than 80% of healthcare providers use an Apple smartphone. Once the *Airway Assessment App* was downloaded from the Google Store, installation was seamless and opening the app was intuitive. It is not clear from the app description, however, who the authors consider the main audience for the app.

When opening the app, the user is immediately brought to a page that most clinicians familiar with airway management would recognize as six different factors that may be used to describe an airway. These factors are as follows: Mallampati score, upper lip bite test, thyromental distance, sternomental distance, interincisor gap, and neck mobility. The app then asks the user to provide a score for each of the different factors in a structured format. For example, the Mallampati factor in the app could be a 0 to 3 value, where 0 would correlate with a Mallampati score of 1. Other factors such as the upper-lip bite test could be scored on a 0 to 2 scale. The application then sums the score and provides an "assessment" of the difficulty of the airway. After this "assessment" and scoring, the user has the option of filling out other variables such as the patient name, age, gender, body mass index, medical record number, the Cormack–Lehane grade, and an e-mail address that can be used to export the results. The application can be used in English and Spanish.

While there are many factors to consider when reviewing a smartphone application, such as user interface and usability, it is probably best to start with just seeing if the application does what it is intended to do. In order to "test the app," I engaged a colleague and conducted an airway assessment using the app. With a Mallampati score of 1, ability to bite the upper lip easily, good thyromental distance, and good neck mobility, the airway assessment app calculated a score of "3," which was then defined as an "Easy Airway." My own individual assessment of my colleague's airway, independent of the app, would also describe the airway as "reassuring." So far so good!

To further explore the limits of the application, however, I simulated different airways to determine what the app defined as "easy" or "difficult." The *Airway Assessment App* seemed to define any calculated score of greater than or equal to 5 as a "difficult airway." This cutoff was true for a variety of different combinations of airway variables, even some that many would not judge as "difficult." For example, the Airway Assessment App would designate a Mallampati score of 2, thyromental distance of 2 fingerbreadth, moderate interincisor gap, and moderate neck mobility with being unable to bite the upper lip as a "difficult airway." In a real clinical scenario, it is unlikely that a clinician would consider this a "difficult airway." Changing these variables to make