United States has dedicated considerable effort during the past two decades to unravelling the remarkable complexities of the neonatal electroencephalogram (EEG). In spite of these efforts, the level of understanding of the EEG of neonates among anesthesiologists, neonatologists, pediatricians, pediatric neurologists and even highly specialized clinical electroencephalographers has remained disappointingly low. Clearly, there was a need for a teaching compendium providing a practical, understandable, up-to-date, clinically oriented overview of this topic. The *Atlas of Neonatal Electroencephalography* by Werner, Stockard and Bickford of the Department of Neurosciences, University of California at San Diego, fills this need well.

The first four chapters of the atlas deal with: the polygraphic techniques for monitoring the cerebral activity and other pertinent electrophysiologic modalities in the newborn; the features of neonatal sleep–wake states and the development of such states in the premature and newborn at term; the ontogenesis of the EEG of the premature; the nature and significance of alterations of the EEG and other electrophysiologic indices in various pathologic conditions. These chapters provide a succinct, competent and lucid summary of the most significant, pertinent, multilingual literature. Each topic is abundantly and elegantly illustrated by figures depicting technically impeccable and competently interpreted recordings. To overcome the problem of the loss of detail inherent in the illustration of 16-channel records, some figures include insets portraying enlargements of details of special interest. The illustrations are accompanied by clear headings, additional narrative comments, and terse legends that effectively convey concepts at times difficult to explain. Simple charts summarize the most important developmental changes. Guidelines for interpreting the normal neonatal EEG are given, along with descriptions of criteria for determining the infant's conceptional age and state and evaluating the EEG in relation to both these characteristics. Special effort is made to delineate criteria for differentiating normal from abnormal patterns without indulging in oversimplification. The authors clearly acknowledge the diagnostic limitations of the neonatal EEG, but emphasize its prognostic usefulness. The significances of individual EEG alterations are discussed in this context and a few clinical conditions are explored in special depth by providing brief case histories illustrated by logic and pathologic findings. A classification of the main features of the neonatal EEG is briefly described.

This part of the atlas has only minor flaws. Figures 1–25 are not presented sequentially. Some electroencephalographers may question the use by the authors of frontal electrodes in non-standard locations, a choice for which no explanation is given. Others may doubt the adequacy of an electrode system that is routinely limited to nine scalp electrodes, although the placement of additional leads whenever appropriate is clearly advocated by the authors. However, the technical standards set by this volume are exemplary and well worth imitating.

Surprisingly, the last chapter, on computer techniques in neonatal EEG, is of more limited scope and caliber than those preceding it. No attempt is made to summarize the literature in this area. Thus, major contributions such as the analyses by H. Prechtl and his associates in Groningen of the statistical properties and interrelationships of the modalties monitored in neonatal polygraphic recordings and the elegant computations by the same authors of auto- and cross-spectra and coherence functions in the EEGs of infants are not acknowledged. Several illustrations depict sequential power spectra ("compressed spectral arrays") of neonatal EEGs. This technique, which has proved helpful in assessing the relatively stationary background rhythms of adult EEGs, appears especially ill-suited to the analysis of neonatal EEGs.

Exceptions include infrequent pathologic circumstances in which neonatal EEG abnormalities mimic those occurring in the adult (figure 116). This chapter does not adequately discuss the contribution of cerebral evoked potentials to the electrophysiologic assessment of the newborn. Far-field, brainstem auditory evoked potentials are briefly referred to but are illustrated only by a response obtained from an adult (figure 121). A glossary of terms most commonly used in neonatal electroencephalography is provided at the end of the atlas. The use of a few terms such as "dick-brush" pattern and "lability" may or may not be favored by all electroencephalographers. However, by and large this glossary is carefully phrased and should prove helpful in encouraging the use of appropriate terminology in this field.

In this reviewer's opinion this atlas is an excellent and timely addition to the literature on the neonatal EEG. Its publication should do a great deal to clarify basic concepts on the EEG of the neonate. We strongly suggest this volume as a teaching and reference manual to all clinical electroencephalographers, neurologists and neonatologists who participate in evaluating central nervous system function in neonates, whether premature or full-term, and whether healthy or diseased. Those anesthesiologists who have special interest in human brain development and share in the responsibility of handling neonates also should have it available for consultation.

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*Patient Care in Neurosurgery* is a valuable attempt to provide up-to-date information for physicians who may be suddenly faced with diagnostic and therapeutic problems associated with management problems of the neurosurgical patient.

Its value is impaired by poor editing. Typographical errors abound, paragraphing and indexing numbers appear without relevance, and brand names of drugs are used without the appropriate generic names. The bibliography is up-to-date and well rounded. The first three chapters present valuable, recent data relating to basic cerebrovascular physiology, metabolism, cerebral edema, and intracranial pressure. Inexplicably, normal physiologic values and ranges are not included as a guide for the reader. In discussing hyperventilation with CO2 reduction, the changes in cellular oxygen availability due to shifts in the oxygen–hemoglobin dissociation curve are not mentioned. Other omissions concern cerebral perfusion pressure and its use as an endpoint for therapeutic consideration; the role of the right unshelled junction in cerebral edema; and the roles of cerebrospinal fluid pH, Pco2, and bicarbonates in coma.

Following the chapter on neurologic diagnostic studies, an important chapter on intraoperative management during craniocervical procedures is marred by simplistic statements relating to anesthetic agents' ability to reduce oxygen consumption, protective effects of anesthetic agents against cerebral hypoxia, and by the concept of a vascular steal without adequate explanation. The importance of the Doppler ultrasonic unit as an early warning aid is not appreciated, since it is stated that "a Doppler device is useful to monitor heart sounds continuously, although an esophageal stethoscope is equally suitable." Apparently, the authors do not
understand the sensitivity of the Doppler for detecting venous air embolism.

In dealing with intracranial pressure reduction, no mention is made of furosemide or the measurement of serum osmolality as a guide to osmotherapy, nor is there adequate discussion of airway management and ventilation in severe head injury, high spinal-cord injury, or coma.

Notwithstanding these criticisms, this book should stimulate the

house officer to think in terms of the underlying mechanisms involved, and provides generally good guidelines for patient care.

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Reviews of Audiovisual Aids


This tape-slide teaching sequence consists of a 21-minute lecture on cassette tape, a carousel of 72 accompanying slides, and a booklet of text and questions. It is directed to medical students, and describes the standard evaluation of adequacy of ventilation, and ventilatory reserve. Its topic is the variables to be measured in patients in respiratory failure. It does not deal with the anesthetized patient. Perhaps the foremost virtue of the emphasis on quantification of respiratory variables as guides to the treatment of patients in respiratory failure.

Three basic principles are described: the utility of measurement of alveolar-to-arterial oxygen tension difference, quantification of dead space-to-tidal volume differences, and the importance of ventilatory reserve as measured by vital capacity and inspiratory force.

The author describes the several etiologies of hypoxia, goes on to the alveolar air equation, and quantitates shunt fraction by the method of taking 5 per cent of the alveolar-to-arterial oxygen tension difference. An error in the slides of the alveolar air equation is confusing, P\(_{\text{A}}\)\(_{\text{O}}\) being repeatedly written as P\(_{\text{A}}\). Less forgivable is the author's failure to describe the limitations of the simplified shunt approximation. Although the example given is appropriate with a P\(_{\text{A}}\)\(_{\text{O}}\) greater than 150 torr, one is left with the impression that the method has no inherent limitations. The shunt equation is neither mentioned nor described. Quantification of the dead space-to-tidal volume ratio and measurement of ventilatory reserve fare better, and the author suggests reasonable though arbitrary limitations for the three variables in deciding when a patient needs ventilatory support.

It is clear that this teaching tool is directed at a very naive audience, presumably medical students. Indeed, it may be at too superficial a level for students who have completed a course in cardiopulmonary physiology. It is, however, clear and direct, and successfully introduces a complex and clinically important topic.

As an audiovisual presentation, it is not optimally done. The slides, although colorful and clear, do not complement the text. Rather, they repeat visually what has been stated in the tape. At an average rate of slightly more than three per minute, the number of slides is too great, and their informational content too low. Perhaps most frustrating is the fact that there is no indication in the tape on when to advance the slides, requiring the student to guess. This is not only confusing but distracting.

In summary, an important topic is addressed, the relevant variables are discussed, and their application is appropriate. The presentation suffers from a few inaccuracies, oversimplifications, and less than optimal audiovisual techniques.

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Since I have never reviewed an audiovisual program before, I have chosen my own organizational format, commenting first on the slides alone, then on the audio portion of the program, and then on how the two fit together addressing two areas, quality and content.

Slides: In general, the slides are well done. The information presented is clear, colorful, and visually appealing. Several questions came to mind while viewing the slides alone without listening to the tape, but these questions were usually answered when the audio portion and slides were reviewed simultaneously. The quality of a few slides could be improved. For example, the printing on the slides showing answers to the self-evaluation questions was small, and could occupy more area of the slide. Several slides either omitted important concepts or failed to illustrate them clearly. In slide 18, the intent is to show a happy, awake mother undergoing cesarean section with regional anesthesia. The mother is not receiving an increased P\(_{\text{A}}\)\(_{\text{O}}\). Many obstetric anesthesiologists now feel that the parturient should receive a high inspired oxygen concentration to improve fetal oxygenation even during elective cesarean section. Slide 19 shows a neonate in a bassinet, but one cannot see the head of the baby. An assistant is standing by the side of the bassinet with a stethoscope around his neck but is not listening to the neonate, as he should be. A gloved resuscitator holds a self-inflating bag intended for positive-pressure ventilation. But the infant obviously has good motor tone, evidenced by prominent flexion of the lower extremities. Therefore, the infant appears normal and vigorous, while the individuals standing around the neonate appear poised to conduct serious resuscitative efforts. The "staged" nature of the slide would be evident to an individual familiar with neonatal resuscitation. Slide 23 deals with prevention and treatment of hypotension associated with regional anesthesia for cesarean section. The slide appropriately illustrates monitoring maternal blood pressure, administering fluids, and having ephedrine readily available to treat hypotension should it occur. However, proper positioning of the mother, an essential step in the prevention and treatment of hypotension associated with regional anesthesia in obstetrics, is omitted. Slide 30 suggests a caudal or lumbar epidural injection of saline solution to treat postspinal headache, but does not include the more recent therapeutic modality of epidural blood patch. Slide 31 suggests that if the spinal anesthetic level does not extend higher than the sixth thoracic dermatome, maternal blood pressure will be maintained, while if the level is below T6, the mother will experience pain. This is an oversimplification, to say the least.

Audio: Many of the authors' recommendations for managing regional anesthesia for cesarean section are both timely and appropriate. For example, the avoidance of standard premedication, the administration of antacid to any woman undergoing cesarean section, the importance of relative hypovolemia in contributing to maternal hypotension, and the therapy of hypo-