

testing in concussion and some redundancy there. In general, the sections on concussion suffer from the fact that the field of concussion is moving forward rapidly and logistics do not allow for up-to-date information to be included in a textbook format. This is understandable but the book has that limitation. For example, even the chapter written by Bob Cantu describing various grading systems and concussion management approaches does not include his most recent grading system published in 2001 which has significant changes from that of his previous guidelines. Perhaps reflecting this advancement in the science of a concussion, it would have been of some use to include some of the newer data perhaps in the future/research section. For example, along with discussion of neuroimaging and functional imaging, data published from a number of groups regarding electrophysiological concussion analysis might have been of some interest. Moreover, although up-to-date data can not necessarily be included in such a textbook, at least reference should be made to some of the significant controversies in the concussion literature regarding grading systems, return to play and the relative importance of loss of consciousness, post-traumatic amnesia and post-concussion symptoms. A particularly nice feature of the book is the attempt to include a chapter by a helmet manufacturer to reflect the state of the art of that piece of equipment. There would probably be some interest as well to look at other equipment such as visors, mouthguards, elbow pads and cowboy collars. This has practical implications for trainers and team doctors alike. Also of some potential value would have been a section on concussion rehabilitation, as there is much current interest and effort in that particular approach to management.

In summary, while no book can be entirely comprehensive for such a large and rapidly progressing field, this book contains a remarkable amount of solid information, well-written and presented, well-illustrated with appropriate figures and tables and will be a great addition to any collection in the sport medicine office, athletic training room/locker room and indeed parts of it relevant directly to the sideline itself.

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THE VEGETATIVE STATE: MEDICAL FACTS, ETHICAL AND LEGAL DILEMMAS. 2002. By Brian Jennett. Published by Cambridge University Press. 228 pages. C\$67.00 approx.

Brian Jennett and Fred Plumb coined the term “persistent vegetative state” in 1972 to describe wakefulness, including wake and sleep cycles and arousability from sleep, but no evidence of awareness. Vegetative (breathing and basic homeostatic) functions were intact. The term “persistent” subsequently caused confusion because some patients later regained awareness to variable degrees.

Currently “vegetative state” applies to the above syndrome, and “permanent vegetative state” is the prognostic term used when the patient will *never* develop awareness or a state better than vegetative. Concepts are still evolving for vegetative and minimally conscious states. Occasionally patients regain isolated behaviours including crying or mumbling a few repeated words. While relatives seize upon such behaviours as evidence of cognitive function, they do not indicate that widely integrated cerebral activity has returned.

How can we be *sure* that there is no cognitive function if we rely only on behavioural observations? Jennett sites three pieces of evidence that discount cognitive function in these and vegetative patients: no behavioural response to indicate pain and suffering; a decrease in total cerebral blood flow to values comparable to those induced by anesthesia; and extensive bilateral damage to the cerebral hemispheres on pathological examination. He does not, however, mention electrophysiological and functional neuroimaging studies that can explore information processing in more precise ways.

The book provides a well-written summary of the evolution of the concepts of vegetative and minimally conscious states, estimates of their incidence and prevalence and major clinical features. The underlying patterns of pathology are reviewed briefly but accurately. There is a brief discussion of management principles. A strength of the book is the exploration of physician and societal attitudes about vegetative and minimally conscious states as “lives not worth living”. Arguments for limiting and withdrawing care, including “artificial nutrition and hydration,” are reviewed from ethical and legal standpoints. The primacy of autonomy of the patient is well discussed as the most fundamental component of end-of-life decision-making. Landmark American and European legal cases are presented, perhaps to excess (92 pages).

A weakness is the emphasis on trauma with little attention to other causes, such as ischemic encephalopathy after cardiac arrest; this oversight reflects the author’s main interest. In discussing prognosis, only clinical predictors are presented. There is no mention of electrophysiological and other laboratory tests that have shown effectiveness in arriving at earlier prognostic determinations for post-cardiac arrest and trauma patients.

The book will be of interest to those who see severely brain-damaged patients both acutely and in later phases of their care, e.g., neurologists, neurosurgeons, intensivists and rehabilitation physicians. The ethical discussions are especially useful. However, because of limitations in scope of etiologies and prognostic evaluation, the book is an incomplete treatise on the subject of vegetative and minimally conscious states.

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