

## BOOK REVIEWS

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**The Biomechanics and Motor Control of Human Gait.** David Winter. Waterloo, Ontario: University of Waterloo Press, 1987, 72 pp. Illustrated.

by *Joan E. Edelstein, P.T.*

According to David Winter, developer of the first clinical gait laboratory in Canada, and director of the laboratory at the University of Waterloo, the sole purpose of walking is to transport the body safely and efficiently across the ground. Winter reflects his experience in electrical engineering, physiology, and biophysics in this book intended as a resource of normative data, analyses, and interpretation. Three major segments are: an opening chapter on terminology pertaining to gait, biomechanics, anatomy, and neurology; a major section devoted to temporal, stride, kinematic, and electromyographic measurements; and an extensive appendix of kinematic, kinetic, and electromyographic tables.

Intra- and inter-subject variability among nondisabled individuals is dealt with by creating various normalized categories: for example, dividing velocity by body height. Link segment biomechanical analysis copes with the indeterminacy of the motor system, by which the same kinematic phenomenon can be achieved by different muscle activities. Efficient walking requires five functions performed during each stride: 1) generation of

mechanical energy to maintain or increase velocity; 2) absorption of mechanical energy for shock absorption, stability, or to decrease forward velocity; 3) prevention of upper body and limb collapse during stance; 4) maintenance of upright posture; and, 5) control of foot trajectory for ground clearance and gentle landing. He defines concisely more than 80 terms associated with gait description, and deals briefly with the interrelationship of cadence, velocity, and stride length.

Winter addresses various measurement systems with regard to kinematics, describing movement independent of causative forces, then focuses on trajectories and angles of the foot and other bodily segments, using numerous graphs to plot changes through the gait cycle. The chapter on kinematics explores ground reaction forces under various walking circumstances, such as fast and slow cadence. He also provides graphs of mechanical power through the cycle. Finally, he charts the electromyographic phasic activity of 16 trunk and lower-limb muscles.

The format follows a decimal system of paragraph numbering, so that the reader always knows the relation of one concept with another, whether coordinate or subordinate. Chapters conclude with references, many selected from Winter's prolific contributions to the literature.

*The Biomechanics and Motor Control of Human Gait* is a precise distillation of the significant

quantitative studies in the field, combining the author's considerable insights with those of other workers. Educators will find this volume a helpful resource, rather than a text to guide students, for Winter has not synthesized all temporal, kinematic, and kinetic events occurring in a given phase of gait. It is an invaluable reference for anyone associated with a gait laboratory, either as a research investigator, or as one who refers patients for measurement. While Winter emphasizes barefoot walking of non-disabled young adults, this data must be regarded as the essential foundation for understanding the walking characteristics of other groups, including patients.

**Directory of Services for Blind and Visually Impaired Persons in the United States.** 23rd Edition. New York: American Foundation for the Blind, 1988, 378 pp.

by Jerome D. Schein, Ph.D.

This indispensable reference almost doubles the number of listings in the preceding edition. It contains basic information about 1,500 national, regional, state, and local programs and services covering federal and regional agencies, state commissions and vocational-rehabilitation agencies, low-vision clinics, braille and talking-book libraries, instructional-materials centers, schools and other training facilities for visually-impaired persons, programs preparing workers to serve visually-impaired people, and guide-dog training centers. Indexing is by subject, state location, and agency name, making this directory an efficient information-retrieval tool for both professionals and lay persons.

**Essential Otolaryngology,** edited by K.J. Lee. 4th Edition. New York: Medical Examination Publishing Company, 1987, 1,007 pp. Illustrated.

by Jerome D. Schein, Ph.D.

This hefty volume aims to prepare otolaryngology residents for their board examinations. As such, it is a mixture of very basic information and highly-sophisticated material. That this mixture of intellectual levels produces the desired results is attested to by the fact that the book is in its fourth edition. It is divided into 43 chapters, beginning with anatomy, and concluding with a chapter that offers 266 bits of miscellaneous information, some

definitions, and 27 "facts to know." In short, the text acts as a study guide. It seems appropriate that the 39 contributors do not include many stellar research names, but rather appear to be drawn from the ranks of good teachers.

Readers seeking a more scholarly presentation will find the references weak: some are out of date (e.g., the text refers to the 1978, not the 1985, edition of Katz's *Handbook of Clinical Audiology*), some classics are omitted, and still other references appear esoteric for the purposes of this review. The chapter authors often do not document their assertions, and the text has no overall bibliography or author index. Nonetheless, the editor's efforts to be comprehensive without sacrificing economy of presentation should be lauded. The occasional, inevitable lapses in some areas—such as hearing aids (especially the newly-emerging digital technology, unilateral impairments, and tinnitus) that are too briefly sketched—should not outweigh the positive contributions of the text when viewed in terms of its stated purpose.

**Managing the Chronic Pain Patient: Theory and Practice at the University of Washington Multidisciplinary Pain Center,** edited by John D. Loeser and Kelly J. Egan. New York: Raven Press, 1989, 253 pp.

by Richard A. Sherman, Ph.D.

The evaluation and management of chronic pain patients has made enormous strides since World War II. Knowledge of what to do and, as important, what not to do, is growing and changing almost daily. This superb manual covers all the vital aspects of this dynamic field from theory, through the roles of different team members, to treatment approaches. The history of Washington University's clinic and its founder, Dr. John J. Bonica, is synonymous with the development of the modern team approach to chronic pain and of most current modalities. Therefore, this manual is not subject to the limitations of one institution's experiences.

The first two sections of the book contain an overview of chronic pain and pain clinics, along with information on behavioral evaluation and management. Taken together, they provide a review of the theory and practice of what to do and not to do with chronic pain patients. The overall smooth style helps the reader grasp the complex interactions

between the multitude of physical and psychological factors which combine to produce and sustain each individual's pain experience.

The third section of the book consists of five specialized chapters that cover assessment and management of pain in children and cancer patients, selection of patients for neurosurgical procedures, and the use of regional anesthesia in pain management. The chapter which compiles the effects of various blocks for pain relief is an especially valuable review. The section ends with a reprint of the definitions of pain terms recommended by the International Association for the Study of Pain. This is important because a major problem in working with pain patients is the lack of a common vocabulary among diverse health care providers, which makes clear communication of each specialty's findings difficult.

The book should be of great help to the referring health care provider because it explains the role and limitations of a typical chronic pain clinic. It should be useful to providers working with chronic pain patients in gaining a better understanding of their patients, and in avoiding the more typical mistakes which prevent recovery. Those working regularly with chronic pain patients will find a valuable condensation of practical material among the specialized chapters. The book also is recommended for any group intending to start a pain clinic, because it gives details on the roles of health care staff and the way such a clinic functions.

**Tinnitus: Pathophysiology and Management**, edited by Masaaki Kitahara. New York: Igaku-Shoin, 1988, 121 pp.

by Jerome D. Schein, Ph.D.

Tinnitus is a condition that some patients find annoying to the point of suicide, and most physi-

cians find extremely confusing. The editor points to the relatively small amount of material that has been written about this highly prevalent malady, largely because it has had a correspondingly small amount of research. This slender volume goes a long way toward bringing together the available literature, and presenting the prevailing concepts of diagnosis and treatment.

As the title indicates, roughly half of the text deals with the pathophysiology of tinnitus, with chapters on classification, etiology, physiology, measurement, and diagnosis. The remaining chapters address the use of drugs, biofeedback, electrical stimulation, masking, and combinations of these treatments.

"Combinations of treatment" is not a euphemism for "trial and error"; instead, it refers to the approach recommended for the treatment of *intolerable tinnitus*—an extreme form defined in terms of the patient's response to it. Recommended for its management are the simultaneous use of Tegretol or Mysolin, biofeedback and earplugs, an acoustic tinnitus masker, and an electrical tinnitus suppressor. The author of this regimen notes that, "Actually 70 percent of patients with intolerable tinnitus can be reduced by 50 percent or more with the combined treatment. Of course, we do not deny that we should follow our studies to determine the effect of each single treatment . . . [the battery of treatment is used] because tinnitus is not produced by one cause and many patients with intolerable tinnitus do exist. Furthermore, increasing treatment effectiveness is one of the most important approaches to the advance of tinnitus study. Any new treatment developed would be included in the combined treatment battery." If nothing else, that statement highlights the desperation that often accompanies the patient into the clinic.