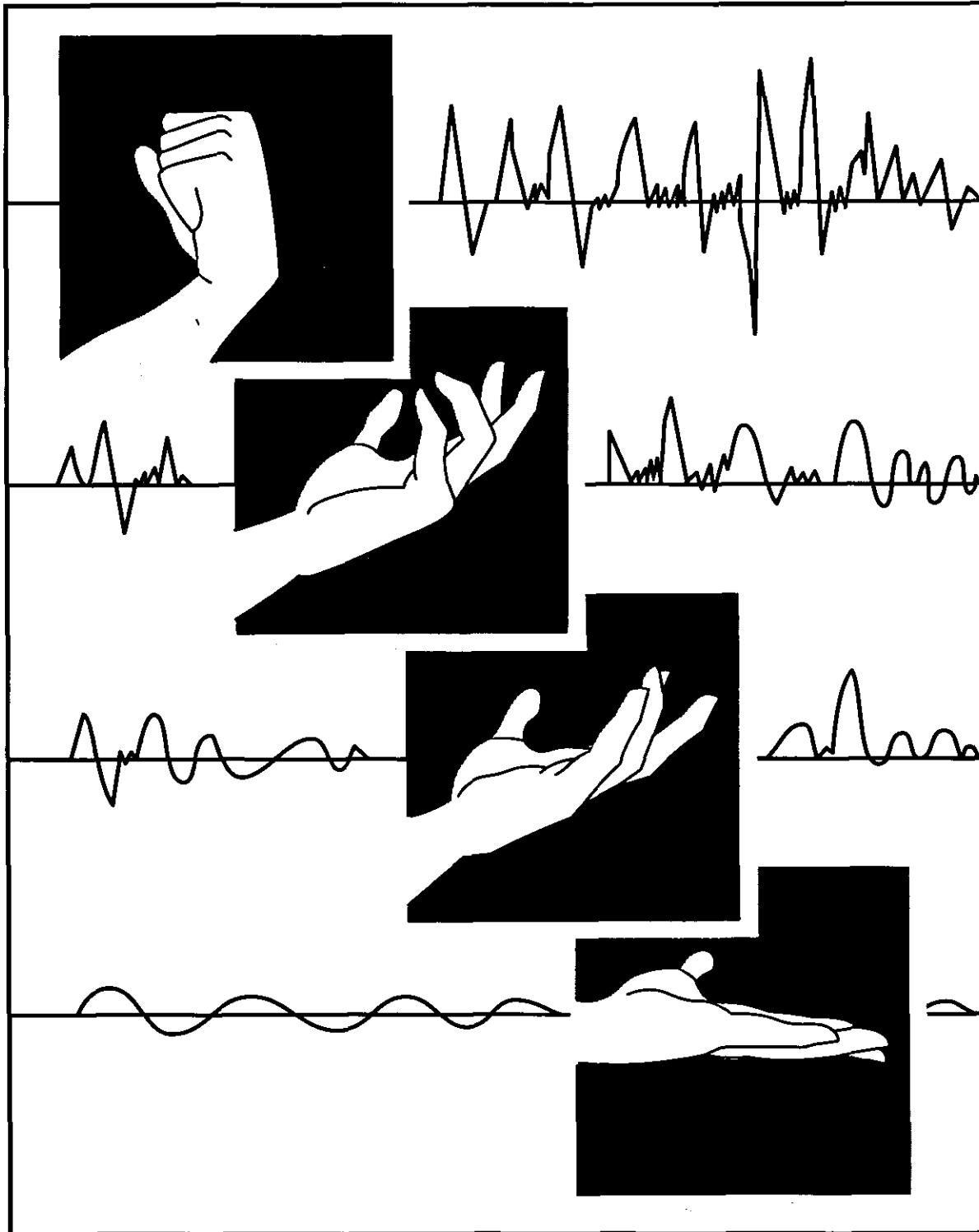


Selected Topics in Surface Electromyography for Use in the Occupational Setting: Expert Perspectives



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Institute for Occupational Safety and Health

CDC
CENTERS FOR DISEASE CONTROL

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EXPERT PERSPECTIVES**

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Gary L. Soderberg, PhD, PT
Editor

PROLOGUE

Surface electromyography (EMG) is a technique whereby voltage-measuring electrodes attached to the surface of the skin are used to detect and/or infer various phenomena relating to muscular contractions. The development of sophisticated electronic instrumentation has permitted the use of surface EMG in most areas of ergonomic research and analysis involving muscle activity. Despite the increasing diversity of applications, there was, at the inception time of this project, no reference work available which provided basic instruction and information on the interpretation and applications of surface EMG. It is this need which the present volume begins to address, through the use of expert perspectives. A biographical sketch of each author, all experts in the field residing at nationally prominent educational institutions, is included at the beginning of each chapter. The Editor-in-Chief is Dr. Gary L. Soderberg, Director of the Graduate Program in Physical Therapy at the University of Iowa.

Although not comprehensive, an attempt was made to span the field. Note however that, applications aside, the phenomena under consideration are largely restricted to muscle activation, relative intensity and fatigue. Chapter One, by Dr. William Marras, provides a brief overview, while Chapter Two, by Dr. Robert Lamb and Donald Hobart, presents the anatomic and physiological basis for surface EMG. Chapters Three (Dr. Gary L. Soderberg), Four (David G. Gerlman and Dr. Thomas M. Cook), and Five (Dr. Barney LeVeau and Dr. Gunnar B. J. Andersson) introduce aspects of experimental technique, instrumentation and signal processing, respectively; this material is sufficient to serve as a source of basic instruction. Chapter Six (Dr. Mark Redfern) discusses interpretation of the EMG output, with a particular emphasis on problematic aspects. Finally, Chapter Seven (Dr. William Marras) examines various typical applications of EMG to ergonomics from the perspective of appropriate of statistical design.

These chapters represent the expert opinions of the individual scientists who authored them, derived from their own clinical practice and evaluation of the literature. No comprehensive attempt has been made to standardize nomenclature or procedure. Topics were selected by the individual contributors and editorial efforts have been abbreviated in order to accommodate their differing viewpoints, therefore some degree of overlap in subject matter remains.

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