

INTERNATIONAL WORKSHOP ON
HUMAN SUBJECTS FOR BIOMECHANICAL RESEARCH"

Fourth Annual Meeting
Dearborn, Michigan
October 22, 1977

INTRODUCTORY COMMENTS

This is the fourth in a series of workshop meetings which originated in Oklahoma City four years ago with the purpose of bringing together those researchers who were utilizing human subjects for Biomechanical Research. Several problem areas were identified in the initial meetings. Committees which were set up to address these problems subsequently reported at our intervening sessions, and their activities were duly recorded in our proceedings. A major sector of this work, that of the Coordinate Systems Guidelines Committee under the chairmanship of Dr. Dan Thomas, has been completed, and we will have an opportunity during the current meeting to evaluate the results in the context of acceptance by the technical community here and abroad. We will also consider whether any problems have developed in the application of these guidelines.

With continuing experience in the use of human subjects, especially the cadaver, as a tool for biomechanics research, several new and quite basic problems have emerged which have significant implications regarding the validity and credibility of such use. These problems lie primarily in the area of injury assessment, particularly soft tissue injury. A host of associated difficulties have been identified. These range from criteria for cadaver specimen selection and description, to the final decision process by which observed cadaver trauma is converted into a clinically based AIS or injury rating. As part of these proceedings, our Co-Chairmen Drs. Tarriere and Melvin will develop ideas and seek direction from this group as to how we can best develop a strategy for addressing these problems.

Following this we will proceed to technical sessions where observations on cadaver utilization, comparability, and instrumentation will be presented.

I have several additional comments: First, I wish to repeat the major ground rule of our workshop: The work presented here will be recorded and sent to all participants, but these proceedings are not intended for reference in any publication. This is to maintain the informal nature of our presentations. However, there are some individual presentations which may be referenced by title, author and organization and these papers will be so identified on their title pages. Second, in order to send the material to you, we ask that you fill in the attendance sheets which have been passed around. List your own names and those of your associates who are not present but who wish to be included in our mailing. Do this regardless of whether you are currently on our mailing list. We have run out of address labels and we are updating our distribution. Lastly, I am pleased to announce that we have found an official home for our workshop. The Stapp Conference Committee has agreed to recognize our existence and will include our meeting requirements in the Stapp Conference planning format. For the present they will arrange to have a day reserved either before or after the conference for our proceedings.

Next year at New Orleans our meeting is scheduled for the day proceeding the Stapp Car Crash Conference and will be described as a workshop in the formal announcement. We will continue to maintain our informal format, and will continue the separate preparation of our program announcement and printed proceedings.

Thank you.

Arthur E. Hirsch
Chairman

CONTENTS

<u>MEETING MINUTES</u>	1
<u>COMMITTEE REPORTS</u>	
Guidelines Committee Report - Discussions	
Anthropometric Data For Pelvic Definition C.C. Snow and H.M. Reynolds	13
Anatomical Coordinate Systems for Human Body Segments - A.J. Padaonkar and A.I. King	26
Ad- Hoc Committee on Injury Scaling J.W. Melvin and C.H. Tarriere	55
Discussion of Injury Scaling J.D. States	58
<u>TECHNICAL DISCUSSIONS</u>	
<u>VALIDITY STUDIES</u>	
Comparison of In-Vivo and Cadaver Brain Injuries E. Neil Gunby	61
Brain Motions During Constant Frequency Head Vibration W.A. Alter III	64
Classification of Cranio-Encephalic Lesions C. Tarriere and C. Got.	72
An Experimental Model for Closed Head Impact Injury R.W. Smith	76
Vascular System Pressurization Techniques Nusholtz, G.S., Stalnaker, R.L. and Melvin, J.W.	80
<u>INSTRUMENTATION</u>	
Cross-Axis Effects on the Measurement of Angular Acceleration Using Linear Accelerometers. A.S. Hu and A.K. Johnson	85
Micro-Miniature Accelerometer/Transmitter E. Konigsberg	104
A Method of Mounting and Measuring the Location of a Nine Accelerometer Package on Cadaveric Specimens - C.R. Hassler and H.B. Pritz	119

CADAVER COMPARABILITY

Bending and Hardness Tests of Human Ribs
D. Kallieris, G. Schmidt, F. Schulz and
M. Theis 124