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JOHN PAUL STAPP MEMORIAL LECTURE

A RETROSPECTIVE LOOK AT MY CONTRIBUTIONS TO STAPP

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ABSTRACT – This paper describes some of the highlights of my work in injury/impact biomechanics which was made possible by the work of many of my colleagues and students at Wayne State University. These papers appeared as Stapp publications from 1969 through 2010. Out of the 64 papers in which I had some form of involvement, there are several that stand out as significant contributions to the field, at least in my opinion. The measurement of brain motion during impact, the development of a comprehensive brain injury model, the delineation of the mechanisms of aortic rupture, the whiplash hypothesis and the invention of the six-axis femur load cell are described. I wish to express my profound gratitude to my co-authors and many unnamed contributors for their hard work and dedication without which I would not have been able to accomplish what I did in my exciting career.

INTRODUCTION

It is indeed an honor to be invited to present the Stapp Memorial Lecture at the 56th Stapp Car Crash Conference. It is a tradition to invite participants of the Conference to give such a lecture after they have retired. In my case, I have not fully retired but have stepped down from the chairmanship of the Biomedical Engineering Department at Wayne State University and it is a retirement of sorts.

In this talk, I would like to review my Stapp contributions over the past 40-plus years and highlight some of the more important and interesting papers. However, before I launch into this task, let me first acknowledge the work of my former students and those of my present and former colleagues and, above all, the research sponsors of our work in impact biomechanics.

SOME STATISTICS

As far as I can determine, I am an author on 64 Stapp papers, beginning in 1969. All 64 papers are listed in alphabetical order in the References section below. They are identified by a numerical superscript in front of the name of the first author and the numbers represent the chronological order of the papers.

Although it was relatively easy in the beginning to have papers accepted for publication in the Stapp Conference Proceedings, the paper-review process became more stringent with time as the Stapp publications moved into the status of a peer-reviewed journal. And, if it is any comfort to all would-be Stapp authors, there is no favoritism accorded to manuscripts submitted by members of the Stapp Advisory Committee during the paper-review process. Over the past two decades, reviews of Stapp papers have typically been very thorough, involving numerous comments by reviewers and two or more iterations of the initial manuscript. However, as I am sure many authors of Stapp papers can attest to, this thorough review process, as difficult as it can be, dramatically improves the quality of the papers that are selected for publication in the Stapp Journal.

Out of the 48 or so graduate students who have co-authored these 64 papers, I served as advisor for 17. The others were graduate students of my colleagues, including Dr. King Yang, Dr. John Cavanaugh and Dr. Paul Begeman. In addition, many co-authors worked for sponsoring organizations with whom we collaborated closely, particularly the researchers from Toyota over a 14-year period.

Now a word about our sponsors. These Stapp papers could not have been written without the financial support of federal, industrial, and corporate sponsors to whom I express my sincere gratitude for having the confidence in our ability to attain the goals of the proposed research. Federal support came from the National Highway Traffic Safety Administration

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