Commentary on the History of the Naval Biodynamics Laboratory

(Almost a Success)

History Associates, Inc. completed the history on August 25, 2017 and it was approved by the U.S. Army Aeromedical Research Laboratory (USAARL) in January 2018. Publication is not yet done. This is an independent internet distribution which warrants comment.

"Cold Cat Shots", that is an aircraft that is catapulted off an aircraft carrier with insufficient force causing the plane to splash into the water, often resulted in loss of aviator and aircraft. Speculation on the unrecorded aviator injury led to the initial proposal by Commander C. L. Ewing, MC USN in 1965 to measure the head and neck response of volunteers to impact acceleration to provide needed information for engineers to redesign cockpit seats and harnesses. The U.S. Army initially funded the work in 1965. Captain George W. Beeler MSC, USA and I began helping Dr. Ewing to implement the project in 1966 as a joint Army-Navy effort. I was assigned as Aviation Medicine Research liaison between the Army and Navy, at USAARL, by Admiral Frank Voris MC USN. We used the impact accelerator at Wayne State University for the first volunteer experiments that validated the experimental techniques.

This led to the formation of the Naval Biodynamics Laboratory (NBDL), in New Orleans. Its purpose was to measure the mechanics of brain injury. About 3000 human experiments on 333 Navy enlisted volunteers and about 500 primate experiments were conducted.

Disruption of new experimental designs occurred in 1983 by resignation of several high level scientists due to conflict with US Navy Medical Research and Development Command. Routine experiments continued until 1996 when the Navy closed the laboratory as part of Base Realignment and Closure (BRAC) decisions in 1995. The NBDL database was transferred to the University of New Orleans.

The experimental design relied on the experience of John P. Stapp[1]. There have been many publications of the NBDL work and widespread distribution of the experimental data given to DOT. Thunnissen et al[2] is an example funded by Snell. The limitations of modeling and need for experimental data is identified[3]. References 4 and 5 contain essential neuropathological and neurophysiological publications. Efforts to evaluate, compile and distribute the data from 2004 through 2007 were disrupted by OIC Naval Aerospace Medical Research Laboratory and CO U. S. Navy Medical Research and Development Command. Both Navy organizations no longer exist.

As a result I met with a USAARL representative at the Aerospace Medical Association Conference, New Orleans, May 2007. We decided to return the NBDL data to the Army where the project began in order to make it available to the scientific community. It is uncertain whether all the data has been compiled. Some may be lost.

In 1988 the medical follow up program provided to each of the 333 subjects in the volunteer agreement documents was halted due to lack of funding and was terminated in 1996. Medical follow up provides longitudinal information on the long term effects of the acceleration impacts the subjects were exposed to during their one year duty as human subjects.

I recommend:

1. Audit data from NBDL, USAARL, Pax River, DOT, AFIP, ONR and Snell (C.L. Ewing's files) associated with this work.

2. Complete the analysis and distribution of the NBDL data and related information. For example, analyze and publish the female volunteer data which has not been done.

3. Restart the volunteer medical program follow up. The SEC-NAV approval of the permanent change of duty for 333 volunteers for hazardous duty experimentation included medical follow up promises.

This effort would assure the ultimate success of NBDL and fulfill an obligation to the volunteers.

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Please provide questions, comments and any recommendations to the website.

1. Ryan, Craig; Sonic Wind, The Story of John Paul Stapp and How a Renegade Doctor Became the Fastest Man on Earth; W.W. Norton & Company, Inc. New York, NY (2015)

2. Thunnissen J, Wismans J, Ewing C.; Thomas D.; Human Volunteer Head-Neck Response in Frontal Flexion: A New Analysis, SAE paper 952721, Proceedings of the 39th Stapp Car Crash Conference, Coronado CA, USA 439-460, (1995)

3. Sanchez, Erin J. et al.; Evaluation of Head and Brain Injury Risk Functions Using Sub-Injurious Human Volunteer Data; JOURNAL OF NEUROTRAUMA 34:2410-2424 (August 15, 2017)

4. Ewing, Channing L. et. Al.; Impact Injury of the Head and Spine; Charles C. Thomas, Springfield, IL (1983)

5. Sances, Anthony Jr. et al.: Mechanisms of Head and Spine Trauma; Alroy; Goshen, New York (1986)