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DEPARTMENT OF THE NAVY
Office of the Secretary
Washington

7 - APR 1954

From: Secretary of the Navy
To: Commander, U. S. Naval Air Development Center
Johnsville, Pennsylvania

Subj: Project NM 001 060.17, Use of Human Subjects for Study of
the Hemodynamic Effects of Inflation of Full Pressure Half
Suit During Exposure to Positive Acceleration; permission for

ref: (a) NADC ltr NA 2166 of 5 Mar 1954

1. Authorization to conduct experimental studies of a medical nature
involving persons in the naval service as specified in reference (a)
is hereby granted.

2. This does not constitute authorization to pay volunteers for these
studies incentive pay for the performance of extra hazardous duties.

J. H. SMITH, Jr.
Assistant Secretary of the Navy for Air

Copy to:
Chief of Naval Personnel
Chief, Bureau of Medicine & Surgery

Records EXOS (2)
Prepared by:
Cdr. H. F. Fischer, Jr. USN (Pers-A111)
Rm 2056 Arl Annex
Ext. 41475
3/31/54

RETURNED TO ORIGINATOR FOR
MAILING THIS DATE 4-5
/s/

CONFIDENTIAL FILE

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CLEARED TRACER DESK
Date 8 APR 1954

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SECOND MEMORANDUM FOR SAC ltr A 2166 of 5 March 1954

From: Chief of Naval Personnel

To: Secretary of the Navy

Subj: Project # 001 060.17, Use of Human Subjects for Study of the hemodynamic Effects of Inflation of Full Pressure Half Suit During Exposure to Positive acceleration; permission for

1. Forwarded, recommending approval.
2. There is no authority under existing law to pay volunteers for these experiments incentive pay for the performance of extra-hazardous duties.

Copy to:
SAC, Johnsville, Pa.
SUNFD

W. Dana

BUMSEC-71:jd1
All/L5-2

15 MAR 1954

FIRST ENDORSEMENT on NADC ltr MA 2166 of 5 March 1954

From: Chief, Bureau of Medicine and Surgery
To: Secretary of the Navy
Via: Chief of Naval Personnel

Subj: Project NM 001 060.17, Use of Human Subjects for Study of the Hemodynamic Effects of Inflation of Full Pressure Half Suit During Exposure to Positive Acceleration; permission for

1. Forwarded re-addressed recommending approval.
2. The Chief of the Bureau of Medicine and Surgery has carefully reviewed the contemplated experimental design outlined in the basic correspondence and is of the opinion that under the controlled supervision of the distinguished group of scientists, at the Mayo Clinic, who are collaborating in this study, no harmful effects will result.

W. Dana
W. DANA
Assistant Chief for Research and
Medical Military Specialties

Copy to:
NADC, Johnsville, Pa.

ADDRESS REPLY TO
U. S. NAVAL AIR DEVELOPMENT CENTER
JOHNSVILLE, PENNSYLVANIA
AND REFER TO NO.

MA

2166

U. S. NAVAL AIR DEVELOPMENT CENTER
JOHNSVILLE, PENNSYLVANIA

5 MAR 1954

- From: Commander, U.S. Naval Air Development Center, Johnsville, Pa.
To: Secretary of the Navy, Washington, D. C.
Via: Chief, Bureau of Medicine and Surgery
- Subj: Project NM 001 060.17; Use of Human Subjects for Study of the Hemodynamic Effects of Inflation of Full Pressure Half Suit During Exposure to Positive Acceleration; permission for
- Encl: (1) Copy of Research Proposal NavMed Form 98 of Project NM 001 060.17
(2) Copy of BuAer ltr Aer-AE-14 09110 of 2 May 1952
1. Permission is requested for LT David H. Lewis, (MC) USNR to volunteer as a subject for the studies on the hemodynamic effects of pressurization of a full pressure half suit during positive acceleration.
 2. As indicated in proposed NavMed Form 98 enclosure (1) these studies are planned for the summer of 1954 in cooperation with the Cardiovascular Section of the Mayo Clinic contingent upon the demonstration by the Physiology Group at the Aviation Medical Acceleration Laboratory that the presence of intracardiac catheters during positive acceleration is without danger in apes, monkeys, and dogs.
 3. Four civilian volunteers from the Mayo Clinic, one civilian volunteer from Duke University School of Medicine and Dr. D. H. Lewis from AMAL, all of whom are physicians intimately concerned with the project and experienced in both centrifuge and "G" suit experiments, will be subjects. Pressure measurements from a wedged pulmonary catheter, from a pulmonary artery catheter, from a catheter in the right atrium, from a central and a peripheral arterial catheter will be made. In addition, cardiac output is to be determined by the direct Fick method, by the dye dilution method, and by the pulse contour method. Suit pressure, applied pressures from two points on the surface of the abdomen, rectal pressure, electrocardiogram, and standard spiographic tracings of respiration are to be included also.
 4. With the above measurements it is expected that analysis of the data, under the supervision of Dr. Lewis at AMAL, will reveal the nature of the circulatory and respiratory changes elicited by positive acceleration and the mechanism or mechanisms by which the "G" suit affords protection.
 5. Attention is called to paragraph 3. of enclosure (2) in which the Bureau of Aeronautics recommends the participation of LCDRs Stauffer and Beckman as observers and, if the individuals so desired, as test subjects in the previous "G" suits conducted at the Mayo Clinic. Please note that the present project is considered as the subsequent phase of these previous studies.
 6. Early approval of this request is respectfully requested in view of the cooperative nature of these studies.

G. J. Pfingstag

G. J. PFINGSTAG

PROJECT NUMBER AND TITLE (Leave number blank for new projects)

NM 001 060 Acceleration and Deceleration Studies with the Human Centrifuge and Research Aircraft

STUDY NUMBER AND TITLE

NM 001 060.17 A Study of the Hemodynamic Effects of Inflation of Full Pressure Half Suit during Exposure to Positive Acceleration

LOCATION OF STUDY

Aviation Medical Acceleration Laboratory, Naval Air Development Center, Johnsville, Pa and Mayo Clinic, Rochester, Minnesota.

ESTIMATED DURATION : OPERATIONAL REQUIREMENT NUMBER : SECURITY CLASSIFICATION

18 months : (Leave blank if undetermined) :
: :
: :
: : (Unclassified)
: : (Recommended)

SUBJECTS TO BE USED IN STUDY, IF ANY (Certain studies using human subjects require SecNav approval - BuMed obtains clearance)

Human volunteers, civilian and military

ADDITIONAL FUNDS, IF ANY, REQUIRING BUREAU : PRINCIPAL INVESTIGATOR

ALLOCATION TO PROJECT IN PRESENT FISCAL YEAR : D. H. Lewis, LT MC USNR; A. Stoll;
\$10,000.00 : Dr. Earl H. Wood, Mayo Clinic
:

CONSULTANTS LCDR E.L. Beckman; Dr. K. Penrod : COLLABORATORS Drs. E.H. Lambert,
of Duke Univ. Sch. of Med.; Mr. D. Clark of : E.J. Baldes, C.F. Code, H. Burchell,
Clark Co., Worcester, Mass.; CDR H.A. Smedal : H.J.C. Swan, H.F. Helmholtz, Jr. of Mayo
MC USN: Aero-Medical Lab., WADC, Dayton, Ohio. Clin:

OBJECTIVES AND EXPERIMENTAL DESIGN (continue on following sheet, if necessary)

The objective of this study is to observe the hemodynamic effects of pressurization of a full pressure half suit in man during positive acceleration. This study is to be done in collaboration with the Cardiovascular Section of the Mayo Clinic, contingent upon the demonstration by the Physiology Group at AMAL that the presence of intracardiac catheters during positive acceleration is without danger in animals (apes, monkeys, and dogs), Phase II of Project NM 001 060.06, "A Study of the Effects of External Pressurization of the Legs and Abdominal Cavity upon the Cardiovascular System when Applied during Exposure to High Headward Acceleration." The human experiments are to be carried out at the Mayo Clinic since their laboratory has the experience and equipment in human cardiac catheterization and acceleration. The actual experiments are planned for the summer of 1954 and will begin in June 1954. Analysis of data is expected to require several months. The subjects of these experiments will all be volunteers, i.e., physicians intimately concerned with the project. Five civilian volunteers will be obtained by the Mayo Clinic and Duke University School of Medicine and one military subject from AMAL. The measurements to be made consist of intravascular pressures from various parts of the circulatory system including pulmonary vascular pressures, venous pressure, and arterial pressure. In addition suit pressure, applied pressure, and rectal pressure will be measured. Cardiac output will be determined by the pulse contour method, the direct Fick method, and the dye injection method. Respiratory measurements are to be made by standard spiographic tracings. At the conclusion of the experiments, data analysis will be done at the Aviation Medical Acceleration Laboratory.

FOLLOWING SPACES ON THIS PAGE TO BE COMPLETED BY RESEARCH DIVISION

PARENT PROGRAM : BASIC FIELD

DATE APPROVED : BRANCH CODE
:

Use following sheet for "additional remarks" if any

DEPARTMENT OF THE NAVY
Bureau of Aeronautics
Washington 25, D.C.

Aer-AE-14
09110

2 May 1952

From: Chief, Bureau of Aeronautics
To: Commander, Naval Air Development Center
Johnsville, Pennsylvania
Commanding Officer, School Aviation Medicine
Naval Air Station, Pensacola, Florida

Subj: Navy Participation in Anti-G Suit Tests at Mayo Clinic:
recommendations concerning

Encl: (1) David Clark Co., Inc. confidential ltr of 23 Apr 1952
to Chief, Bureau of Aeronautics

1. As indicated by enclosure (1), the David Clark Co., Inc. has proposed that the Navy have representatives at proposed tests of new type anti-G suits. These suits, it is understood are largely patterned after the lower half of the Navy full pressure suit and as indicated in the enclosure are the result of consultations between the David Clark Co. and Navy, Air Force, Mayo and other civilian groups "G" physiologists. The Navy has several pilot protective equipment contracts with this company as does the Air Force, although this particular development and the proposed tests are being financed at no expense to the government.
2. Representatives of this bureau and the Bureau of Medicine and Surgery as well as of your laboratories have been participating in this development and Pensacola has been centrifuge testing this type of suit, in addition to others.
3. It is therefore considered highly desirable that such participation in this research and development continue including the tests at the Mayo Clinic tentatively proposed for the week of July 14, 1952. It is requested that, LCDR F. R. Stauffer (MC), USN from the Acceleration Unit, School of Aviation Medicine, Pensacola, Florida and LCDR E. L. Beckman (MC), USN of the Aviation Medical Acceleration Laboratory, Naval Air Development Center, Johnsville, Pennsylvania as a minimum be made available to participate in the proposed tests as observers, and also to serve as test subjects, if the individuals concerned so desire.
4. It is suggested that subject to the approval of the respective commanding officers, that the details as to the final determination of dates be made directly with the David Clark Company and the Mayo Clinic. However, it is suggested that BuAer, AE-14 and AE-522, CDR. H. H. Smedal (MC), USN, BAGR, Central District, Wright-Patterson Air Force Base, Dayton, Ohio, and BuMed Code 714 receive copies of correspondence in connection with these arrangements.

Copy to: BuMed Code 714
CDR H. H. Smedal
David Clark Co., Inc.

J. E. Sullivan
By direction

Office Memorandum • UNITED STATES GOVERNMENT

TO : Secretary of the Navy

DATE: 6 APR 1954

FROM : Chief of Naval Personnel

SUBJECT: Project NM 001 060.17, Use of Human Subjects for Study of the Hemodynamic Effects of Inflation of Full Pressure Half Suit During Exposure to Positive Acceleration; permission for

1. The Commander, U. S. Naval Air Development Center, Johnsville, Pennsylvania requests authority to utilize naval personnel in the conduct of experiments of a medical nature designed to test the protection afforded by a "G" suit under positive acceleration. Civilian volunteers from Mayo Clinic, Duke University and the American Medical Acceleration Laboratory will also participate as subjects.
2. Precedent exists for utilizing civilian as well as naval personnel in experimental studies of a medical nature provided that the Chief, Bureau of Medicine and Surgery certifies that, in his opinion, no physical injury will result to participants in the experimental studies. This certification has been made.
3. A letter has been prepared for your signature approving this request and stating that no extra hazardous duty pay is authorized for the projected experiments.

Very respectfully,



M. E. ARNOLD
Deputy Chief of Naval Personnel

Signature recommended
M. Kelly