

The Department of Defense  
RESEARCH AND DEVELOPMENT BOARD

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PROGRAM GUIDANCE REPORT

Prepared by

COMMITTEE ON MEDICAL SCIENCES

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The Department of Defense  
RESEARCH AND DEVELOPMENT BOARD  
Washington 25, D. C.

Approved: Lowell T. Coggeshall, M.D.  
Chairman

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RESEARCH AND DEVELOPMENT ON NEW AND IMPROVED  
TECHNIQUES AND EQUIPMENT FOR SOLUTION OF  
MEDICAL PROBLEMS PECULIAR TO ATOMIC WARFARE

<u>PROBLEM</u>	<u>EMPHASIS</u>
Evaluation of Universal Protective Dressings, Dextran for burn shock and proteolytic enzymes presently proposed for rapid slough removal.	125 Conclude in 1953
Evaluation of present therapy of uncomplicated radiation injury (Transfusions, antibiotics, plasma, fluids, etc.).	Decrease 4
Determination of hazard of ingestion and inhalation of radioactive materials.	Decrease 5
Search for a biological factor which promotes recovery from radiation injury.	Maintain
Studies of small area local burns in human volunteers.	Maintain
Studies of large area burn wounds.	Maintain
Mechanism of systemic effects and death from burns.	Increase
Studies of combined effects of thermal burns with radiation, trauma and infection.	Increase
Determination of critical dose of radiation to incapacitate within a matter of hours.	Increase Markedly
Determination of single, repeated, and protracted dosages of radiation in relation to military effectiveness.	Increase Markedly
Simplify methods for handling and treatment of mass burn casualties.	Greatly Increase

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BASIC RESEARCH - MEDICAL AND BIOLOGICAL SCIENCES

PROBLEM

The real value of basic research is in the unexpected results which often develop. For this reason it is impossible to select with confidence specific projects which are more promising than others. The general goal of such investigations in the field of medical sciences is a better understanding of the functions of living organisms and their interactions with their environment and with each other. Such an understanding is indispensable in every area for improvement in clinical management and general health of personnel. Encouragement of basic research therefore cannot be omitted from even the most critical project lists, since it provides the essential background for every scientific undertaking.

EMPHASIS

Maintain

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RESEARCH AND DEVELOPMENT ON NEW AND IMPROVED  
MEDICAL TECHNIQUES, METHODS AND EQUIPMENT  
FOR SURVIVAL AND RESCUE

<u>PROBLEM</u>	<u>EMPHASIS</u>
Nutritional aspects of survival rations (survival at sea).	Decrease <i>b</i>
Development of standardized escape capsule and its equipment.	Maintain
Earliest possible location and rescue of personnel.	Maintain

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RESEARCH AND DEVELOPMENT ON NEW AND IMPROVED PHYSIOLOGICAL ADAPTATION OF THE COMBATANT TO THE OPERATION OF, AND ESCAPE FROM VEHICLES OF WARFARE, SUCH AS AIRCRAFT, SUBMARINE, TANKS AND WARSHIPS

<u>PROBLEM</u>	<u>EMPHASIS</u>
Effects of prolonged snorkelling on submarine personnel.	Eliminate
Development and evaluation of ejectable components (Seats, capsules and cockpits).	Maintain
Effects of deleterious factors on vision (such as CO <sub>2</sub> , anoxia, etc.).	Maintain
Habitability aboard combatant vessels.	Maintain
Integration of all personal equipment.	Maintain
Limits of tolerance and effects of sound, vibration and enforced silence on submarine personnel.	Maintain
Medical aspects of selection, classification and training.	Maintain
Pressure suits; development and physiological evaluation.	Maintain
Studies in fatigue in aviation personnel.	Maintain
Studies on oxygen toxicity and practical trials of mixtures for Underwater Demolition Teams.	Maintain
Wound ballistics (50% increase in personnel is requested).	Increase
Habitability (temperature and humidity, etc.) aboard troop transports.	Initiate
Air-conditioned clothing, development and physiological evaluation.	Increase

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(CONTINUED)

<u>PROGRAM</u>	<u>EMPHASIS</u>
Biophysical effects of intense sound and vibration and methods of protection.	Increase
Increased reliability and acceptability of personal oxygen equipment.	Increase
Investigation of problems of orientation in both visual and instrument flight.	Increase
Physiological effects of accelerative forces.	Increase
Protection of personnel in crash. (To be coordinated with Comm. on Aeronautics).	Increase
Temperature control in aircraft.	Increase
Visual problems in high performance aircraft.	Increase
Atmospheric tolerance and control and removal of noxious substances in submarines.	Increase Markedly

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RESEARCH AND DEVELOPMENT ON NEW AND IMPROVED PHYSIOLOGICAL ADAPTATION OF THE COMBATANT TO THE STRESSES OF EXTREME NATURAL ENVIRONMENTS, SUCH AS ENCOUNTERED IN ARCTIC, JUNGLE, MOUNTAIN, SEA AND DESERT WARFARE

<u>PROBLEM</u>	<u>EMPHASIS</u>
Studies of the circulatory and respiratory responses to adverse environments.	Maintain
The development of methods suitable for the study of the physiological aspects of personnel selection with particular reference to the stresses encountered in arctic, desert, jungle, and mountain warfare.	Initiate
Effects of long-continued exposure to hot environments.	Initiate
Search for the studies of the action of drugs against adverse physiological conditions such as cold, heat, fatigue, nerve gas poisoning and motion sickness.	Increase
Studies leading to the development of methods of enhancing man's tolerance to heat and cold, in both acute and chronic exposures, by preconditioning, food, drugs, and external protection.	Increase
Determination of the effects of wearing special protective clothing (e.g., for protection against fragments, AW, BW, and CW) on the physiological capabilities of its wearers, and on the effectiveness of standard items of personal equipment.	Increase Markedly
Development of satisfactory evaluated tests of fitness for (and fatigue from) particular tasks under various stresses.	Increase Markedly
Study of total clothing and equipment assemblies of combat personnel with a view to their better integration, and analysis of the potentiality for reducing weight and bulk, or actual elimination of individual components.	Increase Markedly

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RESEARCH AND DEVELOPMENT ON NEW AND IMPROVED MILITARY APPLICATION  
OF ALL PHASES OF PREVENTIVE MEDICINE EXCLUDING MENTAL HYGIENE

<u>PROBLEM</u>	<u>EMPHASIS</u>
Malaria.	Decrease 8
Cold injury.	Maintain
Complete parenteral feeding including intravenous fat.	Maintain
Development of new insecticides.	Maintain
Enteric diseases with especial emphasis on bacillary dysentery as applicable to ships and submarines.	Maintain
Health hazards of military chemicals and casualty treatment thereof.	Maintain
Hepatitis.	Maintain
Influenza.	Maintain
Oral diagnostic aids.	Maintain
Redesigning of present day equipment to improve safety characteristics.	Maintain
Streptococcal diseases including rheumatic fever.	Maintain
Study of sensory perception and motor skills in accident repeaters.	Maintain
Toxicity hazards of candidate insecticides, repellants and rodenticides.	Maintain
Explore the establishment of a system for the collection, collation, evaluation and dissemination of veterinary medical intelligence.	Initiate
Rift Valley Fever	Initiate
Studies of possible substances and mechanisms capable of modifying metabolism in such a way as to make possible the maintenance of body economy and satisfactory performance under conditions of deficient food intake.	Initiate

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(CONTINUED)

<u>PROGRAM</u>	<u>EMPHASIS</u>
Leptospirosis.	Increase Moderately
Arctic Sanitation.	Increase
Basic aspects of insect resistance to insecticides.	Increase
Caries and periodontal disease control.	Increase
Chemoprophylaxis.	Increase
Common respiratory diseases.	Increase
Enteric infections - bacterial.	Increase
Geomedicine.	Increase
Hemorrhagic Fever.	Increase
Improvement of immunizing agents for the following communicable diseases: scrub typhus, gas gangrene, brucellosis, smallpox.	Increase
Schistosomiasis.	Increase
Skin diseases.	Increase
Study of personality characteristics of accident repeaters.	Increase
Unified service recording, disease classification and utilization of simplified reporting forms, particularly for the combat situation.	Increase
Virus removal or viricidal treatment of water	Increase
Determination of nutritional status and requirements of normal subjects and those with injury and disease.	Increase Markedly

RESEARCH AND DEVELOPMENT ON NEW AND IMPROVED MILITARY APPLI-  
CATIONS OF MENTAL HYGIENE FOR THE PREVENTION OF PSYCHIATRIC  
CASUALTIES AND MENTAL AND PSYCHIATRIC REHABILITATION

PROGRAM

EMPHASIS

Continued search for new methods of selection, assessment and assignment of submarine personnel from mental health aspects.

Maintain

Correlation of job classification with physical and mental profile.

Maintain

Study of influence of fatigue and length of combat tour of duty on psychiatric casualty rates.

Maintain

Collection and analysis of pertinent data pertaining to the problems of preventive psychiatry from past wars and the Korean conflict.

Initiate

Study and definition of the psychiatric aspects of disciplinary problems.

Initiate

Research in treatment methods for psychiatric casualties.

Increase

Study and definition of present and World War II replacement policies.

Increase

Study and definition of principles underlying good leadership and proper selection of officers, except psychological testing.

Increase

Study and definition of role of motivation and incentive in determining incidence of psychiatric disorders.

Increase

Study and definition of training methods with view to their modification to fit individuals of varying capabilities and emotional stability.

Increase

Study and definition of underlying principles governing dynamics of individual and group behavior and definition of the nature of the sustaining factors in interpersonal relationship action to prevent psychiatric breakdown.

Increase

RESEARCH AND DEVELOPMENT ON NEW AND IMPROVED METHODS, MATERIALS, FACILITIES, AND EQUIPMENT FOR THE EVACUATION, TREATMENT AND REHABILITATION OF ALL CASUALTIES EXCEPT THOSE PECULIAR TO RADIOLOGICAL, BIOLOGICAL, AND CHEMICAL WARFARE; AND EXCEPT MENTAL AND PSYCHIATRIC CASUALTIES.

<u>PROGRAM</u>	<u>EMPHASIS</u>
Cold injury.	Maintain
Development of forward evacuation with assigned ambulance aircraft.	Maintain
Development of plasma expanders.	Maintain
Liver damage, both infectious and chemical.	Maintain
Maxillofacial injury surgical treatment methods.	Maintain
Protective body armor.	Maintain
Skin diseases.	Maintain
Treatment facilities efficiency studies to decrease man hour loss.	Maintain
Tropical diseases.	Maintain
Capabilities of a trained surgeon and surgical team for major surgery over varying periods of time of combat stress.	Initiate
Effects of various flight conditions on oral structures and dental materials.	Initiate
Field study of methods of handling of casualties and treatment peculiar to present combat areas.	Initiate
Time lag in relation to wounding and resuscitation, and wounding and surgery.	Initiate
Improvement of dental treatment methods.	Increase
Preservation of Cellular Elements of Blood.	Increase