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The front cover photograph marks the historic moment at the Naval Submarine Medical Research Laboratory in Groton, Conn., when the U.S. Navy's first extended air-saturation-diving project was completed at 2130 on 30 Oct 1973. For further particulars, see the feature article which begins on page 4.

The photo on page 2 was taken at Naval Hospital San Diego, Calif., when the Surgeon General VADM D.L. Custis, MC, USN (left foreground) was briefed on the Traumatology Service at the hospital.

The continued support of the Illustrations and Exhibits, and the Photography Divisions of the Media Department, Naval Medical Training Institute, NNMC, Bethesda, Md., is gratefully acknowledged.



from the Chief

The beginning of each new year brings the promise of new opportunities and achievements. This is as true with institutions as it is with individuals. While this sense of renewal and hope are fresh in mind, it is appropriate for "Navy Medicine" to anticipate and prepare for the future. We learn from the past, but do not live in it. No military nor civilian institution dedicated to health care today is likely to survive, let alone renew itself, unless its dominant orientation is forward. Clearly we have embarked on a period of profound and rapid change.

A new year also implies youth and vigor. Navy Medicine and Dentistry must remain young and free of organizational paralysis. Nothing effects attitudes toward meeting the problems of the future more powerfully than what might be termed a self-seen image. The institution which can identify inherent vigor and growth potential will look eagerly to change. To meet the challenge and effectively control the impact will require both institutional and individual flexibility.

Our horizon is clouded by many factors. With the accelerating nationwide change of philosophy in health-care thinking, quality health care, more than ever will be considered a right of *every* citizen. The exact nature of the emerging National Health Insurance Plan will this year become clear. Military Medicine's interface will be defined. Certain traditions long held sacred in the health industry — military as well as civilian — will be tested and many will be discarded. Health-care systems and institutions will be reshaped to adapt to new demands and new concepts. Further turmoil, hopefully transient, is sure to evolve.

We in Navy Medicine and Dentistry can look to 1974 and beyond with confidence, for collectively we have the vigor and the resolve to lend all talent and energy to shape that future. But we must further resolve that this is a year for all of us to stand together as we never have before. This is the year when our numerical strength will reach its lowest ebb, and the greatest sacrifice is needed. This is the year for change. For if we, the members of the Navy Medical Department cannot find the "new" concepts, the "better" ways of delivering health care and greater professional satisfaction for our people — if we let changes block our vision, there are many less qualified who will gladly hand us their improvident and impulsive solutions. We shall not let this happen.

Have a good Year!



Shallow Saturation Dive Using Compressed Air

Naval Submarine Medical Research Laboratory,
Naval Submarine Medical Center,
Naval Submarine Base New London,
Groton, Connecticut 06340.

The United States Navy's first extended air-saturation-diving project was completed at 2130 on Tuesday, 30 October 1973. At that hour CAPT Vernon A. Burkhart, MC, USN, Commanding Officer of the Submarine Medical Center, and CDR R.L. Sphar, MC, USN, Officer in Charge of the Naval Submarine Medical Research Laboratory, congratulated the two volunteer Navy divers as they "surfaced" from the 30-day saturation dive which the Laboratory has been conducting in its hyperbaric chamber complex under the title SHAD-I (Shallow Habitat Air Dives). The two divers, Larry Burton, HT/1c (DV), USN and Jack Welch, HT/1c (DV), USN, were found to be in fine health and spirits after their long confinement.

The project, designed to encompass investigation in the shallow and intermediate diving zones, is the Navy's first such project using compressed air as the principal breathing gas. In the past, shallow-air-saturation diving has received little investigative attention, while mixed-

The opinions or assertions contained herein are those of the authors, and are not to be construed as official or necessarily reflecting the views of the Navy Department, or the naval service at large.



EMERGING FROM 30-DAY AIR-SATURATION-DIVING TEST.—CAPT Vernon A. Burkhart, MC, USN (2nd from left), CO of the Naval Submarine Medical Center; and CDR Raymond L. Sphar, MC, USN (3rd from left), Officer in Charge, Naval Submarine Medical Research Laboratory in Groton, Conn.; greet Larry Burton, HT/1c (DV), USN as he emerges from the Center's hyperbaric chamber on completion of the Air Saturation Diving Project, SHAD-I. CDR Robert J. Duke, USN (right) is Head of the unit at the Naval Underwater Systems Center, Newport, R.I., where the volunteer divers are assigned. Burton was accompanied by Jack Welch, HT/1c (DV), USN, on the extended test in a hyperbaric-chamber complex.



MONITORING AIR-SATURATION DIVE.—The 30-day confinement period began on 1 Oct 1973, in the cylindrical chamber used originally in the Sealab Project. One of the Navy's most comfortable models, the chamber measures 9 ft in diameter. Watching pre-decompression activity closely (from left to right) are: BMCM Michael Oranczak (obscured from view); TM2 Gary Seibert; HMCS Jack Caldwell; LCDR G.M. Adams, MSC, USN; and ENC James Jordan, USN (Ret.).

gas-saturation diving to great depths for extended periods has been developed as a feasible reality. However, both the availability and the economics of compressed air encourage its study as a breathing medium in shallow-saturation diving.

The human-subject dives conducted as SHAD-I, followed a 60-day multi-animal study at 50 feet and a 36-day multi-animal study at 60 feet conducted by the Naval Submarine Medical Research Laboratory in 1972. These preliminary animal studies indicated biomedically that human studies of a similar design could be conducted with safety.

The basic protocol of SHAD-I was to explore man's capabilities in air-saturation diving at a depth equivalent to 50 feet of sea water for 30 days. The two United States Navy divers, who were the subjects, engaged in an extensive biomedical-testing program designed to determine their response to the air-saturation dive. Excursion dives at pressures equivalent to depths between five and 235 feet of sea water were conducted. The Project Coordinator and Principal Investigator for SHAD-I was LCDR George M. Adams, MSC, USN.

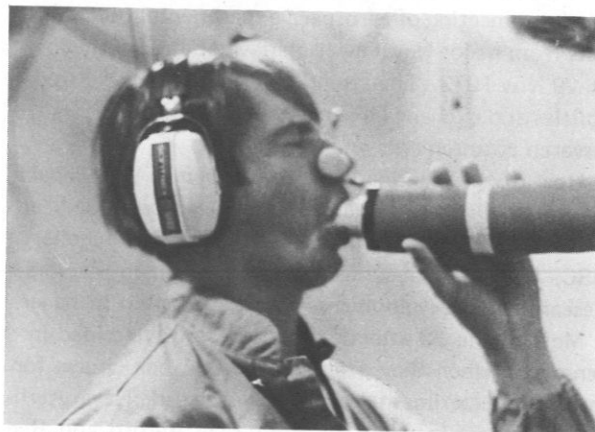
CDR Claude A. Harvey, MC, USN served as Head of the SHAD-I Medical Supervisory Team, and ENC James E. Jordan (MDV), USN (Ret.) was the Diving Supervisor.

CDR R.L. Sphar, MC, USN, Officer in Charge of the Laboratory, stated that volunteer divers for SHAD-I began extensive training and testing on 17 September. The principal diving team and a back-up team were fully trained in the various biomedical tasks involved in SHAD-I.

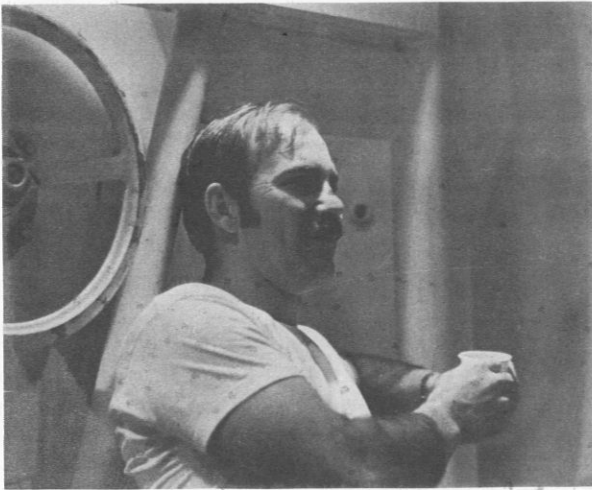
As is well known to the diving fraternity, saturation diving is based on the concept that at a fixed depth, body tissues rapidly become saturated with the breathing gas available. Once saturated, the time required for safe decompression does not increase. Thus, divers can live in pressurized habitats for long periods without increasing the time required for decompression. For example, in SHAD-I, tissue saturation was complete at 60 hours and past that point, the time required for safe decompression to the surface remained the same for the remaining 27½ days.

Dr. Charles F. Gell, Scientific Director of the Laboratory, pointed out that during SHAD-I, 25 investigators, representing all of the scientific disciplines within the Laboratory, compiled extensive biomedical information. In addition to participation in the Laboratory's longitudinal health survey of divers, the volunteer subjects participated in various tracking and discrimination tasks daily throughout the dive, and in routine monitoring of visually evoked brain responses and electroencephalographic patterns.

Pulmonary function was continuously monitored in each volunteer. Moderate workloads were undertaken using bicycle endurance tests, with exhaled gases being collected via a SCUBA mouthpiece. Respiration rate,



CHAMBER STUDIES.—Diver Jack Welch, HT/2c (DV) USN, diligently performs pulmonary function study.



COLLECTION CHAMBER.—Diver Larry Burton, HT/1c (DV) USN, inside the chamber, collects saliva for the dental portion of the test program.

electrocardiogram (EKG) and gas analysis were monitored throughout the exercise periods. Venous blood samples were obtained for blood-gas analysis, for correlation with respiratory-gas analysis. Visual acuity,

eye-muscle changes, depth perception, field of view, and night-vision sensitivity were measured to assess the volunteers for possible subtle effects of elevated oxygen partial pressure breathing.

Upon completion of the 30-day "dive," the divers entered a 14-day period of post-dive testing for comparison with the data collected in the pre-dive testing period.

Continuation of SHAD studies are planned following completion of SHAD-I. These tasks are contemplated as exploratory studies relative to medical feasibility, operational design, and definition of safety procedures in intermediate and shallow diving.

As no significant medical variations were observed during SHAD-I, air-saturation diving in the open ocean has been documented as a realistic possibility for operational use. Shallow and intermediate-depth habitats will provide marine biologists, marine geologists, and oceanographers with stable undersea dwellings for extensive explorations. The ready availability and low cost of air as a breathing medium, and the ease of its use in saturation diving should make habitats of this type an environment of choice in undersea-exploration development. ☪

AEROSPACE PSYCHOLOGISTS MEET

RADM Oscar Gray, Jr., MC, USN, Commanding Officer, Naval Aerospace and Regional Medical Center welcomed to Pensacola Mr. Harris B. Stone, Director, Research and Development Plans Division of the Office of the Chief of Naval Operations, the keynote speaker at a joint meeting of aerospace experimental psychologists from major Naval aviation-development activities, 26-29 Nov 1973. The attendees meet annually to update policies and exchange information on human-factors-research requirements and programs.

Host of the meeting was CAPT Newton W. Allebach, MC, USN, Officer-in-Charge, Naval Aerospace Medical Research Laboratory; and LCDR Paul R. Chatelier, MSC, USN, Air Systems Command Human Factors Research and Development, was the program manager.

Most of the 33 attendees had previously resided in Pensacola, when they attended the 26-week course for aerospace experimental psychologists at the Naval Aerospace Medical Institute. — PAO, Nav Aerosp and Reg Med Center, Pensacola, Fla.



AEROSPACE PSYCHOLOGISTS.—RADM Oscar Gray, Jr., MC, USN (left), CO, Naval Aerospace and Regional Medical Center chats with meeting participants (left to right): Harris B. Stone, Director, Research and Development Plans Division of the Office of Chief of Naval Operations; CDR Thomas J. Gallagher, MSC, USN, from BUMED; CAPT Newton W. Allebach, MC, USN, Officer-in-Charge, Nav Aerospace Med Res Lab; and LCDR Paul R. Chatelier, MSC, USN, Air Systems Command Human Factors Research and Development. — PAO, Nav Aerosp and Reg Med Center, Pensacola, Fla. ☪

OTTO FUEL II:

Health Hazards and Precautions

By CAPT Julio C. Rivera, MC, USN,
Chief of Occupational Health Service,
Naval Regional Medical Center, Charleston, S.C.

INTRODUCTION

Otto Fuel II is a liquid propellant currently being used in MK-46 and MK-48 torpedoes. Its increased use on shore-and-afloat torpedo preparation and maintenance operations has prompted many inquiries from medical-department personnel about its hazards, appropriate precautions, and treatment of personnel exposed to it. The staff of the Navy Industrial Environmental Health Center (NIEHC) has recently prepared a detailed NAVMED P-5112, NIEHC Bulletin: Otto Fuel II, which includes useful information on physical and chemical properties, physiological and special hazards, precautions, storage and handling, and special medical considerations. Since this bulletin is in the early stages of publication, and in order to meet the urgent needs of medical-department personnel, this advanced report on the health hazards, precautions, and special medical information is hereby published in part, as included in the NAVMED P-5112: Otto Fuel II.

CHEMICAL COMPOSITION

Otto Fuel II is a red-orange, free-flowing liquid with a distinctive odor. It is a nitrated ester to which a desensitizing agent and a stabilizer have been added. The chief component, the nitrated ester, is more accurately

termed 1, 2-propylene glycol dinitrate, or PGDN. The other components are 2-nitro diphenylamine (desensitizer), and di-n-butylsebacate (stabilizer).

OCCUPATIONAL EXPOSURE LIMITS

The Threshold Limit Value (TLV) for airborne concentrations of Otto Fuel II is a ceiling "C" limit of 0.2 ppm or 1.3 mg/M³. The lowering of this TLV is under consideration. Emergency Exposure Limit (EEL) for Otto Fuel II has not been set, and the atmospheric concentration immediately hazardous to life is unknown.

PHYSIOLOGICAL HAZARDS

GENERAL

The nitrated ester is the ingredient in Otto Fuel II which is of medical concern. Nitrated esters are known for their acute effects, including nasal congestion, headaches, dizziness, nausea, dilation of blood vessels, decrease in blood pressure, and labored breathing. Nitrated esters will also convert hemoglobin into methemoglobin, but in Otto Fuel II intoxication the levels of methemoglobin are usually low.

Tolerance to the cardiovascular effects of vasodilator organic nitrates can occur. Headache, dizziness, and a fall in blood pressure often appear during the first few days of exposure. Tolerance may then develop, and the rest of the working week is usually symptom-free. Upon returning to work after a week-end without exposure, the first contact with the organic

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nitrate often produces symptoms again. It has also been postulated that if it does exist, the tolerance mechanism may exert a compensatory action which, when the organic nitrate is withdrawn, precipitates coronary insufficiency due to coronary vasospasm. This chain of events may result in death.

Chronic effects of long-term exposure to Otto Fuel II, or to propylene glycol dinitrate (PGDN) are unknown. PGDN appears to be toxicologically similar to ethylene glycol dinitrate (EGDN). The severity of toxicologic effects may vary with the concentration, time of exposure, and temperature of the propellant.

INHALATION

Recent human responses to varying concentrations of Otto Fuel II in controlled chamber exposures reveal that the first untoward subjective effect experienced by the subjects was the onset of mild headache, usually frontal in location. Nasal congestion was not a problem, and it was reported only once during the sequence of exposures. It was noted that a small segment of the population may well develop headache after an eight-hour exposure to concentrations as low as 0.1 ppm. The majority of individuals will develop a mild headache after exposure to the current TLV of 0.2 ppm, for intervals as short as four hours. A few individuals are able to tolerate one-hour exposures to concentrations of 0.35, 0.5, and 1.5 ppm; however, exposure for longer periods invariably results in headache.

Exposure to Otto Fuel II at 0.5 ppm for six hours results in the onset of severe disequilibrium. The subjects are unable to perform a modified Romberg test, or a normal heel-to-toe test. At this point the subjects generally have severe headache, but if properly motivated, still possess good manual coordination and are able to function intellectually. Exposure to Otto Fuel II at 1.5 ppm precipitates definite eye irritation, without conjunctivitis or excessive lacrimation, after 30-40 minutes of exposure. Since the chronic effects of long-term exposure are not fully known, vapor inhalation must be avoided.

SKIN AND EYE CONTACT

Skin absorption of Otto Fuel II may also cause headaches, dizziness, and nausea. Overexposure can result from excess skin contact. There has been insufficient time for observation to establish whatever the long-term chronic effects may be; therefore, skin contact must be avoided. Yellowish staining of the contacted skin may occur. When splashed into the eyes, Otto

Fuel II may cause severe irritation; exposure to its vapor may also produce eye irritation.

INGESTION

Ingestion of Otto Fuel II may cause disorders of the gastrointestinal tract and mucosal membranes, dilation of blood vessels, headaches, nausea, and dizziness. Ingestion could result in death.

SPECIAL HAZARDS

Significant overexposure to Otto Fuel II can occur as a result of contact with the skin and/or vapor inhalation. In fact, the total exposure and the clinical effects are often the result of both modes of exposure. Solvents should never be used to cleanse Otto Fuel II from the skin, since solvents defat the skin and tend to increase Otto Fuel II absorption.

Any absorbent materials saturated with Otto Fuel II can present a fire hazard through a wicking action. Otto Fuel II is a monopropellant; that is, it does not require an atmosphere containing oxygen to support combustion. Otto Fuel II fires can be controlled with a waterspray or carbon-dioxide fog, which act to cool the fuel below its ignition temperature of 250°F. The by-products from the combustion of Otto Fuel II include nitrogen dioxide (NO₂), carbon monoxide (CO), carbon dioxide (CO₂), hydrogen (H₂), methane (CH₄), and hydrogen cyanide (HCN). A torpedo run of more than a few seconds produces sufficient amounts of these products to present a hazard to personnel. These hazards can be toxic or explosive in nature.

TOXIC HAZARDS

The combustion by-products that produce toxic effects by inhalation are CO, CO₂, NO₂, and HCN. Initial symptoms of overexposure to these substances include: CO — headaches, CO₂ — hyperventilation (extremely rapid or deep breathing), NO₂ — no noticeable initial symptoms at low levels, and HCN — dizziness and nausea (burnt-almond odor). Continued exposure to any of these toxic substances may produce some, or all of the following effects: dizziness, nausea, headaches, unconsciousness, and death. Note that exposure to NO₂, even at low levels, is particularly and insidiously hazardous. It will cause pulmonary edema (abnormal accumulation of fluid in lung tissue, which results in swelling of the tissue and difficulty in breathing) within 18 to 26 hours *after* exposure.

EXPLOSIVE HAZARDS

The hydrogen and methane gases generated by a torpedo-engine run can produce an explosive atmosphere within a compartment. Based on theoretical analysis of the percentages of hydrogen (13% to 37%) and methane (3% to 18%) in the torpedo-exhaust gas, and on the basis of known lower explosive limits of these gases (hydrogen, 4% and methane, 5.3% by volume), the explosive limit in a typical torpedo room could be reached in anywhere from six to ten seconds of torpedo-running time.

PRECAUTIONS

GENERAL WORK AREA REQUIREMENTS

General room ventilation is not sufficient to control Otto Fuel II vapor. Local exhaust systems are required. Eye-wash fountains and deluge showers are required in Otto Fuel II handling areas.

INHALATION

Local exhaust ventilation, designed to control the fuel vapor at its source is required during all operations involving Otto Fuel II and Otto Fuel II-contaminated materials, in order to maintain an air concentration below the TLV. For short-term emergency exposures constant flow, demand flow, or positive-pressure demand-breathing equipment (U.S. Bureau of Mines-approved) must be used.

SKIN CONTACT

A daily change of freshly laundered or clean disposable coveralls shall be provided. A neoprene apron shall be worn over coveralls. Hand protection (e.g., neoprene gloves), is required. If thin-layer neoprene or polyethylene is used, new gloves should be used for each operation. *Do not cleanse the skin of Otto Fuel II with solvents.* Protective clothing must be examined frequently for integrity, since Otto Fuel II and many of the solvents used will cause decomposition of the materials. Showers should be encouraged at the end of the work day. Lockers should be provided for street clothing.

EYE CONTACT

Face shields or chemical-workers' goggles should be worn during all Otto Fuel II, or Otto Fuel II-

contaminated materials-transfer operations, or where a danger of splashing is present.

INGESTION

Hands must be washed before eating, drinking, or smoking. No food, drinking fluids, or cigarette smoking shall be permitted in areas where Otto Fuel II is handled.

SPECIAL MEDICAL INFORMATION

PREPLACEMENT EXAMINATION

Preplacement and preassignment physical examinations are required for personnel with occupational exposure to Otto Fuel II, in accordance with BUMED-INST 6270.7 series and BUPERS transfer directives for MK-46 and MK-48 torpedo training. Exclude persons with hypertensive cardiovascular disease, post-coronary disease, arrhythmia, and arterial hypotension when the systolic blood pressure is persistently less than 100 mm Hg in the sitting or standing position (unless there are no associated symptoms, and a complete evaluation reveals no abnormality). In addition, persons with glaucoma, anemia, migraine, liver disease, and alcoholism should be excluded. Physical examination before exposure (and annually) should include the following:

A 14" x 17" chest X-ray study, FEV₁ and/or timed vital capacity test; 12-lead electrocardiogram study; blood sugar, SGOT, CBC, and urinalysis determinations, and; blood pressure measurements while resting, standing, and after one minute and two minutes of exercise.

PERIODIC EXAMINATION

Yearly examinations are required for personnel with occupational exposure to Otto Fuel II. The examination should be as inclusive as the preemployment examination, and the history should cover cumulative exposure to Otto Fuel II, ingestion of medications and unusual symptoms such as migraine or other types of headaches, insomnia, skin diseases, and rapid weight changes, in addition to a review of systems. If the skin, particularly on the hands is stained orange-yellow, sloppy work habits are suggested; the worker should be encouraged, for his own benefit, to utilize cleaner techniques.

TEMPORARY REASSIGNMENT

If employees develop frequent vomiting, acute chronic sinusitis, disorientation, insomnia, or an increase

in the number or severity of headaches, temporary reassignment away from the source of exposure is recommended. This maneuver will assist in establishing whether or not the symptoms are due to Otto Fuel II exposure.

EMERGENCY TREATMENT

Inhalation: Remove affected personnel from contaminated areas to fresh air, and encourage hot black coffee by mouth, for headaches. Oxygen breathing (100%) for 20 minutes, or aspirin, will also alleviate the headaches.

Skin Contact: Remove all contaminated clothing. Wash contaminated areas for at least 15 minutes with large amounts of soap and water. *Solvents are never to be used to cleanse Otto Fuel II from the skin as they will increase skin absorption.* Fresh air and a cup of hot black coffee, or 100% oxygen breathing for 20 minutes, or aspirin, generally alleviates the headache resulting from skin contact.

Eye Contact: Irrigate the eyes for at least 15 minutes with large amounts of water. Raise the upper and lower eyelids to insure adequate irrigation. Consider an ophthalmological consultation.

Ingestion: Induce vomiting with simple emetics (e.g., soapy-water solution, or insert finger in back of throat). Gastric lavage with water or dilute (1:5000) solution of potassium permanganate may be used, as

in the case of poisoning with other nitrates. A magnesium-sulfate solution (about 15-30 grams in water) may be left in the stomach.

Severe Intoxication: Methemoglobinemia is usually mild and generally will not require additional treatment beyond that described above. In severe poisoning with nitrates, it is recommended that 1000 cc 5% glucose-in-water be given intravenously if venous blood levels of methemoglobin reach 40%. If methemoglobinemia reaches a level of 60% or more, a 1% solution (10 mg per ml) of methylene blue (dose=1-2 mg/kg body weight) may be given intravenously over a period of five minutes. Methylene blue should only be used by experienced personnel as it may cause hemolysis; in the absence of methemoglobin it may paradoxically convert hemoglobin to methemoglobin. Some cases of severe poisoning with nitrates, having methemoglobin concentrations as high as 70% in venous-blood samples, have made uneventful recoveries within 24 hours without demonstrable permanent residual effects. It is imperative that patients be closely observed and remain in bed for at least 24 hours, if methemoglobin concentration reaches 40%.

Exposure to Combustion By-products: The combustion by-products that produce toxic effects by inhalation are CO, CO₂, NO₂, and HCN. Individual Environmental Health Bulletins (NAVMED P-5112) should be consulted for information about these substances. ☘

ANNUAL CAARD MEETING

CAARD (Counselors on Alcoholism, Addictions and Related Dependencies) held its 5th annual meeting in San Diego on 3 Nov 1973. CAARD members, representing all the West Coast affiliate groups, were in attendance. Principal speakers were: Dr. Robert O'Briant — Garden Sullivan Hospital, San Francisco; George Staub — Director, Los Angeles County Alcohol Abuse & Alcoholism Programs, and; CDR Eugene Dale Geiger, USN of the San Diego Naval Base Rehabilitation program.

A CAARD special award was given to CDR Richard Jewell, USN (Ret.), for being the prime mover in starting the Long Beach Navy program. CAPT J.J. Zuska, MC, USN, recently retired and awarded a Distinguished Service Medal, has stated that Dick Jewell was responsible for alerting him to the possibility of identifying and successfully treating Navy personnel afflicted by alcoholism. The success of this program not only resulted in the U.S. Navy programs now operating around

the world, but is credited with motivating all of the other U.S. Armed Forces to adopt similar alcoholism-control programs throughout the Department of Defense. Dick Jewell symbolizes the experienced specialist, whose compelling interest in alcoholism advances the cause of rehabilitation and the type of new professional which CAARD represents.

The CAARD Award Committee also honored Robert T. Dorris, its Executive Director and Founder, with the newly established annual award for his work in the field of counseling on alcoholism, addiction, and related dependencies.

Founded in 1967, CAARD now has affiliate chapters and members from California to Massachusetts. Its most current thrust is co-sponsoring counselor-training courses, and operating an employment clearinghouse and a certification program designed to identify trained specialists for working in the field of substance abuse.— PAO, CAARD, Los Angeles, Calif. ☘

THE DISASTER 3/50 KIT

By CDR Philip J. Goscienski, MC, USN,
Naval Hospital
San Diego, California 92134.

In July 1972 three physicians from the Naval Hospital San Diego were assigned to participate in relief operations in Luzon, Republic of the Philippines, in response to one of the worst flood disasters in the history of the country (*U.S. Navy Medicine*, 61:24-25, Apr 1973). Augmenting medical teams organized and supplied by the U.S. Naval Hospital Subic Bay, these physicians were deployed by helicopter to several flood-stricken towns and cities, to provide medical assistance. Transportation and supply problems were soon encountered and identified as major obstacles to effective delivery of medical care, despite the hard work and long hours contributed by supporting personnel. By the close of the mission, it was obvious to the physicians called upon to assist in disaster-relief operations that proper preparation and equipment must be planned and assembled well in advance of the emergency, in order to respond and perform effectively. To this end, personnel of the Naval Hospital San Diego have prepared the Disaster 3/50 Kit. LCDR H.R. Hensle, MSC, USN; LT R.A. Christiansen, MSC, USNR; and HM1 F. Schubert, USN devoted many hours to designing, developing and packaging the kit.

The Disaster 3/50 Kit is a supply block which will enable one physician to treat approximately 50 patients

per day for about three days; hence the numerical designation. Contents of the kit include medications used in the management of common, acute medical problems presented by adults and children, as well as parenteral fluids, and drugs needed for emergency resuscitation. A limited supply of burn and wound dressings is included, but the Disaster 3/50 Kit is not intended for burn and trauma problems encountered on a large scale.

The kit is packed in two metal "mount-out" boxes (see accompanying photograph), weighs 180 pounds,



THE DISASTER 3/50 KIT. — LT R.A. Christiansen, MSC, USNR (left) and HM1 F. Schubert (right) display the product which they planned and developed. Metal boxes are banded prior to deployment.

The opinions or assertions contained herein are those of the author and are not to be construed as official, or necessarily reflecting the views of the Navy Department or the naval service at large.

and has a volume of 7.2 cu ft. The cost of all supplies is approximately \$920.00. A complete list of the contents may be obtained from the author.

Transportation problems encountered in the Philippine flood disaster of 1972 influenced the design and size of the Disaster 3/50 Kit. The kit is light enough to be carried into the field by two or three persons, and can fit into a vehicle considerably smaller than an American-style pickup truck. Nevertheless, it contains enough supplies to enable a physician to work for at least two or three days, until larger and better-equipped medical units can be mobilized.

In order to obtain a useful yet easily transportable kit, it was necessary to make numerous compromises in the selection of supplies. For instance, medications for the treatment of relatively minor respiratory and gastrointestinal problems are allocated in amounts smaller than those which are customarily prescribed in this country under normal conditions. Many types of materials utilized by general and orthopedic surgeons were not included in the Disaster 3/50 Kit because these articles (dressings, splints, plaster, etc.) take up considerable space. Although the disaster-relief operation which inspired development of the Disaster 3/50 Kit occurred in a rather medically primitive or rural

tropical country, the necessary drugs for treating chronic problems such as parasite diseases and tuberculosis, are not included. Medications requiring refrigeration, such as benzathine penicillin and vaccines, are also not included. Frequent changes in mode of transportation, lack of ice or refrigeration at the disaster site, and the relative bulk of effective portable coolant material preclude carrying such items. Alternative drugs are available for most illnesses. The need for immunization materials in a disaster situation may vary and it is not generally predictable.

One of the more compelling reasons for preparing the Disaster 3/50 Kit became evident after it had been assembled; it is not possible to plan the contents of the kit, or to order, collect and pack these items overnight. Some supplies must be specially ordered, and some standard drugs and materials are present in only limited amounts, even in larger hospitals.

Undoubtedly, the Disaster 3/50 Kit will not exactly fit all disaster situations, and will not accommodate the preferences of all physicians. However, for most generalists/pediatricians assigned to disaster relief, the kit does offer desirable readiness, mobility, and capability for independent action — the necessary prerequisites for effective utilization of professional personnel. ☛

SCIENTIST-IN-THE-SEA PROGRAM

Scientist-in-the-Sea (SITS), a unique program that enables graduate students to become effective members of the scientific-diving community, recently began its third edition at the Naval Coastal Systems Laboratory, Panama City, Fla.

Scientist-in-the-Sea is an unusual program designed to provide its students with the breadth and depth of scientific-diving information and skills, to meet the growing demands of the marine-science community. Through SITS, young scientists and engineers of high potential are trained in advanced diving techniques, equipment, and technology, enabling them to effectively implement their academic scientific knowledge in an ocean environment.

The 10-week SITS curriculum is designed to include underwater photography; swimmer navigation; search and recovery methods; underwater communications; advanced umbilical diving techniques; underwater vehicles; planning and implementation of diving programs; exposure to saturation-diving techniques and equipment; and closed, semi-closed, and open-circuit scuba. Also included are relevant scientific principles and methods contributed by oceanography, engineering science, biological sciences, diving physiology, and medicine.—

NAVNEWS No. 0480, Washington, D.C. ☛

INFECTIOUS MONONUCLEOSIS:

Some Unusual Clinical Presentations

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INTRODUCTION

The diagnosis of infectious mononucleosis (IM) is often suspected when a young patient presents with pharyngitis, fever, cervical lymphadenopathy, and a negative pharyngeal bacterial culture. However, when unusual features herald the disease, it may be confused with other conditions. Under such circumstances a high index of suspicion for IM, on the part of the physician is essential to prevent unnecessary biopsy procedures, and other tests to which patients might otherwise be subjected. Prompt arrival at a diagnosis further allays patient and physician anxiety, allowing appropriate therapy.

Within this paper seven patients are considered, whose clinical courses represent some of the unusual pictures that this illness may present. We have included comments relative to the nodal histopathology, and an analysis of the relative frequency of uric-acid

elevations in IM, as reflected by the group of patients studied.

PATIENTS AND METHODS

The charts of 52 cases of infectious mononucleosis treated at the Naval Hospital Bethesda, Md., were selected for review. Most patients were seen in 1972 or 1973; one was admitted in 1969, and one in 1971. All but one were inpatients.

Seven patients whose clinical manifestations illustrated some of the unusual presentations of this disease were selected for study.

Uric-acid determinations were recorded from each chart, from Sequential Multiple Analysis (SMA)-12, auto-analyzer data. This method utilizes phosphotungstic acid to oxidize uric acid to allantoin, releasing tungsten blue which can be measured spectrophotometrically.

RESULTS

The unusual clinical features of the seven cases are summarized in Table 1.

The opinions and assertions contained in the above article are those of the authors, and are not to be construed as official, or as necessarily reflecting the views of the Navy Department or the naval service at large.

TABLE 1
UNUSUAL CLINICAL PRESENTATIONS
OF INFECTIOUS MONONUCLEOSIS

Patient	Age/Sex	Special Clinical Feature
1	28/M	Presented with inguinal adenopathy
2	21/M	Simulated lymphoma on biopsy specimen
3	18/M	Hyperuricemia
4	17/M	Hyperuricemia
5	23/M	Chronic febrile illness
6	3/F	Unusual age, and upper-airway obstruction
7	15/F	Presented with secondary pneumonia

Individual case reports will be briefly considered as follows:

CASE NO. 1: Unusual Site of Presentation

A 28-year-old physician with tender, left, inguinal adenopathy reported to the clinic. He had no upper respiratory-tract symptoms. No other lymph node enlargement was found on physical examination. A differential white blood cell (WBC) count revealed 77% lymphocytes, many of which were atypical. A Monospot (Ortho Diagnostics) test was positive. It was not until 18 days later that the patient developed a sore throat and cervical adenopathy. The differential heterophile-antibody test performed at this time was positive (titer after guinea-pig absorption, 1:224; after beef red-cell absorption, 1:7).

Comment: Inguinal adenopathy without cervical-node enlargement occurs only in rare instances in IM.¹ However, the positive Monospot test and abnormal blood film secured the diagnosis in this patient. A most interesting feature in this case is that the pharyngitis and cervical adenopathy were delayed for 18 days beyond the onset of the illness.

CASE NO. 2: Simulation of Lymphoma

A 21-year-old male was admitted to another medical facility with left-cervical lymphadenopathy, fever, and night sweats. A Monospot test was reported negative on admission. Because of the suspicion of lymphoma, a left cervical-node biopsy was performed.

Two weeks later the patient was transferred to the Naval Hospital Bethesda. Laboratory evaluation revealed a WBC count of 9,200/mm³, with the following differential count: 22% neutrophils, 3% bands, 7% monocytes, and 68% lymphocytes, many of which were atypical. The serum glutamic oxaloacetic transaminase (SGOT) level was 50 milliunits/ml (normal 5-40), and the serum glutamic pyruvic transaminase (SGPT) was 83 milliunits/ml (normal 5-40). The Monospot test was repeated and found to be positive. The heterophile-antibody titer was 1:224; after beef red-cell absorption, it decreased to 1:14.

Examination of the lymph node biopsy specimen showed diffuse follicular hyperplasia with large reactive germinal centers throughout the node. The basic architecture of the node was retained, but there were some areas of architectural obliteration which showed proliferating cells of the lymphocytic/plasmacytic series. Reticular lymphoblasts characterized by the presence of scanty cytoplasm, large nuclei, and eosinophilic nucleoli were seen. Occasionally, such cells were found with double nuclei, bearing a striking resemblance to Reed-Sternberg cells (see Figure 1). A liver biopsy revealed a mononuclear infiltrate consistent with IM. The patient recovered uneventfully.

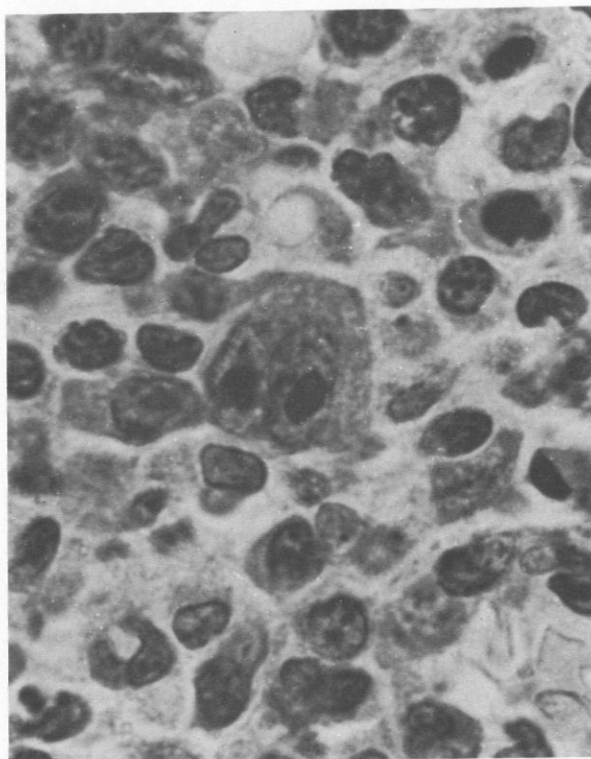


Figure 1.—A double-nucleated "reticular lymphoblast," closely resembling the Reed-Sternberg cell of Hodgkin's disease is seen in the center of the above photograph. (H&E; X 1200)

Comment: It has been recognized that the lymphadenopathy of IM may simulate malignant lymphoma,² and the histopathologic features may be misinterpreted by the unwary pathologist. One source of confusion is that *Reed-Sternberg-like cells* have been found in lymph node biopsy specimens taken from patients with IM,^{3,4} similar to the finding in our case. Further study, however, has revealed that this cell is most likely a "reticular lymphoblast," also known as a "basophilic stem cell," or more functionally perhaps, an "immunoblast." The exact origin or nature of these cells is unknown. Similar cells may appear in other viral infections such as postvaccinal lymphadenitis,⁵ and in a variety of other conditions.⁴ Slavador and co-workers² have suggested the following distinguishing features of lymph node histopathology in IM: ". . . (1) a variable incomplete effacement of lymph node architecture; (2) 'mixed' lymphoid proliferation, often with a prominent component of reticular lymphoblasts, producing a 'mottled' appearance; (3) cellular filling of sinuses; and (4) moderate trabecular, capsular, and perinodal infiltration."

Basically, the lymph node biopsy specimen in this case was characteristic of the foregoing description.

It is also wise to keep in mind that false positive heterophile-antibody tests have been reported in lymphoma.⁶

CASE NO. 3 and NO. 4: Hyperuricemia

CASE NO. 3: An 18-year-old male developed a sore throat followed by weakness, fatigue, and generalized adenopathy. The Monospot test was positive. On admission his uric acid level was 11.5 mg/100 ml (normal 2.5-8.0); on the sixth hospital day it had reached a peak of 16.2 mg/100 ml. A urine test for uric acid was 422 mg/24 hours (normal 200-500). No specific therapy was given for the hyperuricemia, other than hydration. On the 28th hospital day the uric-acid value was 10.2, and a subsequent determination three weeks later was reported to be normal.

CASE NO. 4: A 17-year-old male was admitted with a one-week history of anorexia, five-pound weight loss, sore throat, and massive lymphadenopathy. The peripheral blood smear showed 88% lymphocytes, with many atypical forms. The Monospot test was positive. The uric-acid determination was 12.5 mg/100 mg. One day later, after hydration, the uric-acid value had fallen to 8.4 mg/100 ml. He recovered uneventfully.

Comment: Hyperuricemia has been previously reported to occur in IM. Cowdery⁷ found a statistically

significant elevation of the mean of the uric-acid determinations in 21 patients with IM, as compared with normal controls. He found that the uric-acid elevation was generally highest within the first ten days of the illness, and returned to normal by the end of the second week. However, the highest value seen among his group of patients was only 11.0 mg/100 ml.

Among our own 52 cases, the uric-acid level (in mg/100 ml) was also elevated in six others, as follows: 8.6, 8.6, 8.9, 9.5, 9.6, and 11.6. Three additional patients were found to have top-normal values of 8.0, 8.0, and 8.1.

The hyperuricemia did not appear to correlate with the degree of leukocytosis. The most plausible explanation for the hyperuricemia is a heightened purine biosynthesis, associated with the increased nucleic-acid production that occurs in this disease.

CASE NO. 5: Chronic Febrile Illness

A 23-year-old man was admitted with a one-month history of fever, malaise, anorexia, weight loss, pharyngitis, and sore throat. Physical examination revealed cervical adenopathy, mild pharyngeal inflammation, and hepatosplenomegaly. The peripheral-blood smear revealed atypical lymphocytosis. The Monospot test was positive.

Comment: IM may present as an indolent, low-grade infection. The diagnosis should be considered in all such cases.

CASE NO. 6: Unusual Age of Onset and Upper-Airway Obstruction

A three-year-old female was admitted to the Naval Hospital Bethesda, because of upper-airway obstruction. The child was well until she developed a sore throat and fever, which did not respond to penicillin. A Monospot test was positive. Physical examination revealed maculopapular rash, large anterior-cervical nodes, enlarged tonsils, and a palpable spleen. A WBC count was 22,900/cu mm, with 60% atypical lymphocytes. Progressive respiratory distress required relief by endotracheal intubation. Dexamethasone was also administered. The patient gradually improved, and made a full recovery.

Comment: Croup, epiglottitis, bacterial pharyngitis, and many other viral infections may present with similar clinical findings, in this age group. It is important to consider IM as a possible cause, since the airway obstruction may subside dramatically with the use of steroidal compounds.

IM can occur in this age group, but it is unusual.

CASE NO. 7: IM Presenting with a Secondary Pneumonia

A 15-year-old female was admitted because of a persistent right middle lobe infiltrate. She was well until 13 days prior to admission, when she developed malaise, chills, fever, and a productive cough. Sputum examination revealed gram-positive pneumococci, and chest X-ray showed an infiltrate and loss of volume in the right-middle lobe. Penicillin therapy was instituted, but because of failure to respond the patient was admitted for further evaluation. On physical examination, the spleen was noted to be enlarged. At bronchoscopy, removal of mucous plugs from the right middle lobe orifice resulted in better aeration. A WBC count was 6,100/cu mm, with 85% lymphocytes (many atypical) on differential count. Liver-profile studies showed elevated alkaline phosphatase, lactic-acid dehydrogenase, and SGOT values. The Monospot test was positive.

The patient was treated with erythromycin, fluids, and pulmonary physical therapy. Her pneumonia gradually resolved and she went on to recover. It thus appeared that this patient presented both bacterial pneumonitis, and IM.

Comment: No patient in Hoagland's series of patients presented what could be called "mononucleosis" pneumonia.⁸ If pneumonitis occurs in IM, it is usually bacterial and represents a complication of IM, perhaps as a result of airway obstruction due to hilar adenopathy or mononuclear infiltrates, dehydration, etc.

It is important to note that examination of the peripheral-blood smear in this case revealed atypical lymphocytosis, a strong clue to the diagnosis of co-existing IM.

SUMMARY AND CONCLUSIONS

IM may present with unusual or confusing features. It is important for the physician to harbor a high index of suspicion for IM in a wide variety of clinical

circumstances. The diagnosis is easily made with the use of the Monospot test, or other form of heterophile-antibody detection. Atypical lymphocytosis detected on examination of the peripheral-blood smear will help confirm the diagnosis.

The immunoblast of IM closely resembles the Reed-Sternberg cell of Hodgkin's disease, but other histopathologic features of the lymph node will distinguish between the two diseases.

Hyperuricemia appears to be fairly common in IM, but the condition is mild, self-limited, and rarely requires treatment other than hydration.

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FILING CHAMPUS CLAIMS

The Department of Defense has placed a time limitation on filing claims by beneficiaries of the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS).

The new policy, effective for supplies and services provided under CHAMPUS on or after 1 Jan 1974, specifies the deadline for filing claims as the last day of the calendar year following the calendar year in which services and supplies are provided.

Officials said growth of the CHAMPUS program since 1966, when civilian health-care benefits were greatly expanded for military people, has created an urgent need for more efficient and effective claim-processing procedures. Most health-insurance carriers, both governmental and civilian, also require a limit on claim filing. — NAVNEWS No. 0487 (14 Dec 1973), Washington, D.C. ☞

THE COMPOSITE WORK UNIT: A Critical Analysis*

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American military health-care systems perform a variety of services (e.g., examinations, refractions, outpatient and emergency visits, and inpatient care) to a variety of beneficiaries (e.g., active duty, retired, and dependent personnel) in a variety of geographically-dispersed facilities (e.g., aid stations, dispensaries, and hospitals). While it is difficult to use a single quantitative variable to summarize the activity of military health-care systems, two major measures have been employed for this purpose. Prior to, and immediately following World War II, the number of occupied-bed days was used as the summary measure of military health-care systems. During the early 1950s, the inadequacies of occupied-bed days as a summary measure of medical activity were recognized, as the lengths of inpatient stays shortened and the volume of outpatient visits increased. A new quantitative measure was needed in order to summarize total-system activity, and to compare facilities one with another.

To develop a new measure of medical activity, a tri-service study of 34 CONUS hospitals was undertaken beginning in October 1956. The objectives of the study were: (1) to isolate those factors, in addition to the number of occupied-bed days, that significantly affected patient-care workload, and (2) to quantify the impact of such factors.¹ From the study emerged the Composite Work Unit (CWU)** as employed by military hospitals today.²⁻⁴ Essentially, the CWU attempts to weight and combine those factors that materially affect patient-care workload. The measure, which was revalidated in 1967, is presently defined as:

$$\text{CWU} = \text{average daily-occupied beds} + \\ (\text{average daily admissions} \times 10) + \\ (\text{average daily births} \times 10) + \\ (\text{average daily outpatient visits} \times 0.30)***$$

Since its creation and wide-scale implementation as a workload measure, the CWU has been the object of a growing amount of criticism. In the opinion of many, the CWU reflects neither the increasing amount nor the changing character of workload faced by military hospitals. Yet, amid the criticism there has been little systematic and rigorous analysis of the CWU as

*A more complete version of this analysis is available from the Naval School of Health Care Administration as Research Paper No. 8, "The Composite Work Unit: A Critical Analysis."

While this paper is a product of the BUMED-funded Medical Workload Prediction Project (65104N MF 018.02.01 100B), the opinions expressed herein are those of the author and should not be construed as reflecting the views of the Bureau of Medicine and Surgery, the Navy Department, or the naval service at large.

**The CWU is known in the Army as the MCCU.

***The U.S. Air Force employs a weight of 0.25 for outpatient visits.

a measure of workload. It is the objective of this paper to, at least partially, fill that void: (1) by analyzing the implicit assumptions upon which the CWU is based, (2) by comparing the measure's intended and actual uses, and (3) by evaluating the methodology of the CWU's empirical revalidation.

The CWU: Underlying Assumptions

The CWU makes five assumptions about the structure and dynamics of health services-delivery systems that do not accurately reflect phenomena or relationships as they exist in the real world.

First, the CWU assumes that the hospital produces a homogeneous product. For example, all occupied-bed days are presumed to be equivalent (i.e., equal to 1.0 workload units). However, it is clear that the occupied-bed-day measure does not reflect the amount of workload generated by one patient day of care, but rather only registers that some care was provided.⁵

Patients vary by condition, the presence and severity of complications, type of treatment (e.g., medical versus surgical), kind of accommodations (e.g., semi-private versus ward), age, and sex to mention only several factors.⁶ Patients possessing differing packages of characteristics generate highly variable workloads per occupied-bed day.^{7,8,9,10,11} The same is true of admissions, births, and outpatient visits.

Second, the CWU measures only alterations in the volume of services provided (occupied-bed days, outpatient visits, etc.), and in no way accounts for changes in the quality of services produced. It measures only the quantity of service units produced, and thus understates workload in periods when the objective is quality maximization. This situation is compounded by the fact that the base level of quality, around which a particular delivery enterprise varies is increasing significantly across time.¹²

Third, the CWU assumes that economies of scale in health-care production either do not operate, or do not have a large enough effect to be significant. This is contrary to a substantial body of literature which shows that efficiency of production varies considerably between hospitals within a given year, and within the system as a whole across years.^{9,13,14} Thus, while the CWU assumes that units of production have identical resource requirements, available evidence suggests that the resources required per CWU should decrease with increasing output.

Fourth, the CWU fails to recognize that units of service can conceivably be produced through different mixes of manpower. For example, an outpatient visit can be produced by combining different quantities of

physician, nurse, medic, and laboratory-technician time. Theoretically, all possible alternative mixes deviate around some "optimum" combination of manpower. However, the CWU does not recognize differences in the types of manpower used to perform work.

Fifth, the hours of different types of manpower were assumed to require equivalent resources. No distinction was made between hours of physician time, versus hours of nursing or auxiliary-personnel time. Time is not a pure factor, but rather has differential relative value depending upon "whose time it is." One hour of physician time has considerably greater relative value (either in terms of cost or worth) than a similar amount of time expended by a corpsman. It is readily apparent that hours of different types of manpower cannot be directly added together, in order to quantify the impact of workload on resource requirements.

The CWU: Intended vs Actual Use

Articles and reports documenting the initial design of the CWU indicate that the measure was developed specifically to relate manning levels to associated direct patient-care workload. The CWU was seen as a ". . . simple measurement to evaluate manpower for 'patient care' on an overall and command basis, . . . [as] an effective tool by which available-manpower resources can be distributed equitably."³ The methodology employed in quantifying the weights assigned to the four components of the CWU (admissions, births, occupied-bed days, and outpatient visits) focused totally upon measuring the relative amount of staff time allocated to particular functions.

The use to which the CWU is presently being put is considerably different than the use for which it was designed. As noted above, the CWU was initially developed as a staffing tool. As time passed, the CWU came to be viewed as a more generally applicable measure of workload. The implied rationale underlying such a generalization centered upon the assumption that if the CWU was a valid tool for distributing manpower, then it must have validity for allocating funds for supplies and equipment. More recently, the CWU has been used by the different services to support fund requirements for total patient-care activities and, to some extent, to assist in making decisions regarding the allocation of resources across major commands. It is a major leap from predicting staffing levels based upon measured workload, to predicting or justifying total-resource requirements. Even if it can be assumed that the CWU is valid for the former function, and there is reason to doubt even this, there is no evidence to suggest that the CWU is valid for the latter.

The CWU: A Methodological Appraisal

As noted in the first section of this paper, the CWU was developed in 1957 and revalidated ten years later in 1967. The objective of the revalidation study, which was conducted by the Hospital Management Engineering Branch, Office of the Surgeon General, USA, was to determine if the originally assigned relative-weighting factors were still valid. Available documentation indicates that the effort to revalidate the CWU followed essentially the same methodology employed in the original tri-service study conducted in 1957.¹⁵ Attempts were made to distribute total personnel time across five functions:

- "a. Getting the patient into the hospital including the patient's history, physical examination, diagnosis admission (into the hospital and into the ward) and initial care and treatment.
- "b. Day-to-day patient care including general nursing care, subsistence and ward house-keeping.
- "c. Getting the patient out of the hospital including decision and instruction concerning follow-up care, records and reports, and the disposition process. . .
- "d. Delivery and nursing care of newborn infants.
- "e. Outpatient care."

These five functions were combined to reflect time devoted to admission (i.e., admission and discharge), occupied-bed days, births, and outpatient visits. Quantitative analysis indicated that the weighting factors assigned by the initial study still held. That is, the workload (based upon the number of personnel hours) associated with an admission, a birth, an occupied-bed day, and an outpatient visit still stood in the relationship of 10:10:1:0.3.

The methodology employed in the revalidation study has one deficiency that entails serious consequences when CWU is employed as either a measure of workload in relation to staffing, or as a general purpose resource allocator.

While the revalidation methodology could conceivably have registered relative changes in personnel hours associated with an admission, birth, occupied-bed day, or an outpatient visit, the study as designed did not attempt to sense an absolute change in the relationship between personnel requirements and workload, either per component or in the aggregate. In the 1967 study:

"The relative amount of medical care personnel resources used in meeting the work

requirements represented by the separate elements of the MCCU (CWU) was established by using the personnel to bed-occupied ratio as the base 1, and then relating the other ratios to the base factor. This process results in a weight for each MCCU (CWU) workload element which expresses its manpower value in relation to that of day-to-day patient care."¹⁵

The methodology employed assumed that the personnel-to-bed ratios of military hospitals remained perfectly constant across the ten-year period, 1957-1967. Additionally, it was implicitly assumed that the mix of personnel per occupied-bed day also remained exactly the same. These assumptions introduce an error of major magnitude into the study. For example, the personnel-to-bed ratio for naval hospitals increased from 1.37 in 1957, to 2.30 in 1971. Completely discounting changes in the mix of personnel, the CWU understates the actual amount of personnel required to service a given workload for naval hospitals in 1971 by almost 68% when compared with 1957. Given this flaw, the CWU as presently designed can, at best, be used only to allocate total personnel hours *relatively* across the four "work centers" (admissions, births, occupied-bed days, and outpatient visits) — it cannot and should not be used to measure requirements for absolute increases in staffing complements across years. This deficiency becomes a serious shortcoming when the CWU is used to allocate resources across years.

Conclusions

The composite work unit was initially developed in 1956, and was subsequently revalidated in 1967. Since its implementation as a measure of workload in military hospitals, the CWU has been the subject of growing criticism. Despite this dissatisfaction, the CWU has been subjected to little rigorous analysis. It was the objective of this paper to attempt to partially fill this void. The primary findings of this analysis are summarized below:

- . The CWU makes several assumptions about both the structure and dynamics of health services-delivery systems that do not accurately reflect phenomena or relationships as they exist in the real world.
- . It would appear that the CWU is presently being used for functions for which it was not initially designed. The CWU was originally developed as a measure to assess the association of given amounts of workload with particular manning levels. With passage of time, however, the

CWU has been employed to justify fund requirements for total patient-care activities and, to some extent, to assist in making decisions regarding the allocation of resources across major commands.

Because of its initial design, the CWU is incapable of registering absolute increases in the relationship between personnel requirements and workload. That is, the measure assumes that the resources required (expressed in terms of either personnel or total dollars) to produce a standard unit of service (one occupied-bed), remain perfectly constant from year to year.

The CWU is inadequate as a measure of workload on numerous grounds. Questions may then be raised: How can the presently conceptualized workload measure be improved; or, alternatively, Can an entirely new measure be developed? Several concluding observations appear warranted regarding these questions.

First, given the present unavailability of a better measure, we feel that the CWU should not be discarded. The purpose of any quantitative tool is to limit the decision space, so that informed judgment can be employed over a narrower range of alternatives. The CWU does provide some information for the decision maker who is faced with the task of resource allocation. Such information should not be ignored, *nor* should it form the sole foundation for a decision.

Second, given the analyses provided in this paper an immediate attempt should be made to adjust the CWU, to correct for inherent deficiencies. When used as a general-resource allocator, decision makers should realize that the CWU does not reflect absolute increases in factor prices across time, associated with the production of a constant amount of output. The decision maker should be extremely sensitive to the fact that the CWU does not account for changes in resource requirements which result from alterations in the quality of care provided, or advancements in the technological sophistication with which care is delivered.

Third, we feel that the preceding suggestions should be considered only as short-term expedients. The CWU has major structural deficiencies that would not be eradicated, even if the above refinements were implemented. The Research Division of The Naval School

of Health Care Administration is presently engaged in a study to conceptualize, design, and test a more valid measure of workload. The outpatient portion of the project is presently nearing completion, and the inpatient analysis is expected to start shortly.

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THE GASTROENTEROLOGISTS' CORNER

Hepatitis and the Australia Antigen

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INTRODUCTION

One of the intriguing aspects of practically all human infections is the wide range of susceptibility to the same agent that is demonstrated by different people. Since 1961 Dr. Baruch Blumberg, and associates at the Institute for Cancer Research, Fox Chase, Philadelphia, Pa., have been making a particular study of this problem in an effort to learn why some people do not get sick, even though exposed to the same infectious agent as people who do get sick. Heredity may be one answer. Constitutional factors affecting immunity may be another consideration, as well as the dosage of the infectious agent, and the period of life at which the person is exposed. All these circumstances apply to viral hepatitis as much as to any other infection.

The opinions expressed herein are those of the author, and cannot be construed as reflecting the views of the Navy Department or the naval service at large.

Dr. Cerda is an active participant in U.S. NAVY MEDICINE, and represents the finest example of a highly respected physician who is also a dedicated member of the Naval Reserve.

SERENDIPITY AND THE AUSTRALIA ANTIGEN

The discovery of Australia antigen [Au(1)] by Dr. Blumberg and his group of investigators constituted an incidental outgrowth of research into the general problems of constitutional differences among various groups of people. The initial idea involved the premise that the characteristics of serum proteins might be affected by genetic traits (polymorphism). They explored the possibility that such differences might give rise to antibodies against particular serum proteins, in patients who had had multiple transfusions. Low-density lipoproteins appeared to be the most immunogenic. Utilizing the technique of immunodiffusion in agar gel, the serum of an Australian aborigine was found to react with serum from a hemophiliac who had received multiple transfusions. This antigen could not be saturated by normal lipoproteins, and was, therefore considered abnormal; it was named Australia antigen [Au(1)].

By 1966 Blumberg and co-workers had shown that Au(1) was associated with hepatitis. These observations

opened wide the door to the epoch-making research dealing with the major unsolved problem of hepatitis — the detection of a viral agent.

WORLDWIDE PREVALENCE OF AUSTRALIA ANTIGEN

Since the initial pioneer studies by Blumberg, a large body of data has been accumulated which seems to show that Au(1) is rare in the United States and Northern Europe (0.1%). In other areas of the world, particularly the tropics, the prevalence varies. Among the Bantus of South Africa, 2.8% of the population tested were positive for the antigen; in Ghana the figure is 9.5%, and in Taiwan it is 13.0%. Peruvian Indians have an incidence of 20.2%, and blacks from Brazil, 2.5%.

ASSOCIATION OF Au(1) WITH DISEASES OTHER THAN HEPATITIS

A particularly intriguing, early finding was the frequent discovery of the Au(1) in two other diseases: Down's syndrome (mongolism), and certain types of leukemia. Other conditions in which Au(1) occurred

with high frequency were diseases associated with chromosomal abnormalities, such as Fanconi's congenital aplastic anemia and related syndromes; in the co-twin of a patient with leukemia; and in survivors of the atomic bomb in Hiroshima. Au(1) occurs in about 30% of patients with Down's syndrome in large institutions. It is far less common in other types of mental retardation kept in large institutions, and in patients with Down's syndrome in small institutions. Noninstitutionalized subjects with Down's syndrome do not have Au(1), but when they are admitted to a large institution, Au(1) frequently appears in their blood.

AUSTRALIA ANTIGEN AS AN INFECTIOUS AGENT

In one patient with Down's syndrome who was admitted to a large institution, clinically acute hepatitis developed with the appearance of Au(1) in the blood. This was a breakthrough which provided evidence that Au(1) was indeed etiologically related to infectious hepatitis. Another interesting finding was that one of the laboratory technicians associated with the research



WARD ROUNDS. — During a recent tour of active duty, CDR James J. Cerda, MC, USNR-R (3rd from the left), Associate Professor of Medicine at the University of Florida College of Medicine, made ward rounds with the gastroenterology-department staff officers at Naval Hospital Philadelphia.

group developed infectious hepatitis, and Au(1) also appeared in her blood for the first time. The appearance of the antigen coincided with the highest level of the serum transaminase, and disappeared as the transaminase decreased. This observation not only confirmed the relationship of the antigen to hepatitis, but demonstrated readily that the appearance of the antigen might be transient and need not be persistent in most patients.

Since that time, an enormous number of observations have been made, confirming the original hypothesis that Au(1) is related to viral hepatitis. The transmissibility of Au(1), likewise, has been readily proven. Australia antigen appears in about 1% of Japanese blood donors, particularly professional donors, an observation similar to that made in this country. Au(1) may appear in the blood as early as 12 days after transfusion, and is frequently *not* associated with jaundice. In some patients antibodies develop against Au(1), and in some of these patients hepatitis is not evident. There is also some experimental proof of transmissibility of Australia antigen. It is possible to transmit Au(1) to the chimpanzee, African Green Monkey, marmoset, and the orangutan. The antigen is highly stable, and has been recovered from sera kept for 20 years in storage. A liver-cell suspension, which is overlaid with fluorescent antiserum to Au(1), will demonstrate fluorescent particles in liver-cell nuclei taken from hepatitis patients with Au(1) in their blood, but will not generally fluoresce in association with liver-cell suspensions from patients who do not have hepatitis or Au(1) in their blood.

IS AUSTRALIA ANTIGEN A VIRUS?

Whether or not Au(1) is a true virus, or perhaps some other type of submicroscopic infectious particle, has not as yet been entirely elucidated. However, there is much suggestive evidence for its viral nature. For example, Au(1) has been isolated by density-gradient sedimentation, making it possible to examine it under the electron microscope. It appears to be a particle of 200 Å in diameter, with knob-like subunits measuring approximately 30 Å on the surface. In some of the particles, a central core is observed. Specific antibody, produced in rabbits causes the particles to agglutinate, often in large aggregates or in rows. In some of the preparations, elongated sausage-shaped particles can also be seen. Larger (420 Å) particles have also been described.

Thus far, the evidence is not complete in establishing the true nature of Au(1). Au(1) apparently contains no DNA, and an extremely small quantity (about

5%) of RNA, and even this may be a contaminant. It may represent another type of infective agent which cannot be classified according to the usual criteria for a virus. For example, a similar problem exists in scrapie, a disease of sheep caused by a transmissible agent of extremely minute size, which is apparently lacking in nucleic acid. However, we must accept the observations which show that the particle is extremely infectious. It is not quite clear why it should occur in such high prevalence in certain parts of the world, particularly the tropics. It appears likely, however, that environmental conditions associated with constitutional factors and susceptibility are more important. The exact role of poor sanitation or of an intermediate host, such as the mosquito, have not been thoroughly investigated.

VARIETIES OF AUSTRALIA ANTIGEN

Australia antigen has been found to contain subtypes in which specific antibodies cross-react with subgroup antigens, indicating a close relationship. Although this aspect of the study of Au(1) is quite recent, it appears that there is at least one antigenic subtype, (a). Another, (x) is common to all positive sera. Two other subtypes, (b and y) are exclusive. These subtypes may be of considerable importance, for example in epidemiologic surveillance studies, and in clinical typing of acute and chronic hepatitis.

DISORDERS ASSOCIATED WITH PERSISTENCE OF Au(1)

1. *Down's syndrome.* A number of conditions, in which there is persistence of Au(1) have now been identified. One of these is Down's syndrome (mongolism). Such persons present a high frequency of persistent Au(1) in the blood, and concomitant chronic anicteric hepatitis (about 30% of institutionalized patients). In 43 of these patients reported in one published series, the antigen was found to persist more or less indefinitely. In rare instances the antigen disappeared for a brief period, but reappeared later. None of these patients had received transfusions. However, they lived in an environment where hepatitis was common, and high standards of sanitation were difficult to maintain. Jaundice was comparatively rare in this group, but liver biopsy has shown histologic evidence of chronic hepatitis in nearly every case. The transaminase (SGPT) levels of these patients were moderately elevated. The fact that other mentally retarded patients in the same institutions rarely demonstrated the presence of Au(1), and none of the employees had

Au(1) in their blood, reflects the unique susceptibility of patients with Down's syndrome to chronic anicteric hepatitis. The latter observation is consistent with the idea of a constitutional factor (a susceptibility change), which is peculiar to these patients and is presumably associated with their chromosomal abnormality. Such a concept is also consistent with the observation that patients with Down's syndrome are far more likely to develop leukemia than other mentally retarded subjects.

2. *Leukemia:* Au(1) is also common in patients with acute myelogenous leukemia, and with acute and chronic lymphocytic leukemia; it is uncommon, however, in patients with chronic myelogenous leukemia. Also, these patients do not present signs of acute hepatitis. Most of the cases have received transfusions as part of their therapy, in contrast to patients with Down's syndrome who give no history of transfusions.

3. *Lepromatous leprosy:* These subjects offer striking immunological differences from normal subjects, and from those with tuberculoid leprosy. Lepromatous lepers are deficient in cellular hypersensitivity, and their skin tests with lepromin are negative. This immune deficiency appears to be lifelong, and may precede the onset of the disease. Au(1) occurs two to three times more frequently in these patients than in tuberculoid leprosy, or in healthy people living in the same geographic area.

4. *Chronic renal insufficiency treated by dialysis:* It is well known that patients with chronic renal insufficiency are deficient in certain immune responses which, fortunately, allows them to accept a kidney transplant much more readily than other patients. However, the defect also predisposes them to persistence of Au(1). In a recent study, in which 16 staff members (nurses and technicians) were exposed to the antigen, acute viral hepatitis developed in six. On the other hand, patients with chronic renal disease did not become jaundiced and their SGPT levels remained below 300 units, reflecting the existence of chronic anicteric hepatitis.

There are other conditions associated with persistence of Au(1). These include Hodgkin's disease, and agammaglobulinemia. Persistence of Au(1) has not been demonstrated in sarcoidosis. It may be persistent in some patients with chronic hepatitis associated with drug abuse. Persistence in the latter group suggests that the hepatitis virus is being freely passed around the drug community. The high incidence of hepatitis associated with the growing number of drug abusers also coincides with the disappearance of the seasonal fall-winter peaks, and the increases in age-specific attack rates for viral hepatitis in general. It is important to emphasize that rarely, in the categories

listed above, do these patients show clinical signs of liver disease. There may be slight increases in the SGPT levels. On the other hand, liver biopsies reveal a wide spectrum of abnormalities, from minimal infiltrates to early postnecrotic cirrhosis.

DISTINCTION BETWEEN "INFECTIOUS" AND "SERUM" HEPATITIS

Formerly, it was assumed that there were two distinct types of hepatitis virus. One was the so-called SH virus, which was thought to be transmitted *only* by parenteral introduction of blood, or serum from a carrier or patient with this particular type of virus. The other was IH hepatitis, transmitted by the fecal-oral mode of spread. These entities were further separated by the fact that the SH hepatitis seemed to have a long incubation period (three months, or more) whereas IH hepatitis had a much shorter incubation period (about 21 days). Although this classification was convenient, it was based largely on clinical grounds. Many studies following the discovery of the Au(1) have now shown this classification to be of no value. For example, Au(1)-associated hepatitis has been shown to have an incubation period of considerable range, without sharp separation into two separate types. In addition, the excellent studies by Krugman, and others have shown that Au(1) can be transmitted not only by the parenteral route, but also by the fecal-oral route. In fact, the agent has been demonstrated in feces, urine, and saliva of carriers. This assumes even more importance when one recognizes that approximately 30% of adults with viral hepatitis, who have Au(1) in their blood, give no history of having been exposed to blood or blood products, directly or parenterally.

CLINICAL USES OF THE TEST FOR AUSTRALIA ANTIGEN

1. *Screening of donors:* The test for Au(1) is now widely used in many hospitals in which transfusions are given, both to test individual units of blood and to test donors as possible carriers. Although the test is highly specific, it should be remembered that it is not invariably positive in donors who may at other times show a positive reaction, or who may show the antigen only in their liver. In addition, the number of positives will increase depending on the sensitivity of the test employed. At present, the most sensitive method for detecting Au(1) is by solid-phase radioimmunoassay. Complement fixation is probably the next most sensitive method, followed by counter immunoelectrophoresis, and the original immunodiffusion-

in-agar technique, the latter being the least sensitive but highly specific.

The source of donor blood is an extremely serious matter in a large city. Volunteer donors are far less likely to carry the antigen, in contrast to paid donors, or inmates of a prison. The testing of blood for the antigen has now become practicable in routine blood-bank work, and indeed this is required in many states in the U.S.A., before blood can be used for transfusion. The antibody used for the detection of Au(1) is generally obtained from patients with hemophilia who have received large numbers of transfusions and have, therefore, developed a high titer of antibody against Au(1). Although the original screening method, using the immunodiffusion took about 24-48 hours, newer methods make it possible to detect the antigen in as little as two hours.

2. *Diagnosis of acute viral hepatitis:* The Au(1) test has great usefulness in the differential diagnosis of jaundice. It is positive in a large portion (upwards of 80%) of cases of acute viral hepatitis, including fulminant hepatitis. In some patients it is possible even to predict the eventual development of viral hepatitis, if by some chance the blood is tested in the preclinical stage. Testing for Au(1) is done as part of the primary screen, in many hospitals.

3. *Diagnosis of chronic hepatitis:* The role of Au(1) has an important bearing on the problems confronting patients with chronic anicteric hepatitis, who may be carriers of the virus and who may, in turn, eventually develop advanced liver disease.

4. *Test for progression of acute into chronic hepatitis:* This is an important consideration in every patient who develops acute viral hepatitis, and may help to establish the prognosis. Progression to chronic hepatitis can be predicted when the antigen persists for longer than two months in the patient's blood. In the majority of patients with acute hepatitis, the antigen disappears by the end of one or two months.

5. *Prognosis for patients requiring repeated transfusions:* Patients with hematologic disorders, such as thalassemia and sickle cell anemia, are particularly at risk because of the fact that they require repeated transfusions to maintain an adequate level of hemoglobin. Tests for Au(1) may be important in projecting their prognosis.

6. *Epidemiologic surveillance of institutions:* This too may be important, particularly when there is an outbreak of hepatitis, and the test will serve to separate carriers from susceptible subjects.

7. *Surveillance of high risk groups:*

A. *Laboratory Personnel*

(1) *Clinical Laboratories:* Any person handling

blood, especially blood taken from subjects who may be carrying the antigen, are at risk.

(2) *Blood banks and blood donor stations:* The risk is particularly high in these facilities because of the amount of blood with which the personnel come into direct contact.

(3) *Research laboratories dealing with human blood or tissues:* Surveillance is of the utmost importance in laboratories doing research on blood or on hepatitis.

(4) *Pathological laboratories:* Ward personnel, and the staff working in renal-dialysis units are included with this category of personnel at high risk.

8. *Periodic testing for possible sources of infection outside of institutions:*

A. *Patients with chronic dialysis:* This consideration applies to patients who are ambulatory and go back to their homes after dialysis. Such patients may spread the disease to members of their families, and others.

B. *Food handlers:* This may be an important point to consider in institutions. Indeed, it might be more useful to test potential food handlers for Au(1) than to test them for syphilis, as is the common practice.

C. *Dentists and dental assistants:* The frequency with which dentists and their assistants come in contact with the virus makes them a group at particular risk, not only for themselves, but also as a source of infection for other people.

SUMMARY

The discovery of Australia antigen has led to a complete revision of our concepts of viral hepatitis. It has allowed us to more precisely define the disease, provide better epidemiologic data, and study the immunology and genetics of viral hepatitis and associated diseases. Application of the Au(1) test should decrease the morbidity and mortality of viral hepatitis. The outlook is indeed bright for the identification of the hepatitis virus, and for the production of a vaccine as a means of prophylaxis.

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MAN OF THE YEAR IN 1973

Hospital Corpsman First Class Harry E. Salzer, Jr., chosen the Man of the Year at the Naval Aerospace and Regional Medical Center in Pensacola, Fla., was congratulated by RADM Oscar Gray, Jr., MC, USN, Center Commanding Officer; he also received a watch from the Pensacola Chapter of the Navy League on 12

Oct 1973, in conjunction with Navy Birthday ceremonies conducted 12-13 Oct 1973. P.O. Salzer and his family were transported from, and to their home in the Admiral's car. Later the Salzers visited the Naval Aviation Museum.—PAO, Nav Aerospace and Reg Med Center, Pensacola, Fla.



MAN OF THE YEAR IN 1973.—HM1 Harry E. Salzer, Jr. was chosen Man of the Year, and was so honored at the Naval Aerospace and Regional Medical Center in Pensacola, Fla., on 12 Oct 1973. Shown visiting the Naval Aviation Museum following the ceremonies are members of the Salzer family: Curtis and Tussha (kneeling in front); and standing (from left to right), HM1 Salzer, USN; his wife, Sonja; Harry; Terry; and Kent.

COMMUNITY HEALTH PROGRAMS

Naval Station Keflavik, Iceland

By CDR Adeline R. Fudala, NC, USN*

and

LTJG Warrell F. Leadbeater, MSC, USN**

An overseas military health-care facility exists primarily to render medical and surgical support of its active-duty personnel, dependents, and retired personnel. The extent of this support is usually dependent upon numerous factors, such as the immediate availability of medical and paramedical personnel, the financial and equipment resources, the medical facility's workload, and the needs of the community. It is quite possible that some Naval medical facilities could expand their services, within their budgetary limitations into a well-defined, coordinated system of health-care services. The established range of services should not interfere with the primary mission. Constant monitoring is essential to ensure program effectiveness.

The Station Dispensary at the U.S. Naval Station, Keflavik, Iceland, is a semi-remote medical facility with surgical capabilities. Manned by nine Naval medical officers, an Air Force Flight Surgeon, two Medical Service Corps officers, ten Navy nurses, and 44 hospital corpsmen, the Dispensary is primarily responsible

for the medical care and treatment of approximately 6,000 active duty, dependent, civil service, and State Department personnel. In addition to general medical treatment, surgical, obstetrical, gynecological, pediatric, and dermatologic specialty care is provided by staff physicians. Specialized treatment in the areas of orthopedics, ophthalmology, ENT, and urology is also rendered at the Dispensary by Icelandic contract physicians, from nearby Reykjavik. Other specialized consultant services are obtained on an individual basis. The U.S. Air Force Hospital at Weisbaden, Germany, is a secondary resource where Keflavik patients may obtain prolonged hospitalization, and highly specialized medical care.

Under the direction of CAPT Jerome Levy, MC, USN, the Senior Medical Officer and Iceland Defense Force Staff Surgeon, the Dispensary staff has implemented a comprehensive and somewhat unique health program for its community. Dependent personnel such as registered nurses, laboratory technicians, and other paramedical personnel play vital roles in various programs. Additionally, in conjunction with the A.T. Mahan Dependent School at Keflavik, school health and educational programs have been instituted. Medical Department personnel work cooperatively with the A.T. Mahan School psychologist and school nurse.

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DISASTER CONTROL

The country of Iceland is a relatively new land mass created by undersea explosion, still presenting geological activity. Volcanic eruptions and earthquakes are common. Geothermal underground activity produces geysers and bubbling pools of very hot water which is a source of heat for homes, hospitals, and industrial buildings throughout Iceland.

The Dispensary at Keflavik is located near a major international airport which services military, as well as commercial aircraft. The combination of weather elements, particularly high winds; large jet airliners with full passenger loads; and winter days of little daylight, provide the potential setting for a major disaster on the base, or near it.

Although no such disaster has yet occurred, a well-coordinated disaster preparedness plan has been devised and exercised. The Medical Department staff, in conjunction with the U.S. Naval Station and Icelandic officials, have cooperated fully in this program. Since it is a well accepted concept that an effective disaster-control program must include the entire community, the civilian residents of Keflavik and Reykjavik have been included, and the disaster-management plan is constantly evaluated. Mock drills are conducted periodically by the entire base, and also independently by the Dispensary staff. Furthermore, emphasis has been placed on training medical personnel in duties which tend to parallel their daily functions. A disaster control grid projection, which illustrates the Keflavik complex has been constructed; the grid projection is designed to locate a disaster scene, and to facilitate a rapid response.

The Disaster Plan includes both Navy and civilian nurses, and has been implemented to meet mass-casualty

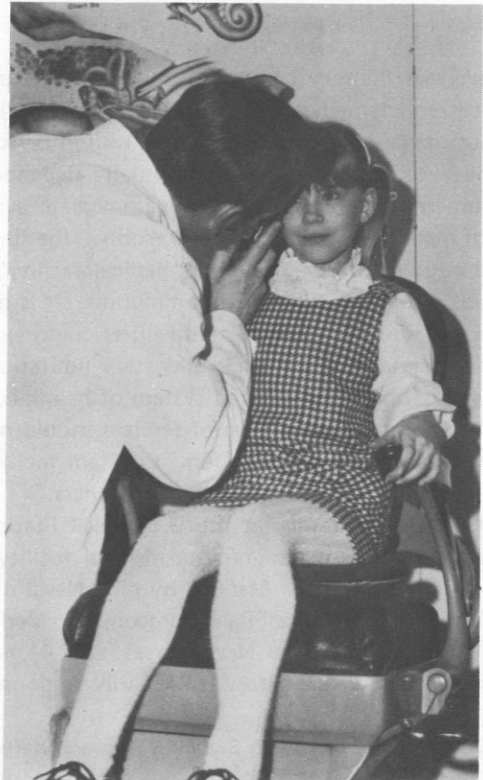


DISASTER CONTROL GRID PROJECTION.—Viewing the Keflavik complex from a potential disaster standpoint are (from left to right): CDR Adeline R. Fudala, NC, USN; CAPT J. Levy, MC, USN, Senior Medical Officer; HMC Eugene Prosser, USN; and HMC David Sincebaugh, USN.

disasters. A training program is underway for volunteer registered nurses to assist in the operating room. In formulating the disaster plan, CAPT Levy and his staff have held numerous meetings with local Icelandic medical authorities. In the event of a mass disaster, acute medical emergencies would be airlifted to the four major hospitals in Reykjavik, and commercial and military buses would be utilized for most ambulatory and stretcher cases.

SCHOOL HEALTH

In keeping with the Department of Defense policy to provide medical support for overseas dependent schools, the school health-care program at Keflavik is comprehensive. Mrs. Jeanette Miller, the School Nurse is the primary focal point between the school administration and the dispensary. Cooperation and free communication are important, necessary elements for the success of this venture. Screening procedures, such as visual testing and Tuberculin skin testing are conducted annually. Approximately 1000 school children received annual physical examinations in 1972-1973.



THE EYES HAVE IT.—LCDR Robert L. Anderson, MC, USN performs the visual examination desired by a pupil of the A.T. Mahan Dependent School.



MOSQUITO BITES IN ICELAND.—HM2 Roger Henning applies Tuberculin PPD skin test for an incredulous recipient.

The Dental Department at Keflavik also provides an annual Preventive Dentistry Program. LT Ronald D. Trotman, MC, USNR, pediatrician at the Station Dispensary acts as liaison agent for the dispensary and the school administration.

The Dispensary staff officers and enlisted personnel have actively participated in the Mahan School programs on education, health, and career planning. LT Joseph Sharkey, MC, USNR has extended the Navy's Drug Education Program into the upper grades at the school. Also, first-aid and venereal-disease presentations have been provided.

COMMUNITY HEALTH

The nursing Community Health Programs came into existence approximately one and one-half years ago when CDR (now CAPT) Robert Meyers, MC, USN and CDR H. Maureen Fitzgerald, NC, USN recognized the need for extending the Health Program into the base community. Prenatal classes were initiated first, and



1972-1973 ANNUAL PHYSICALS.—LT Ronald D. Trotman, MC, USNR (left), the friendly pediatrician evaluates two charming Dependent-School pupils, as Jeanette Miller, R.N. (the School Nurse) assists.



A LIVING DOLL.—Expertly handling the "prize package," Mrs. June Lunney, R.N., (a volunteer), conducts prenatal class.

were followed shortly thereafter by organized instruction on the Lamaze method of childbirth. Since then, the Community Health Programs have been expanded to include breast-feeding classes, and prenatal- and postpartum-home visits.

Prenatal classes are conducted in conjunction with movies, demonstrations, and informal discussions. The purpose of these classes is to alleviate fear, instill a deeper understanding of pregnancy, and to present childbirth as the meaningful and gratifying experience that it should be. This five-series class includes topics, such as: medical terminology, anatomy and physiology of pregnancy, types of anesthesia, signs of labor, stages of labor, and obstetric clinic and hospital routines. Time for questions and discussions is also provided.



CHILDBIRTH METHOD.—Attractive Mrs. Ann Kinsey, R.N. (right), a volunteer, conducts class for parents-in-waiting on the Lamaze method of childbirth.

Instruction in the Lamaze method of childbirth serves as an effective preparation for labor and delivery, by assisting the prospective parents to become active participants in the birth process. These classes are offered to couples in the latter part of the 7th month, and into the 8th month of pregnancy. Husbands are urged to attend because their role is an active and important one. During the course of instruction, the husband assists his wife by learning and practicing the exercises and breathing techniques. A trained husband can help his wife to apply the method correctly; he also can provide valuable emotional and psychological support during the actual labor and delivery. This five-series session includes: anatomy and physiology, neuromuscular-relaxation exercises, application of breathing techniques, and types of anesthesia.

Breastfeeding classes are conducted in a relaxed atmosphere on an informal basis. Advantages, techniques of breastfeeding, manual expression of milk, emotional and psychological experiences, positioning of the infant,



POSTPARTUM HOME VISIT.—Mrs. Katherine Meair, R.N. (center), another kind volunteer, demonstrates care in handling the infant to a new mother in her own home.

personal hygiene, and types of suitable clothing are discussed. Ample opportunity for questions and open discussion is provided.

Prenatal and postpartum home visits are offered to patients on request. A patient coming to the obstetric clinic for the first time receives information regarding the available maternal and pediatric Community-Health Programs on the base, and is actively encouraged to avail herself of these benefits. After delivery and prior to discharge, the mother is given the opportunity to arrange for postpartum home visits by a registered professional nurse. The nurse's home visits are tailored to the patient's individual needs, which may vary from accomplishing routine care of the infant and mother, to dealing with sibling rivalry.

MEDICAL CONFERENCES

Periodic professional conferences are held jointly by the staff medical officers, Nurse Corps officers, and members of the Icelandic medical community. So far, six Medical conferences have been conducted, for which prominent Navy physicians have traveled to Iceland to present stimulating medical lectures; additional presentations have been given by Navy lecturers at hospitals in Reykjavik. As a reciprocal gesture, the Reykjavik Medical Society invites the Dispensary physicians to Reykjavik conferences which feature prominent European physicians as lecturers. Every other month, a professional nurse inservice-education program is sponsored by the Navy nurses at the Dispensary. Guest speakers are selected from the Dispensary medical staff, and from members of other professional fields related to nursing. Numerous civilian nurses, wives of military and civilian personnel, and Icelandic nurses from Reykjavik attend these programs.

Though Iceland may be, geographically rather remote, the ongoing medical/community-health programs are right on. ☘

FIRST CO-EDUCATIONAL OCS CLASS

Members of the first co-educational class in the 22-year history of the naval Officer Candidate School (OCS) were recently commissioned at the Naval Officer Training Center in Newport, R.I.

Forty-two women were among the 163 graduates who completed the 19-week course leading to a Navy commission. During the training, both men and women underwent essentially the same academic training, and were subject to the same physical-education program and military drill. Although none of the women graduates in the class went directly to duty aboard ship, they were assigned billets throughout the world aboard naval stations and with staffs. — NAVNEWS No. 0481 (12/14/73), Washington, D.C. ☘

A STUDY of OUTPATIENT ATTITUDES on the ORGANIZATION and DELIVERY of MILITARY HEALTH SERVICES

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Introduction

A direct consequence of the increasing complexity of delivering health services, public accountability has evolved as a serious concern of hospital administrators and physicians. Such accountability not only impacts on the dollar value of those medical services provided, but also culminates in greater patient expectations. Studies indicate that patients express their rights to health care more frequently in settings where those medical services are precontracted. Although there is no financial agreement or financial charge for outpatient services, the Government is obligated to the serviceman and his dependents for a wide range of medical care in uniformed-service hospitals/outpatient clinics, when available. For the purpose of this study, military medicine is considered analogous to a highly organized, prepaid, group-medical practice, and is thereby subject to similar patient-behavior patterns.

To aid in the coordination of satellite military medical facilities, and in the elimination of fragmented and uneconomical medical services, the Navy has developed and implemented the concept of regionalization. The establishment of a consolidated group of medical

facilities under the control of a regional director necessitates the development of a comprehensive health-care program to provide a full spectrum of health services. Effective allocation of available health manpower and resources is essential if the regional program is to meet the health needs of military personnel and the dependent community.

Traditionally, planning and evaluation of health services have been controlled by those actually providing the services, without consumer participation. However, hospitals can no longer effectively relate to their respective communities without consumer participation and support. Efforts to involve our clientele in the planning process should be initiated. However, involvement of the community must be organized and manageable if constructive effectiveness is to be achieved,¹ and chaos prevented. Since we provide a personal service, our planning efforts should relate to personal needs. Ultimately the effects of this planning process will result in an increased public awareness of available services, and should promote greater faith in our system.

Study Objectives

The present study was undertaken to collect and evaluate patient attitudes concerning organization and delivery of outpatient-health services at the NRMC Naval Hospital, Long Beach, Calif. To the extent that consumer attitudes and expressed personal needs

The opinions or assertions expressed in the above article are those of the author, and are not to be construed as official or representing the views of the Navy Department or the naval service at large.

introduce important aspects of constructive planning for efficient medical-care delivery, this information merits serious consideration.

Although it can be posited that the average patient cannot accurately evaluate the professional quality of care received, he can relate to his experiences in interaction with the health-care system, by the formation of finite and recordable attitudes. As members of the health-care team, we often formulate our own opinions of patient expectations, without benefit of concrete data upon which to base valid conclusions. More often than not, these opinions stem from incidents involving conflict or patient dissatisfaction, shutting out those with diverse and positive attitudes. In this particular study, a patient's attitude shall be defined as the expression of those perceptions resulting from his interaction with various components of the health-services system at the NRM Naval Hospital, Long Beach. In the present context an attitude conveys an affective, vice a functional relationship with the psychological object involved. In other words, the attitudes expressed are not direct products of an individual's motive-satisfaction process, rather they are formed by the stimulating effect of the psychological object of each questionnaire item.²

As a result of an attitudinal study of the subscribers of the Montifiore Medical Group in New York conducted by Dr. Eliot Freidson, the following observations are noted:

1. A patient's attitude is influenced by the degree of formal organization of medical services.
2. Prepaid-group practices are perceived as less personal, yet providing greater specialist availability than solo practitioners; the former suggest greater diagnostic capabilities leading to better medical care.
3. Prepaid-group practices tend to force systematic pressures on the doctor-patient relationship, thus inhibiting the development of trust between patients and their doctors.
4. Prepaid-group practices are perceived as creating a charity-clinic atmosphere and a lack of intimacy.
5. The organization of prepaid-group practices is viewed by patients as less flexible, tending to limit patient satisfaction.
6. The nature of prepaid contracted medical services tends to encourage the overt expression of patients' rights to care, vice private fee-for-service medical practices, giving rise to an expected higher rate of patient dissatisfaction.³

It was accordingly posited that dependents visiting the NRM Naval Hospital, Long Beach have established attitudes toward the organization and delivery

of those medical services. An examination of those attitudes should enhance our ability to improve the delivery of health care, through better understanding of patient expectations. The objectives of the present study were formulated as follows:

1. To adapt and administer a viable sociological index which will evoke collective patient attitudes towards the organization and delivery of medical care at this facility;

2. To collect data in an objectively analytical manner that will allow the examination of significant relationships to formulate conclusions concerning the homogeneity of response, dependent on socio-demographic data provided by the study respondents;

3. To suggest effective goals in the pursuit of improved methods for delivering health-care services at this facility.

Study Questionnaire and Sampling Response

In order to collect and evaluate various attitudes of patients, a questionnaire utilized by Dr. Eliot Freidson in a study of the Montifiore Medical Group of New York was excerpted, revised, and adapted for application in the military-medical setting. Pertinent demographic and personal data were obtained from each respondent, in order to establish categories of major sociological groups as a basis for correlative cross analyses. A random sample of those dependents visiting the Naval Hospital was drawn over a ten-day study period, resulting in a total of 561 respondents. In terms of the total number of questionnaires distributed, this represents a 78% response rate. However, no data were recorded to indicate the number of patients who refused to fill out the questionnaire. Any questionnaires returned without responses were redistributed to other patients. The questionnaire was divided into two sections: section one addressed the care and system of health services at the NRM Naval Hospital; section two dealt with patient perception of the system, and care received under the benefits of the CHAMPUS program. The present report is primarily concerned with the results drawn from the first section.

Study Results

Since the volume of data collected was immense, a selected number of questionnaire items are presented herein to allow for greater in-depth analysis of resultant response trends, in terms of the following sociologic groups:

1. The sponsor's status (enlisted/officer)
2. The number of years served on active duty (or retired if applicable) by the sponsor
3. The pattern of utilization of the health-services system by the respondent over a two-year period.

In all cases where comparisons relating to selected sociological groups were investigated, the chi-square test was applied to determine the probability of differences in response, if any. As a general rule, if the probability of receiving a chi-square equal to, or greater than the computed value was less than .05, the null hypothesis was rejected, and it was determined that statistically significant differences existed between the various sociological groups and their responses to key-questionnaire items.

General Patient Satisfaction

Table 1 reflects the frequency distribution of response to the question exploring the degree of satisfaction with the medical care provided at the Naval Hospital. Of those responding, 50.9% indicated they are completely satisfied with the care received; 45.6% indicated general satisfaction, with some complaints; only 3.5% reported general dissatisfaction. Based on

the observed frequencies of response for each category, it appears that the highly organized system of delivering health services at the Naval Hospital has not significantly inhibited patient satisfaction. The degree of general dissatisfaction with the system is lower than might have been expected, based on study data reported by Dr. Freidson in the Montifiore Group survey. The Montifiore Group subscribers indicated a 7.0% response rate in the general dissatisfaction category.⁴

Although nearly 51% of the respondents reported complete satisfaction with the care received (Table 1), many of those respondents obviously recognized some type of complaint important to them when confronted with a list of suggested shortcomings (Table 2). The latter tendency, however, in no way negates the positive responses noted in the previous question. If it is true that patient expectations are greater with the group-practice concept, the major complaints reported in Table 2 may, in fact, reflect the systematic pressures posited earlier. It should be pointed out that waiting time is not only a common complaint of group practices, but is reported with almost equal frequency in solo-practitioner settings.

Since a relatively large number of respondents identified the high turnover of physicians as a major complaint, it would appear that this inhibiting factor,

TABLE 1

IN GENERAL, ARE YOU SATISFIED WITH THE MEDICAL CARE YOU HAVE RECEIVED FROM THE NAVAL HOSPITAL (OUTPATIENT CLINIC)?

Yes, completely satisfied	Some complaints but generally satisfied	No, generally dissatisfied	Total responding
276 (50.9%)	247 (45.6%)	19 (3.5%)	542

TABLE 2

HERE ARE SOME COMPLAINTS ABOUT MILITARY DOCTORS. PLEASE CHECK THE MOST IMPORTANT ONE WITH WHICH YOU AGREE.

Waiting for the doctor, even when I have an appointment	Feeling the doctor is rushing me in and out of his office	Can't keep the same doctor; they change so often	No complaints	Other complaints that are most important	Total responding
148 (29.9%)	71 (14.4%)	102 (20.6%)	145 (29.4%)	28 (5.7%)	517

intrinsic to military medicine is not readily accepted as unavoidable by many patients. However, the data do not necessarily lead to an implied absence of true and meaningful patient-physician relationships, but merely reflect dissatisfaction with the system. Many patients also regarded as a major complaint the criticism that physicians rush them in and out. Each visit with a physician may have been perceived by the patient as too brief, because patients sense that military physicians are freed from financial incentives that may be present in fee-for-service practices. Under given circumstances, patients express a desire for greater physician interest. Of course, this impression of being rushed might also imply simple disinterest, or an excessive patient workload per physician necessitating reduced consultation time per patient.

Choice of Physician

Although many respondents reported insufficient physician-consultation time and changing physicians as major criticisms of the military-medical system, most

singled out a military physician encountered over the past ten years as a favorite (Table 3).

It appears that many patients have been able to establish good relationships with military physicians, regardless of interdicting or inhibiting features of the system of health care. In other words, patients may not accept some aspects of the system of military-medical care, but they are able to selectively associate well with individual physicians.

Patient Perception of Various Components of the Health-Care Team

In medical settings roles of the health-care team are well defined and consistent, in order to promote better coordination of effort and establish a functional hierarchy of line relationships. Although respondents indicated highly favorable attitudes toward all components of the health-care team, there were significant differences in patient perception among the various groups (Table 4). It is posited that reported differences in response can be related directly to the defined and actual

TABLE 3

MOST PATIENTS HAVE A FAVORITE DOCTOR, OR ONE THEY LIKE BEST.
PLEASE INDICATE THE TYPE OF DOCTOR YOU HAVE LIKED BEST DURING THE PAST TEN YEARS.

A military doctor	A civilian doctor	Both civilian and military	Total responding
295 (55.4%)	56 (10.5%)	182 (34.1%)	533

TABLE 4

PATIENT PERCEPTION OF HEALTH-TEAM PERSONNEL

Type of Personnel	Most pleasant and courteous	Most pleasant and cold	Most rude and disagreeable	Total responding
Nurses	447	73	13	533
Corpsmen	509	35	3	547
Receptionists	489	56	7	552
Telephone Operators	479	52	7	538
Totals	1924	216	30	2170

$\chi^2 = 24.301$ $df = 6^0$ $p < .005$

TABLE 5

SOME PEOPLE SAY THAT MILITARY MEDICINE CREATES A CLINIC ATMOSPHERE THAT MAKES THEM FEEL THEY ARE CHARITY CASES. DO YOU AGREE?

Yes, very much	Yes a bit	No, not at all	Total responding
47 (8.5%)	171 (31.1%)	333 (60.4%)	551

TABLE 6

PATIENT PERCEPTION OF A CLINIC ATMOSPHERE BASED ON: SPONSOR'S STATUS (ENLISTED/OFFICER); SPONSOR'S YEARS OF ACTIVE DUTY; AND RESPONDENT'S USE OF MEDICAL SERVICES OVER A TWO-YEAR PERIOD.

Some people say that military medicine has a clinic atmosphere that makes them feel they are charity cases. Do you agree?

SPONSOR'S RATE/RANK

	Enlisted sponsor	Officer sponsor	Totals
Yes, very much	29	9	38
Yes, a bit	118	39	157
No, not at all	213	80	293
Totals	360	128	488

$$\chi^2 = .456 \quad df = 2^0 \quad p > .10$$

SPONSOR'S YEARS OF ACTIVE DUTY

	0-10 Years	10-20 + Years	Retired	Totals
Yes, very much	11	18	11	40
Yes, a bit	40	66	50	156
No, not at all	50	103	136	289
Totals	101	187	197	485

$$\chi^2 = 13.473 \quad df = 4^0 \quad p < .01$$

RESPONDENT'S USE OF MEDICAL SERVICES

	Once or twice a year	Three or four times a year	Five times or more a year	Totals
Yes, very much	12	10	24	46
Yes, a bit	47	44	77	168
No, not at all	109	87	128	324
Totals	168	141	229	538

$$\chi^2 = 4.108 \quad df = 4^0 \quad p > .10$$

roles of those health-team personnel, and the impact of their interaction on patients. In the clinic setting nurses tend to play an administrative role, having the responsibility and authority for controlling day-to-day clinic operation, routinely relaying command and physician policy to patients. Often, this interaction involves confronting patients with policies which they may not readily accept or like. In this respect, there is great potential for patient-nurse conflict. In turn, the nurse is then perceived by the patient as uncooperative and uncompromising. Conversely, the hospital corpsman primarily performs actual services, is perceived as the provider of tangible benefits, and therefore operates in an area with considerably less potential for conflict. On the other hand, telephone operators and receptionists have mixed roles, performing services for both patients and administrative officials. It logically follows that patient attitudes concerning these personnel should fall into an intermediate range of response, between nurses and corpsmen. Although few negative responses were elicited for each category of personnel, greater emphasis on patient education, to define health-team-personnel roles, might further improve patient-personnel relationships and open better lines of positive interaction. It is my belief that a majority of outpatient complaints could be effectively averted by better communication between patients and clinic personnel.

Patient Perception of the Clinic Setting

On the basis of data recorded in Table 5, a large majority of patients did not perceive the outpatient service as a "charity care" type of atmosphere. This would tend to support the data cited earlier, which reflected general patient satisfaction with the care received at the Naval Hospital.

When the data were controlled for the sponsor's rate/rank and patient-utilization rate over a two-year

period, no significant associations evolved (See Table 6). It is significant that these variables did not have a bearing on group-response trends. However, when the data were analyzed in terms of the sponsor's number of years of active duty, retired personnel and their dependents reported significantly higher response rates in the "no, not at all" category than did the other two groups. This effect probably reflects a greater dependency on the military system for primary medical care, by retired personnel and their dependents. In addition, the latter group reported cost factors with greater frequency in criticizing the CHAMPUS program than did other categories of respondents.

Patient Perception of Overuse of Military Medicine

As expected, sample trends shown in Table 7 indicate that a majority of those responding do not consider the system is overused by too many patients because it is cost-free. However, it was surprising that over 37% of the sample population did agree with the alleged overuse to some degree. In relation to the selected sociologic groupings, more associations occurred in patients' perceptions of overuse of military-medical care than in any other selected questionnaire items (See Table 8). Patients with enlisted sponsors reported comparatively stronger negative and positive attitudes than did dependents of officer personnel; however, as was expected, these reported differences are not considered significant. Patient perception of overuse of military-medical care was either not affected, or a function of the sponsors' number of years of active duty. In regard to the concept of overuse, no one group of respondents emerged as proponents or opponents. As expected, a patient is more likely to disagree with the proposition that military medicine is overused by too many patients, as his utilization of available services increases. This revolves around, and supports the precept that highly structured group

TABLE 7

SOME PEOPLE SAY THAT TOO MANY PATIENTS OVERUSE THE MEDICAL CARE AVAILABLE FROM MILITARY MEDICINE BECAUSE IT IS FREE. DO YOU AGREE?

Yes, agree completely	Yes, agree generally	No, generally do not agree	No, disagree completely	Total responding
77 (14.7%)	119 (22.6%)	255 (48.6%)	74 (14.1%)	525

TABLE 8

PATIENT PERCEPTION OF OVERUSE OF MILITARY MEDICAL CARE BASED ON: SPONSOR'S STATUS (ENLISTED/OFFICER); SPONSOR'S YEARS OF ACTIVE DUTY; RESPONDENT'S USE OF MEDICAL SERVICES OVER A TWO-YEAR PERIOD; AND PATIENT PERCEPTION OF CLINIC ATMOSPHERE.

Some people say that too many patients overuse the medical care available from military medicine because it is free. Do you agree?

SPONSOR'S RATE/RANK

	Enlisted sponsor	Officer sponsor	Totals
Yes, agree completely	57	11	68
Yes, agree generally	78	28	106
No, generally do not agree	156	71	227
No, disagree completely	55	13	68
Totals	346	123	469

$\chi^2 = 7.373$ df = 3⁰ p < .10

SPONSOR'S YEARS OF ACTIVE DUTY

	0-10 Years	10-20 + Years	Retired	Totals
Yes, agree completely	16	30	22	68
Yes, agree generally	25	42	41	108
No, generally do not agree	38	80	102	220
No, disagree completely	11	27	27	65
Totals	90	179	192	461

$\chi^2 = 5.989$ df = 6⁰ p > .10

RESPONDENT'S USE OF MEDICAL SERVICES

	Once or twice a year	Three or four times a year	Five times or more a year	Totals
Yes, agree completely	30	19	27	76
Yes, agree generally	40	35	43	118
No, generally do not agree	71	68	108	247
No, disagree completely	15	12	45	72
Totals	156	134	223	513

$\chi^2 = 16.652$ df = 6⁰ p < .025

PATIENT PERCEPTION OF CLINIC ATMOSPHERE

	Yes, very much	Yes, a bit	No, not at all	Totals
Yes, agree completely	11	27	39	77
Yes, agree generally	13	48	57	118
No, generally do not agree	16	76	157	249
No, disagree completely	4	15	55	74
Totals	44	166	308	518

$\chi^2 = 24.615$ df = 6⁰ p < .005

practices induce greater expression of the right to care. In fact, the higher response rate for this category of respondent may implicate over-utilization on their part, warranting further study.

As shown in Table 8, patients who perceive the out-patient service as a clinic atmosphere to dispense charity care strongly agreed that the system is over-utilized. Conversely, those who felt no sense of a free-clinic atmosphere perceived patients as not over-utilizing the system. The items compared in this section, overall, produced the greatest homogeneity of response implicating specific target groups, which could well serve to test the value of health-education programs as an effective tool for the control of behavioral response. No judgment shall be made concerning the actual overuse of military medicine; however, future studies of this nature should be explored.

Patient Perception of Appropriate Controls Over the System

When proposed measures to curb the overuse of military-medical care were presented, the total-sample-response trend was well distributed among three categories, except for a low response rate for financial charges (See Table 9).

The lack of response favoring financial charges correlates with an overt expression of the right to medical care. The most popular response fell within the altruistic concept of "health-education programs." The validity of this concept is questionable, however; it surely warrants further investigation and application. In comparing the responses, statistically significant trends did not develop in relation to the sponsors' status, time served on active duty, nor respondent-utilization rates over the past two years (See Table 10). Such an apparent lack of finite differences in response hinders the analysis of this concept, in that no one group of individuals thought differently than the other

sociological groups. Furthermore, as was anticipated, no one group evolved as either a proponent or opponent of financial controls over the system.

However, definite patterns of response evolved when the categories of responses to overuse-corrective measures were controlled, and compared with the manner in which these respondents indicated alternative-control measures (See Table 11).

As respondents tended to agree the system was over-used by too many, they then selected financial charges as an effective control measure, increasing the expected response rate threefold. Those who felt that military-medical care is not overused by too many patients, on the other hand, expressed their rights to care by indicating "No attempt should be made to control military medicine." Clearly, these categories of patients are protective of the medical benefit available to them, and they eagerly responded to defend it when this military right was challenged in some way.

Conclusions and Recommendations

Although clearly identifiable homogeneous trends of response did not evolve in each study item, based on selected socio-demographic variables, the results of this survey tend to reject some of the precepts reported by other studies of subscribers of prepaid-group practices. The following observations apply to the study reported herein:

1. Patients are well satisfied with the care received, with only a small percentage indicating general dissatisfaction.
2. The major complaint reported by respondents may, in fact, be a product of systematic pressures associated with highly structured group practices, and may represent an expression of increased patient expectations.
3. The choice of physician indicates a general satisfaction, and establishment of faith in patient-physician relationships.

TABLE 9

WHICH OF THE FOLLOWING ITEMS WOULD BE BEST TO LIMIT THE OVERUSE OF MILITARY MEDICAL CARE?

Nothing will prevent overuse	Health-education programs	Financial charges for emergency room visits/doctor visits	No attempts should be made to control overuse	Total
146 (30.2%)	179 (36.9%)	36 (7.4%)	123 (25.4%)	484

TABLE 10

PATIENT PERCEPTION OF EFFECTIVE CONTROLS FOR MILITARY MEDICINE BASED ON: SPONSOR'S RATE/RANK; SPONSOR'S YEARS OF ACTIVE DUTY; AND RESPONDENT'S USE OF MEDICAL SERVICES.

Which of the following items would be best to limit the overuse of military medical care?

	SPONSOR'S RATE/RANK		Totals
	Enlisted sponsor	Officer sponsor	
Nothing will prevent overuse	99	29	128
Health-education programs	111	48	159
Financial charges	18	11	29
No attempt should be made to control it	78	34	112
Totals	306	122	428

$$\chi^2 = 3.839 \quad df = 3^0 \quad p < .90$$

SPONSOR'S YEARS OF ACTIVE DUTY

	SPONSOR'S YEARS OF ACTIVE DUTY			Totals
	0-10 Years	10-20 + Years	Retired	
Nothing will prevent overuse	31	46	50	127
Health-education programs	28	63	73	164
Financial charges	6	16	10	32
No attempt should be made to control it	22	39	43	104
Totals	87	164	176	427

$$\chi^2 = 4.601 \quad df = 6^0 \quad p < .90$$

RESPONDENT'S USE OF MEDICAL SERVICES

	RESPONDENT'S USE OF MEDICAL SERVICES			Totals
	Once or twice a year	Three or four times a year	Five times or more a year	
Nothing will prevent overuse	40	38	63	141
Health-education programs	59	45	71	175
Financial charges	17	11	8	36
No attempt should be made to control it	32	32	57	121
Totals	148	126	199	473

$$\chi^2 = 9.246 \quad df = 6^0 \quad p < .90$$

TABLE 11

PATIENT PERCEPTION OF EFFECTIVE CONTROLS FOR MILITARY MEDICAL CARE BASED ON PATIENT PERCEPTION OF OVERUSE BY TOO MANY PATIENTS OF MILITARY MEDICINE.

Which of the following items would be best to limit the overuse of military-medical care?

	PATIENT PERCEPTION OF OVERUSE BY TOO MANY PATIENTS				Total responding
	Yes, agree completely	Yes, agree generally	No, generally do not agree	No, disagree completely	
Nothing will prevent overuse	28	41	58	16	143
Health-education programs	25	46	84	12	167
Financial charges	16	9	8	2	35
No attempt should be made to control it	4	10	71	36	121
Totals	73	106	221	66	466

Combining columns 1 and 2; and, 3 and 4: $\chi^2 = 60.164$ $df = 3^0$ $p < .005$

4. Although members of the health-care team were perceived as "pleasant and courteous" by a vast majority of respondents, differences of perceptions are rationalized in terms of defined personnel roles within the organization of medical services.

5. A small minority of respondents viewed military medicine as having created a clinic atmosphere resembling those which dispense charity care; the latter viewpoint could be reciprocally related to the degree of satisfaction with medical care reported by these respondents.

6. Although a majority of respondents did not view military medicine as being overused by too many patients, the response rate was not as high as anticipated.

7. A majority of those responding did not regard financial charges as an effective means of controlling the system, thereby supporting the expected overt expression of "the right" to medical care.

The application of this type of sociological index to medical-service consumers provides an effective tool for gauging the degree of patient satisfaction with the organization and delivery of those services. More im-

portantly, as the concept of regionalization is expanded by innovative patient-oriented health programs, the projection of acceptance by patients can be better understood and predicted if they are involved in the planning process. It is strongly recommended that the regional command establish some mechanism, oral or written, whereby patients may provide input to the regional-planning program. An understanding and review of patient expectations will enhance our ability to improve the system of delivering health-care services.

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NAVY DENTAL CORPS

Casualty Treatment Training Program

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The objective of the course is to *REDUCE THE RISK OF BEING OVERWHELMED BY A CASUALTY EXPERIENCE*. Ideally, this is accomplished by continuous training and planning, through which reflex action may be called into play when the situation requires. Unfortunately, many casualty situations, especially of a mass nature and occurring within a "usually normal" atmosphere do not demonstrate that any of the foregoing has been seriously considered. It might be comfortably assumed that disasters will be properly handled, or that you will never be involved; but what if you are wrong? Your erroneous assumption could make you a part of the problem, rather than its solution.

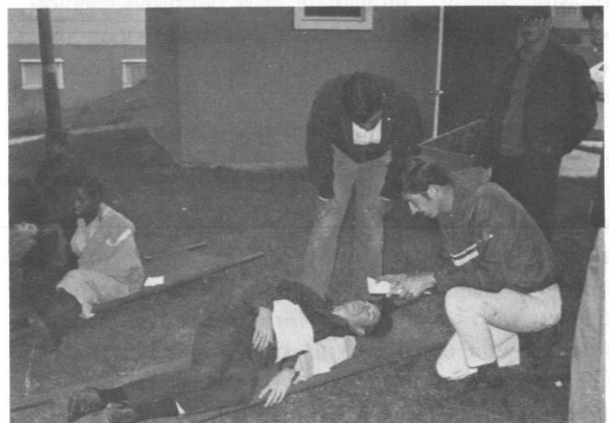
Military disaster plans are a requirement, and it is a fact that they often appear well organized on paper. It is also true that, should one ask to see such a plan it could very well be traced to an office safe, with the custodian of that safe unavailable. Once the plan has been made available for study, it would most likely approximate the thickness of a telephone book in

The opinions or assertions contained herein are those of the author and are not to be construed as official, or necessarily reflecting the views of the Navy Department, or the naval service at large.

Accompanying photographs were taken in field exercises, during the one-week course in casualty training for dental officers at the Great Lakes Naval Training Center.

volume, containing pages of detailed instructions and data that are no longer applicable. On further investigation, it might become obvious that there is no realistic coordination between the major commands located in a contiguous area, and their individually prepared disaster plans.

Recent hurricane disasters affecting a large city and a major military installation in a coastal area, documented by senior military medical personnel, testify as to the inadequate preparedness of governing bodies and individuals through whom remedial action was





desperately needed. In both geographic instances the first elements to be lost were communications, potable water, and power; everything, including hospitals promptly became useless. Injuries were not the immediate problem. Communications, control of supplies, and control of resources are basic weapons in disaster control. Immediate mass definitive medical care is a second priority; it is dependent upon the viability of communications, resources, and flow of supplies.

In a disaster situation, and the term is used in the broadest sense to include everything from a combat situation to a mass disaster caused by natural phenomena, you may be forced to act or contribute as an individual, at least until some semblance of situational normalcy can be restored. The degree of effectiveness with which you perform will reflect the sum total of your experience (if any), training maturity, judgment as to priorities, and emotional stability, as evidenced by failure to become overwhelmed.

The one-week course in casualty training that is conducted at Great Lakes should, at least acquaint dental officers with some of the situations they might encounter, identify potential problems, and suggest how they might be handled. It is a calculated effort to bring to professional maturity the inherent capability of versatile performance in a professional emergency.

The course is military-oriented, but broad principles apply to any situation. We try to create for the new dental officer, whenever possible, the feel of a combat situation. The field exercise, on the last day, tests professional performance under these stressful conditions.

The course, including supplied reading materials is designed to force the dental officer to think, to be concerned, to wonder how he will react, or contribute in an emergency life-saving situation, in a mass disaster, or combat environment.

Time and operational requirements do not permit an in-depth review of casualty care in one week; for this reason, extensive reference material is supplied. Various forms of additional instruction are presented throughout the year.





Experience gained in preparing this course, and by participating in the ABC Warfare course at the Naval Medical Training Institute has convinced me that disaster control is an extremely complex and fluid field. No one individual, no matter how great his expertise is an "across the board" expert. A great deal of practical coordination amongst knowledgeable people is necessary to formulate an effective disaster-control plan. Individual application, study, and a desire to prepare oneself for assuming responsibility in a disaster or emergency life-saving situation are strong indications that a health-care professional will not be found lacking.

DON'T ASSUME!

WHAT IF YOU'RE WRONG? ☘

MAC PROVIDES FREE FLIGHTS

Space-available travel has been used by servicemen and families for years, often providing worldwide travel ventures at no personal expense. Such travel is often referred to as a "military hop."

To enjoy this benefit, space-available travelers should be aware of the following conditions: Reservations cannot be made; Military Airlift Command (MAC) cannot guarantee to continue a passenger's travel, nor to return him to his point of origin. But rest assured, all space available on passenger and cargo aircraft is used for space-available travelers.

Travel applications are made at any MAC passenger terminal space-available counter. Applicants must have a valid leave order for the countries to be visited, an ID card, current immunizations, and passport, if applicable. Be sure to have your shot record validated at your immunization clinic.

Applicants may register for five destinations. Passengers are listed in four categories, and moved on a "first in, first out" basis starting with category one and proceeding through the separate lists:

Category 1: Round-trip emergency travel in connection with serious illness, death or impending death of a member of the immediate family of military and civilian employees.

Category 2: Leave status for military members and dependents. (Special restrictions do apply. Better check.)

Category 3: Certain secondary-school dependents of military and civilian personnel.

Category 4: Retired military members and dependents (non-business-connected travel).

Precise eligibility requirements for categories should be obtained from the MAC terminal counter.

Once on a space-available list, you stay on it until

you get a flight unless one of the following things happens:

You fail to answer a passenger call; You refuse a seat on a flight which has been posted at least 24 hours on the terminal's flight-status board; You are registered for a destination not normally serviced from the terminal, and haven't gotten a flight in 10 days; You are refused selection for reasons of improper attire, inebriation, excess baggage, etc.

After removal from a list, persons can register again, at which time they would be returned to the bottom of their category.

Space-available passengers are provided the same accommodations aboard the aircraft as duty passengers, regardless of their category. People will not be off-loaded or "bumped" at en-route stations to provide seats for other space-available passengers.

If removed for space-required passengers, the space-available travelers go on local space-available lists with the same priority as at their previous location, including the original date and time of application.

Passenger-service people are aware of the personal anxieties encountered when traveling space available. Travelers can help relieve problems by frequently reviewing the terminal flight-status board for possible flights, being aware of their position on the space-available register, and listening to terminal announcements. This will assist passenger-services specialists in expediting movements.

Travelers should be prepared to defray lodging cost while waiting for flights, for return travel by commercial transportation, and other essential personal expenses, should these become necessary. — NAVNEWS No. 0485 (12/14/73), Washington, D.C. ☘

Patient Acceptance Survey

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INTRODUCTION

In January 1973 the idea of a patient-acceptance survey was first conceived at Naval Hospital Bremerton, Wash. The intent of the survey actually involved four main areas of interest. Since Naval Hospital Bremerton was the first naval hospital to establish an outpatient-dictation system, did not normally accept walk-in patients other than emergencies, and was attempting to offer a Family-Practice Service, there was considerable interest in the degree of acceptance of these features by the patient community. The command was also interested in evaluating the impressions held by outpatients concerning the staff personnel with which they had come in contact. Further insight as to why patients come to the hospital, as well as the frequency of their visits, was desired by the command. The patients were asked to comment on problems and new proposals, through structured, multiple-choice answers. Finally, the patients' perception of "waiting" was to be analyzed.

Intensive research was conducted over a six-week period, in order to determine exactly what questions should be asked, how they should be worded, and precisely what areas of inquiry would evoke the greater number of responses. Sources of information were expanded through the use of interlibrary loans arranged

by the Medical Librarian at the Naval Hospital. An annotated bibliography was developed, and the proposed questions were submitted to the Commanding Officer for approval in late Feb 1973.

PROCEDURE

The survey initially consisted of 21 questions, but was expanded to 26 when it was decided that several of the questions could be made more specific by subdividing them. The proposed survey contained five major parts, discounting the suggestions for implementation, and the Commanding Officer's introductory letter to the respondents. The first part, the identification area, which was intentionally vague so as not to infringe on the confidentiality of the questionnaire, comprises the first two questions. The second part, the authority area consists of five questions, which establish the patient's ability to make generalized comparisons. The third, or comparison area of inquiry, comprises the next six questions. The pointed area of comparison commences with the 14th question, and continues through the 25th question. It should be noted that several of these questions certainly would be classified as comparative in nature, and were so regarded in interpreting the results; for simplification of definition, however, they are identified as "pointed" questions. The final question was provided for general comment; it has evolved either as a restatement of the previous questions, or as a generality of little significant value.

The opinions or assertions contained herein are those of the author and are not to be construed as official, or reflecting the views of the Navy Department or the naval service at large.

Except for the last, all of the questions were multiple choice. Questions five through 25 offered a continuum in their answers, usually ranging from "good to bad." In several questions "No opinion" was offered as a response, since it was felt that some respondents would not have used the system involved, or would not be affected by a change in that system.

Because it is obvious that patients cannot judge the professional competence of physicians with any validity, no questions requiring that type of judgment were presented. However, the questionnaire did solicit an opinion as to how well the health professional adjusted his directions to a comprehensible level for the patient.

Although the hospital does provide many services for outpatients, the number of questions was kept to a minimum in order to prevent a loss of patient interest in the survey. Nevertheless, an attempt was made to cover the greatest part of the "spectrum of services" offered.

At the time when the survey was being developed, it was considered that the hospital maintained an excellent rapport with the patient community. However, the survey was constructed in such a way that, should there be a considerable number of unfavorable responses, the forms could be reassessed in order to identify causes for the unsatisfactory reports of performance or delivery of the services provided.

Prior to the implementation of the survey, it was suggested that the purpose for the survey, and the potential value of its application be given wide dissemination. Unfortunately this was not achieved, and the only advertisement which the survey received was in the form of an announcement, in a newsletter that does not enjoy wide distribution. Information about the survey and its objective was presented at several Chief-of-Service Conferences, and several Staff-Officer Conferences. Cooperation was widely solicited and gratefully received by all concerned.

O & M funds were used to conduct the survey, and the printing was obtained through the District Printing and Publications Office. There were six pages of questions, plus postage information printed on the reverse side of the back sheet. This information simplified return of the completed surveys for counting purposes, and provided anonymity to encourage patients to respond more freely to the questions posed. It was estimated that during any given five-day work week, approximately 2,500 patients visit the hospital as outpatients; forms for 2,500 respondents were accordingly prepared.

The survey questionnaires were distributed in three ways. First, surveys were placed in the charts that were to be delivered to various clinics for appointment visits. These would be handed to the patient by the clinic personnel, when patients appeared in clinic to keep their appointments. Secondly, those patients appearing at the Outpatient-Record Office to obtain their own records (as a result of a late appointment, or for other medical reasons), would be given a survey questionnaire at the time that the record was issued. Finally, the Emergency Room would distribute surveys to those active-duty patients appearing for sick call, to the "after-hours" patients, and to the emergency patients.

Commencing at 0700 on Monday, 9 Apr 1973, the Patient Acceptance Survey was conducted. By Wednesday it had become obvious that there would be sufficient kits to continue the survey for a full seven days, ending at 0700 on Monday, 16 Apr. Even with the two-day extension, only 1,668 questionnaires were distributed, and 832 kits have been retained for a comparison study to be conducted at a later date. With the postage paid and the forms addressed for return, our rate of response was somewhat disappointing. Only 346 surveys were returned, for a response rate of 20.74%. It had been anticipated that greater interest would be displayed.

RESULTS

Questionnaire Responses

Number Respondents (Total: 346)

- | | |
|-------|---|
| (337) | 1. Sex: Male, 37.68%.
Female, 62.31%. |
| (20) | 2. Status: Active Duty, 6.21% (Navy and Marine Corps, 95%). |
| (122) | Dependent, 37.8% (Navy and Marine Corps, 93%). |
| (90) | Retired Military, 27.95%. |
| (112) | Dependents of Retired Military, 34.78%. |

- (334) 3. *Time of Visit:*
 AM (0730-1200 Noon), 59%.
 PM (1200-1600), 37.7%.
 Night (1600-0730), 2.90%.
- (348) 4. *This visit was:*
 By appointment, 80.17%.
 Walk-in/Emergency, 19.82%.
- (350) 5. *My medical care has:*
 A. Always been with military medical activities, 50.28%.
 B. Been with both military and civilian medical clinics, 48.28%.
 C. Always been with civilian clinics, 1.42%.
 D. None of the above, 0%.
- (349) 6. *The patient visiting the doctor today usually visits a doctor:*
 A. No more than once a year, 11.1%.
 B. One to six times a year, 57.5%.
 C. Six to twelve times a year, 20.9%.
 D. More than twelve times a year, 10.3%.
- (350) 7. *The patient visiting the doctor today:*
 A. Does so infrequently and only for minor illnesses, 47.71%.
 B. Has seasonal medical problems, 14.0%.
 C. Does so regularly for specialist problems, 32.28%.
 D. Is being seen frequently by several specialists for several problems, 6.0%.
- (336) 8. *The present system for appointments is:*
 A. Better and more efficient than any other system I have used, 38.39%.
 B. As good as any other system I have used, 52.67%.
 C. Worse than any other system I have used, 1.48%.
 D. No opinion, 7.44%.
- (370) 9. *The requirement for making appointments rather than seeing nonemergency patients as walk-ins:*
 A. Prevents unnecessary waiting time to see a doctor, 53.51%.
 B. Enables the doctor to spend more time with each patient, 25.13%.
 C. Does nothing to shorten waiting time nor enable the doctor to spend more time with the patients, 2.70%.
 D. Is unfair to the sick patient who feels he should be seen by a doctor, 13.78%.
- (341) 10. *I think a central appointment office with one number to call for appointments:*
 A. Would simplify seeing a doctor, 26.9%.
 B. Would work about the same as the present system, 39.0%.
 C. Would complicate and confuse matters too much to be useful, 16.12%.
 D. No opinion, 17.88%.
- (350) 11. *The attitude of the clinic staff is:*
 A. Better than at any other place I have been treated, 40%.
 B. As good as any other place that I have been treated, 48.8%.
 C. Not as good as other places that I have been treated, 6.85%.
 D. No opinion, 4.28%.
- (348) 12. *The waiting time to see the doctor was:*
 A. Far less than I expected, 41%.
 B. About as long as I expected, 46.83%.
 C. Far longer than I expected, 8.62%.
 D. Entirely too long, 3.44%.

- (347) 13. *The waiting time for other activities connected with this visit, including being assisted in the laboratory, having prescriptions filled, and obtaining medical records was:*
- A. Far less than I expected, 46.97%.
 - B. About as long as I expected, 46.39%.
 - C. Far longer than I expected, 5.18%.
 - D. Entirely too long, 1.44%.
- (318) 14. *The longest waiting period that I had today was:*
- A. At the record office, 11.3%.
 - B. To see the doctor, 67.6%.
 - C. To have a prescription filled, 6.6%.
 - D. To have a laboratory sample taken, 2.51%.
 - E. Other _____, 11.94%.
- (345) 15. *My longest wait today was:*
- A. 2 to 5 minutes, 15%.
 - B. 5 to 10 minutes, 25.5%.
 - C. 10 to 15 minutes, 22.6%.
 - D. Longer than 15 minutes, 36.8%.
- (339) 16. *The doctor I saw was:*
- A. Very understanding and took a lot of time to answer my questions, 51.9%.
 - B. Understanding and answered my questions, 43.06%.
 - C. Not too interested in what I had to say, 5.01%.
 - D. Rude and indignant, 0%.
- (334) 17. *The doctor's directions in regard to how I can help myself were:*
- A. Very simple and easy to understand, 80%.
 - B. Fairly simple and understandable, 17.06%.
 - C. Complicated but understandable, 2.09%.
 - D. Too complicated for me to understand, 0%.
- (331) 18. *From what I learned from the doctor today I will:*
- A. Follow his advice and directions to the letter, 93.9%.
 - B. Follow his advice only until I feel well, 4.22%.
 - C. Consider his advice but do what I think is best, 1.81%.
 - D. Ignore the doctor because he confuses me, 0%.
- (275) 19. *As a result of my visit:*
- A. I have less fear of seeing a doctor than I have ever had before, 51.27%.
 - B. I have less fear than usual about returning, 40%.
 - C. I am as fearful as ever about seeing doctors, 7.63%.
 - D. I am afraid to return, 1.09%.
- (340) 20. *The attitude of all the hospital staff that I have come in contact with in regards to this particular visit has been:*
- A. Better than at any other activity I have been associated with, 40.88%.
 - B. As good as any other activity that I have been associated with, 52.35%.
 - C. Worse than any other activity that I have been associated with, 3.52%.
 - D. No opinion, 3.23%.
- (327) 21. *Location of the pharmacy and laboratory in the outpatient area is:*
- A. A great service and reduces waiting time, 80.7%.
 - B. Nice, but service and waiting time are the same as ever, 11.92%.
 - C. A nuisance and not nearly as efficient as the old system, 0%.
 - D. Never use the facilities, 7.33%.

- (343) 22. *Distance traveled in order to be seen at NAVHOSP Bremerton:*
- A. Less than 10 miles, 54%
 - B. 10 to 25 miles, 26.8%
 - C. 25 to 40 miles, 8.74%
 - D. 40 miles or more, 9.91%
- (331) 23. *Allowing patients to come see a doctor after normal working hours by either appointment or walk-in, and under conditions other than emergencies would:*
- A. Be very beneficial from the standpoint of babysitters, transportation, etc., 43%.
 - B. Cause the same difficulties that are now present, 1%.
 - C. Be too difficult for the patients, 0.09%.
 - D. No opinion, 45%.
- (239) 24. *Some people say too many patients "overuse" the medical care available from military medicine because it's "free." Do you agree?*
- A. Yes, agree completely, 17.99%.
 - B. Yes, agree generally, 28.87%
 - C. No, generally do not agree, 71.96%.
 - D. No, disagree completely, 23.01%
- (310) 25. *Which of the following items would be best to limit the "overuse" of military medical care (select only one):*
- A. Nothing will prevent "overuse," 33%.
 - B. Health-education programs, 38%.
 - C. Financial charges for emergency room visits/doctor visits, 6%.
 - D. No attempts should be made to control its overuse, 21%.
26. *Any comments or suggestions you would care to make which would improve our service to you.*

DISCUSSION

While a discussion of the overall results would serve little purpose here, the command did glean some information that might be applicable to the Navy community as a whole. First, 45% of the patients, in answering the question concerning whether or not an after-hours clinic should be established, indicated "No opinion." At the same time, 43% felt that it would be beneficial — hardly a mandate for establishing such clinics, considering the manpower and money required to maintain and support such a facility. Secondly, in addressing the question of overuse of military-medical facilities because they are "free," there were only 239 total responses, and the majority of them did not agree with the overuse statement. However, out of those that did agree (completely or generally) with the statement (109, total; 41.28%, completely; 58.71%, generally), 44.66%

felt that nothing will prevent overuse; 34.59% felt that health-education programs offer the solution; 13.59% opted for financial charges for walk-in and emergency-doctor visits, and; 6.79% felt that nothing should be done to prevent overuse.

CONCLUSION

Even with only slightly better than a 20% return ratio, it is felt that this survey does shed some light on the feelings of our patient community, and a valid view of our facility and operating procedures does emerge. In looking forward to the comparative study planned for the future, it will be interesting to note the difference that may result from greater advertisement, and a new hospital staff. Regardless of the return ratio, we feel optimistically certain that we shall maintain our favorable rapport with the patient community of Bremerton, Wash.

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PENSACOLA — UNIV. SOUTHERN ALABAMA MED. SCHOOL

CAPT Neil V. White, MC, USN, Commanding Officer of Pensacola Naval Hospital, briefed University of Southern Alabama Medical School faculty members during a recent visit for orientation, in connection with long-range plans of the Hospital to seek affiliation with the School.

Recent visitors from the University of Southern

Alabama Medical School included: Dr. A. Lewis, School Diagnostic Resources; Dr. J. Hughes, School Growth and Development; Dr. Sid Huggins, Assistant Dean of the School; Dr. John McGehee, Medical Specialties, and; Dr. Arthur Donovan, Chief of Surgical Specialties.—PAO, Nav Aerosp and Reg Med Center, Pensacola, Fla.



HOSPITAL TO AFFILIATE WITH SCHOOL.—CAPT Neil V. White, MC, USN (far right), Commanding Officer of Pensacola Naval Hospital, briefed University of Southern Alabama Medical School faculty members during a recent orientation visit, in connection with long-range plans of the Hospital to seek affiliation with the School. Present at the meeting were (from left to right): LT K.M. Hoffman and LCDR T.F. Harrington (both attached to the Hospital Family Practice Residency Program); Dr. A. Lewis; Dr. J. Hughes; and Dr. Sid Huggins, Assistant Dean of the School. ㉔



ARMED FORCES REGIONAL HEALTH-SERVICE SYSTEM

A new health-care program, which went into effect on 1 Oct, has divided the contiguous United States into 13 tri-Service medical regions based on military population and location of special-treatment facilities.

The new plan, called the Armed Forces Regional Health Service System, is to provide maximum use of Defense Department medical resources, and to increase patient satisfaction.

Under the system, patients can be referred to any Service facility in their region whenever a specialist or treatment is not available locally.

Intended to provide a more uniform delivery of health-care services, the system also offers a cooperative arrangement which affords the latest advances in diagnosis and treatment. In addition, it is designed to increase productivity and achieve economy without unnecessary duplication of resources, and more efficient use of professional medical personnel.

Each region has a Tri-Service Regional Review Committee to monitor health-services capabilities and operations.

An estimated ten million servicemen and women, retirees, and all of their eligible dependents, now use Department of Defense hospitals and outpatient clinics.

Tri-Service regionalization on a worldwide basis may become effective later this year.

The 13 Regions and States are: *Region 1:* Washington State, Oregon, Idaho, and Montana; *Region 2:* Northern California and Nevada; *Region 3:* Southern California; *Region 4:* North Dakota, South Dakota, Wyoming, Colorado, Nebraska, Kansas, and Utah;

Region 5: Arizona and New Mexico; *Region 6:* Texas, Arkansas, and Oklahoma; *Region 7:* Minnesota, Iowa, Wisconsin, Michigan, and Northern Tip of Illinois; *Region 8:* Missouri, Indiana, Ohio, Kentucky, and balance of Illinois; *Region 9:* Tennessee, Mississippi, Louisiana, Alabama, and Northern Florida; *Region 10:* Pennsylvania, New York, Massachusetts, Connecticut, New Jersey, Vermont, New Hampshire, Delaware, Maine, and Rhode Island; *Region 11:* Maryland, District of Columbia, and Northern Virginia; *Region 12:* Southern Virginia and North Carolina; *Region 13:* Georgia, South Carolina, and balance of Florida (Northwestern Panhandle). — ASD (M&RA), Armed Forces Information Service News Feature, Washington, D.C. 🇺🇸

NEW NAVAL MEDICAL MATERIEL COMMAND ESTABLISHED

On 1 Dec 1973 the Field Branch, Bureau of Medicine and Surgery was redesignated as the Naval Medical Materiel Support Command.

The Naval Medical Materiel Support Command is responsible for materiel support for naval medical and dental activities on a worldwide basis. Additionally, this command serves as the Materiel Division, Bureau of Medicine and Surgery, Washington, D.C.

The first Commanding Officer named to head this activity is CAPT Solomon C. Pflag, MSC, USN, a logistician and pharmacist with over 31 years of naval service.

This command will retain its current address on the grounds of the Naval Hospital at Broad and Pattison Streets in South Philadelphia, Pa. — Code 1, BUMED, Washington, D.C. 🇺🇸

TRAINING FOR NAVAL RESERVE HOSPITAL CORPSMEN

The Naval Regional Medical Center, Portsmouth, Va., is providing an Inservice Training Refresher Course for Naval Reserve Hospital Corpsmen, HM3 and below; and an Independent Duty Refresher Course for reservists in the rate of HM2 and above.

The Inservice Course is five days long, and is followed by clinical ward experience at the medical center, in order to round out a full tour of ACDUTRA. It furnishes refresher training in a Corpsman's duties required for advancement-in-rate, and is expected to improve the quality of health-care delivery. Included in the course of study are: emergency medical-care procedures; cardiopulmonary resuscitation; and treatment of fractures, wounds, shock, and hemorrhage. An added feature is the recognition and emergency treatment of drug abuse.

The Independent Duty Course is completed in ten working days, and offers the student concentrated

instruction relating to advanced principles and techniques of patient care, first aid, emergency medical and surgical conditions, shipboard sanitation and preventive medicine, and medical administrative procedures. Emphasis is placed on functional responsibility of Medical Department Representatives, in accordance with current BUMED, and Fleet and Type-Command directives.

These are not exclusive Naval Reserve Courses. In keeping with the one-Navy concept, reservists are integrated with the Regular Navy class attendees.

Complete information regarding both courses will be published in the next revision of the ACDUTRA Catalog. In the meantime, all Naval District Medical Program Officers have received information regarding the courses. Interested Naval Reserve Hospital Corpsmen may make application for this ACDUTRA through regular channels. — BUMED, Code 36.☪

NAVAL GRADUATE DENTAL SCHOOL STAFF HOLDS FORMAL DINING-IN

On 22 May 1973, 30 members of the Naval Graduate Dental School staff attended a formal dining-in at the National Naval Medical Center (NNMC) Commissioned Officers' Mess (Open), reviving a traditional naval

ceremony which had fallen into disuse since World War II. President of the mess was the School's Commanding Officer, RADM George D. Selfridge, DC, USN. Prior to the traditional toasts to the Commander in Chief



and the U.S. Navy, he introduced the official guest of the mess, VADM Donald L. Custis, MC, USN, Chief of the Bureau of Medicine and Surgery.

Dining-in was adopted from the officers' messes of the Royal Navy and the regimental messes of the British Army, the traditions of which have been well described by Kipling and other British writers. It is believed that these traditions stemmed from formal founders' day celebrations in the universities, which in turn were derived from observations of festal days in the ancient monasteries. Music for the occasion was provided by the Navy Band. — PAO, NNMC, Bethesda, Md. 🍷

GORGAS MEMORIAL INSTITUTE MEETING

The Gorgas Memorial Institute of Tropical and Preventive Medicine, Inc., held its 51st annual meetings in Washington, D.C., on Thursday morning, 1 Nov 1973, at the Medical Society of the District of Columbia building. The Institute is a nonprofit organization incorporated in 1921 under the laws of the State of Delaware, and registered in the Republic of Panama. It is a living memorial to MAJ GEN William Crawford Gorgas for his outstanding accomplishments in the control of disease.

The Gorgas Memorial Laboratory was established in Panama City in 1929, as the research arm of the Gorgas Memorial Institute, and has worked continuously since that year in biomedical research related to the tropics. It has contributed most of the knowledge of tropical diseases developed in Panama during the past 44 years, and is credited with many pioneering accomplishments reported in scientific journals.

The Gorgas Memorial Institute has continued the operation of the Middle America Research Unit in the Panama Canal Zone, under a contract with the National Institute of Allergy and Infectious Diseases.

New members elected to the Board of Directors were: CAPT Charles E. Brodine, MC, USN, Director, Research Division, Bureau of Medicine and Surgery, Navy Department; BRIG GEN Kenneth R. Dirks, MC, USA, Commanding, U.S. Army Medical Research and Development Command; and Dr. Mauricio Martins da Silva, Chief, Department of Research Development and Coordination, Pan American Health Organization.

The Board of Directors elected as President and Chairman of the Board for a one-year term, Jack W. Millar, M.D., Chairman and Professor, Department of Epidemiology and Environmental Health, The George Washington University School of Medicine; and re-elected incumbent officers. New members elected to the Executive Committee were BRIG GEN Dirks;

Dr. Martins da Silva; and COL Philip K. Russell, MC, USA, Director, Division of Communicable Disease and Immunology, Walter Reed Army Institute of Research. A group of 24 distinguished scientists was elected to the Advisory Scientific Board.

Outgoing President RADM Calvin B. Galloway, MC, USN (Ret.) announced the appointment of Pedro Galindo, M.S., as Deputy Director of the Gorgas Memorial Laboratory, an entomologist who has served the organization in various capacities since 1947.

Dr. Martin D. Young, Director of Research of the Gorgas Memorial Institute, reviewed the research activities during the past year. Other participants in the Scientific Program were Pedro Galindo, M.S.; Dr. Karl M. Johnson, Director, GMI-MARU; and COL Bryce C. Walton, MSC, USA, Commanding Officer, USAMRU-Panama. Brief accounts of interest are reviewed below.

VIBRIO PARAHAEMOLYTICUS IN PANAMA

Vibrio parahaemolyticus has been recovered from sea water in Panama. This organism has not yet been reported from Central America or from the Isthmus of Panama, so far as we know.

V. parahaemolyticus, an enteropathogenic, holophilic bacterium is the major etiologic agent of acute gastroenteritis in Japan. It is believed that more than 70% of enteritis outbreaks in that country are caused by this organism. Japanese investigators have found the microorganism widely distributed in the coastal sea waters of Japan, the Philippines, Taiwan, Hong Kong, and Singapore.

Recently, in the U.S., this same organism has been reported as the etiologic cause of common-source gastroenteritis outbreaks from Atlantic, Pacific, and Gulf-coast states, and from Hawaii. Vibrios were isolated from patients' stool specimens, and from a variety of sea foods.

Recognition of *V. parahaemolyticus* as a pathogen in diarrheal diseases became a major concern to the Gorgas Memorial Laboratory, since surveys of enteropathogens carried out in Panama have revealed a low prevalence of the commonly sought enteropathogens, such as *Shigella*, *Salmonella*, *Arizona*, and enteropathogenic *Escherichia coli*.

Bacteriologic assessment of sea water, fish, shellfish, and other marine food for *V. parahaemolyticus* was initiated a few months ago. Also, all diarrheal cases brought to our attention are being promptly investigated for the presence of this organism.

Sea water from the Bay of Panama was sampled, along a section of coastline which included: the channel at the Pacific entrance to the Panama Canal; offshore sites along the coast, up to 25 miles to the

west of the Canal; and at the Yacht Club dock within the canal, where small pleasure craft are anchored. Samples were taken at distances of 100 to 1000 yards from shore.

In isolation and identification of colonies suspected of being *V. parahaemolyticus*, the procedures outlined by the United States Food and Drug Administration were followed.

Samples of sea water were collected from 20 sites; six were positive for this organism. All isolates were subsequently confirmed by the Center for Disease Control, Atlanta, Ga.

Five of the vibrio isolates were recovered from waters within the channel, or near the approaches to the Panama Canal; the sixth was recovered 100 yards offshore, in front of a small village, 25 miles west of the canal.

Infections due to *V. parahaemolyticus* are uncommon in the Western Hemisphere, but cases and outbreaks of diarrhea in North America, attributed to this organism have become more common in recent years. This is probably due to an increased awareness of the role and danger of this microorganism as a pathogen, its wide distribution, and better and more specific screening methods now available in the laboratory.

This report adds one more geographic area to the list of places where *V. parahaemolyticus* is now known to occur.

MALARIA

Following the discovery several years ago that monkeys from Panama could be used for the study of human malaria, a search has been underway to determine how many kinds of monkeys are susceptible. The use of monkeys for the study of malaria, and for the development of needed new drugs is obviously of great advantage. The monkeys may in part replace man, who in the past has been about the only acceptable subject for the final testing of drugs.

It is being found that there is variability in monkeys, just as there is in people, in the susceptibility to human malaria. In Panama, of the seven species of monkeys, at least three of them can act as hosts for *Plasmodium vivax* of man (*Aotus tribirgatus*, *Saimiri sciureus* and *Ateles fusciceps*).

Important is the finding that *Plasmodium falciparum* can be grown in Panama monkeys. Strangely, it cannot be induced directly from man; after being passed from the Colombia *Aotus* monkey, however, it will then grow in the Panama *Aotus*. The *Saimiri* and *Cebus* monkeys also will act as hosts to this species of malaria.

The human malaria in monkeys responds to the

common antimalarial drugs, similar to human malaria in man. This means that certain of these animals can be useful in the testing of new compounds, and in the detection of malaria strains that are resistant to certain of the usual drugs.

LEISHMANIASIS

Leishmaniasis is a disease caused by the parasite, *Leishmania braziliensis*. Transmission is by Phlebotomus flies. The disease is widespread through Latin America.

Cutaneous leishmaniasis is of particular importance to the farmers in Panama, who settle in new jungle areas and clear the forests. In such conditions epidemics often occur.

The infections produce ulcerating lesions on unprotected areas of the body. After the patient is treated and the lesions heal, disfiguring scars remain for life.

In a small proportion of cases, mucocutaneous lesions appear. These are difficult to diagnose and to treat. They may destroy much of the mouth and upper throat; in rare instances, deaths have occurred due to choking.

The program is based on long-range epidemiologic studies to identify the reservoir hosts and insect vectors, the types of parasites present and their relationship to human and/or animal reservoirs; and to develop experimental laboratory studies involving experimental hosts, colonization of insect vectors to determine their capacities as vectors, colonization of vertebrate hosts, and characterization of the parasite cycles in the insect and vertebrate hosts.

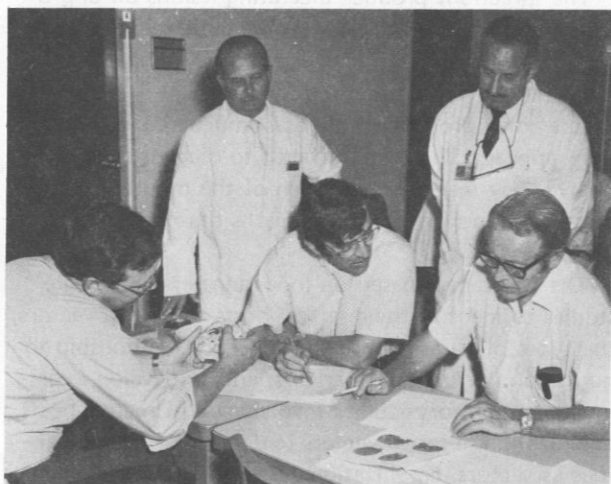
The search for reservoir hosts during the year continues to emphasize that the two-toed sloth is the most important, though not the only, reservoir host in Panama. Twenty-five percent of the two-toed sloths studied were infected with *Leishmania braziliensis*.

Experimental studies of colonized wild rodents were conducted to determine the course of the infection in these animals, and to assess their utility in identification of the various *Leishmania* species. One of the significant findings is that the rice rat, *Oryzomys capito* is easily infected with *L. mexicana*, but not with *L. braziliensis*. This is a very useful model for the differentiation of two human species of human leishmaniasis.

Attempts are underway to colonize other species of wild rodents, in the search for better models for identifying parasite species, and for biological study of the disease. — PAO, Gorgas Memorial Institute of Tropical and Preventive Medicine, Inc.; 2007 Eye Street NW, Washington, D.C. 20006. 🍷

ANNUAL AFIP COURSE IN FORENSIC DENTISTRY

The 10th Annual Course in Forensic Dentistry was conducted at the Armed Forces Institute of Pathology (AFIP) in Washington, D.C. during the first week of October. It is the only course of its kind presented in the United States, and is designed to develop a critically needed nucleus of dentists trained in the principles of identification, criminal investigation, and dental jurisprudence. By presenting this course the AFIP is trying to respond to the urgent, collective requirements of the medical, dental, legal, and law-enforcement professions.



FORENSIC DENTISTRY COURSE OF INSTRUCTION. — Renowned forensic odontologist, Dr. Reider F. Sognaes (seated at far right) enlightens two professional students in post-mortem charting procedures. Standing observers are: Course Faculty Member, Dr. R.C. Boyers (left); and CAPT S. Hoffman, DC, USN (right), Course Director, and Chief of the Dental and Oral Pathology Division. — AFIP, Washington, D.C.

The highlights of this course are the laboratory exercises in identification of human remains through the comparison of post-mortem dental examination charts with antemortem dental records, and a trial demonstration in which a Forensic Dentist is called upon to testify as an expert witness in a murder trial.

Dr. Reider F. Sognaes, a world-renowned forensic odontologist participated in the course program this year. Dr. Sognaes recently published a treatise describing his identification of the remains of Adolf Hitler and Eva Braun, by comparing antemortem records with post-mortem dental charts which he had made. He is currently involved in the dental identification of remains purported to be that of the late Martin Borman.

This program in Forensic Dentistry is presented annually at the AFIP in Washington, D.C., during the first week in October. It is open to all Federal, military, and civilian members of the medical, dental, legal and law-enforcement professions.

Application procedure and further information may be obtained by writing to: Associate Director for Education, Armed Forces Institute of Pathology, Washington, D.C., 20306. — PAO, AFIP, Washington, D.C. ☘

SOCIETY OF AIR FORCE CLINICAL SURGEONS MEETING

The Society of Air Force Clinical Surgeons Meeting will be held at the Stardust Hotel, Las Vegas, Nev., on 8-10 April 1974.

Participation by Navy medical officers is invited. Due to a reduction in the number of allocated spaces, however, funding from Air Force sources is not available this year.

Officers interested in submitting abstracts should forward them, no later than 15 Jan 1974, to:

COL H. Rolan Zick, MC, USAF, Program Chairman;
Society of Air Force Clinical Surgeons,
Chairman, Department of Surgery,
David Grant USAF Medical Center,
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(This notice was received by U.S. NAV MED on 7 Dec 1973. Keep those cards and letters coming in, folks, but please get them in early enough. — Ed.) ☘

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TELEVISION FOR HOSPITAL PATIENTS AT NNMCM

A color-television set was presented to RADM R.B. Williams, Jr., MC, USN, Commanding Officer of the National Naval Medical Center at Bethesda, by RADM A.D. Gelinet, French Navy, Chairman of the Naval Attaches' Association of Washington, D.C.

The television set will be placed on the orthopedic ward at the National Naval Medical Center. — PAO, NNMCM, Bethesda, Md.



SOAP OPERAS COME TO NNMCM. — A color-television set was presented to RADM R. B. Williams, Jr., MC, USN (center), Commanding Officer of the National Naval Medical Center by RADM A.D. Gelinet, French Navy (left), Chairman of the Naval Attaches' Association of Washington, D.C. CAPT L. Lingren, Royal Swedish Navy (right), a member of the Naval Attaches Association Executive Committee, joined in the presentation.

UNITED STATES NAVY MEDICINE

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FIRST DENTAL OFFICER TO COMPLETE NAVY DIVERS' SCHOOL.—LCDR Robert G. Esquire, DC, USN, from the Naval Submarine Medical Research Laboratory in Groton, Conn., recently completed the two-month course for Navy divers given at the Navy School, Diving and Salvage, Washington, D.C. Deeply involved in research on the oral physiology of subjects exposed to the hyperbaric environment, Dr. Esquire seeks to improve understanding of the interrelationships of oral tissues, oral bacterial ecology and oral fluids, and the general health status of divers during underwater operations.—PAO, Nav Sub Med Res Lab, Nav Sub Med Center, Nav Sub Base, Groton, Conn.



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