
QUARTERLY REPORT

RESEARCH ON NAVY-RELATED COMBAT
CASUALTY CARE ISSUES, NAVY OPERATIONAL-
RELATED INJURIES AND ILLNESSES AND
APPROACHES TO ENHANCE NAVY/MARINE
CORPS PERSONNEL COMBAT PERFORMANCE

Prepared for

Naval Medical Research Institute
Bethesda, Maryland 20814

As Required By
Contract Number N00014-95-D-0048
(GC-2728)

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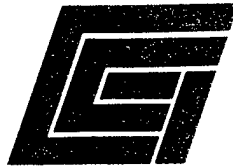


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June 25, 1998

Commanding Officer
Naval Medical Research Institute
8901 Wisconsin Avenue
Bethesda, MD 20814-5044

Attention: Lt. Richard A. Gustafson, Code 02/23

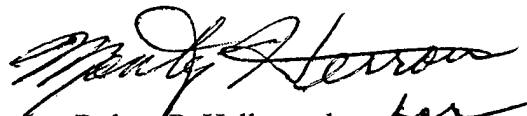
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GC-2728/3117

Dear Lt. Gustafson:

In accordance with the Contract Data Requirements List (DD Form 1423), ELIN A001, GEO-CENTERS, INC. is pleased to submit its quarterly progress report for the period December 1997 through February, 1998.

If you have any questions, please contact Dr. Monty Herron at (301) 231-6144 or the undersigned at (617) 964-7070.

Sincerely,


Robert P. Hallsworth
Contracts Administrator

Enclosure

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ANNUAL PROGRESS REPORT
OPTION YEAR ONE
GC-PR-2728-00

CONTRACT NUMBER: N00014-95-D-0048

REPORTING PERIOD: December 1, 1997 - February 27, 1998

REPORT DATE: June 25, 1998

**RESEARCH ON NAVY-RELATED COMBAT CASUALTY CARE ISSUES, NAVY
OPERATIONAL-RELATED INJURIES AND ILLNESSES AND APPROACHES TO
ENHANCED NAVY/MARINE CORPS PERSONNEL COMBAT PERFORMANCE**

I. INTRODUCTION

This report summarizes the results of GEO-CENTERS' technical activities for the first option year one of the Naval Medical Research Institute (NMRI) Contract N00014-95-D-0048, Delivery Orders 002 and 003. The delivery orders encompass a variety of scientific studies that are capable of supporting ongoing and projected programs under the cognizance of NMRI; NMRI TOX/DET-Dayton, OH; NMRI/DET-San Antonio, TX; NDRI-Great Lakes, IL; the NDRI Detachment-Bethesda, MD; the National Naval Medical Center-Bethesda, MD; and the U.S. Navy Clothing and Textile Facility-Natick, MA.

The format for these periodic technical progress reports consists of four sections each listed by the location of the research. The sections are (1) Descriptions of work to be performed, (2) Objectives planned for the current reporting period, (3) Summary of work performed during current reporting period, and (4) Objectives for the next reporting period. Accumulated scientific reports, technical reports and journal articles are being provided as part of this quarterly technical progress report. Specifically, the research conducted by GEO-CENTERS during this quarterly reporting period has been focused on the following general scientific programs:

- A. Infectious disease threat assessment and preventive medicine programs.
- B. Immune cell biology, wound repair and artificial blood studies.
- C. Biomedical diving programs.
- D. Breast Care Center.
- E. Breast Cancer Research & Education Initiative (BRIN)
- F. Directed Energy Effects Research
- G. Dental related diseases.
- H. Toxicological studies.
- I. Human Performance and U.S. Navy Clothing Development



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II. NMRI, Bethesda, MD

A. INFECTIOUS DISEASE THREAT ASSESSMENT AND PREVENTIVE MEDICINE PROGRAMS

CHRISTIAN, WOHLRABE

Description Of Work To Be Performed

- Provided assistance to the adenovirus surveillance project within the Preventive Medicine Division of Naval Hospital, Great Lakes, IL.
- Assist in the development and implementation of "Operation Stop Cough", a programmatic approach to reducing respiratory illness among Navy recruits.
- Assist with general infectious disease surveillance relevant to recruit respiratory illness.

Technical Objectives For The Reporting Period

- Continue culture surveillance for adenoviral illness among recruits.
- Emphasize new methods of increasing culture returns from our outpatient clinics.
- Assist with report of recent adenovirus outbreak.
- Collect metrics on hygiene/handwashing for Operation Stop Cough
- Continue to liaison between investigators, providers, laboratory staff, and patients to provide adenovirus surveillance information.

Summary Of Work Performed During Current Reporting Period

- Assisted with report of a recent outbreak of adenoviral illness in recruits. Data prepared for Navy Environmental Health Center and Recruit Healthcare Symposium.
- Provided weekly assistance with streptococcal infection control, targeting prevention education to recruits and division commanders.



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- Continued to distribute, collect, and arrange mail-out of culture materials for adenovirus surveillance. Provided acute quality control on culture media.
- Provided assistance to medical professionals in obtaining adenovirus cultures.
- Reviewed records and provided quality control for case reports of respiratory illness.
- Inspected handwashing facilities for recruits, as a quality metric for Operation Stop Cough.

Goals/Objectives For Next Reporting Period

- Continue work on the adenovirus surveillance project, modifying procedures as the protocol and recruit needs change.
- Assist with response to streptococcal pharyngitis outbreak, including the provision of additional antibiotic prophylaxis for recruits.
- Assist with industrial hygiene data collection relevant to new air cleaning units in recruit barracks.
- Continue to provide data on handwashing for Operation Stop Cough
- Re-evaluate development of video aids to encourage hygiene/handwashing among recruits.

JENDREK

Description Of Work To Be Performed

- Scott Jendrek conducts fermentations in a BL-3 suite and depending on the organism of the fermentation may also perform some or all of the downstream processing associated with the project. He also creates all associated paperwork (standard operating procedures, batch records, etc.) with the fermenter and related equipment. Scott also does much of the HPLC work towards optimizing current protein purification methods and procedures, as well as some of the Molecular Biology associated with his position.

Technical Objectives For The Reporting Period

- Scott will continue his work on the LF production and write a batch record for the fermentation. He will then go back to the isoform separation work which was started just prior to the emphasis being placed on the LF project.



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Summary Of Work Performed During Current Reporting Period

- The Lethal Factor producing strain of *B. anthracis* was completely optimized for the 20 liter level. It has been shown to be reproducible almost to the point at which overlay of the separate fermentations may be done. The harvesting of the fermentation needs to be worked out in order to increase protein recovery and decrease cell lysis. The batch record is currently about fifty percent complete, depending mostly upon which form of harvest is ultimately selected.

Goals/Objectives For Next Reporting Period

- Next quarter Scott will be working on completing the work on the LF fermentation. After the completion of the LF fermentation work, he will then assist in the research on how the PA and LF bind together in the "complex" formation. Depending on time constraints, Scott may also continue work on the isoform separation of Protective Antigen again.

KERBY

Description Of Work To Be Performed

- Senior Scientist; Head of DSD Core Molecular Biology Support group, Diagnostic Systems Division, Systems Development Department: to develop diagnostic systems to detect and differentiate various viruses, bacteria, and toxins.

Technical Objectives For The Reporting Period

- Design and synthesize primers and probes for DSD.
- Test various primers for their usefulness as PCR or sequencing primers.
- Continue with the automated sequence analysis of various viral and bacterial PCR products or clones.
- Continue the cloning of selected genes or fragments as needed.



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Summary Of Work Performed During Current Reporting Period

- Synthesized sequencing and PCR primers for Anthrax, Plague, Q-fever, poxviruses, Ebola Hantaan, Dengue, and Shigella, as well as Biotin probes for these species.
- Tested eleven pairs of primers for orthopoxviruses, and three primer pairs for Anthrax and Brucella species.
- Verified the sequences of PCR products or clones of Poxviruses, Y.pestis, B.anthraxis, F.tularensis, C.burnetti, S.aureus, and other agents.

Goals/Objectives For Next Reporting Period

- Continue in primer and probe synthesis, automated sequencing analysis, cloning genes of interest, and development of rapid diagnostic systems such as Oncor's Sunrise Uniprimer fluorescently-labeled PCR products.
- Give molecular biology support for up-coming DARPA research projects assigned to DSD.

MIHALIC

Description Of Work To Be Performed

- As a Geocenters contracted employee, I am presently working in the Diagnostic Systems Division at the United States Army Medical Research Institute of Infectious Diseases (USAMRIID) at Ft. Detrick, Md. My position in the lab is as an entry level lab technician. The objective of the division is to develop and optimize assays for the detection of infectious diseases. My personal responsibilities at the time are in developing and optimizing electrophoretic assays applicable to the overall interests of the division.

Technical Objectives For The Reporting Period

Hantaan Western Blot Assay

- Establish quality control standards for assay.
- Validate assay with extended panel of human sera.
- Use knowledge of this assay to develop similar confirmatory assays for other viruses.
- Train someone else in the production of the western blot assay I developed so that we can make it a kit assay.



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Recombinant Hantaan Project

- Assist in the production of a large quantity of recombinant hantaan nucleocapsid antigen for use in many assays.
- Help develop a fast, lateral flow assay to detect antibodies in sera. We will try and apply this assay to many different diseases such as hantaan and also plague.
- Begin working on the expression and purification of a recombinant ebola protein.

**Summary Of Work Performed During
Current Reporting Period**

Hantaan Western Blot Assay

- Presented a poster at The Meeting for The American Society of Tropical Medicine and Hygiene in Orlando, Florida.
- Established quality control standards for the Hantaan western blot assay.
- Began a timecourse study for the storage of western blot strips.
- Used similar format for a confirmatory Ebola western blot.

Recombinant Hantaan Project

- Sent a frozen stock away for upscaled production of recombinant Hantaan nucleocapsid.
- Developed growth and induction curves for the ebola recombinant protein.

Goals/Objectives For Next Reporting Period

- Continue validation of Hantaan western blot assay.
- Write a manuscript on the Hantaan western blot assay.
- Develop new assays of either western blot or lateral flow format using purified recombinant Hantaan products instead of native proteins.



HEAVEY

Description Of Work To Be Performed

- Senior Scientist II

Technical Objectives For The Reporting Period

Orthopoxvirus Project:

- Confirm sequences and transfer the cloned monkeypox virus genes into a VEE replicon for expression in vitro, and confirm expression of proteins in vitro.
- Initiate efforts to obtain variola genes through WHO, which may prove as useful targets for detection of orthopoxviruses in aerosols.

Filovirus Project:

- Evaluate post-challenge serum from guinea pigs which were immunized with VEE replicon expressing MBGV proteins via ELISA to determine if sterile immunity was obtained.
- Immunize a new group of guinea pigs with VEE replicons to examine the ability of individual gene products to protect against a heterologous challenge virus. Specifically, MBGV GP, NP, and VP35 will be used to immunize animals three times at 28 day intervals. After completion of immunization schedule, half the animals will be challenged with a homologous virus isolate and half with a heterologous virus isolate.

Summary Of Work Performed During Current Reporting Period

Orthopox Project:

- Several forms of poxvirus (vaccinia) antigen were produced. These include, cell associated vaccinia, vaccinia extracted with Genetron, and vaccinia extracted with Genetron followed by treatment with trypsin. This antigen was used in preliminary studies to determine if any of the production methods of antigen impact negatively on the ability of selected Mabs to recognize vaccinia virus in an ELISA.
- Cloned several genes from monkeypox virus that may be useful as targets for detection of orthopoxviruses in aerosols. Genes cloned from monkeypox (D8L, L1R, A33R, A34R, and



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H3L) were sequenced and then subcloned in the VEE replicon. The clones were examined for expression of protein and VEE replicon particle packaged.

- Arrangements were made for access to killed variola antigen at the Centers for Disease Control and Prevention in Atlanta, GA. This antigen will be used to confirm that Mabs which cross react with vaccinia and monkeypox in ELISA also react with variola.

Filovirus Project:

- Continued guinea pig challenge experiments to determine the efficacy of VEE replicon-based vaccines for Marburg virus (MBGV). Three lines of experimentation were begun or continued.
- Strain 13 guinea pigs were immunized with VEE replicons expressing either MBGV GP, GPTM, NP or VP35 3 times at 28 day intervals. For each antigen, animals were divided in half and one half challenged with a homologous virus (MBGV Musoke) and the other half challenged with a heterologous virus (MBGV Ravn), in order to evaluate the ability of replicon vaccination to induce a cross protective response. Experiment is ongoing with results expected in 1-2 weeks.
- Three different strains of guinea pigs were immunized with VEE replicons that expressed either MBGV GP, NP, or VP35. Three immunizations have been administered 28 days apart. Serum antibody titers have been determined, and animals will be challenged in the near future to determine if there is an effect of genetic background (i.e. MHC type) on protection with any of the antigens listed above.
- Strain 13 guinea pigs have been immunized with VEE replicons expressing MBGV GP, NP, or VP35. Three immunizations have been administered 28 days apart. Serum antibody titers will be determined. Serum and immune cells will be obtained from these immune animals for transfer into naive strain 13 guinea pigs to indicate whether antibody or cell mediated immunity is the predominant effector of protection.

Goals/Objectives For Next Quarter

Orthopoxvirus Project:

- More extensive evaluation of Mabs ability to recognize antigen produced and treated with Genetron and/or trypsin.
- Production of larger amounts of Mabs which appear to be promising with respect to reaction to variola (and other poxviruses) as a deliverable.
- Start immunizations of animals with VEE replicons which express the individual cloned monkeypox and/or vaccinia genes to generate a wider array of reagents (both polyclonal and



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monoclonal antibodies) useful for detection of orthopoxviruses in the environment.

Filovirus Project:

- Finish the three existing guinea pig experiments.
- Start immunizations of nonhuman primates with VEE replicon expressing MBGV GP and NP genes to examine protective efficacy in a more relevant model.



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II. NMRI, Bethesda, MD

B. IMMUNE CELL BIOLOGY, WOUND REPAIR RESEARCH AND ARTIFICIAL BLOOD PROGRAM

THOMAS

Description Of Work To Be Performed

- Mr. Thomas, as Engineer III, serves as the Computer Aided Design Drafter(CADD) Manager, representing GEO-Centers, Inc., in support of biomedical research and development activities located at the Walter Reed Army Institute of Research(WRAIR)-Health Facility Planning Agency(HFPA) Office. He is responsible for organizing, managing and maintaining a CADD department and establishing a system of files and directories for working drawings. Mr. Thomas is also responsible for implementing procedures for manipulation of drawing files and developing user(working) drawings from existing documentation of new health facility.

Technical Objectives For The Reporting Period

- The primary objectives during this reporting period included developing user drawings of all floors of new health facility;
- Provide assistance to and coordinate with the Health Facility Planning Office(HFPO) and Corp. Of Engineers(COE) to facilitate updates and revisions to design of new facility;
- Provide technical training to COE, HFPO, Transition Action Team(TAT) and other staff members in utilizing CADD program-MicroStation Review;
- Other objectives include verifying hardware/software needs, determining items needed to further enhance the productivity of CADD department.

Summary Of Work Performed During Current Reporting Period

- Established a substantial quantity of user drawings;



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- Generated drawings for HFPO and TAT staff, for use in presentations, meetings and tours of new facility;
- Trained various staff members in the use of CAD package;
- Determined needs and validated necessary purchases of plotter and printer equipment, paper and various other CAD and computer supplies;
- Attended MicroStation 95 conference/seminar to gain further knowledge, skills and tools available in MicroStation to assist in increasing productivity of drawing design.

Goals/Objectives For Next Reporting Period

- Continue to provide support to HFPO/HFPA, Army, Navy, COE and TAT staff;
- Continue to generate working drawings which can be used effectively for space utilization;
- Continue to maintain all CADD systems up and functioning at optimum levels;
- Implement updates to existing contract drawings per changes and revisions made by COE;
- Investigate potential for linking a database and CAD package to create renderings for space management;
- Stay abreast of any new CAD features or processes which may assist in the design of the user drawings and arrange for any further training as necessary.



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II. NMRI, Bethesda, MD

C. BIOMEDICAL DIVING RESEARCH

OBOWA

Description Of Work To Be Performed

- Provide technical assistance in the Diving Medicine research laboratory investigating exposure to hyperbaric oxygen (HBO) and its effects on the CNS. Prepare brain and spinal cord tissues for histopathology, histochemistry and immunohistochemistry staining procedures. Responsible for small animal care and welfare. Perform surgical procedures on rats. Insure laboratory is maintained and adequately stocked.

Technical Objectives For The Reporting Period

- Development of a rodent model of spinal cord decompression sickness (DCS). This model will be utilized to evaluate pharmacological interventions for prevention and treatment of DCS in US Navy divers.
- Investigate what role vascular intracellular adhesion molecules may play in central nervous system ischemia/reperfusion injury.
- Study immuno-modulation in pathophysiology of DCS.
- Optimize immunohistochemical staining procedures to apply in DCS models.

Summary Of Work Performed During Current Reporting Period

- Prepared animal CNS tissues for all staining procedures.
- Assisted investigators with dive chamber operation.
- Responsibility for maintenance of laboratory facility and supplies.
- Completed the first phase for rodent DCS modeling. Tissue staining is still ongoing and we will transition some of this work to swine. More rodent DCS experiments are in planning stage.



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Goals/Objectives For Next Reporting Period

- Planned decompression studies of vascular adhesion molecules has been very successful and more work is planned in this area. The role of endothelial cell adhesion molecules and cytokines in ischemia reperfusion injury will be evaluated utilizing histochemistry and immunohistochemical techniques, also counter receptors to these molecules on white blood cells will be studied using flow cytometry.
- Blood markers of decompression sickness will be evaluated for usefulness in prediction of decompression outcome in rodents and swine.
- Anticipate 50% completion on the function of vascular adhesion molecules in the spinal cord injury which is currently under development.
- Will begin EEG depth electrode recording in the oxygen toxicity work unit and assist with pharmacological modulation of oxygen induced seizures.
- Begin a pilot study to try to quantify infarct size in a rabbit model of cerebral arterial gas embolism (CAGE). If the model is successful, future studies will be initiated towards the treatment of CAGE.

PORTER

Description Of Work To Be Performed

- Support in the selection and testing of a hyperbaric CO2 analyzer for fleet submarine dry deck shelter use.
- Begin work on new tasking to develop and implement a field test plan for divers air bank sampling on 688 class submarines.
- Assist with other laboratory duties as needed.

Technical Objectives For The Reporting Period

- Continue the testing program for the hyperbaric CO2 analyzers approved for fleet use.
- Support new tasking to develop and implement a field test plan for divers air bank sampling on 688 class submarines.



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Summary Of Work Performed During Current Reporting Period

- Six prototype hyperbaric analyzers completed a comprehensive testing program. Testing included months of hyperbaric testing in a laboratory hyperbaric chamber. Testing also involved collecting data from field sites aboard fleet dry deck shelters.
- A report based on the findings with the six prototype units was prepared and sent to NAVSEA.
- As a result of the favorable findings, thirteen new hyperbaric CO2 analyzers were ordered for fleet use. These analyzers were received and tested with a similar, but abbreviated, test plan.
- The new CO2 analyzers completed testing and were sent to US Navy Seal Delivery Vehicle Teams for fleet use.
- Ninety new sample bombs, and sampling equipment, were procured and assembled for 688 air bank test program. Actual testing to begin in FY98
- Air bank samples were collected on two 688 submarines due for DDS overhaul.
- Performed other laboratory as requested.

Publications, Abstracts, etc.

- Co-authored and constructed a poster presentation "PROPOSED REVISED PROCEDURES FOR SCREENING DIVING AIR FOR DRY DECK SHELTER OPERATIONS" presented at the 1997 Undersea Hyperbaric Medical Society meeting in Cancun, Mexico (abstract attached).

Goals/Objectives For Next Reporting Period

- Continue testing program for dry deck shelter hyperbaric CO2 analyzers that will be issued to Seal Delivery Teams for fleet use.
- Continue work on tasking to develop and implement a field test plan for divers air bank sampling on 688 class submarines.



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II. NMRI, Bethesda, MD

D. BREAST CARE CENTER

GRIMES, JENKINS, WILLIAMS, MCGEE

Patient Service Representative

Description Of Work To Be Performed

- Process and interview patients, incorporate standard patient registration procedures.
- Maintain uniform policy for check-in/check-out procedures.
- Collect third party insurance forms on each patient.
- Receive patients and incoming telephone calls/inquiries, determine priorities and refer to proper person/department.
- Ensure that all incomplete patient records and third party forms are corrected or returned to proper staff for completion/correction.
- Set up records and filing system for paperwork associated with each patient record. Ensure that all documents processed are in accordance with department standards and that all forms are in designated order in the patient records. Label files for permanent shadow files.
- Orient new support team members and clinical team staff to office routine.
- Call all no-shows, record reason for not keeping appointment in shadow file and initial.
- Print Composite Health Care System (CHCS) daily schedule and end of day reports. Check end of day report for accuracy.
- ADS System: Educate providers, ensure completeness/accuracy of ADS forms, scan forms.
- Inform Technical Assistant of supply levels.

Technical Objectives For The Reporting Period

- Change patient chart system.
- Modify division of duties based on personnel changes and elimination of rotating positions.
- Streamline and organize front-desk procedures.
- Retrieve and ensure completion of third party insurance forms
- Improve routing and response to incoming telephone calls/inquires



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- Use standard registration procedures requiring plastic green card for imprinting all forms pertinent to each patient.
- Coordinate policies for scheduling appointments/procedures for patients calling/walk-ins/consults/cards.
- Streamline physician schedule notification process.
- Refine CHCS daily schedule and end of day reporting.

Summary Of Work Performed During Current Reporting Period

- Divided duties among remaining 3 Patient Service Representative Positions. Trained temporaries.
- Continued organization of front-desk procedures
- Assisted in development of standard operating procedures.
- Processed and interviewed patients through CHCS and designated forms, obtained and updated all patient demographic information and ensured completion of forms.
- Obtained and verified pertinent insurance information utilizing available forms. Obtained third party insurance forms from physicians at end of each visit.
- Required identification card from each patient and imprinted all clinic forms pertinent to that patient.
- Received patients and incoming telephone calls/inquiries, determined priorities and referred to the proper source.
- Explained clinic procedures to patients.
- Retrieved/returned Mammogram films daily.
- Obtain authorization for release of mammogram films from patient, for NNMC file tracking.
- Open monthly clinic schedules and make changes as necessary, based on physician schedule changes.
- Ensured completion of incomplete patient records and third party insurance forms.
- Set up records and maintain filing system for paperwork associated with each patient record. Ensured that all documents processed are in accordance with department standards. Filed all forms in designated order in patient record. Labeled files for permanent shadow files.
- Scheduled and coordinated front desk procedures in accordance with department policy. Identified process problems and helped develop suitable solutions.
- Oriented new support team members and clinical team staff to office routine.



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- Participated in team planning to assure team members meet team quality standards. Maintain department standards of productivity.
- Notified physicians the day before they are scheduled for clinic; let them know approximately how many patients they will have.
- Continue working with the Ambulatory Data System (ADS):

Goals/Objectives For Next Reporting Period

- Complete patient chart conversion process.
- Become more proficient in the use of ADS.
- Given the continuing environment of change and the influx of new employees, we will take this opportunity to scrutinize current processes and increase the efficiency of the front desk area.
- Maintain department standards.
- Become more familiar with TriCare.

KIDWELL

Description Of Work To Be Performed

- Manage and maintain the conference room schedules.
- Order supplies for various departments within the center.
- Manage and maintain the procurement process and database.
- Monitor data collected via CHCS and ADS for accuracy.
- Collect and report monthly man-hour reports.
- Manage patient and physician schedule templates in CHCS.

Technical Objective For The Reporting Period

- Become proficient in Microsoft Access.
- Complete the patient chart filing system conversion if chart availability allows.
- Create an Internet page for the Breast Care Center.
- Update the Patient Service representative SOP.



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Summary Of Work Performed During Current Reporting Period

- Maintained conference room schedules in Schedule+.
- Maintained an adequate supply level.
- Attended a training session in MCP for CHCS .
- Attended a training session on Navy Correspondence Methods.
- Attended a Microsoft Access training course.
- Participated in the coordination of the patient chart filing system conversion and played a major role in the conversion completed to date.
- Created and maintained a new FY98 procurement database in Access. Updated the FY97 database.
- Began planning a research database in conjunction with the Research Nurse.
- Began compiling information to create a Breast Care Center Web page on the Internet.
- Learned the Care Manager program and began using it to track all certified letters sent to patients and consults returned to originators.

Goals/Objectives For Next Reporting Period

- Complete the patient chart filing system conversion if chart availability allows.
- Complete the Breast Care Center Web page for the Internet.
- Continue working with the Research Nurse to create a very detailed research database in Access.
- Update various Breast Care Center brochures and pamphlets.

RICHMAN

Description Of Work To Be Performed

- Perform technical services including mammograms.
- Assisting in biopsies and ultrasounds.



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Technical Objectives For The Reporting Period

- Perform various studies within the department thereby increasing knowledge and experience.
- Broaden understanding of the BCC's procedures and personnel. Expand relationship with BCC.
- Take full advantage of any educational opportunities which may arise as time and schedule permits.
- Continued to increase knowledge of mammography and breast diseases using the doctors as teachers.

Summary Of Work Performed During Current Reporting Period

- Performed a variety of mammograms, stereotactic biopsies, needle localizations and ultrasound procedures.
- Interfaced with mammography doctors to increase knowledge in the areas of mammography and breast disease.
- Continued follow-up for screening mammogram program.
- Worked on patient relations skills.
- Attended Mammotome training January 1998

Goals/Objectives For Next Reporting Period

- Attend an educational mammography seminar.
- Broaden my knowledge of breast diseases and mammography.
- Continue to improve interpersonal skills.
- Attend Mammography Technologist Training Course May 1998
- Continue to assist with management of screening program
- Assist NCM with development of improved patient flow processes through the mammography department



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HIGGINS

Description Of Work To Be Performed

-
- Develop an education program for physicians and nurses on cancer genetics
- Improve the screening process for patient participation in BCC research
- Keep abreast on breast cancer issues using NCI Current Clips
- Further develop personal computer skills
- Attend seminars/conferences on breast cancer issues and professional nursing issues
- Contact tumor registry regarding patient identification for BRCA
- Continue BCC chart review to identify high risk and strong family history
- Organize and schedule BRCA Education Group
- Recruit and register patients for participation in Tam/4-HPR
- Prepare selected pedigrees and reports for weekly pedigree meetings
- Conduct individual and group presentations for BRCA education/counseling
- Continue to act as liaison between BCC and other governmental/research institutions
- Prepare data packets for NCI research nurses working with Tam/4HPR
- Utilizing Care Manager to identify trends of care in the BCC and to document nursing notes
- Keeping the BCC staff abreast of research issues relevant to patient care and staff development
- Continue to attend Graduate School to further enhance nursing knowledge
- Participation and case study presentation at BCC staff meetings and multidisciplinary meetings
- Update and maintain protocol log books
- Attend tumor board weekly
- Prepare and distribute minutes of weekly research meetings in the BCC

Technical Objectives For The Reporting Period

- Research overview of BCC ongoing protocols to distribute to outside providers
- Utilizing Care Manager to identify trends of care in the BCC and to document nursing notes
- Advertisement for patient education program, i.e. flyers and memos
- Evaluation forms for general education group
- Prepare handouts of questions and answers about genetic testing to distribute at general education meetings



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- Log book for Oncor Med specimen issues
- Excel data for Tam/4HPR study
- Work collaboratively to design data base for BRCA study
- Organize and distribute minutes for BCC research meetings
- Improved chart review process
- Completed task synopsis of research nurse position for review by administration

**Summary Of Work Performed During
Current Reporting Period**

- Prepared and distributed minutes of weekly research meetings in the BCC
- Prepare selected pedigrees and reports for weekly pedigree meetings
- Attended breast cancer symposium at Portsmouth as a guest speaker
- Collaborated with NSABP research nurse on menstrual cycle protocol
- Prepared and forwarded date information packets for Tam/4HPR patients to the NCI
- Completed patient information booklet to provide information post education session
- Data collection forms and log-books of patients on protocol
- Conducted the general education group for patients, "Genes and breast Cancer"
- Became more active in the cultural awareness committees
- Revised Tam/4-HPR pathway
- Developed method for follow-up post results
- Registered additional patients on TAM/4-HPR and BRCA protocol
- BCC chart review to identify high risk and strong family history
- Created ovarian screening consults for referrals
- Attended tumor board weekly
- Organized and scheduled the BRCA Education Group
- Conducted individualized and group patient information sessions for BRCA
- Kept the BCC staff abreast of research issues relevant to patient care and staff development
- Reviewed and documented on genetic material received from the National Action Plan on Breast Cancer
- Attended Graduate School to further enhance nursing knowledge
- Updated and maintained protocol log books



Goals/Objectives For Next Reporting Period

- Continue to improve the screening process for patient participation in BCC research
- Continue to keep abreast on breast cancer issues using NCI Current Clips
- Continue to attend seminars/conferences on breast cancer issues and professional nursing issues
- Contact tumor registry regarding patient identification for BRCA
- Continue BCC chart review to identify high risk and strong family history
- Participate in the working group to develop breast cancer genetic information for physicians and nurses
- Prepare information for Dewitt regarding BRCA protocol
- Schedule result sessions for patients and f/u for ovarian screening
- Continue to prepare data packets for NCI research nurses working with Tam/4HPR
- Utilizing Care Manager to identify trends of care in the BCC and to document nursing notes
- Keeping the BCC staff abreast of research issues relevant to patient care and staff development
- Continue to attend Graduate School to further enhance nursing knowledge
- Participation and case study presentation at BCC staff meetings and multidisciplinary meetings
- Update and maintain protocol log books
- Attend tumor board weekly
- Prepare and distribute minutes of weekly research meetings in the BCC

LOUIE

Description Of Work To Be Performed

- Serve as mammographer in the department of radiology at National Naval Medical Center (NNMC).
- Serve as consult for referral cases from outside institutions as well as the Breast Care Center (BCC) here at NNMC. Many of these are complex cases which are sent to NNMC for further evaluation or a second opinion.
- Serve as liaison between the medical staff in the BCC and the mammography section of the radiology department.
- Serve as consultant radiologist for weekly surgical tumor board meetings.



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- Supervise the radiology resident assigned to mammography section
- Serve as consultant to radiology staff regularly rotating through the section.
- Supervise the mammography technologists to insure that mammograms meet American College of Radiology (ACR) and Food and Drug Administration, Division of Mammography (FDA) standards for mammography accreditation.
- Investigate, initiate and participate in the planning of other mammography research projects in which NNMC may be a participant.

Technical Objectives For The Reporting Period

- Continue to follow and further develop the protocols established in the mammography section for evaluating patients with breast abnormalities.
- Continue to perform stereotactic needle core breast biopsies.
- Continue to perform and increase the number of ultrasound guided procedures of the breast, as well as ultrasound scans of the breasts for focal abnormalities.
- Continue to supervise and teach the radiology residents rotating through the mammography section.
- Begin to replace the 14G Biopsy gun with the 11G Mammotome device for biopsies.
- Determine guidelines for which patients are the optimal candidates for the Mammotome.

Summary Of Work Performed During Current Reporting Period

- Continue to serve as one of the two principal mammographers in the department. I am more frequently on the schedule and read more mammographic studies than any other radiologist assigned to the section. There are 1 to 3 half days each week when I am the only mammographer assigned to read films.
- Continued to perform stereotactic needle core biopsies of the breast as well as needle localizations for surgical excisions, on a regular basis.
- The proposal to demonstrate the feasibility of imaging the breast with fluorodeoxyglucose (FDG) using a gamma camera was approved by the Investigational Review Board (IRB). This procedure has never been published before, and will involve a collaboration of the nuclear medicine and mammography departments of NNMC. (Note that only a minority of proposals are approved the first time they are submitted.)
- Increased involvement in teaching the radiology residents as they rotate through the mammography section.



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- Continue to identify interesting cases to add to the resident teaching file.
- Continue to serve as liaison between BCC and the mammography department. The latter is often not informed on decisions and projects taking place in BCC.
- Continue to identify very high risk patients who may be interested in the BRCA gene education and screening program now offered by BCC. These names are forwarded to Sherry Higgins in BCC for future contact.
- Participate in the regularly scheduled BCC research meetings to address ongoing and potential projects involving BCC, how to facilitate the creation of new projects, and how to improve interdepartmental and interinstitutional communication for new projects.
- Continue to attend the Breast Cancer Think Tank workshops sponsored by the NCI to foster collaboration between clinicians and laboratory researchers in their quest for new treatments and cures for breast cancer.
- Begin to refer patients with complex problems to MRI for breast MR and to nuclear medicine for scintimammography. (The latter is separate and different from the above described FDG protocol.) Imaging of the breast now often requires multiple modalities, and this idea was reinforced at the recent Chicago meeting of the Radiological Society of North America (RSNA).
- Continue to participate as a reader for a digital and computer-assisted diagnosis mammography project run by Uniformed Services University of the Health Sciences (USUHS) and the University of South Florida.

Goals/Objectives For Next Reporting Period

- Continue to provide coverage in the mammography section of the radiology department.
- Finish minor revisions to the FDG proposal and acquire the appropriate signatures for final approval before beginning the project.
- Funding for digital acquisition mammography equipment has been approved for CAPT Jerry Thomas of USUHS. There are plans to make NNMC one of the test sites for General Electric's digital acquisition mammography unit. Projects will have to be designed in collaboration with other testing sites.
- Meet with the members of the Transfer of Intelligence Technologies to Improve Breast Cancer Imaging Project (TITIBCI) regarding preliminary data now being collected.
- Continue dialogue with radiologists at NIH (National Institutes of Health) for possible future imaging of our patients on their positron emission tomography (PET) scanner, as well as possible biopsies of our breast patients on their Magnetic Resonance Imaging (MRI) scanner.



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- Continue dialogue with researchers at NCI and NIH regarding a nutritional epidemiological study on breast cancer patients at NNMC. A proposal will be written and submitted.
- Lecture to nurses attending the Educate the Educator course hosted by BCC. (I also spoke at the previous course in Aug 97.)

O'HALLORAN

Description Of Work To Be Performed

Ambulatory Care Nurse Duties carried out until mid Dec 1997

- Collaborates with a multidisciplinary staff concerning patient needs and identifies patients who may benefit from services such as social service, physical therapy or nurse case management.
- Performs professional nursing assessments
- Opening and closing all clinical areas and preparing exam rooms for patient use
- Triage of telephone calls and patient walk-ins
- Responsible for all clinical functions
- Carries out of physician's orders
- Reviews and sorts pathology and mammogram reports
- Oversees preparation of charts for patient visits
- Assignment of nursing lunch breaks to ensure appropriate coverage of the unit
- Processes linen and hazardous material
- Maintains supplies for clinical exam rooms and needle/syringe cart
- Coordinates all FNAs and procedures and notifies Nurse Case Manager of positive diagnosis
- Performs biopsy teaching and APU coverage in absence of Clinical Nurse Educator

Assumed Radiology Nurse Case Management Duties Mid Dec 1997

- Support a research program which focuses on breast cancer.
- Liaison between the Radiology Department-Mammography Section, the Breast Care Center (BCC), and other hospital departments.
- Perform nursing duties.
- Perform managerial duties.



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Technical Objectives For The Reporting Period

Ambulatory Care Nurse Duties carried out until mid Dec 1997

- Organization of patient charts
- Maintain mammography scheduling book
- Modification of daily clinic schedules
- Utilization of Care Central for tracking of FNAs
- Continue to improve computer skills
- Identify nursing roles for ambulatory care setting
- Development of orientation for new nursing staff
- Stocking of all clinical areas
- Breast self examination teaching
- Organization of triage area and triage files

Assumed Radiology Nurse Case Management Duties Mid Dec 1997

- Learn new role, begin to function as the Radiology Nurse Case Manager
- Assist the Radiologists/staff with stereotactic and ultrasound guided breast biopsy procedures.
- Perform assessments on all stereotactic/ultrasound biopsy patients and provide these patients with post breast biopsy teaching instructions.
- Assist with continued development between the BCC and Radiology Department.

Summary Of Work Performed During Current Reporting Period

Ambulatory Care Nurse Duties carried out until mid Dec 1997

- Participated in multidisciplinary meetings to further enhance the relationship between BCC, SSU and GSC and Radiology
- Enhance nursing knowledge base on breast cancer issues
- Further developed personal computer skills
- Triage telephone calls and walk-ins
- Further identified the nursing assignments of the ambulatory care staff
- Coordinated all FNAs and procedures and notify Nurse Case Manager if positive
- Continued to orient new staff members to patient flow processes and forms within the BCC
- Coordinated patient flow activities in the clinical areas with patients, nurses and



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physicians

Assumed Radiology Nurse Case Management Duties Mid Dec 1997

- The above technical objectives were met during the current reporting period.
- Assisted with the re-organization of the mammography scheduling process.
- Supervised other mammography personnel.
- Act as clinic manager for the Mammography Division.
- Tracked 6 month follow-up patients with outcome analysis via BCC Task Management Tool.
- Correlated mammography and pathology findings via CHCS.
- Assisted the BCC with ambulatory/nurse case manager interviews.

Goals/Objectives For Next Reporting Period

- Continue to obtain mammography statistical data for FDA purposes on a monthly basis.
- Track 6 month follow-up patients with outcome analysis via BCC Task Management Tool.
- Complete familiarization with the role of Radiology Nurse Case Manager
- Continue to attend courses towards Masters of Science in Nursing degree
- Increase familiarity with administrative functions and their affect on nursing role
- Work towards integration of physicians, nurses and other personnel to improve and support clinic functions between the Radiology Department and the Breast Care Center, including coordination of mammography scheduling.

ROGERS

Description Of Work To Be Performed

- The social worker will interview and assess newly diagnosed breast cancer patients and provide them with educational materials, support group information, and a description of available social work services. The assessment will include a screening for depression and adjustment, the documentation of the patient's social history and a defining of the patient's environmental support systems.
- The social worker will evaluate and monitor the breast cancer patient's psychosocial and mental status and offer individual, couple, family, or group psychotherapeutic



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intervention or referral as appropriate.

- The worker will encourage and facilitate the identification of the patient's concrete needs and concerns and actively participate with the patient in a solution and task focused pursuit of such.
- Facilitation of the Stage I & Stage II Breast Cancer Survivor Group
- Facilitation of the Advanced Breast Cancer Support Group
- Facilitation of the Spouses of Breast Cancer Patients Support Group
- Solicit new member participation in the afore mentioned Breast Care Center support groups.
- Collect and analyze the support group research data related to the Adjustment and Social Support in Male Spouses of Breast Cancer Patients.
- Act as the liaison between the Breast Care Center and the National Naval Medical Center Social Work Department. As such, the worker will attend social work staff meetings, offer professional coverage and other services when necessary, coordinate communication, and maintain colleagueial rapport and interaction.
- Coordinate Breast Care Center patient participation in the American Cancer Society "Look Good, Feel Better" program for patients undergoing or having completed radiation and chemotherapy treatments.

Technical Objectives For The Reporting Period

- Address the psychosocial and concrete needs of individual patients in the Breast Care Center.
- Provide individual psychotherapy to patients experiencing significant emotional distress following diagnosis.
- Facilitate on-going therapy for patients who have experienced specific types of concerns at the completion of treatment including sexuality and intimacy issues, fear of recurrence, family concerns, etc.
- Facilitate psychotherapeutic intervention with couples who wish to enhance coping skills and increase the level of communication, sense of well-being, and stability in their union during a time of dramatic change and crisis following the diagnosis of breast cancer.
- Work toward beginning the American Cancer Society "I CAN COPE" program at the Breast Care Center. This program will serve to help breast cancer patients communicate and network with other survivors throughout diagnosis, treatment, and beyond.
- Develop social work involvement with the BRCA Gene Study. Social Worker will serve as individual providing therapy to patients who experience anxiety, depression or other



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feelings related to the gene testing process and results of the tests. Examining the option of starting a genetic support group.

**Summary Of Work Performed During
Current Reporting Period.**

- Addressed the psychosocial status and patient/family concerns in the Breast Care Center.
- Worked closely with the Breast Care Center Nurse Case Managers to provide seamless care to patients. This included daily integration and discussion of services provided to ensure a continuity patient care and enhanced patient satisfaction.
- Provided facilitation of the Advanced Breast Cancer Support Group, the Stage I & Stage II Breast Cancer Survivor Group, and the Spouses of Breast Cancer Patients Support Group.
- Worked closely with the CHAMPUS and Supplemental Care offices to ensure that patients wig and breast prosthetics requirements were approved prior to the purchase of such items.
- Actively promoted the Breast Care Center Breast Cancer Survivor groups resulting in increased new membership.
- Provided coverage of emergent psychosocial issues, attended multidisciplinary hospital discharge meeting, and supervised intern team during the social work department mandatory retreat.
- Attended National Naval Medical Center Social Work Department meetings, offered ongoing professional coverage, coordinated communication, and maintained constant collegial interaction.
- Attended and actively participated in meetings of the Medical Ethics Committee of the National Naval Medical Center.
- Attended and actively participated in weekly multidisciplinary rounds on oncology unit of the National Naval Medical Center.
- Coordinated Breast Care Center patient participation in the American Cancer Society "Look Good, Feel Better" program.
- Updated and improved a comprehensive listing of wig salons for patients who are undergoing chemotherapy and may need to locate a wig prosthetic as a result of hair loss.
- Amended and enhanced a comprehensive listing of local lodging with current prices and military or patient discount information for use by patients and their companions.
- Completed touch therapy and relaxation course offered at the National Naval Medical Center.



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- Fulfilled requirements toward clinical licensure by maintaining a schedule of weekly meetings with professional mentor and supervisor.

Goals/Objectives For Next Reporting Period

- Continually provide comprehensive and high quality psychosocial and concrete services and interventions to Breast Care Center patients and their families.
- Coordinate and facilitate individual, couple, family and group psychotherapy for breast care patients.
- Continue to prepare and complete CHAMPUS, Supplemental Care, and Medicare documents for the procurement of necessary concrete items by breast care patients.
- Expand the BCC social work library to include more texts which address emotional issues related to breast cancer.
- Continue working relationship with the American Cancer Society to bring to the Breast Care Center quality programs which address psychosocial issues related to cancer.
- Participate actively in the Educate the Educator Program sponsored by the Breast Care Center.
- Compile a listing of current breast cancer and related literature, recommended by National Naval Medical Center health and mental health professionals, which will be made available to breast care patients, their companions, and families.
- Gather and implement the use of statistical tools with which to better monitor patient satisfaction levels and develop educational aspect of stage I/stage II breast cancer support group.

SNEE, LAHL

Description Of Work To Be Performed

- Case manages new breast cancer patients
- Utilizes the "Care Manager" and "Care Charter" software to document and track the patient's progress through the clinical care pathway of breast cancer treatment
- Helps to educate newly diagnosed breast cancer patients about disease, treatments, and follow up care
- Provides educational materials to patients and families
- Coordinates and plans appointments for multidisciplinary care in hospital, including, but not limited to hematology/oncology, radiation/oncology, plastic surgery, physical therapy,



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and social services

- Provides emotional support to women and their families who are facing cancer treatment through verbal and nonverbal communication
- Provides support, comfort, and education to the patient through the use of pre and post op phone calls and by visiting the patient while they are an inpatient.
- Ensures that patients are receiving adequate follow up care
- Tracks breast biopsies and notifies doctor of any malignant pathology reports and ensures that patient is scheduled for appointment with physician
- Teaches and demonstrates the "Care Manager" and "Care Charter" software to interested personnel both within NNMC and at outside facilities
- Assists as needed in clinic as either ambulatory care nurse or nurse educator

Technical Objectives For The Reporting Period

- Assists in the orientation and training of new personnel in the BCC; in particular, the new nurse case manager
- Continues to provide "Care Manager" and "Care Charter" demonstrations to interested parties coming to the BCC
- Ongoing education and training as a new nurse case manager in the BCC
- Ongoing development in the role of the nurse case manager
- Implement processes that will enable appropriate follow up care for breast cancer patients
- Continues to revise and perfect methods to discuss cancer diagnosis with patients
- Continues to gain further knowledge and education in breast cancer and its treatment
- Ongoing development of organizational skills to manage multiple patients and their individual need

Summary Of Work Performed During Current Reporting Period

- Oriented and trained new nurse case manager
- Assisted in the training of new ambulatory care nurses
- Assisted in the interview process to identify candidates for an ambulatory care nurse in the BCC
- Provided education and working demonstration of the "Care Manager" software to interested personnel both within NNMC and to outside facilities
- Successfully oriented to the role of the nurse case manager



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- Provided case management to twelve new cancer patients
- Attended multiple training and educational sessions
- Trained in the use of the computer software, "Care Manager" and "Care Charter"
- Collaborated with the computer software company "Ellora" to provide information related to case management and breast cancer for the development of the new software "Care Central"
- Functioned as an ambulatory care nurse/triage nurse during periods of low staffing and/or high patient volume
- Helped to educate patients and families on breast cancer
- Provided emotional support to women from diagnosis to completion of breast cancer treatment
- Collaborated with multiple disciplines to arrange for patient care
- Developed useful methods for managing many varied and complex patients
- Attended tumor board meetings and was prepared to give additional information concerning breast cancer patients if required or requested by physicians
- Collaborated with staff on the development of a cancer database
- Collaborated with the nursing staff to begin the redesign of the ambulatory nursing role

Goals/Objectives For Next Reporting Period

- Assist the staff from the software company "Ellora" in the development of the new program, "Care Central"
- Develop a nurse case management "letter" to be given to new breast cancer patients to explain the role of case management to the patient and the family
- Work to establish guidelines for information entry in the "Care Manager" and "Care Charter" software
- Document contact with patients through the hospital's "ADS" system
- Assist the ambulatory care staff with daily activities in the unit as the new nursing personnel are oriented and trained
- Assist the nursing team to redesign the nursing roles in the clinic, in particular, the roles of the ambulatory care nurses
- Continue to improve skills as a nurse case manager
- Assist in the development of a breast cancer database
- Continue to enhance our education in breast cancer and it's treatment
- Continue to improve computer skills
- Attend a seminar/conference related to breast cancer



- Continue to participate in multidisciplinary meetings
- Establish guidelines for case management follow up after the acute stage of diagnosis and treatment of the breast cancer patient
- Plan and develop, with nursing and medical personal, a form to be placed in the patient's chart that indicates that patient's individual recommended clinic follow-up schedule after she is diagnosed with breast cancer
- Provide documentation of breast CA staging, including complete pathology reports to BCC shadow record and to inpatient medical records

SNYDER

Description Of Work To Be Performed

- Develop and integrate a breast care educational program for female/male Department of Defense beneficiaries and their support persons.
- Educational program to include all breast care issues with an emphasis on early detection of breast cancer.
- Provide pre-operative teaching and educate patients regarding breast cancer and treatment options.
- Being available as an information resource person for the patient and their support person.
- Plan staff development programs and maintain BCC staff development records.
- Act as relief Ambulatory Care Nurse under the direction of the nurse manager.
- BCC designated safety representative, responsible for safety manuals, monthly safety meetings and BCC safety issues.
- BCC representative on the Education Council Committee.
- BCC representative on the Nurse Practice Committee.

Technical Objectives For The Reporting Period

- Continue to provide patient education.
- Continue to develop array of patient educational materials.
- Continue to act as relief ambulatory care/ triage nurse.
- Continue staff development and safety representative responsibilities.



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Summary Of Work Performed During Current Reporting Period

- Continued responsibility as the designated safety representative of the BCC.
- Participated in command sponsored health fairs.
- Maintained credentialing data base on all Geo-Center employees.
- Plans and institutes staff education calendar and events.
- Functions as Clinical Educator providing teaching on breast self examination, pre and post operative instruction and breast cancer.
- Functioned as relief ambulatory care/ triage nurse providing breast self exam teaching, assisting the physicians with physical exams, procedures, and scheduling of diagnostic tests when needed. Continued to review educational materials and order needed materials.
- Preparation of the Genetics Education program for Physicians and Nurses.
- Preparation/ Implementation of the Orientation program for the new employee RN.
- Participation on the Educational Council Committee.
- Participation on the Nurse Practice Committee.

Goals/Objectives For Next Reporting Period

- Continue responsibility as safety representative.
- Continue to function as Clinical Nurse Educator providing teaching to patients and their support persons.
- Continue to function as relief Ambulatory Care Nurse.
- Preparation and implementation of the orientation program for the new Med. Tech.
- Identify needed materials and supplies for procurement.
- Participate in Wellness programs.
- Continue preparation/ implementation of the Genetics Education program. (on hold)
- Continue staff education calendar and events.
- Discussion with a BCC physician regarding preparation/publication of an abstract about the Nurse Case Manager Curriculum.
- Continue to participate on the Education Council Committee.
- Continue to participate on the Nurse Practice Committee.
- New participation as a member of the Clinical Educator staff meetings.
- New participation as a member of the Education JCAHO Council.



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- Preparation and implementation of the Nurse Case Manager Curriculum.
- Preparation and presentation of the "Breast Cancer" lecture for the Oncology Symposium.
- Acting Team Leader and Triage Ambulatory Nurse as needed during orientation of the new Ambulatory employees.

VAUGHN

Description Of Work To Be Performed

- Process and interview patients in need of mammogram
- Maintain uniform policy for scheduling mammography procedures
- Print and update daily mammography schedule
- Print pending orders list each day, contact and schedule appointments for patients in need of mammogram
- Receive patients and incoming telephone calls/inquires, determine priorities and refer to proper person/department
- Enter CHCS orders for comparison mammograms
- Ensure that all incomplete or incorrect patient mammogram orders are corrected or returned to proper staff for completion/correction
- Handle mail and telephone correspondence regarding mammography scheduling
- Call all no-shows and attempt to re-schedule mammography appointments
- Set up records and filing system for paperwork associated with each patient record. Ensure that all documents processed are in accordance with department standards and that all forms are in designated order

Technical Objectives For The Reporting Period

- Improve routing and response to incoming telephone calls/inquires
- Coordinate policies for scheduling mammography appointments for patients calling, walk-ins, and consults
- Refine CHCS daily schedule
- Modify duties based on personnel changes
- Improve mammography scheduling to allow for more efficient operations
- Be readily available for assistance to co-workers, the mammography department, physicians, and patients requiring assistance with mammography



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**Summary Of Work Performed During
Current Reporting Period**

- Received patients and incoming telephone calls, determined priorities
- Provided assistance to staff requesting help with mammography orders
- Continued to organize log book to improve mammography scheduling
- Performed increased duties as patient volume increased within the BCC and Radiology Department
- Explained mammography procedures to patients
- Obtained authorization for release of mammogram films from patients, for NNMC file tracking
- Open mammography schedules and make changes as necessary, based on departmental needs
- Worked closely with BCC staff to ensure timeliness and accuracy of diagnostic mammography slots
- Oriented new staff to file room procedures and duties
- Participated in team planning to improve mammography scheduling
- Promoted to the mammography scheduler in 10/97. Transitioned to this new position

Goals/Objectives For Next Reporting Period

- As I continue to transition to the permanent position of mammography scheduler, I will become more proficient with the scheduling process
- Will continue to work towards reducing the turnaround time for mammography studies
- Will continue to maintain department standards
- Will become more familiar with TriCare, as it approaches NNMC
- Will continue to work with team to improve patient access to mammography, including development of screening program

WALLACE

Description Of Work To Be Performed



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- Act as Administrator of the Breast Care Center, responding to the needs of patients and staff to meet daily administrative requirements
- Oversee/Manage appointment scheduling system that allows for: maximum access of patients into the clinic, provides for medical training, research protocols, and administrative time, and is responsive to unanticipated demands and special cases.
- Gather workload data, prepare statistical reports, and analyze data to provide information and guidance.
- Patient ombudsman for the Center during Nurse Manager 's absence.
- Coordinate input in order to prepare the annual budget, mid-year reviews, and unprogrammed requirements for the Center. Provide recommendations to the administrative team in the development and formulation of budget requests, based on familiarity and knowledge of Department programs and appropriate procedures, review and analyze budget requests, and determine whether requests for funds and expenditures are proper, necessary, and timely. Monitor use and rate of expenditures of budgeted funds. Oversee funding for all research conducted at the Center, with particular emphasis on clinical trials.
- Responsible for coordinating responses to all correspondence that comes into the Center. This includes Congressional inquiries, complaints, requests for information, requests for guest speakers, etc.
- Coordinate all reports generated in the Center. This includes establishment of a system that will guarantee reports are on time and that all reports reflect accurate data.
- Maintain oversight of equipment inventory and ensure that equipment is maintained.
- Review space utilization within the Center and advise the administrative team on such activities as space allocation and renovation.
- Supervise GEO-CENTERS, INC personnel located in the Breast Care Center, Building 10, 4th Floor, West..
- Manage information systems hardware and software within the Center. Primary coordinator for CHCS and ADS within the Center.
- Maintain oversight of the ordering process for supplies.
- Primary liaison between the military and GEO-CENTERS, INC.
- Provide advice on manpower utilization, work flow, and operational procedures.
- Respond to requests for administrative reports; generate, collate, synthesize and present a wide range of data in written or oral form; edit reports prepared by other members of the Department; and, confer with the administrative team in identifying and resolving administrative problems and needs.



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- Coordinate staffing with the Nurse Manager, analyze manpower utilization and participate in interviews.
- Monitor legal issues. Make Staff Judge Advocate's office aware of potential litigation.
- Work with administrative team to develop plans for guiding future clinic operations.
- Oversee use of the Ambulatory Data System (ADS) for the Center.
- Assist Contract Management Department with maintaining accurate and complete files on contract employees.
- Assist in preparation for VIP tours and briefings.
- Other administrative functions as necessary.

Technical Objectives For The Reporting Period

- Oversee conversion of patient charting system. Ensure appropriateness of conversion plan. Develop timeline for conversion.
- Analyze current staffing and future staffing needs. Determine effectiveness of current nursing staff positions. Hire personnel as necessary. Orient new employees.
- Monitor Breast Cancer Prevention, Education, Diagnosis Initiative issues closely. This includes preparation of Statements of Work and proposals for obligation of future funding and completion/ submission of expenditure of funds reports to the Office of the Assistant Secretary of Defense and Tricare Region 1 Lead Agent's office.
- Implement system for checking data accuracy, with particular attention to use of CHCS, ADS and CareCentral Software.
- Continue to maintain compliance with the Surgeon General's ADS standards.
- Attend weekly meetings of the Information Management Quality Management Board to keep up-to-date on all information systems issues.
- Oversee procurement ordering process. Make sure all necessary supplies are ordered in a timely fashion. Ensure proper documentation.
- Participate in genetics research and cancer database development working groups.
- Act as Point of Contact and Coordinator of the John Silva/Defense Advanced Research Projects Agency project to develop an electronic patient file.
- Assess Ellora Software Inc. projects status. Monitor fund use versus project completion.



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Summary Of Work Performed During Current Reporting Period

- Began preparation for JACHO.
- Maintain pressure on DARPA project to ensure progress and understanding of mutual obligations
- Monitored legal issues.
- Monitored compliance between BCC records and Budget Department records.
- Investigated and implemented methods to improve current work practices.
- Coordinated administrative activities of the BCC.
- Oversight of chart conversion.
- Analyzed staffing needs to determine effectiveness of current staff positions.
Interviewed and Hired 2 new employees. Trained 4 new employees (5th employee due on site in March 1998).
- Oversight of schedule templates, with emphasis on current and future changes related to TRICARE as well as changes related to our transition to a new computer system.
- Maintained relationship with Contract Management Department.
- Coordinated information for POM 2000.
- Handled administrative issues as necessary.
- Monitored Breast Cancer Prevention, Education, Diagnosis Initiative issues closely.
This included preparation of proposals for additional funds.
- Attended weekly meetings of the Information Management Quality Management Board.
- Oversaw procurement ordering process. Made sure all necessary supplies were ordered in a timely fashion.
- Participated in genetics research and cancer database development working groups.
- Acted as Point of Contact and Coordinator of the John Silva/Defense Advanced Research Projects Agency project to develop an electronic patient file.
- Hosted multiple distinguished visitors

Goals/Objectives For Next Reporting Period

- Increase educational opportunities related to anticipated changes in the NNMC information system.
- Resolve outstanding staffing issue.
- Analyze new areas for data collection.



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- Continue preparation for JACHO.
- Continue participation on genetics research and cancer database working groups.
- Continue to coordinate administrative activities of the BCC.
- Continue to actively seek new avenues of funding.
- Maintain pressure on DARPA project to ensure progress and understanding of mutual obligations
- Monitor compliance between BCC records and Budget Department records.
- Actively seek methods to improve current work practices with particular emphasis on the Radiology and Breast Care Center relationship and continued activities toward integration.



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II. NMRI, Bethesda, MD

E. BREAST CANCER RESEARCH & EDUCATION INITIATIVE (BRIN)

*BELLITT, ELLIOTT, FREEMAN, FUSCHINO, HAMMA, MATTHEWS, SEMONES,
STEWART, WHITEHEAD*

Description Of Work To Be Performed

- The Department of Defense (DoD) has recognized and emphasized the importance of increased awareness and education regarding breast cancer and screenings. There are about two million DoD women beneficiaries over the age of 30, which represents 26% of all Military Health Services System (MHSS) beneficiaries. Thirteen percent of the active forces are women, and each year nearly 18,000 new cases of breast cancer are diagnosed in the MHSS. It is through education and awareness of the importance of clinical examinations, mammography, and monthly breast self-examinations (BSE) that breast cancer mortality can be decreased while positively affecting the morale of the DoD workforce.
- The FY97 BRIN Program utilizes a three-phased approach. Phase I focuses on beneficiary access to breast cancer screening, diagnosis, and treatment. Phase II will be implemented by the Military Treatment Facilities (MTFs), and focuses on training programs for all MTF Primary Care Managers on clinical breast cancer examinations and BSE techniques for beneficiaries. Phase III focuses on region-wide education programs.

Technical Objectives For The Reporting Period

Staff in Region V are responsible for:

- Enrolling patients in breast Care Programs.
- Developing pre and post care guidelines for stereotactic and ultrasound guided core biopsies.
- Increasing access by decreasing time between diagnosis of potential problem to mammogram or ultrasound guided core biopsy.
- Provide breast care education programs to the MTF community.
- Develop a Mail Education Reminder Program.



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Summary Of Work Performed During Current Reporting Period

- Continue to provide high quality images for accurate radiologic interpretation.
- Maintained film processors within the set guidelines reducing departmental down time.
- Continue to mentor newer technologists by setting realistic goals and providing guidance.
- Decrease time to mammogram or ultrasound guided core biopsies from 5 months to in some cases, less than 24 hours.
- Set up a schedule and implemented the first wave of the Mail Education Reminder Program
- Held various breast care training sessions throughout the region.

Goals/Objectives For Next Reporting Period

- Continue to provide high quality exams in a timely manner with a continued emphasis on patient care and comfort.
- Strive to keep patient backlog with a two week time frame as opposed to the previous backlog of five months.
- Complete the second and third wave of the Mail Education Reminder Program.
- Continue training in the community.
- Continue to provide high quality, compassionate care to the military beneficiaries.



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II. NMRI, Bethesda, MD

F. DIRECTED ENERGY EFFECTS RESEARCH

ELLIOTT

Description Of Work To Be Performed

- Continue a training program for Rhesus monkeys with ultimate goal of animals trained to perform visual acuity tasks while aligned on and being imaged by, a Scanning Laser Ophthalmoscope.
- Continue experiments in optical physics and ocular physiology
- Operate, and maintain Rodenstock Scanning Laser Ophthalmoscope(SLO).

Technical Objectives For The Reporting Period

Define Animal Performance criteria:

- The objective of this research is to simultaneously evaluate the effects of Q-switched laser exposure on the behavioral indices of visual performance and retinal morphology of Rhesus monkeys performing visual tasks while retinal imaging with SLO takes place. This training program involves a sequence of interim training objectives: Reaction Time Observing Response, Stimulus refinement, Modification of apparatus, Mask training, SLO conditioning and training.
- Continue optics and ocular imaging research program: Small eye experiments, SLO image enhancement, Laser/Retinal lesion mechanism/treatment pilot program.

Summary Of Work Performed During Current Reporting Period

Training Program

- Animal training progress is nominal. The apparatus has been modified and subjects familiarized. Masks have been designed, fabricated and installed.

SLO Operation

- The new Rodenstock SLO is in routine operation.



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Optics and Ocular physiology

- Small eye subjects have been selected and maintained. Laser injury treatment substances identified, selected and acquired.

Goals/Objectives For Next Reporting Period

- Prepare subjects for SLO task.
- Prepare SLO for subjects.
- Continue optics and ocular imaging research program.

GUILLORY

Description Of Work To Be Performed

Compile and analyze data comparison of tactical in-flight information versus visual data collected via manual video tracking (spatial analysis).

Assist in logistical support as necessary.

Technical Objectives For This Reporting Period

Reinforce information to pilots of the threat that handheld lasers pose to any flight operation.

Summary of Work Performed During Current Reporting Period

Acquired spatial positioning data from actual flight sensor data comparison (data scoring).
Provided daily research and administrative support.

Goals/Objectives for the Next Reporting Period

Continue data scoring and logistics assistance.
Provide additional logistical support for the continuing scientific mission.



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RICHARDSON

Description Of Work To Be Performed

- Provide Biological Science Laboratory Technician (Animal) Support to the Microwave Department. Handling and training of non-human primates. Recording and compiling data. In-house management of non-human primates. Administrative support of animal use projects.

Technical Objectives For The Reporting Period

- At this time will be giving technical support to other technicians with their projects, and assist where needed in animal research. Recording data and compiling data on computer programs for publishing.

Summary Of Work Performed During Current Reporting Period

- Assigned duties as Lead Technician in the Millimeter Wave Eye Project.
- Attended and completed computer courses in order to better perform data collection and analysis duties.
- Responsible for animal vivarium, ensuring compliance with AALAC standards, animal health and welfare and functioning as the Detachment Liason with Vet Sciences.

Goals/Objective For Next Reporting Period

- Continued member of the Animal Use Committee. Continue data collection and analysis for Publishing. Continue supporting other technicians with various projects, as well as performing duties as lead technician on the Millimeter Wave project. Continue performing responsibilities regarding the Animal Vivarium.
- Continue computer training
- Planning on attended American Association for Laboratory Animal Science in April.



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THOMPSON

Description Of Work To Be Performed

- Provide technical and analytical support for pulsed laser glare projects.
- Provide support in the experimental design and analytical support for visual psychophysical studies.

Technical Objectives For The Reporting Period

- Continue to coordinate the development of new laboratory facilities for continuation of Pulsed light projects.
- Assist in research, design, and acquisition of various computer, laser, and stimulus generating software and hardware for new laboratory.
- Develop operational and development workstations for Pulsed Light projects.

Summary Of Worked Performed During Current Reporting Period

- Provided research, design and acquisition of computer hardware and software for new experimental Pulsed Light study.
- Provided consultation in purchasing of electronic equipment for future glare study.
- Provided consultation in purchasing backed projection screens for future glare study.
- Performed as liaison between client, BARCO and Pro-Line Video for development of stimulus interface.
- Developed hardware design for new veiling glare project.
- Provided statistical analysis, interpretation of results, and technical document for Pulsed Laser Light glare project.
- Continued to provide support in the development of the HUD and MFD psychostimulus displays.
- Began development of software/hardware interface using LabView software for new veiling glare study
- Developed experimental workstation for phase I of new study evaluating Contrast Sensitivity.
- Designed experimental protocol for phase I pilot study and performed Contrast Sensitivity experiments.



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- Provided statistical and graphical data analysis of phase I pilot experiment.
- Provided client with experimental data analysis, graphical displays and technical support for project defense at annual funding meeting.
- Provided technical report for use and presentation at Lasers On the Modern Battlefield conference held March 98 at Brooks AFB, Texas.
- Developed software/hardware interface for new veiling glare project.
- Interface was tested and performed successfully.
- Designed and installed bench top component topography for laser operation.
- Installed and successfully tested and ran demonstrations of new 5W Coherent laser for veiling glare project.
- Developed experimental protocol successfully conducted Contrast Sensitivity experiments.
- Abstracts presented at Lasers On the Modern Battlefield conference, March 1998.

Goals/Objectives For Next Reporting Period

- Complete development of second laser laboratory.
- Continue development of the experimental workstation and design a method for simulating aircraft cockpit instrumentation symbology.
- Begin experimental data collection for new laser glare study.
- Continue to provide statistical support for all laser department projects.

MARES

Description Of Work To Be Performed

- Function as Supply technician for the Detachment, researching, processing and receiving of orders. Assist other supply technicians within the Detachment in order submission. Complete follow-ups on purchase orders which are beyond the required delivery date. Manage budgetary accounts on all purchases through the base supply departments ie.. Medical supply, Base supply and the Base service store account. Manage the Plant Property Program on monitoring the major and minor equipment inventory. Assist the Administrative Officer on drafting correspondence between the local supply department and the Detachment. Act as command secretary in the absence of the secretary.



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Technical Objectives For The Reporting Period

- Processing orders for the Detachment.
- Update purchase orders that are past due.
- Do Monetary budget for base, medical and the base service store.
- Monitor the major and minor equipment inventory.
- Assist the administrative officer on drafting correspondence between the local supply department and the Detachment.
- Act as command secretary in the absence of the Secretary
- Assists IMPAC Card Holders in the management of IMPAC.

Summary Of Work Performed During Current Reporting Period

- All objectives were met.
- Completed computer training in Excel.

Goals/Objectives For Next Reporting Period

- Continue Detachment Supply support
- Become more educated on computer software programs related to my job.
- Continue education in Administration functions.
- Become educated into the Telnet process of purchasing/budgeting on computer.



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III. NDRI, Great Lakes, IL and NDRI Detachment, Bethesda, MD

A. DENTAL DISEASES-RELATED RESEARCH

BECK

Description Of Work To Be Performed

Provide technical assistance with ongoing research projects. Participate in National Institute of Dental Research (NIDR) linkage analysis projects. Maintain and upgrade the laboratory such that the research experiments are carried out smoothly. Maintain and record proper technical procedures and data produced for each experiment.

Technical Objectives For The Reporting Period

- Participate in NIDR - Molecular Epidemiology linkage analysis studies of genetic disorders.
- Optimize four bone morphogenic protein (BMP) primer sets and three cytokine primer sets for polymerase chain reactions (PCR).
- Grow and maintain human fibroblast cell lines in tissue culture.

Summary Of Work Performed During Current Reporting Period

- Continued to participate in NIDR Molecular Epidemiology projects. These studies deal with the inherited genetic disorders. The most recent completed project dealt with scanning of entire human genome for a potential linkage(s) between screened markers and the genetic disorders such as cleft-lip and palate, Kartagener Syndrome and Early Onset Periodontitis.
- Optimization of each BMP and cytokine primers is completed. In addition, all primers are now being run along with Actin primer set. Actin serves as an internal indicator of how successful the RNA isolations were since all cell types contain message for the Actin product. Thus, by implementing such control will greatly enhance the validity of our



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experiments while measuring BMP or cytokine messages.

- Human gingival fibroblasts were continuously grown *in vitro* for cytokine level measurements as well as the observation of obvious morphological changes upon stimulating with various denture liners.
- Human gingival and pulpal cell lines were established *in vitro* for the purpose of measuring mRNA levels for specific cytokine proteins via *in situ* hybridization and polymerase chain reactions.

Abstracts:

Abstract submitted and accepted by AADR: "Interleukin-1 Genotypes and Risks of Early Onset Periodontitis"

Goals/Objectives For Next Reporting Period

- Continue to participate in NIDR projects. The recent studies have indicated a strong association of interleukin-1 with severity of the periodontitis. In order to investigate this association in thousands of samples collected for the Early Onset Periodontitis (from Medical College of Virginia, Israel, and Chile), proper inventory of each sample, their diagnostic and familial histories need to be properly gathered, logged and maintained. Thus, scrutinizing over every detail will be the primary focus in order to launch this follow up study.
- Regarding the BMP project, samples collected from healthy and diseased patients will be processed using the optimized conditions for each primer set. This will be accomplished by amplifying the BMP regions of the cDNA along with β -Actin region and visualize the fragments using DNA sequencer via gel electrophoresis.
- Regarding the experiments to measure the cytokine (IL-1b, IL-6, and IL-8) levels, RNA isolated from growing human fibroblasts will be subjected to optimized cytokine and Actin PCR conditions. Again, the products will be visualized using a DNA sequencer via gel electrophoresis.
- Regarding the *in situ* experiments, cell lines are ready for bacterial and tumor necrosis factor (TNF- α) stimulation. RNA will be isolated from each sample and cytokine levels (along with Actin) will be measured as described above.



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JONES

Description Of Work To Be Performed

- Senior Research Scientist and Group Leader. Responsible for the Molecular Biological and Molecular Genetic aspects of the projects. This includes the development, evaluation and refinement of molecular biological research protocols.

Technical Objectives For The Reporting Period

- Relative to the program entitled "Biomarkers for Oral Cancer" for the Puerto Rico study subgroup, it is anticipated that SSCP analysis of p53 exons 7 and 9 of the p53 gene will be completed and that DNA sequence analysis using the extended primers will begin.
- Will begin large-scale isolation of DNA from the blood samples received for the Puerto Rico oral cancer case-control study. Will begin the characterization of a number of polymorphic risk-associated genes for these samples.
- Anticipate the continued arrival of specimens from the various sites participating in the VA subgroup of the Biomarkers for Oral cancer study. A tracking database has been established for these samples. Will begin the extraction of DNAs from these materials and the analysis of genetic variation.
- DNAs from the Taiwan Nasopharyngeal Carcinoma Study subgroup will be further characterized using additional genetic markers. A master database of all samples now in hand has been established. Will begin the preparation of these samples for whole-genome mapping in an attempt to identify the gene(s) associated with increased risk for nasopharyngeal carcinoma. The arrival of additional DNA samples for this study is anticipated and these will be incorporated into the ongoing studies.
- Will further characterize the DNAs from the Taiwan Oral Cancer Study subgroup to determine the frequencies of additional polymorphic genes with special emphasis on those associated with high-risk behavior.

Summary Of Work Performed During Current Reporting Period

- Relative to the program entitled "Biomarkers for Oral Cancer," for the Puerto Rico study subgroup, "first pass" SSCP analysis of exons 5, 6 and 8 of the p53 gene has been



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completed. "Extended" PCR primers for each of the p53 exons under investigation were designed and the reactions incorporating them are now being optimized. Strategies for the direct sequence analysis of potential mutants are under development.

- Relative to the program entitled "Biomarkers for Oral Cancer," five shipments of DNA for the Taiwan Nasopharyngeal Carcinoma Study have been received to date. The information relevant to these DNAs has been compiled and incorporated into a database in preparation for a large-scale study to identify genes associated with risk for NPC.
- Relative to the program entitled "Biomarkers for Oral Cancer," for the Greek Oral Cancer Study subgroup, additional blood samples, from both case and control individuals, were obtained and the DNA isolated. A characterization of the frequency of polymorphisms within the *CYP2E1*, *GSTM1* and *GSTT1* genes in the Greek population was carried out and the data submitted for statistical analysis. Further characterization of these DNAs for polymorphisms within a set genetic markers associated with increased cancer risk is in progress.
- Devised an improved allele-specific PCR method for the detection of genetic polymorphisms within the alcohol dehydrogenase 3 (ADH3) gene. Optimization of this method is in progress.
- Relative to the program entitled "Biomarkers for Oral Cancer", samples continue to arrive for the VA Oral Cancer Study subgroup and are presently being archived. For tracking purposes a database of all samples received to date was created. Information on new samples will be added as they arrive.

Publications, Abstracts, etc.

- A. Zavras, J.E. Jones, Y-F. Wang, C.W. Douglas and S.R. Diehl. Molecular Epidemiological Investigation of the Etiology of Oral Cancer. Talk presented at the 1998 AADR Annual Meeting in Minneapolis.

Goals/Objectives For Next Reporting Period

- Will continue the optimization and characterization of the new allele-specific PCR method for the detection of polymorphic variation within the ADH3 gene. Upon completion, this method will be used to evaluate the frequency of polymorphic variation within the ADH3 gene in the Taiwan and Greece case/control studies of oral cancer.
- Relative to the program entitled "Biomarkers for Oral Cancer", anticipate the continued arrival of samples for the VA Oral Cancer Study subgroup. These are presently being



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archived. For tracking purposes a database of all samples received to date is being maintained.

- Relative to the program entitled "Biomarkers for Oral Cancer", for the Puerto Rico study subgroup, anticipate the initiation of DNA sequence determination of potential mutants of the p53 gene identified by SSCP analysis. Will continue the analysis of the study DNAs for genetic alteration within the remaining exons of the p53 gene using SSCP. Will begin a "second pass", far more rigorous analysis of those samples that failed to render a PCR product during the "first pass" characterization.
- Will begin the large-scale isolation of DNA from additional blood samples received for the Puerto Rico oral cancer case/control study. Will begin the characterization of a number of polymorphic risk-associated genes for these samples.
- Relative to the program entitled "Biomarkers for Oral Cancer", Will further characterize the DNAs from the Oral Cancer in Greece study subgroup, to determine the frequencies of additional polymorphic genes associated with increased risk for oral cancer. Have obtained blood samples from a population of "normal" individuals for the assessment of "baseline" values. These DNAs will be isolated and characterized.
- Anticipate continued involvement in the NNDC Resident projects evaluating the role of bone morphogenetic protein (BMP) receptors in bone regeneration in periodontal tissues. Tissue samples for these studies are in the accrual phase.

MILLER

Description Of Work To Be Performed

- Senior Research Scientist and Group Supervisor. Responsible for all aspects of Immunological, Microbiological, and Tumor Biomarker activities within the Naval Dental School. This includes the development and supervision of research protocols, dental resident mentoring activities, instruction of courses in dental microbiology and dental immunology, serving as a link between NIH sponsored research and Naval Dental Research programs, and troubleshooting of research programs, computers, instrumentation and equipment.

Technical Objectives For The Reporting Period

- Relative to the program entitled "Biomarkers for Oral Cancer," the final HPV control study to determine assay sensitivities will be completed. Data from the Puerto Rico DNA



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samples will be evaluated against epidemiological data including smoking incidence. It is anticipated that during the next quarter work will be initiated to evaluate HLA polymorphisms in this group as well as to prepare a manuscript draft. In addition, it is also anticipated that selections will be made to fill the two new positions associated with our tumor biomarkers efforts.

- Relative to the project "Changes in Immunoglobulins as a Result of Smoking Cessation and Relation to Neurotransmitter Genes" funded by NIDR/NIH and jointly conducted by the Navy, Geo-Centers, NIDR, and individuals at the Jerry L. Pettis VA Medical Center in Loma Linda, CA., final blood samples (for a total of 200 subjects) will be collected and evaluated. It is anticipated that all samples will have been collected during the first quarter of 1998. In addition, DNA will continue to be extracted from blood samples in order to begin evaluation of dopamine receptor and transporter gene polymorphisms. In addition, efforts will be made to evaluate cotinine levels in all serum samples. These measurements will help to insure that subjects will be properly identified as to their smoking status.
- Relative to the project "Characterization of Bone Morphogenetic Protein Receptors in Oral Tissues" collection of clinical samples will proceed in preparation for assay.
- Relative to the project concerning the evaluation of cytokine production by oral fibroblasts, optimization of PCR conditions will continue and procedures for *in-situ* hybridization will be developed.
- A new project concerned with a survey of virus associated with periodontal and periradicular infections will be initiated. PCR based procedures will be used to identify specific viral types. During the first quarter of 1978 it is anticipated that PCR conditions will be optimized for several viral DNA samples and that evaluation of some of the clinical samples will have commenced.
- It is anticipated that the course "Oral Immunology" will begin and completed during the first quarter of 1998.

Summary Of Work Performed During Current Reporting Period

- Relative to the program entitled "Biomarkers for Oral Cancer," DNA from Greek study samples have now been extracted and evaluated for genes for the T cell receptor (TCR), p53 exon 8, and HPV-L1. Little evidence for presence of significant HPV DNA was found. The new position for a Scientist I in the Biomarkers program has now been filled.
- Relative to the project "Changes in Immunoglobulins as a Result of Smoking Cessation and Relation to Neurotransmitter Genes" funded by NIDR/NIH and jointly conducted by the



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Navy, Geo-Centers, NIDR, and individuals at the Jerry L. Pettis VA Medical Center in Loma Linda, CA. To date, 153 subjects have been analyzed. We have found that IgG2 levels significantly decreased among 38 subjects who had completely reduced their smoking or had cut back but not quit entirely. We also observed a dose-response relationship between the extent of reduction in smoking and the magnitude of reduction in IgG2. Statistical evaluations of dopamine receptor (DRD2) polymorphism frequencies remain to be completed. An abstract has been submitted and selected for presentation at the Fourth Annual Scientific Sessions of the Society for Research on Nicotine and Tobacco in New Orleans in March.

- Relative to the project concerning the evaluation of cytokine production by oral fibroblasts, work is continuing toward the evaluation of cDNA's obtained from RNA isolated from gingival fibroblasts, pulpal fibroblasts stimulated in culture with a variety of stimulators (TNF, growth factors, and bacterial components). Procedures for *in-situ* hybridization have also been developed. Total RNA has been isolated from frozen clinical periradicular lesion tissue and remains to be reverse transcribed.
- Relative to the project "Characterization of Bone Morphogenetic Protein Receptors in Oral Tissues", collection of clinical samples is continuing. Initial evaluation of BMP-1 mRNA's in periradicular clinical samples has been completed.
- Relative to the studies to evaluate hypersensitivity and cytotoxic effects of soft denture liners, initial studies involving the direct influence of Viscogel (Dentsply), Coe Comfort (GC), FITT (Kerr), Lynal (Caulk/Dentsply), and Coe Soft (Coe Lab) on fibroblast growth have been completed and culture fluids have been evaluated for cytokine levels. In addition, quantitative rt-PCR procedures will be used to measure relative amounts of cytokine mRNA.
- Relative to the survey of viruses associated with periradicular infections, DNA has been secured from 130 clinical samples and evaluated for p53 exon to evaluate DNA quality. Virus assays for HPV, CMV, adenovirus and EBV are being completed.
- The course "Oral Immunology" for dental residents has been successfully completed.

Goals/Objectives For Next Reporting Period

- Relative to the program entitled "Biomarkers for Oral Cancer," DNA from the Greek study and Puerto Rico study samples will be evaluated for 27 HPV subtypes using the Amplicor HPV test system available as a result of a Material Transfer Agreement to NIDR.
- Relative to the project "Changes in Immunoglobulins as a Result of Smoking Cessation and Relation to Neurotransmitter Genes" funded by NIDR/NIH and jointly conducted by the Navy, Geo-Centers, NIDR, and individuals at the Jerry L. Pettis VA Medical Center in Loma



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Linda, CA., collection of additional samples and their analysis will continue. In addition, we would like to begin to evaluate cotinine levels in subject serum samples in an effort to gain additional insight into smoking habits.

- Relative to the project concerning the evaluation of cytokine production by oral fibroblasts, work will continue toward the evaluation of cDNA 's obtained from RNA isolated from gingival fibroblasts, pulpal fibroblasts stimulated in culture with a variety of stimulators (TNF, growth factors, and bacterial components).
- Relative to the project "Characterization of Bone Morphogenetic Protein Receptors in Oral Tissues", collection of clinical samples and evaluation of the BMP-receptors will continue.
- Relative to the studies to evaluate hypersensitivity and cytotoxic effects of soft denture liners , quantitative rt-PCR procedures to measure relative amounts of cytokine mRNA will be completed .
- Relative to the survey of viruses associated with periradicular infections. Virus assays for HPV, CMV, adenovirus and EBV will be completed.

Publications, Abstracts, etc.

- Effect of Smoking Cessation on Total Serum IgG. P. O'Loughlin, G.A. Miller, Y.-F Wang, M. D'Alesandro, L. Ferry, and S.R. Diehl. Journal of Dental Research, 77-A: 192, 1998. (ABSTRACT)



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IV. NMRI TOX/DET Dayton, OH

A. TOXICOLOGICAL STUDIES

ADEMUJOHN

Description Of Work To Be Performed

- The purpose of the neurobehavioral laboratory coordinator at NMRI/TD is to provide technical support to various aspects of ongoing on-site projects in neurobehavioral research. During this quarter the coordinator has been and will be involved in neurobehavioral testing for the effects of simulated stress factors relating to the Gulf War Syndrome on animal models via computer-aided qualitative and quantitative methods. The coordinator also supervises animal training protocols for upcoming pharmaceutical exposure studies.

Technical Objectives For The Reporting Period

- The major technical objectives for this quarter is as follows:
- Ranging using operant - trained animals and measuring subsequent stages of diminished capacity
- To compile, catalog and computerize the above mentioned data.
- To train pigeons and rats for problem solving protocols
- To start and complete a drug dose curve on Scopolamine (SCO) on rats
- To compile and analyze previously collected data from the D-Amphetamine, Diazepam, Haloperidol, Diphenylhydantoin studies completed.
- To obtain operant testing and training data for animals used in operant exposure testing.
- To organize, catalog and generate computer graphics, cumulatively from the above mentioned data.
- To maintain data for future reference in upcoming publications.
- To be responsible for the procurement and securing of all materials used in testing and training protocols
- Responsible for documenting and maintaining operant weights
- Responsible for writing and procurement of standard operating procedures for pigeon,



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- rabbit and rat training protocols
- Responsible for overseeing daily accurate and detailed entries and updates of all work unit laboratory books.
- Responsible for maintaining quality control assurance for all ongoing experiments and/or protocols with / between work unit P. I.'s and laboratory technicians.

Summary Of Work Performed During Current Reporting Period

- Trained and conditioned new and incoming rodent groups to protocol adaptation.
- Maintenance of all laboratory work unit notebooks
- Implemented several data methods to compile training data and weight maintenance on the all operants.
- Compiled stock animal drug history logs
- Compiling meeting memorandums for the OIC
- Trained all incoming personnel on standard procedures for lab techniques.
- Reviewed and edited S.O.P.'s on EEG, Porsolt, new pigeon and rat protocols.
- Analyzed and compiled data on D-Amphetamine, Diazepam, Haloperidol, and Diphenylhydantoin to present a poster presentation on Drug Study Results.

Goals/Objectives For Next Reporting Period

- To accurately oversee the training of rodents for various testing protocols, such as EEG, swimtest.
- To oversee rabbit testing, training and conditioning for upcoming neurobehavioral studies.
- To maintain a clean and orderly laboratory environment.
- To provide technical support in testing relative toxicity of various pharmaceuticals in pigeons and rats and rabbits.
- To procure and document pigeon maintenance pertaining to preparatory requirements for 'shaping' activities , pre-testing and testing protocols.
- Maintain quality assurance in all levels of data acquisition, processing and retrieval for all completed and ongoing lab experiments and protocols.
- To compile and organize the raw laboratory data into a centralized GLP standard retrieval system
- To start and complete drug dose curve/ study on Scopolamine and Fluoxetine.



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- To publish results of above mentioned drug studies.
- To begin testing operants on schedule - induced polydipsia studies on Wistar rats.

Collaborations/ Presentations :

- Ademujohn, C.Y.*, CDR John Rossi III, Glenn Ritchie, PhD., And LT A.F. Nordholm, MSC. USNR, Naval Medical Research Institute Detachment-Toxicology (NMRI/TD) & *Geo-Centers, Inc., 2612 Fifth St. Building 433, Wright-Patterson AFB. OH, 45433-7903. Conference on Issues and Applications in Toxicology and Risk Assessment March, 1998.
- Ritchie, GD, Ademujohn, CY, MacInturf, S, Hulme, ME, McCool, C, Nordholm, AF, Rossi III, J, MacMahon, K, Leahy, H, and Wolfe, RE. Repeated Exposure of Rats to JP-4 Vapor Induces Changes in Neurobehavioral Capacity and 5-HT/5-HIAA Levels.
- Effects of Human Anti-Epileptic Drugs And/Or GABA-B Antagonist CGP-35348 on TMPP-I induced EEG Paroxysms. Glenn D. Ritchie², CDR John Rossi III, MSC, USN¹, LT Alan F. Nordholm, MSC, USNR¹, Mary E. Hulme², Cynthia Y. Ademujohn² and Jeffrey Cassell¹, Naval Medical Research Institute Detachment-Toxicology¹ and Geo-Centers, Inc.,² Wright Patterson Air Force Base, Ohio. Abstract & Poster, NEHC Conference, San Diego, CA, Mar 1998.

BRIGGS

Description Of Work To Be Performed

Dr. Briggs is the General Manager and Senior Contractor Representative for Geo-Centers, Inc., for the NMRI contract at the Toxicology Detachment (NMRI/TD). He serves as a member of the Executive Steering Committee and performs toxicology research as an Associate Investigator. He is responsible for collaborating Geo-Centers, Inc. resources in support of the toxicology research in support of the NMRI/TD mission. Dr. Briggs functions in response to taskings from the Officer-In-Charge of the Detachment. These duties include assuring compliance with the Quality Management Plan.

Technical Objectives For The Reporting Period

- Correlate research activities conducted through Geo-Centers, Inc. resources.
- Assist in the efficient and effective use of resources to comply with project and mission



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obligations.

- Continue to establish capabilities to perform reproductive toxicology and dermal toxicology screening studies and validate the methods to be used.
- Complete the DBNP acute oral study, evaluate the data and help prepare the technical report
- Continue to integrate procedures and plans into the Quality Management Program. This includes the evaluation and implementation of a respiratory protection program, administrative procedures SOPs and audits of current and recently completed projects
- Prepare a poster for the regional Society of Toxicology Meeting and prepare abstracts for the Spring Conference and NEHC Meeting

Summary Of Work Performed During Current Reporting Period

- Collaborated in the preparation of the briefing booklet for use by the transition team presented at Brooks AFB in February
- Collaborated in the preparation of the briefing to NEHC relating to project progress and strategic planning
- Completed the DBNP acute oral study and collaborated in the data evaluation and preparation of the technical report which has been submitted for printing
- Presented the poster at the regional SOT meeting
- Continued to establish the Quality Management Program. More than 150 Standard Operating Procedures have been prepared and are in use
- The respiratory protection and respirator fit testing program has been completed

Publications, Abstracts, Technical Reports, Poster Presentations for the Quarter

- Abstracts for two posters to be presented at NEHC Conference were approved, cleared and prepared
- Abstracts for two posters to be presented at the WPAFB Spring Conference were prepared and cleared
- An Abstract for a poster to be presented at the Teratology Society was approved and cleared. This will be presented in June

Goals/Objectives For Next Reporting Period

- Assist with planning and technical support for toxicology studies conducted at NMRI/TD



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- Continue to collaborate with NMRI/TD in the transition activities
- Continue to finalize Standard Operating Procedures and get them approved by NMRI/TD management. Perform data audits and review technical reports as tasked by the O.I.C.
- Perform reproductive and dermal toxicological evaluations on chemicals of military interest. Get the new Fran cell operational and put the new sperm analyzed into use to comply with the QMP and prepare the Standard Operating Procedures
- Present posters (2) at the NEHC conference and the Spring Conference at WPAFB (2)
- Assist and support research on the acute oral, dermal and inhalation studies with DBNP. At least one additional acute oral study and a dermal penetration study will be performed. Methods development for inhalation studies will be developed.
- Establish the respiratory protection program and ensure the proper training and documentation of the procedures

CONNOLLY

Description Of Work To Be Performed

- Cataloging print and non-print materials for circulation
- Ordering and maintaining serials collection, including claiming missing issues
- Handling reference questions
- Providing interlibrary loan assistance
- Locating needed materials in other libraries
- Preparing book orders

Technical Objectives For The Reporting Period

- Catalog materials as received
- Catalog materials not yet cataloged
- Provide library service to the toxicology community at WPAFB
- Continue working on a manual card catalog
- Become familiar with Microsoft Access database program
- Set up card catalog in Access
- Conduct an audit of library holdings
- Update journal holdings list



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Summary Of Work Performed During Current Reporting Period

- Attended a 2 day Microsoft Access class
- 39 articles obtained from local libraries
- 6 books borrowed from local libraries for customers here
- 9 interlibrary loans obtained
- 3 interlibrary loans provided to another library, including 2 to DTIC
- 12 literature searches conducted using in-house CD-ROM database capabilities
- 5 searches successfully conducted on the Internet for customers, including downloading of documents as required
- 10 reference questions answered
- 5 telephone inquiries on journal locations in local area handled successfully
- 15 requests for articles located and filled from in house resources
- 5 articles obtained using the CARL UnCover system via the Internet
- 1 orientation/training session conducted
- 96 journal volumes consulted by customers
- 27 new books cataloged and prepared for circulation
- 58 card sets typed
- 28 journal issues obtained from other libraries to further complete our collection
- 10 duplicate journal issues sent to other libraries to further complete their collections

Goals/Objectives For Next Reporting Period

- Continue cataloging
- Continue preparing cards for the manual card catalog
- Continue training program
- Set up additional forms, reports, etc. for the Microsoft Access database now being used for the card catalog

HORTON, DIBLEY

Description Of Work To Be Performed

- Maintain Local Area Network (LAN)
- Maintain and upgrade individual Desktop and Laboratory Computers



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- Provide answers, support and expertise in correcting computer problems, including all peripherals attached to these systems
- Continue comprehensive program for maintaining system integration and reliability through back-up procedures, documentation, and redundant systems
- Continue to update information Databases IRIS, Medline, Toxline and Serline
- Organize Media, Manuals and Spare Parts
- Prepare ASDPs for procurement of new computer systems, software and peripherals
- Assist with creation and development of professional presentations by staff scientists
- Maintain in-house software and databases

Technical Objectives For The Reporting Period

- Continued planning for and implementation stages for addition of VA to our LAN
- Incorporate standardized ADP SOPs into ADP SOP manual as needed
- Continue to develop on-line user SOP via our Exchange system

Summary Of Work Performed During Current Reporting Period

- Promoted "Defiant" server to PDC.
- Completed hardware upgrades of "Trilib" and "Excalibur" servers.
- Developed and implemented a fully functional WEB server with corresponding WEB page for TOXDET.
- Installed and configured STARS-FL for Administrative Officer
- Developed inexpensive method of capturing graphical examples of particle data off our APS instrument.
- Built and deployed 8 upgraded PCs to scientific staff. In addition, built from scratch a high end system to automate the Respiratory Toxicology lab.
- Developed mobile solution for HAZMAT staff, thereby allowing them to do onsite inventory of chemicals and materials without having to move these items – a significant safety innovation.
- Updated Service Packs and Hot Fixes as needed on Network Servers
- Ordered various software and hardware upgrades
- Continued to reconfigure Windows Browser and WINS for WAN as needed
- Continued maintenance of Servers including backing up data files
- Continued support of hardware and software for TOXDET personnel



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- Continued to update information Databases
- Continued development of ADP SOP manual - this is an ongoing process that will assist NMRI/TD to meet GALP guidelines
- Mr. Horton and Mr. Dibley have completed their Microsoft Certified System Engineer courses and have taken all corresponding certification exams. They are now fully MCSE and MCP+Internet certified.

Goals/Objectives For Next Reporting Period

- Continue to modify the ADP SOP manual as necessary
- Continue to provide guidelines for installation of network resources for the Neurobehavior group at the VA lab as the plan for the network is developed.
- Mr. Horton should attend a comprehensive Network Security course
- Mr. Dibley should attend an in-depth Microsoft Exchange course

JUNG, NARAYANAN

Description Of Work To Be Performed

Trimethylolpropane (TMPP) Evaluation

- A paper was written on the results of this study and has been sent to a journal for review. HPLC analysis of the levels of amino acids in TMPP exposed rat brains was completed and the analysis of the data begun. The paper written by Dr. Lindsey was accepted by the journal it was submitted to.

DBNP

- A paper was sent out for publication approval. The DBNP technical report was updated and returned to Dr. Briggs. A purity check of the synthesized DBNP was requested and completed. HPLC analysis shows only a single elution peak.

Drug Distribution Study

- A study was proposed by Dr. Nordholm to measure the rate at which five drugs reach the brain using a microdialysis technique. A literature search was conducted to locate HPLC methods for quantitating these drugs from microdialysis samples. The protocol for the experiment has been written and submitted for approval by Dr. Nordholm to the Animal



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Care and Use Committee.

JP-8 Fuel Project

- The standardization of the detection and quantification of JP-8 fuel by Perkin-Elmer GC was begun.

General

- Attended the Society of Toxicology meeting in Seattle, WA, on Feb. 28- March 6.

Technical Objectives for the Reporting Period

TMPP

- Completed analysis of brain homogenate samples for amino acid content by HPLC
- Completed the corrections to the paper and resubmitted it

DBNP

- Verified the purity of the synthesized DBNP
- Completed the update of the technical report and returned it to Dr. Briggs

Drug distribution study

- Locate the HPLC methods for the detection of the five different drugs

JP-8 Fuel Project

- Standardize the GC method by which JP-8 fuel will be quantitated

**Summary of Work Performed During
Current Reporting Period**

TMPP

- The prepared paper has been accepted for publication by the journal. The quantification of 125 brain homogenate samples for their amino acid content has been completed and the analysis of the data is in progress.

DBNP

- This project was completed. We synthesized 2.4 kg of DBNP. The purity of the crystals was verified by melting point and HPLC elution pattern data. The paper was submitted to



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a journal which reviewed it and returned it for corrections. Captain Still also requested that the DBNP technical report be updated. It was written about a year ago. The corrections were completed and reviewed by Dr. Briggs. It was then given to the Captain to be sent out to NMRI.

General

- Attended the SOT meeting in Seattle, WA.

Drug distribution study

- A literature search was conducted to find hplc analysis methods for the detection of diazepam, ethanol, caffeine, nicotine, and amphetamine. Dr. Nordholm has proposed a study that would use microdialysis techniques to take samples directly from the brain of a rat that has been given one of the drugs listed and then use a hplc method to quantitate the drug administered.

JP-8 Fuel Project

- The Perkin-Elmer GC was brought back into operation. The method by which JP-8 fuel can be measured is in the process of being standardized. Once this has been completed, rats will be exposed to different levels of JP-8 fuel and the level in the blood will be quantitated. The clearance of the compound from the system will also be measured.

Publications, Abstracts, Technical Reports, Poster Presentations for the Quarter

- "Absorption, Distribution, Metabolism, and Excretion of 2,6-Di-Tertiary-Butyl-4-Nitrophenol in Fischer-344 Rats" TK Narayanan, A. E. Jung, S. L. Prues, R. L. Carpenter and K. R. Still
- "Tissue Distribution, Metabolism, and Clearance of Trimethylolpropanephosphate (TMPP) in Fischer-344 Rats" Tanjore K. Narayanan, Anne E. Jung, Glenn D. Ritchie, John F. Wyman, and John Rossi III.
- "Acute Effects of a Bicyclopophosphate Neuroconvulsant on Monoamine Neurotransmitter and metabolite Levels in the Rat Brain" James W. Lindsey, Anne E. Jung, Tanjore K. Narayanan, Glenn D. Ritchie.
- "Characterization of the Metabolism, Distribution and Toxicity of 2,6-Di-Tertiary-Butyl-4-Nitrophenol for the Purposes of Health Hazard Assessment" R.L. Carpenter, T.K. Narayanan, A. E. Jung, S. Preus, and K.R. Still - The DBNP Technical Report



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Goals/Objectives For Next Reporting Period

- Increase the productivity in the lab
- Finish the data analysis of the brain amino acid content analysis
- Begin work on the drug distribution study once it has been approved
- Begin exposing rats and running samples of the JP-8 project.

KIMMEL, REBOULET, WHITEHEAD

Description Of Work To Be Performed

- This group is responsible for the design, construction and operation of systems to conduct inhalation toxicity studies. We also are perform a variety of assays of pulmonary toxicity. Our present research focus is the development and exploitation of small animal models of Acute Lung Injury (ALI) and it's more severe form Acute Respiratory Distress Syndrome (ARDS) as induced by inhalation of combustion atmospheres and surrogate combustion atmospheres. We have developed inhalation exposure systems ranging from highly instrumented, single animal, nose-only exposure chambers suitable for inhalation dosimetry studies to a large (690 L) whole-body inhalation exposure chamber. We also have and continue to develop methods to measure small animal pulmonary function and perform histopathological analysis of pulmonary tissue samples.

Technical Objectives For The Reporting Period

- Develop methods to analyze ventilation and pulmonary mechanics in six animals simultaneously and in real time during an exposure.
- Develop an exposure system to expose single animals (nose-only) with a non-rebreathing valve in line
- Develop and perform battery of small animal pulmonary function tests using a pressure type plethysmograph,
- Develop protocol for experiments to verify a mathematical model of hyperventilation induced by CO₂.
- Develop protocol for experiments to verify mathematical model of HbCO production by inhalation of CO.



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Summary Of Work Performed During Current Reporting Period

- All objectives listed above for this quarter were accomplished.
- Began the patent application process for a unique combination head-out volume displacement plethysmograph exposure tube. (
- To date methods have been developed to measure over 60 different parameters associated with pulmonary function and physiology in small animals.
- A physiologically based model of carboxyhemoglobin (COHb) formation by inhalation of carbon monoxide was developed and verified against published data and experimental data collected in the laboratory. The model was proven highly accurate, predicting COHb formation with an average accuracy of 99.3 %. These data were presented at the 37th Annual meeting of the Society of Toxicology and three separate research organizations expressed their interest in cooperative research. Both government technical report and a manuscript for open literature publication have been started.

Publications, Abstracts, Technical Reports, Poster Presentations for the Quarter

- Kimmel EC, Smith EA, Carpenter RL, Reboulet JE, and Black BH. Comparison of the potential risk for inhalation toxicity between laboratory and field generated atmospheres of a dry powder fire suppressant (Submitted - *Inh. Tox* - *accepted - in revision*).
- Kimmel EC, Smith EA, Reboulet JE and Carpenter RL. Application of physiological interactions with dry powder fire suppressant atmospheres for health risk assessment: Implications for pulmonary deposition and toxicity. (Submitted - *J Appl Physiol.*)
- Kimmel EC, Reboulet JE and Carpenter RL. Inhalation exposure chamber leak rate determination with thermal correction. (*Am Ind. Hygiene Assoc. J.* - in press).
- Reboulet, JE, Kimmel EC and Carpenter RL. A basic computer program for rapid standard bag calculations. (*Tox. Methods* - resubmitted*). * New Editor for the Journal recanted acknowledgment of previous editors receipt of the manuscript.

Publications in draft

- Kimmel, Reboulet, Narayanan, Carpenter. The Effects of co-exposure with aerosol particles on acrolein inhalation toxicity. *Toxicol Appl Pharmacol.*
- Kimmel. A head out plethysmograph for measurement of intrapleural pressure and determination of pulmonary mechanics in small animals during inhalation exposure



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without surgical intervention. J Appl Physiol.

Technical Reports in press

- Kimmel EC, Smith EA, Reboulet JE, Still KR, and Carpenter RL. 1997. The physicochemical properties of fire suppressant atmospheres in toxicity vs. fire extinguishment tests: Implications for aerosol deposition and toxicity. 43pp.
- Kimmel EC, and Still KR. 1997. The acute respiratory distress syndrome (ARDS) and militarily relevant inhalation injury: A brief review., 88pp.

Abstracts and presentations given

- Presented three posters at 37th Annual Society of Toxicology Meeting. Seattle WA March 1-6., 1998.

Goals/Objectives For Next Reporting Period

- Start and finish implementation of final battery of small animal Pfts for future research. This includes the complete battery of forced expiratory maneuvers and N2 washout techniques.
- Conduct an experiment needed to verify mathematical model (logistic model using - physiologic constants) of CO₂ induced hyperventilation in animals. This model will be used for risk assessment and prediction of increased dosimetry to other toxins in complex atmospheres which contain CO₂.
- Complete first drafts of: manuscript on the development of a new plethysmographic technique - to J of Applied Physiology; technical reports - on measurement of small pulmonary function in NMRI/TD system - will do a series of reports describing fundamentally different techniques - at present 2 reports have been started addressing barometric methods and a second flow plethysmographic methods for determination of ventilation and dynamic mechanics of breathing. finalize manuscript describing a small scale in expensive solid material combustion furnace for laboratory combustion toxicology studies that was developed by our group - submission to J Fire Sciences.



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MCINTURF

Description Of Work To Be Performed

- Mr. McInturf serves as the research design and analysis assistant for the Neurobehavioral Group at the NMRI/TD, and as a primary research technician for all currently funded neurobehavioral research.
- Mr. McInturf's purpose is to assist in the design, data collection, and analysis for many of the neurobehavioral studies. He is also involved with the fabrication, setup, and operation of hardware/software and other instrumentation for data collection.

Technical Objectives For The Reporting Period

- To continue the collection and analysis of data from the rabbit eyeblink conditioning study. Currently, this study evaluates the effects of neurotoxins (TMPP & PTZ) on conditioned response and/or learning and memory. The study also focuses on identifying possible counteractive or preventive capacities that well known human anticonvulsant agents (Diazepam) may have on neurotoxins.
- To collect and analyze data for a study of repeated exposure to TMPP and /or Diazepam on acoustic startle, prepulse inhibition and acoustic startle habituation in rats.
- Begin design of Morris-like water maze experiment to be used in up-coming neurobehavioral study (as part of the NTAB) involving neurotoxins and possible counteracting drugs.
- Offer assistance in histopathology for rats from the Inter Cranial Self Stimulation Study (ICSS) currently being conducted at the Veterans Administration.
- Continue familiarization of program languages used with current hardware (particularly MED-PC notation) in order to write programs and macros for operant and other studies.
- Continue to offer research design and data analysis assistance with the use of statistical software packages.
- To complete relocation of the NMRI/TD Neurobehavioral Laboratory to the Research Facility of the Veterans' Administration Hospital, Dayton, OH.



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Summary Of Work Performed During Current Reporting Period

- Collection and analysis of data for initial sample of the rabbit eyeblink conditioning study involving TMPP and Diazepam.
- Attended Society of Toxicology Conference for presentation of poster session. Postertitle: Acute and Long-Term Consequences From Repeated Exposure to JP-4 Jet Fuel.
- Completed fabrication of Morris-like water maze pool with frame to present visual cues. All hardware and software is fully functional.
- Setup and operation of all hardware and instruments for acoustic startle and conditioned eyeblink response.
- Completed literature surveys on eyeblink, jet-fuel, acoustic startle, and water maze as relevant to NMRI/TD research.
- Continued familiarization of programming languages and a variety of software applications that run on many of the data collecting instruments.

Publications, Abstracts, Technical Reports, Poster Presentations for the Quarter

- Nordholm, A., Ritchie, G., MacMahon, K., McInturf, S., Hulme, M.B and Rossi III, J. Acute and long-term consequences from repeated exposure of rats to JP-4 jet fuel and/or stress. *Abstract*, Society of Toxicology, Annual Meeting, Seattle, WA, 1998.

Goals/Objectives For Next Reporting Period

- To complete all current studies involving the effects of convulsants and anticonvulsants in rabbits and perform a critical analysis. To assist in writing the paper on eyeblink conditioning and TMPP.
- Implantation of canula in rabbits to further study effects of neurotoxins and anticonvulsants when administered directly in brain.
- To complete all aspects of water maze construction and assist in experimental design of relevant NMRI/TD study.
- To further assist in slide preparation and analysis of ICSS rat tissue slices.
- To attend Conference on Issues and Applications in Toxicology and Risk Assessment being held at the Hope Hotel at Wright Patterson Air Force Base. Poster presentation title: The Navy Neurobehavioral Assessment Battery (NTAB): The Effects of TMPP, PTZ, and Diazepam on the Conditioned Eyeblink Response, A Simple Form of Learning.



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HULME

Description Of Work To Be Performed

- Mrs. Hulme serves as the research design and analysis assistant for the Neurobehavioral Group at the NMRI/TD, and as a primary research technician for all currently funded neurobehavioral research.
- Mrs. Hulme's purpose is to assist in the design, data collection, and analysis for many of the neurobehavioral studies. She is also involved with the fabrication, setup, and operation of hardware/software and other instrumentation for data collection.

Technical Objectives For The Reporting Period

- To continue the collection and analysis of data from the roto-wheel and grip strength study. Currently these studies evaluate the effects of Diazepam, and Ethanol on motor system integrity and endurance.
- To take over the pigeon operant conditioning study (Anis Miladi is currently updating me on the process).
- To collect and analyze the data from the anit-convulsant study. Five anit-convulsants will be evaluated on TMPP induced rats.
- Present poster at the Conference on Issues and Applications in Toxicology and Risk Assessment titled, "Validation of NTAB Roto-wheel and Forelimb Grip Strength Test Using Diazepam or Ethanol to Measure Motor System Integrity and Endurance".

Summary Of Work Performed During Current Reporting Period

- Collection and analysis of data for roto-wheel and grip strength tests using Diazepam, and Ethanol.
- Completed literature surveys on jet-fuel, grip strength, eye-blink, and roto-wheel as relevant to NMRI/TD research.
- Assisted in the completion of the paper, "Effects of GABA-B antagonist CGP-35348 and human anti-epileptic drugs on spontaneous and chemically-induced absence-like SWD's in Fisher-344 rats. *Epilepsia*, In preparation.



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Publications, Abstracts, Technical Reports, Poster Presentations for the Quarter

- Ritchie, G.D., **Hulme, M.E.**, Nordholm, A.F., and Rossi III, J. Effects of GABA-B antagonist CGP-35348 and human anti-epileptic drugs on spontaneous and chemically-induced absence-like SWD's in Fisher-344 rats. *Epilepsia*, In preparation.
- Ritchie, G.D., McInturf, S., **Hulme, M.E.**, McCool, C. Repeated exposure of rats to JP-4 jet fuel vapor induces changes in neurobehavioral capacity and 5-HT/5-HIAA levels. *Toxicology and Environmental Health*, In Preparation

Goals/Objectives For Next Reporting Period

- To complete all current studies involving the effects of Diazepam, and Ethanol in rats on the roto-wheel and grip strength test.
- To collect and analyze data from the pigeon operant study.
- To attend Conference on Issues and Applications in Toxicology and Risk Assessment being held at the Hope Hotel at Wright Patterson Air Force Base.

SMITH, PRUES

Description Of Work To Be Performed

Assist in the research performed at the Navy Medical Research Institute/Toxicology Detachment (NMRI/TD) which entails the following tasks:

- Conduct, design, and oversee studies addressing Navy related research issues.
- Provide necessary paperwork for the accounting of project funding
- Maintain GLP compliant data books on those studies with which there is personal involvement.
- Submit articles, revisions for publication of project findings to peer-reviewed journals.
- Submission of timely progress reports.

Technical Objectives For The Reporting Period

- New Methods in Physiological Based Pharmacokinetic Modeling -- the objective of this research is to develop new methods of obtaining data for PBPK modeling while reducing the number of animals needed to conduct certain traditional toxicology studies (ADME studies).
- Cardiac Sensitization -- The objective of this research is to determine the mechanism of



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action of TMPP. TMPP is a by-product from the breakdown of synthetic lubricants that produces a neurotoxic response.

- Contract Representative on Safety Policy Committee (Prues) -- The objective of this duty is to act as liaison between the navy and Geo-Centers personnel in addressing the concerns of workplace related safety issues.
- Respiratory Protection Program Manager (Prues) -- Assist in setup, operation and maintenance of the NMRI/TD Respiratory Protection Program.
- Technical support for the Air Force Aircraft Composite Material (ACM) project is to be provided.

Summary of Work Performed During Current Reporting Period

- PBPK Modeling (Homeostasis)--Present an abstract and poster at the annual meeting of the Society of Toxicology in Seattle, WA which contains the results of our findings both graphic and statistical describing the homeostatic effects following a serial blood collection and subsequent transfusion in the rat.
- Cardiac Sensitization--Present an abstract and poster at the annual meeting of the Society of Toxicology in Seattle, WA which contains the results of our findings both graphic and statistical describing the changes in 15 hemodynamic/mechanical parameters of dogs pretreated with atropine or atenolol prior to the onset of ventricular arrhythmia by ouabain.
- TMPP Project--Glial Fibrillary Acidic Protein (GFAP)--Wrote preproposal for developing GFAP microassay (The Development of Neuro Proteins Microassays).
- Intracranial Selfstimulation (CSS)--Performed dose curve studies on rats with EEG electrode implants. Performed EEG electrode implantation surgeries on another group of test rats.
- Provided assistance/training for projects requiring drug preparation, surgical implantation of devices via stereotaxic methodology, etc., as needed.

Abstracts:

- "The Evaluation of Blood Transfusions During Serial Blood Sampling." S.L. Prues, E.A. Smith, and A.F. Walsh. Submitted to The Society of Toxicology for its meeting in March, 1998.
- "Predicting Cardiac Sensitization Using Logistic Regression on Cardiovascular



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Parameters." E.A. Smith, T. Nakayama, R. Hamlin, J. Power, E. Henderick and K.R. Still.

- "Comparision of Toxicity after Exposure to Two Formulations of SFE Formulation A." Eldon A. Smith, E. C. Kimmel, J.E. Reboulet, S. L. Prues, and R.L. Carpenter, Fundamental and Applied Toxicology (in review).

Goals/Objectives For Next Reporting Period

- Continue refining a GFAP immunoassay (to investigate subtle changes in the central nervous system) for the TMPP project.
- Continue the dose curve response for the ICSS study both on previous test group as well as the new test group of animals.
- Continue providing general assistance and training where necessary for the TMPP project.
- Analyse the tissue samples collected for the Air Force ACM project and submit findings to the project leader.
- Continue representation of Geo-Centers concerns regarding health and safety.
- Conduct/support additional pulmonary physiology studies involving cross comparision of traditionally collected blood samples to serially collected blood samples replaced with transfused blood for the purpose of blood gas analysis.
- Continue writing new protocols in the area of cardiac toxicology, pulmonary toxicology and PBPK modeing.



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V. NMRI, Natick, MA

A. HUMAN PERFORMANCE AND U.S. NAVY CLOTHING DEVELOPMENT

Description Of Work To Be Performed

Program I: Flame Protective Clothing Research (Pawar)

- The primary research goal for the current reporting period was to complete calibration routines for the automation of Thermal Protection Performance (TPP) equipment, demonstrate the Burn Injury Sensor Calibration System (BISC) for its usefulness in the selection of a sensor to suit a given fire hazard and validate the Wissler math model for additional data on rough and calm seas. However, due to the high priority given to completion of math modeling project, the TPP sensor calibration and development of the BISC system could not proceed as planned. Therefore, major part of this quarter was spent on Math Modeling Project which is completed to a stage of writing final report.

Program II: U.S. Navy Certification Program for Commercial Environmental/Occupational (CEO) Protective Clothing/Equipment (Macek)

- GEO-CENTERS, INC. will establish a program to be used by NCTRF to certify commercial off-the-shelf protective clothing/equipment as meeting or exceeding Navy functional performance requirements. This program will make possible the direct purchase of certified commercial protective clothing/equipment for shipboard use by Navy personnel.

Program III: Database Search (Macek, Collins)

- Conduct an extensive search of databases to determine commercial, DoD and non-DoD government organizations with which the U.S. Navy Clothing & Textile Facility (NCTRF) may enter into cooperative R&D agreements for the research, development, and testing of dress and protective clothing systems.
- Determine cooperative opportunities for dual-use technology, technology transition, and technology exploitation.
- Prepare a technical briefing to highlight the technical expertise and unique facilities and equipment available at NCTRF. This briefing could be used by agencies seeking cooperative research, development, and acquisition agreements.



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- Prepare documentation to convey the technical expertise and unique facilities and equipment available at NCTRF. This documentation could be used by NCTRF employees to serve as a marketing tool and as a handout after the technical briefing is presented.

Program IV: Great Lakes Prototype Footwear Test (Buller, Collins)

- Provide technical support in the development of the Enhanced Chukka Shoe surveys for recruits, leaders, shipboard personnel, and Naval Academy personnel.
- Provide technical support for experimental design of study.
- Provide software support in the production of an on-line data entry program and database management.
- Provide data collection support at the Recruit Training Center (RTC).
- Analyze data by test group and write final report of findings of the study.

Program V: Technical Reports (Macek, Schneider)

- Analyze and organize information provided on projects conducted in the Navy Clothing and Textile Research Facility (NCTRF).
- Develop technical reports and articles for publication in peer-reviewed journals.

Program VI: Utility Uniform Study (Buller, Meyers, Collins)

Commercial-Off-the-Shelf Utility Uniform Study

- Design questionnaire to assess fit, performance, durability and preference for two commercial off-the-shelf utility uniforms. The two styles are: 1) Redcap, and 2) Levi 505.
- Produce issue data sheets and explanatory package for subjects.
- Reproduce questionnaires and issue packages.
- Analyze data.
- Write final report.



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Main Utility Uniform Study

- Adapt questionnaire, data sheets, and explanatory package from COTS study for three uniform configurations: 1) 14 oz. Denim with 4 oz. Chambray Shirt, 2) 11 oz. Denim with 4 oz. Chambray Shirt, and 3) "Dickie" Style.
- Reproduce questionnaires and issue packages for all test participants.
- Provide support of two issuers to 16 test sites on the East and West Coasts, with approximately 75 test participants at each site.
- Provide support of two Human Factors Engineers to visit each test site twice during the duration of the study to issue and collect surveys and to collect subject comments. Visits will occur three and six months after issue of utility uniforms.
- Enter, clean, verify, and tabulate collected data.
- Analyze data based upon experimental design and study hypothesis, using standard univariate and multivariate statistical techniques.
- Write report detailing whole study providing a clear explanation of the analytical techniques adopted and the conclusions reached from analysis of the data.

Program VII: Oxford Shoe Study (Buller, Stern-Wolfson)

- Design questionnaire to assess fit, performance, durability and preference for three Oxford shoe sole configurations.
- Design issue data sheets.
- Enter, clean, verify, and tabulate collected data.
- Analyze data based upon experimental design and study hypothesis, using standard univariate and multivariate statistical techniques.
- Write report detailing whole study providing a clear explanation of the analytical techniques adopted and the conclusions reached from analysis of the data.

Technical Objectives For The Reporting Period

Program I: Flame Protective Clothing Research

- None.



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Program II: U.S. Navy Certification Program for Commercial Environmental/Occupational (CEO) Protective Clothing/Equipment

- Complete editorial changes to the certification program report and submit to NCTRF for review and comment.

Program III: Database Search

- Complete final revisions to prototype brochure, folder cover, and information sheets.

Program IV: Great Lakes Prototype Footwear Test

- None.

Program V: Technical Reports

- To conduct work on two reports for the Navy Clothing and Textile Research Facility.

Program VI: Utility Uniform Study

COTS Study

- Analyze all data.
- Produce integrated final report for both COTS study and main study.

Main Utility Uniform Study

- Report analysis of data in full integrated technical report.

Program VII: Oxford Shoe Study

- Enter, verify, and clean all phase two and most of phase three data.



**Summary Of Work Performed During Current
Reporting Period**

Program I: Flame Protective Clothing Research

- None.

Program II: U.S. Navy Certification Program for Commercial Environmental/Occupational (CEO) Protective Clothing/Equipment

- None.

Program III: Database Search

- Revised draft brochure, folder cover, and information sheets in accordance with suggested changes obtained from NCTRF and produced a final product.
- Delivered electronic files for use to produce high quality brochures, folder covers, and information sheets.

Program IV: Great Lakes Protective Footwear Test

- None.

Program V: Technical Reports

- Work was continued on the report which dealt with the development of a laboratory method of rough sea simulation for the immersion testing of protective clothing using a Wave Maker that was installed in the NCTRF environmental tank. A draft of the technical report, titled *Comparison of Field and Laboratory Tests of Body Cooling Rates Using a Wave Maker to Simulate Rough Seas*, has undergone full editorial review.
- Work continued on the second report entitled, *Pumped Fluid System for Body Heat Transfer*. Some references, to be supplied by the Project Officer are needed to complete the article.



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Program VI: Utility Uniform Study

COTS Study

- All data from the COTS study were analyzed using standard statistical techniques.
- Report on findings was integrated into final technical report.

Main Utility Uniform Study

- All data were combined and analyzed using standard statistical techniques.
- Final technical report of study was produced.

Program VII: Oxford Shoe Study

- All phase two data and all phase three data which had been returned were entered, verified, and cleaned.

Goals/Objectives For Next Reporting Period

Program I: Flame Protective Clothing Research

- None.

Program II: U.S. Navy Certification Program for Commercial Environmental/Occupational (CEO) Protective Clothing/Equipment

- Upon receiving comments from NCTRF on the certification program report, GEO-CENTERS, INC. will incorporate the changes into the report.

Program III: Database Search

- None.

Program IV: Great Lakes Protective Footwear Test

- None



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Program V: Technical Reports

- Complete work on the two projects described above and submit the draft technical reports to the Project Officers for review.
- Begin work on an article dealing with the NCTRF studies of laboratory rough sea simulation methods for publication in a peer-reviewed technical journal.

Program VI: Utility Uniform Study

COTS Study

- None. Study and final report have been completed.

Main Utility Uniform Study

- None. Study and final report have been completed.

Program VII: Oxford Shoe Study

- Analyze combined data set.
- Provide summary report of combined data.
- Write final technical report.

