

REPOSITORY DOE/PASO  
COLLECTION DOE/NV  
BOX No. 1236  
BNL FOLDER #3  
FOLDER FY 1979  
MEDICAL PROGRAM

*fill sub 12/28*

BROOKHAVEN NATIONAL LABORATORY  
ASSOCIATED UNIVERSITIES, INC.

402062 Upton, New York 11973  
(516) 345-

5 December 1978

Dear *Harry*

I must apologize for the use of this form letter to keep our survey group informed of new developments. Due to the short lead time, however, I feel this will be the most expeditious means of communication.

" The most exciting news is that we have just completed the contract negotiations for our own vessel--the Egabrad, soon to be renamed the Likteneur II. The accommodations on this ship appear to be much improved over our previous surveys. In addition, we hope to be able to perform the entire examination aboard ship, rather than half on shore and half aboard ship. This should facilitate the flow of patients. Additionally we are looking for two more interpreters. We have obtained detailed street maps of Majuro and Ebeye and a grid map will be used to preplan the street survey--hopefully reducing some of the previous confusion.

I plan to arrive in Honolulu on 10 January 1979 and will be staying at the airport Ramada Inn until we leave for Majuro on Saturday, 13 January, on Air Micronesia (Continental), Flight # *675 of 0730*

Our common contact point in Honolulu will be a Mr. Jimmy Board, Holmes and ~~Harver~~ travel section at Hickam Field, phone (808) 422-9243. If he is unavailable, the DOE/PASO coordinator, a Mr. Harry Brown, at (808) 422-9211 should be able to help. My schedule includes performing complete examinations on three Marshallese at Tripler Army Hospital, beginning at 0800 on 11 January, then, either that afternoon or on Friday, Dr. Cronkite and I plan to visit the University of Hawaii to discuss possible future affiliations.

I hope that we can all get together some time before we leave for Majuro--hopefully Friday night for dinner. I'll try to coordinate the affair, if you'll leave a message for me at the Ramada Inn; otherwise we can all meet at the airport. I am enclosing a copy of the 1979 Protocol. I hope it will answer most of your questions. Please feel free to call if any problems arise--hope to see you Friday night, 12 January 1979, in Honolulu. Mele kalakamaka!

Aloha,

*Shugh*

*Harry FYD.  
for the OP plan  
- note ship leave Kwaj  
for Udonik about 1800 1/25*

BEST COPY AVAILABLE

## PROTOCOL FOR THE FIRST 1979 MEDICAL SURVEY IN THE MARSHALL ISLANDS

The 1979 Medical Survey will take place January 15 - February 14. Attached is the expected itinerary (Enclosure I) and a list of participating personnel (Enclosure II).

### TRAVEL

The MAC plane (C-141, Army) will be used between Honolulu and Kwajalein and Air Micronesia (Continental) between Kwajalein and Majuro. We have chartered a 115' oceanographic vessel (Enclosure III) that should be a vast improvement over previous ships. We will attempt to do all of our screening work aboard.

### SUPPORT

Agencies, besides BNL, include DOE-Honolulu, US Army and Global Assoc., Kwajalein and Trust Territory, Majuro and Ebeye. Kwajalein is the main support base (with Mr. Ted Murawski as liaison for Global). The survey is carried out in conjunction with the Department of Health Services of the Trust Territory, headquarters in Saipan, Mariana Islands and the District Headquarters at the hospital at Majuro (Dr. Ezra Riklon).

### BACKGROUND AND OBJECTIVES

Before outlining the examination procedures a brief summary of the background material and objectives are presented below. Details of medical findings can be found in published reports. Also a copy of Form 189 is enclosed outlining the program.

#### Early Effects

The fallout accident in 1954 resulted in exposure of the Marshallese on Rongelap, Ailingnae and Utirik atolls to fallout radiation before they were evacuated by about 2 days. There were also 28 military personnel exposed on Rongelap atoll receiving about the same exposure as the Ailingnae group, and 23 Japanese fishermen exposed on the Lucky Dragon. Whole-body exposure from penetrating gamma radiation gave an estimated 175 rads to the 64 people living on Rongelap, 69 rads to the 18 people on Ailingnae (these were Rongelap people on a fishing trip to this nearby atoll during the fallout) and 14 rads to 158 people living on Utirik atoll. In addition, there was internal absorption of radionuclides from inhalation and ingestion of contaminated food and water and fallout deposited on the body caused significant skin exposure in the Rongelap and Ailingnae groups. The radiation to the skin was spotty and superficial and the dose, though indeterminate, was probably greater than 1000 rads. Except for radioisotopes of Iodine, the radionuclides absorbed from the fallout are not believed to have resulted in significant internal exposure. The magnitude of the dose to the thyroid glands from radioactive iodines was not appreciated until later when thyroid nodules unexpectedly developed and re-evaluation of the dose showed that the early estimates had to be revised upward, particularly in the children.

The Rongelap and Ailingnae people were the only Marshallese to develop acute effects of exposure (transient nausea and vomiting, hemopoietic depression and widespread beta skin burns and epilation, but with no detectible acute

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effects related to internal absorption of radionuclides). The low dose Utirik group showed only statistically a slight depression in platelets without clinical signs of exposure. There were no deaths associated with the acute exposure of the Marshallese and, except for the skin burns, no treatment was necessary. Blood levels returned to near normal by one year and beta burns healed and hair regrew within a year with only a mild scarring and residua in about 15 people.

During the ensuing 9-10 years the people appeared as healthy as the population of unexposed Rongelap people used as a control group (about 200) with no further evidence of radiation effects, except possibly an increase in miscarriages and stillbirths in exposed women. At 10 years chromosome studies showed residual evidence of exposure in some people in the form of slightly elevated numbers of aberrations.

#### Late Effects

The only diseases that have been positively identified in man as late effects of radiation exposure are benign and malignant tumors. Of these, leukemias (except CLL) and thyroid tumors have been the principal ones. ~~More recently, based largely on Japanese data and cases of spondylitis treated with X-irradiation, other malignancies associated with radiation exposure have begun to appear. These are cancers of the breast, lungs, and stomach, and other gastrointestinal tumors.~~ In the case of the Marshallese, numerous thyroid tumors have developed (see below) and possibly associated with radiation exposure has been one fatal case of acute leukemia and ~~one death from cancer of the stomach.~~ Animal studies have shown some nonspecific late effects such as accelerated aging and premature deaths from degenerative diseases. Such effects have not been detected in exposed human beings. In the Marshallese numerous studies for premature aging effects, similar to those carried out in the Japanese, have not revealed evidence for such effects. There has been no indication thus far of any increase in degenerative diseases among the exposed Marshallese or Japanese. Similarly, though genetic defects in offspring of irradiated animals have been demonstrated, such defects have not been positively identified in studies of the first generation of the Japanese. In view of the negative nature of the Japanese findings no comprehensive genetic studies of the Marshallese children have been carried out. No apparent effects have been noted in the newborn, most of whom have been examined. Dr. J. Neel (Univ. of Michigan) has examined, with negative results, a limited number of blood samples of children of exposed Marshallese for variants of serum proteins and erythrocyte enzymes that might indicate genetic mutations. These studies will be extended. It should be pointed out that the Marshallese worry a great deal about possible genetic effects in their children and have not readily accepted our explanation for the lack of inclusion of children in such studies. With the expanded medical program, begun last year, examination of children on Rongelap and Utirik may help satisfy their desires in this regard. However, lack of inclusion of the children for the hospitalization benefits of PL 5-52 (Fallout Survivor's Act) continues to be resented by the people.

Between 5-10 years after exposure growth retardation in several of the children exposed at less than 5 years of age (particularly notable in two boys exposed at 1 year of age) was the first evidence of thyroid injury. Thyroid nodularity first began to appear at 9 years after exposure in the Rongelap people and shortly thereafter in the Ailingnae group and more recently in the Utirik population. Enclosure III shows the present status of the thyroid findings, including surgery. The institution of hormone treatment (Synthroid) in all exposed Rongelap people, which began in 1965, has been essential in

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maintaining a euthyroid state in the operated cases and has been important in correcting growth retardation in the children. However, the ~~development of thyroid nodularities causes us to question the effect of the treatment in preventing the development of such nodularities.~~ Several years ago the Ailingnae group were also included in the treatment program. Serious consideration must now be given to including the exposed Utirik group also. A few in this group with thyroid nodules have been placed on Synthroid therapy.

The development of three cases of thyroid cancer in the Utirik group was unexpected. One wonders if something is unusual in the Utirik situation since the incidence is higher than expected for cancer based on risk/rad for Rongelap and Japanese data without increase in benign nodules which are usually increased to a greater extent from radiation. This points to the fact that we badly need more data on the general incidence of thyroid tumors in the Marshallese people. Therefore on this survey a continuation of the study of such tumors in other exposed Rongelap and Utirik people is planned. Followup will include observations with a trial period of Synthroid suppressive treatment, followed by surgery if indicated. During the past several years, with the development of more sensitive tests of thyroid function (RAI for T<sub>4</sub>, TSH, T<sub>3</sub>, TSH and TRH stimulation tests) extensive examinations of the exposed Rongelap people have indicated that some of the exposed Rongelap people who have shown no evidence of thyroid nodules and who appear clinically euthyroid have reduced thyroid function. Further such tests will be carried out on this survey. This finding may portend trouble ahead in some of this group. These people with biochemical hypothyroidism will be included for compensation.

#### Examinations

The forthcoming survey will include examinations of all people living on Rongelap and Utirik, including children and exposed and control Rongelap and Utirik people living on Majuro and Ebeye. In addition a thyroid survey of unexposed Rongelap and Utirik people living at Majuro and Ebeye will be included.

#### Potential 1979 Exams (by Age + Sex)

	Males			Females		
	14-25	>25-40	>40	14-25	>25-40	>40
Rong. exp, children of Rong. exp	24	16	15	24	22	12
Utirik exp, children of Utirik exp.	26	32	15	16	35	31
Rong. unexp, children of Rong. unexp.	41	36	31	38	43	38
Utirik unexp, children of Uritik unexp.	30	10	13	28	9	10
Totals:	121	94	74	106	109	91
Grand Total:	595					

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## Procedures:

Medical Histories and Physical examinations will be recorded on the special sheets (Enclosure IV) which will be furnished later. Available will be a copy of the previous years' exams and a brief summary of past medical findings. The examining doctors should review the medical history and, with the T.T. medics, expand on it if necessary. The summary of significant positive findings should be completed on the last page of the exam forms. The examining physician should initial the routing sheet. The examining physician should personally confer with each subject, giving them briefly the results of the exams and proposed treatment. He should initial the checkoff list for this on the routing sheet. In addition to routine physical exams, more detailed or special exams of certain organ systems will be emphasized:

### Cancer Detection

This is the most important aspect of the exams with particular emphasis placed on screening for possible malignancies that are recognized as being associated with radiation exposure. Since cancer statistics are sparse for the Marshall Islands, documentation of these findings is of particular importance.

### Thyroid Examinations

Routine inspection and palpation of the thyroid and neck with drawings of the thyroid are indicated. Note clinical evidence of thyroid function. A sheet with a thyroid drawing is attached to the physical exam forms. Plasma will be collected for TSH on designated Rongelap and Utirik people. As referred to above, additional thyroid exams will be carried out on unexposed Rongelap and Utirik people living at Majuro and Ebeye. Those with thyroid nodules will be evaluated for surgery and if needed referred to the U.S. for surgery. These control studies are needed to establish a better basis for the incidence of thyroid cancer in the Marshallese people.

### Leukemia

In addition to hematological evaluation, careful exam of the lymphatic system including liver and spleen will be done.

### Lungs

An x-ray machine will be available for routine chest plates. Such x-rays will be evaluated on all patients with abnormal findings on physical exam.

### Breasts

Referral is possible for biopsy or possible surgery of any cases with suspicious findings in the breast. Honolulu is the nearest place where mammography can be done.

### Stomach and GI Tract

Rectal exam should be done on all subjects  $\geq$  40 years of age with test of feces on glove for occult blood ("Hematest"). Proctoscopic exam can be done if indicated. Flat plates of the abdomen may be done.

### Genitourinary

Pelvic exams on all mature females (greater than 14) with two Pap smears to be fixed (Cell-Guard for later staining and reading). If indicated biopsy of the cervix and uterine washings will be performed as indicated. Gram-stained smears for GC may be done. Serology for syphilis will be done on those not previously tested and repeats on certain people with positive titers to determine if the disease is quiescent or progressive. In older people (greater than about 30) previous yaws infections may cause false positive syphilis reactions. Urine exam, routine (lab-stix) and microscopic if indicated will be done. (See Enclosure V).

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### Skin

Careful exam with color photography of any suspicious lesions particularly in the area of previous beta burns. Biopsies if indicated.

### Other Special Studies

Diabetes - There is a high incidence of middle-age onset type hypoglycemia and/or diabetes and it is the subject of a special study under the direction of Dr. James Field. Computerized data will be available soon. Evaluation of the vascular and neurological status of diabetic cases should be attempted. Blood sugars (Pre- and Postglucola) have already been studied in most of the Rongelap and Utirik people, but a few additional tests may be necessary.

Intestinal Parasite Survey and Treatment - During the past 18 months an intestinal parasite survey was completed at Rongelap Island by Drs. Krotoski and Knudsen. Studies include stool exams and serological studies (Immunofluorescence). The Rongelap people received mebendazole anthelmintic therapy (generosity of Ortho Pharmaceuticals) every three months. A similar study is currently underway on Utirik using pyrantal pamoate.

Studies of Polymorphism and rare protein variance in blood of some children of exposed and unexposed parents as an index of genetic effects of exposure will be repeated by Dr. J. Neel at the University of Michigan. He has expanded his battery of tests which he is carrying out on the descendents of exposed Japanese.

Laboratory & X-Ray Exams are outlined in Enclosure V.

Clinical Reviews - The findings on physical examinations will be reviewed in conjunction with laboratory and x-ray findings every few days and at the end of an island stay. Recommendations for further diagnostic procedures or treatment with possible referrals will be made to the Trust Territory.

### Treatment

Every effort should be made to treat all conditions, even minor ailments, on the completion of the physical exam. Also at the outer islands every morning (usually 8-9 AM) Sick call will be held and treatment given when possible. An adequate supply of common drugs, that from experience are likely to be appropriate, will be available.

### Rapport

In the past there have been some misunderstandings among the people regarding medical exams which have largely stemmed from communication difficulties. It is hoped that we can improve rapport by: having frank question/answer discussions at the village meetings, by educational talks by the staff, by patient/doctor conferences at the time of the physical exam, and by treatment of ailments wherever possible. In addition, at Rongelap and Utirik, gifts brought to the people will include food, clothing donations and eyeglasses for reading. The latter, based on previous years' experience, is particularly appreciated by the people. It is hoped to show movies at night and have a party before leaving the island.

### Personal Data

Informal summer clothing (shorts and sport shirts) are all that are needed in the Marshalls. Don't forget bathing suit, sneakers, old shoes, face masks, and snorkel, hat, sun lotion, photographic equipment, writing material, etc. Physicians may wish to bring their own stethoscope but physical exam equipment

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will be available. Most of the personal items can be purchased at MACY'S at Kwajelein, including liquor and sundries. ~~One~~<sup>Two</sup> hundred dollars (\$200.) tax-free foreign purchases at Kwajelein may be brought back through customs. Only items that are probably worth considering are cameras, stereo equipment and jewelry.

Passports and immunization records are not necessary. Travel expenses for reimbursement include \$18/day subsistence, cost of hotel rooms (keep receipts) taxi, limousine, cost of traveler's checks, etc. Round trip airline tickets will be furnished. Travel expenses will be reimbursed by BNL at the end of the period. Advance travel money up to \$1000 may be obtained if desired.

HSP:gc

  
Hugh S. Pratt

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Phone: J. Foard 12/6/78

Hotels and Transportation

H. Pratt  
Ramada Inn 1/10, 1/11, 1/12  
Pick up Gov't. car at Ramada Inn desk.  
Return keys to Ramada Inn desk before  
leaving for Majuro.  
Air Mike Flight #675 Lv.: 0730  
↓  
Majuro 1/13/79

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B. Dobyns  
Ramada Inn 1/12/79  
Air Mike Flight #675 Lv.: 0730  
↓  
Majuro 1/13/79

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H. Evert  
Air Mike Flight #675 Lv.: 0730  
↓  
Majuro 1/13/79

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B. Boccia  
Outrigger West 1/11, 1/12  
Air Mike Flight #675 Lv.: 0730  
↓  
Majuro 1/13/79

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Ruth and John  
Nicoloff  
Pagoda Hotel 1/22, 1/23  
Gov't. car at Ramada Inn for J. Nicoloff  
MAC 1/24/79 Lv.: 0800 Check in: 0600  
↓  
Kwaj

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M. Dekle  
Pagoda Hotel 1/23/79  
MAC 1/24/79 Lv.: 0800 Check in: 0600  
↓  
Kwaj (Ride to Hickham with Nicoloff's)

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Tina Cronkite  
Air Mike Flight #675 Lv.: 0730  
↓  
Majuro 1/13/79

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W. Scott  
Outrigger West 1/6, 1/7  
Gov't car at Ramada Inn  
MAC 1/8/79 Lv.: 0800 Check in: 0600  
↓  
Kwaj.

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D. Clareus & B. Brown  
Pagoda Hotel 1/20, 1/21  
Gov't. car for D. Clareus at Ramada Inn  
MAC 1/22/79 Lv.: 0800 Check in: 0600  
↓  
Kwaj

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W. Grant			
W. Scott			
P. Heotis	Air Mike	Kwaj → Majuro	1/10/79
J. Kabua			

H. Pratt			
B. Dobyns			
H. Evert			
B. Boccia			
W. Grant			
W. Scott			
T. Cronkite	Air Mike	Majuro → Kwaj	1/18/79
P. Heotis		Flt #643	
J. Kabua			
S. Shoniber			
N. Zetkeja			
L. Elanjo			
K. Gideon			
J. Aiman	(for name only)		

Note: Jim Foard will meet all MAC departing passengers at Hickham AFB.  
 He will have orders (if not already received) and vehicles may  
 be left with him.

Majuro car rentals:	{	Station Wagon	1/11/79	(T.T. time)
		Med. sized <del>car</del>		
		Med. sized car	1/14/79	(T.T. time)