

## SUMMARY

MEDICAL SURVEY OF MARSHALLESE PEOPLE 12 YEARS AFTER  
ACCIDENTAL EXPOSURE TO RADIOACTIVE FALLOUT

Robert A. Conard, M.D.

Head, Special Medical Examinations of  
Marshallese People Exposed to Fallout

Medical Research Center  
Brookhaven National Laboratory  
Upton, L.I., New York 11973

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The Medical Research Center  
Brookhaven National Laboratory

5007406 Upton, L. I., New York

REPOSITORY BNL Records  
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The medical survey of the Marshallese people who had been exposed to radioactive fallout in 1954 was carried out in March, 1966, 12 years after the accident. The medical team consisted of four members sponsored by Brookhaven National Laboratory (2 physicians and 2 technicians) and four from the Trust Territory (1 physician, 1 practitioner, and 2 technicians).

Dynamic demographic data were obtained at each island, and examinations of exposed people included interval medical histories, complete physical examinations (emphasis on thyroid and cancer surveys), routine hematological studies, urine analyses, x-rays of childrens' wrists and hands for growth data and other x-rays as indicated; thyroid uptake and excretion studies, and thyroid scans (using I<sup>132</sup>) in selected cases with thyroid abnormalities. Medical treatment was given to those who needed it.

There were 176 exposed people examined, 71 Rongelap and 105 Utirik people located as follows:

<u>Group</u>	<u>At Majuro</u>	<u>At Ebeye</u>	<u>At Rongelap</u>	<u>At Utirik</u>
Rongelap	7	23	41	-
Utirik	<u>12</u>	<u>15</u>	-	<u>78</u>
Total	19	38	41	78

In addition, thyroid examinations were conducted on 194 unexposed people at Rongelap and Utirik.

Of main interest were the thyroid findings which are summarized in the attached tables. During the past three years definite nodules of the thyroid gland have been noted in 16 exposed people and hypothyroidism in an additional two cases. All but one case occurred in the more heavily exposed population (55 living of the original 64 people) who received about 175 rads of whole body gamma radiation. Seventy-nine percent of these thyroid abnormalities

were in children exposed at less than 10 years of age, and two cases of thyroid nodules were noted in adults in the more heavily exposed group. One case with a nodule was noted in an adult woman in the smaller Rongelap group (14 of 18 living) that had received less than half the exposure of the other group. Five children and one adult (the first six cases) have had surgery. The nodules in the children were removed and proved to be benign adenomatous nodules closely resembling goiter of iodine deficiency. The one adult case had a mixed papillary and follicular carcinoma with localized metastasis. An increase in thyroid nodule cases noted among the exposed Rongelap people during the past six months may in part be related to inconsistent thyroid hormone therapy which had been instituted in September, 1965. There was evidence that the hormone had helped in some cases--two hypothyroid boys who had exhibited growth retardation showed considerable improvement and spurt in growth following hormone treatment. In one case a nodule disappeared on the hormone treatment. However, in five other cases (three teenage girls and two adult women) there were either lack of reduction in nodule size, increase in size, or appearance of new nodules. These cases were thought to be complying with the treatment schedule. These five cases will be brought to Brookhaven National Laboratory in May for further examinations and possible surgery. Also noted were three new cases (teenage boys) with nodules. However, they had not been on hormone therapy. The latter cases will be reevaluated following six months hormone therapy. There were two older Utirik people who had small nodules, probably not significant since there was a low incidence in unexposed people greater than 50 years of age at both Rongelap and Utirik (1.5%), but no nodules were noted in the younger age group

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in contrast to the high incidence in this age group of the exposed Rongelap people.

The general health of the Rongelap and Utirik people otherwise appeared good. There had been no disease epidemics and no unusual illnesses had occurred. Birth rate and death rate were about the same as in the past. There were a number of medical conditions noted, and in some cases hospitalization and further follow-up were recommended.

The medical team worked well together, and the examination schedule went smoothly with excellent cooperation of the Marshallese. Just before our arrival at Rongelap the exposed people there had been paid their compensation money. A village meeting was held prior to starting examinations, and the people seemed quite happy about having received their money. They were commended on their prudence in putting their money in savings accounts and only using the interest. As usual, the movies and luaus on both islands were enjoyed by all.

A complete medical report covering findings of both the 11- and 12-year surveys will be published later.

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THYROID ABNORMALITIES IN EXPOSED RONGELAP PEOPLE, 1966

<u>Case</u>	<u>Present Age</u>	<u>Age at Exposure</u>	<u>Sex</u>	<u>Date Abnormality Noted</u>	<u>Findings</u>
17	15	3	F	3/63	Benign nodules, complete thyroidectomy 1964. No recurrence.
21	15	3	F	3/64	Benign nodules, complete thyroidectomy, parathyroidectomy 1964. No recurrence.
69	16	4	F	3/64	Benign nodules, partial thyroidectomy 1964. No recurrence.
20	19	7	F	3/65	Benign nodule, partial thyroidectomy 1965. No recurrence.
2	13	1	M	3/65	Benign nodule, partial thyroidectomy 1965. No recurrence.
64	42	30	F	3/65	Malignant nodule, thyroidectomy--surgical and with radioiodine 1965. No recurrence noted on physical examination.*
5	13	1	M	3/65	Hypothyroid, PBI less than 2 $\mu$ gm% March, 1965, marked retardation of growth; 3/66 growth spurt and improved appearance on hormone.
3	13	1	M	3/65	Hypothyroid, PBI less than 2 $\mu$ gm% March, 1965, marked retardation of growth; 3/66 growth spurt and improved appearance on hormone.

\*Unable to carry out follow-up thyroid uptake and X-ray studies due to pregnancy.

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THYROID ABNORMALITIES IN EXPOSED RONGELAP PEOPLE, 1966 (continued)

<u>Case</u>	<u>Present Age</u>	<u>Age at Exposure</u>	<u>Sex</u>	<u>Date Abnormality Noted</u>	<u>Findings</u>
72	18	6	F	9/65	3 mm. nodule left lobe. No exam 3/66.
42	15	3	F	9/65	2 mm. nodule right lower lobe; 3/66-- nodular enlargement entire gland; firm 5 mm. nodule right lobe.
61	20	8	F	9/65	6-8 mm. smooth nodule left lower pole; 3/66 1 cm. nodule left lobe.
40	41	29	M	9/65	2 mm. nodule right lower pole; 3/66 no nodules detected.
59**	46	36	F	9/65	5 mm. nodule midline; 3/66 same.
54	13	1	M	3/66	Nodular enlargement left lobe and isthmus with 2 mm. firm nodule.
19	17	5	M	3/66	Multinodular soft goitre--gland 1-1/2 normal size; 1 cm. nodule right lower pole.
36	19	7	M	3/66	About 1 cm. nodule-not clearly demarked-right lower pole. Many tiny nodules surface of gland.
33	13	1	F	3/66	In 9/65 questionable irregular gland. Now definite 5 mm. nodule left lobe. ? pretracheal lymph node.
35	13	1	F	3/66	In 9/65 questionable small nodule; now 5 mm. nodule right lobe.

\*\*Exposed to only 69 rads whole body radiation and presumably proportionately less thyroid dose.

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RONGELAP THYROID ABNORMALITIES  
AGE SPECIFIC INCIDENCE (1966)\*

<u>Age at Exposure</u>	<u>No. Exposed</u>	<u>Nodules</u>		<u>Hypothyroidism</u>		<u>Total Abnormalities</u>	
		<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>% of Group</u>
1- 5	13	9	69.2	2	15.4	11	84.6
6-10	6	4	66.7	-	-	4	66.7
11-15	7	0	0	-	-	0	0
16-20	5	0	0	-	-	0	0
>20	24	2	8.3	-	-	2	8.3

\*In 55 living of original 64 Rongelap people in heavily exposed group. One nodule in woman in lesser exposed group (not included in table).

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