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INTERPRETATION OF URINALYSES FOR PU IN RONGELAP NATIVES

SYMBOL: BMBP:GMD

This is a follow-up to your request for interpretation of Pu data on
Rongelap natives contained in the attached paper.

According to LASL research, the relationships between Pu excretion,
body burden, and time after exposure may be expressed in the equation

$$U = 0.23 \, t^{-0.77}$$

where: U = urinary excretion per day in percentage of
ingested dose
t = time after ingestion.

On the 24th day, the percentage of excretion would have been about
0.02 of the ingested dose. Assuming that the rate of excretion of
urine was 1.5 liters/day, then

$$1 \, d/m/l = \frac{1.5}{(2.2 \times 10^{6})(2 \times 10^{-4})} = \sim 3.4 \times 10^{-3} \, \mu c.$$

The maximum permissible body burden recommended by Handbook 52 for
Pu is $4 \times 10^{-2} \, \mu c$. Therefore

$$\frac{4 \times 10^{-2}}{3.4 \times 10^{-3}} = \sim 12 \, d/m/l \text{ at } 24 \text{ days}$$ BEST COPY AVAILABLE

would correspond to a maximum permissible body burden.

Three of the readings on the attached data sheet are at or above
this value. However, there appears to me to be uncertainty con-
cerning the reliability of the data since it is unlikely, for
example, that patient Kotado would have excretion rates of Pu that
differ by a factor of 100 on two successive days.

Attachments: data sheets fm Dr. Harley, NYO (M.S.37078)

MILITARY RESEARCH & APPL. 7-5

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