

A Nomogram for the Estimation of Microcuries and Millimicrograms From CPM¹

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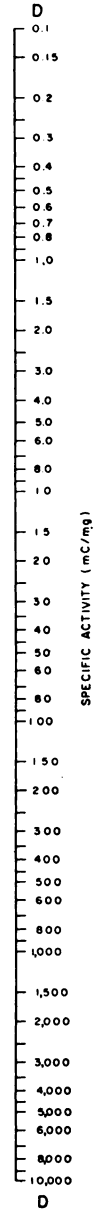
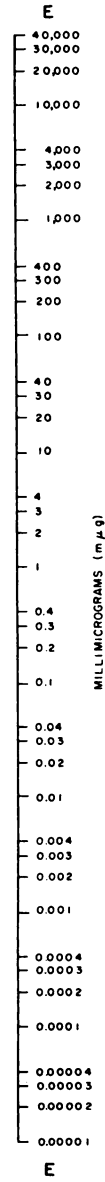
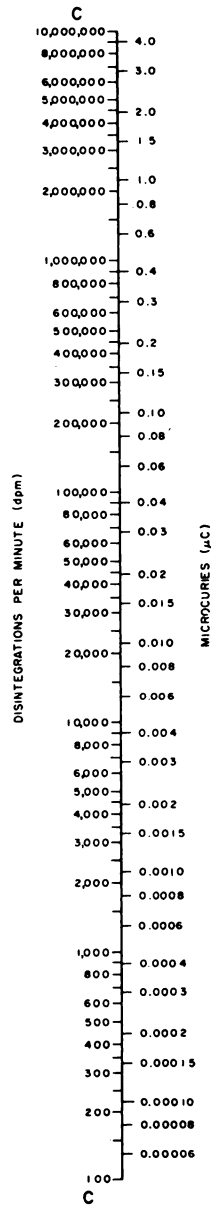
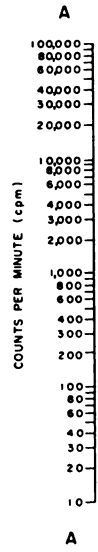
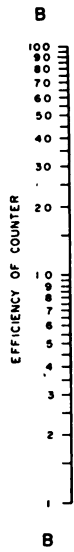
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The desirability of expressing biological measurements in terms of primary physical or chemical parameters has been stressed by others and in earlier publications by this group (1, 2). Translation of an instrumental reading into these more meaningful values necessitates calculations which are sometimes avoided by physicians and biologists. Such calculations can be eliminated by nomograms constructed on the basis of established techniques (3). The soundness of this practice became apparent to us when appropriate nomograms made possible the reading of gravitational force from rpm (1), and of dose rate from microcuries (2). Estimations of the latter still require the calculation of disintegrations per minute from the counts per minute given by a radiation measuring system. It was thought that elimination of this computation might not only facilitate dosimetric estimates, but might be useful also in the daily choices of the amounts of various radioisotopes necessary for specific investigations and tests. Since this nomogram was useful to some workers at this Center, it was thought that its publication might extend its utility to others.

The present nomogram permits direct reading of disintegrations per minute (dpm) and microcuries (μc) given the efficiency (E) of a counting assembly and the counts per minute (cpm) registered by it. Furthermore, the nomogram allows estimation of millimicrograms ($\text{m}\mu\text{g}$) when both the microcuries (μc) and the specific activity (SA) are known. These processes can be reversed when the

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knowns are reversed, as can be seen from the following equations used in constructing the nomogram (4):

$$\text{dpm} = \frac{\text{cpm}}{E}$$

$$\mu\text{C} = \frac{\text{dpm}}{2.22 \times 10^6}$$

$$\text{m}\mu\text{g} = \frac{\text{dpm}}{\text{SA}}$$

USE OF NOMOGRAM

1. To estimate μC (or dpm): locate cpm on A and efficiency on B. Draw straight line. Read μC (or dpm) on C.
2. To estimate cpm: locate μC (or dpm) and efficiency on scales C and B, respectively. Draw straight line. Read cpm on A.
3. To estimate $\text{m}\mu\text{g}$ locate μC (or dpm) on C and specific activity on D. Draw straight line. Read $\text{m}\mu\text{g}$ on E.
4. To estimate specific activity: locate μC (or dpm) and $\text{m}\mu\text{g}$ on scale C and E, respectively. Draw straight line. Read specific activity on D.

When one of the drawn straight lines intercepts any of the scales at values higher than those printed here, the nomogram is still useful if one proceeds as follows: Divide the primary datum (cpm, dpm, μC , E or SA) by a number large enough to permit interception of the printed portion of the scale by the straight line. Follow steps 1-4 and multiply the final value by the number used to divide the primary datum.

Enlarged working copies (17 × 22 inches) are available on request both of the present nomogram and of the one that estimates the dose rate of internally administered isotopes (2).

SUMMARY

A nomogram is presented which permits estimation of 1) dpm and microcuries from cpm and efficiency of the counter; 2) of millimicrograms from cpm and specific activity.

REFERENCES

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