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STUDENT VERSION
DOG DRUGS

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Abstract: We offer a problem to determine the necessary drug administration in order to keep a dog sedated with specific information on half-life for an exponentially decaying presence of the drug in the body.

SCENARIO DESCRIPTION

In [1, p. 166, Exercise 6] the following problem is posed.

> In the dog, an intravenous dose of 30 mg of pentobarbital sodium per kilogram of body weight will usually produce surgical anesthesia. Also in the dog, pentobarbital has a biological half-life of about 4.5 hours, due almost entirely to metabolism.
>
> You anesthetize a 14-kg dog with the above dose of pentobarbital. Two hours later the anesthesia is obviously beginning to lighten and you want to restore the original depth of anesthesia. How many milligrams of pentobarbital sodium should you inject?

REFERENCES

[1] Riggs, D. S. 1963. *The Mathematical Approach to Physiological Problems*. Cambridge MA: The M.I.T. Press.