

**Unit 6**  
**Estimation**  
**Practice Quiz**

*Note: This quiz is shorter than those for previous units because the unit 6 practice problems are extensive. Be sure to review these, too!*

Some studies of Alzheimer's disease (AD) have shown an increase in  $^{14}\text{CO}_2$  production in patients with the disease. In one such study, the following  $^{14}\text{CO}_2$  values were obtained from 16 neocortical biopsy samples from AD patients.

1009 1280 1180 1255 1547 2352 1956 1080  
1776 1767 1680 2050 1452 2857 3100 1621

Assume that the population of such values is normally distributed with a known standard deviation of  $\sigma = 350$ .

1. Construct a 95 percent confidence interval for  $\mu$ .
2. If the true population mean is  $\mu = 1800$  with  $\sigma = 350$ , what proportion of patient values would be greater than 1900?
3. If the true population mean is  $\mu = 1800$  with  $\sigma = 350$ , what proportion of means of size 16 would be greater than 1900? What proportion of means from samples of size 25 would be greater than 1900?
4. Considering the derivation of confidence interval estimates, comment on the role of sample size in the estimation of the unknown population mean parameter.
5. Now, assume that the population of such values is normally distributed with unknown mean and **unknown** variance. Construct a 95% confidence interval for the population mean. Compare this interval to the interval you got for question #1.