A pharmaceutical company has developed a new drug to reduce cholesterol. A regulatory agency will recommend the new drug for use if there is convincing evidence that the mean reduction in cholesterol level after one month of use is more than 20 milligrams/deciliter (mg/dl), because a mean reduction of this magnitude would be greater than the mean reduction for the current most widely used drug.

The pharmaceutical company collected data by giving the new drug to a random sample of 50 people from the population of people with high cholesterol. The reduction in cholesterol after one month of use was recorded for each individual in the sample, resulting in a sample mean reduction and standard deviation of 24 mg/dl and 15 mg/dl, respectively.

(a) The regulatory agency decides to use an interval estimate for the population mean reduction in cholesterol level for the new drug. Provide this 95 percent confidence interval. Be sure to interpret this interval.

Step 1) We are interested in finding the true population mean reduction in cholesterol level for the new drug.

Step 2) Conditions:

* SRS: it was stated in the problem that a random sample of 50 people was taken
* Normality: Since the sample size is large (>30) it is safe to use t procedures and $\overbar{x}\~N$ according to the central limit theorem
* Independence: It can be assumed the population of people with high cholesterol is greater than 10n (10\*50 = 500 people)

Step 3) Since $σ$ is unknown we will use a 1-sample t interval with df = 49

 $\overbar{x}\pm t^{\*}(\frac{s}{\sqrt{n}})$ = $24\pm (2.021)(\frac{15}{\sqrt{50}})$ = $24\pm 4.2872$ = (19.7128, 28.2872)

step 4) I am 95% confident that the true population mean reduction in cholesterol level for this new drug is between 19.7128 and 28.2872 mg/dl.