

4. A study was conducted of 90 adult male patients following a new treatment for congestive heart failure, and the increase in exercise capacity (in minutes) over a four-week treatment period. The data yields the mean increase 2.17 minutes, and the sample standard deviation 1.05 minutes. Researchers wants to evaluate whether the new treatment had improved the exercise capacity in comparison to the standard treatment which has produced an average increase of 2 minutes.

(a) Construct the null and alternative hypothesis for the test.

The null hypothesis is that the mean increase is less than or equal to 2 minutes.

The alternative hypothesis is that it is more than 2 minutes.

(b) Calculate the test statistic. Using the significance level 0.05, find the critical region for the test.

Test statistic is $T = 1.535963$

Critical region is $T > 1.662155$

(c) What conclusions can you draw from this study?

We do not reject the null hypothesis, and conclude that there is not sufficient evidence to support that the mean increase is more than 2 minutes.