In-Class Exercise: Exercise Therapy Trial

The data is saved in the stren.txt file. Here are some features about the data:

* Subjects were assigned to one of two weightlifting programs to increase muscle strength.
* Treatment 1: number of repetitions of the exercises was increased as subjects became stronger.
* Treatment 2, number of repetitions was held constant but amount of weight was increased as subjects became stronger.
* Measurements of body strength were taken at baseline and on days 2, 4, 6, 8, 10, and 12.

Problems:

1. Read data into R. Note, use the na.strings = "." option in the read.table function as the stren.txt uses . to denote missing values.
2. Transform the data from wide format to long format.
3. Produce the spaghetti plot.
4. Produce the mean profile plot.
5. Install the lme4 package and load the package.
6. Fit a LMM with fixed linear time, trt, and random intercept (patient) and random slope, with REML estimation.
7. Report the summary of the results. Comment.
8. Produce individual prediction.
9. Produce mean prediction.
10. Produce residual plot. Comment.
11. Produce QQ plot.