For this summer’s REU program, I will be studying two different health care processes. These processes are; the identification of a patient before conducting patient care tasks to study whether workers catch identification errors, and the surgery process in order to study the effects of sleep deprivation on surgeons.

These two processes are considered to be complex and have the potential to pose serious threats to patient safety. The goal of our research is to design visualizations that can be given to health care decision makers to allow them to: 1) better understand how people actually complete these processes and 2) decide what actions need to be taken in order to minimize the chances that individuals commit process-related errors. In order to accomplish our goal, we have and will be collecting and documenting how individuals complete the aforementioned processes. We will first analyze this data at an aggregate level – to understand whether bar-coding technology allows nurses to more efficiently identify patients, for instance. We will also transform this process execution data into visualizations based on Markov Chains. Once the Markov Chain visualizations are created, we hope they will essentially “map” out and form a clear picture of the processes, to enable health care decision makers to make more accurate assumptions about the processes and make better decisions about how to improve the processes.

Another essential component of this work is to determine how effective the Markov Chain visualizations are at relaying the process data to the health care decision makers. In order to do this we need to answer the question, ”Is the visualization helping the decision maker gain knowledge about the process?” We will research visualization evaluation methods and design a study to answer the aforementioned question. Once this work is completed, we can be more certain that our research will help improve these processes and patient safety.