

Patient Data Analysis

As can be seen in Figure 1, we performed a short patient data analysis on antibiotic administration times within the JHU PICU. Our goal was to establish a baseline of current practice and identify areas for improvement. We hoped to use this information to later compare the data collected after our proposed solution was implemented. By comparing the before and after data, we would be able to determine the effectiveness of our proposed solution and assess its impact on patient outcomes. This analysis would be crucial in evaluating the success of our research project and determining if further improvements are needed.

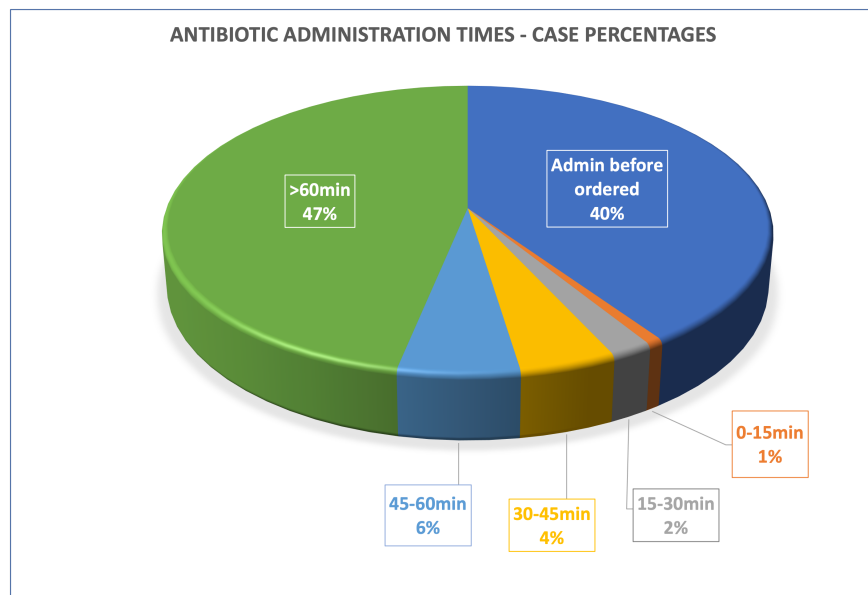


Figure 1: Antibiotic Administration Times

The dataset we were provided contained timestamps for when orders were placed and administered. Based on the provided data, it is clear that a significant percentage (47 %) of patients in the JHU PICU have a greater than 1-hour antibiotic administration time, while only a small percentage of patients receive antibiotics within the recommended time frame. Specifically, only 6% of patients received antibiotics between 45-60 minutes, 4% between 30-45 minutes, 2% between 15-30 minutes, and just 1% within 0-15 minutes. These findings suggest that there is a significant opportunity to improve patient outcomes by reducing antibiotic administration time in the JHU PICU. Our research project entails identifying the root causes of the delays and implementing an appropriate solution. The gap analysis report, which can also be found on our Wiki page, identified the biggest delay in antibiotic administration.

Approach

When analyzing the dataset, there were some timestamps for medication orders that did not have any timestamps for medication administration. This indicated some medications were ordered yet not administered and this could be due to an incomplete order. Because the goal of this analysis was to analyze antibiotic administration time, the medications that were not administered were omitted. Furthermore, some medications had multiple administration times with only one timestamp for when the order was placed. In these instances, we only looked at the timestamp of the first antibiotic administration. With this new dataset, we then found the difference in time between when a medication was ordered to when it was administered. Next, we separated these time differences into a category of administration time being greater than 1 hour and four categories of administration time being less than 1 hour, with each category consisting of 15-minute intervals. However, there is one unique category that consists of 40% of the data. This data group resulted in a negative antibiotic administration meaning the antibiotics were administered prior to being ordered. This can be explained by the fact that in certain emergency situations, antibiotics may be administered prior to a formal order being placed by a physician.