# Reducing Bone, Liver, and Lung Biopsy Turnaround Times for Potential Oncology Patients by Standardizing System Processes

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Parkland Health

Parkland Health is one of the largest public hospitals in the U.S. Opened in 1894, Parkland is a safety net provider that serves the 2.6M people of Dallas County, Texas, including uninsured, underinsured, and lower-income patients. Parkland offers multiple services within the hospital, but we are specifically interested in the interaction of medical imaging (radiology) and cancer care (oncology). Our goal is to reduce biopsy turnaround times of potential oncology patients to less than 14 days from biopsy order to biopsy appointment completed
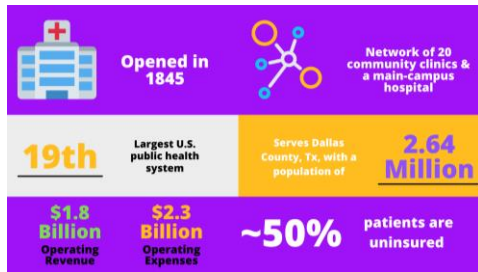

System of Interest

The process starts when the patient arrives at either the ED or the COPC. When a potential oncology patient arrives through the ED, a physician sees the patient and makes a radiology order, such as CT scan or Xray. Potential oncology patients entering the system through a COPC get a referral for a radiology appointment. If the radiology procedure reveals a threat, patients receive a biopsy order, and operations schedules an appointment for the biopsy. If the biopsy reveals cancer, the patient is scheduled for oncology to discuss cancer treatment. The process requires the patients to move between several departments including primary care, operations, oncology, and radiology.
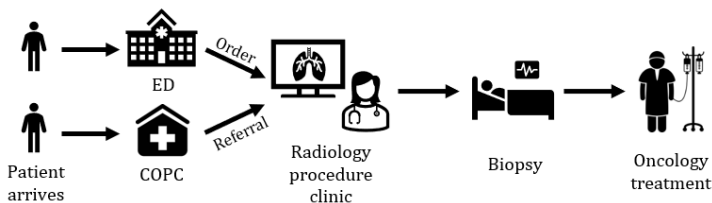

Current System Performance

In general, patients at Parkland take on average 27 days from the time when the biopsy order is placed to when it is completed. However, when patients also visit the Interventional Radiology (IR) clinic, the average time increases to 31 days. Only around 29% of appointments meet the 14 days goal.
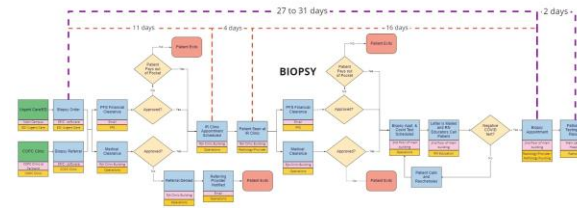
Around 53% of patients with Biopsy order go through IR clinic. These patients complete their appointments 84% of the time, 13% cancel their appointments and 3% do not show.

Technical Analysis

To assess the flow of patients, we measured the system performance using the number of days it takes from biopsy ordered to results. We used data provided by Parkland from 2015 to 2021. The data showed that 61% of the appointments are completed while 39% are cancelled. We felt that a cause for cancel appointments goes to the scheduling process in which patients are notified of their appointments without being asked for their availability. Further analysis show that most of the biopsy appointments are scheduled during the morning which means that hour of the day represents a significant factor in the system performance.
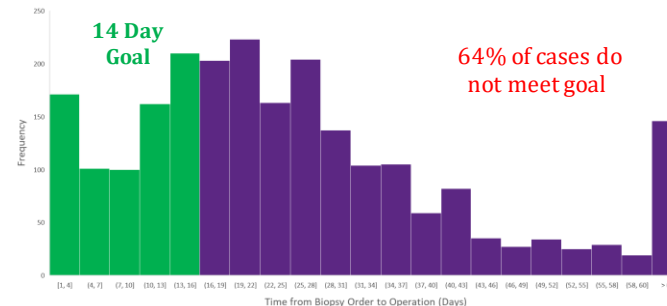
Recommendations

Analyzing historical data obtained by Parkland led our team to three main recommendations for the Radiology department to decrease delays and improve patient experience. The first being to combine the jobs of RN Educator and Scheduler (1). The second is to eliminate the IR clinical visit (2) and the third recommendation is to incorporate a standard method of data collection across all departments involved in the biopsy process (3).
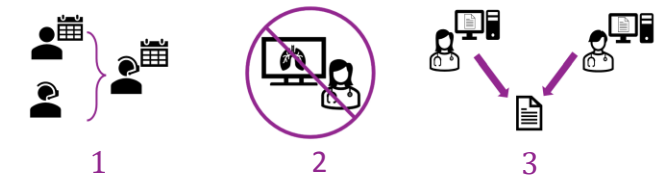
Simulation Model

A baseline Arena simulation model was created to determine if our recommendations improve upon current system performance. We tested two of our recommendations using Arena models, which showed favorable results. First, combining the jobs of RN educators and schedulers while enhancing AudioCare will reduce rescheduling by 19% and delays by 4 days. Next, eliminating IR clinic visits within the process will reduce the overall system time by 6 days.