

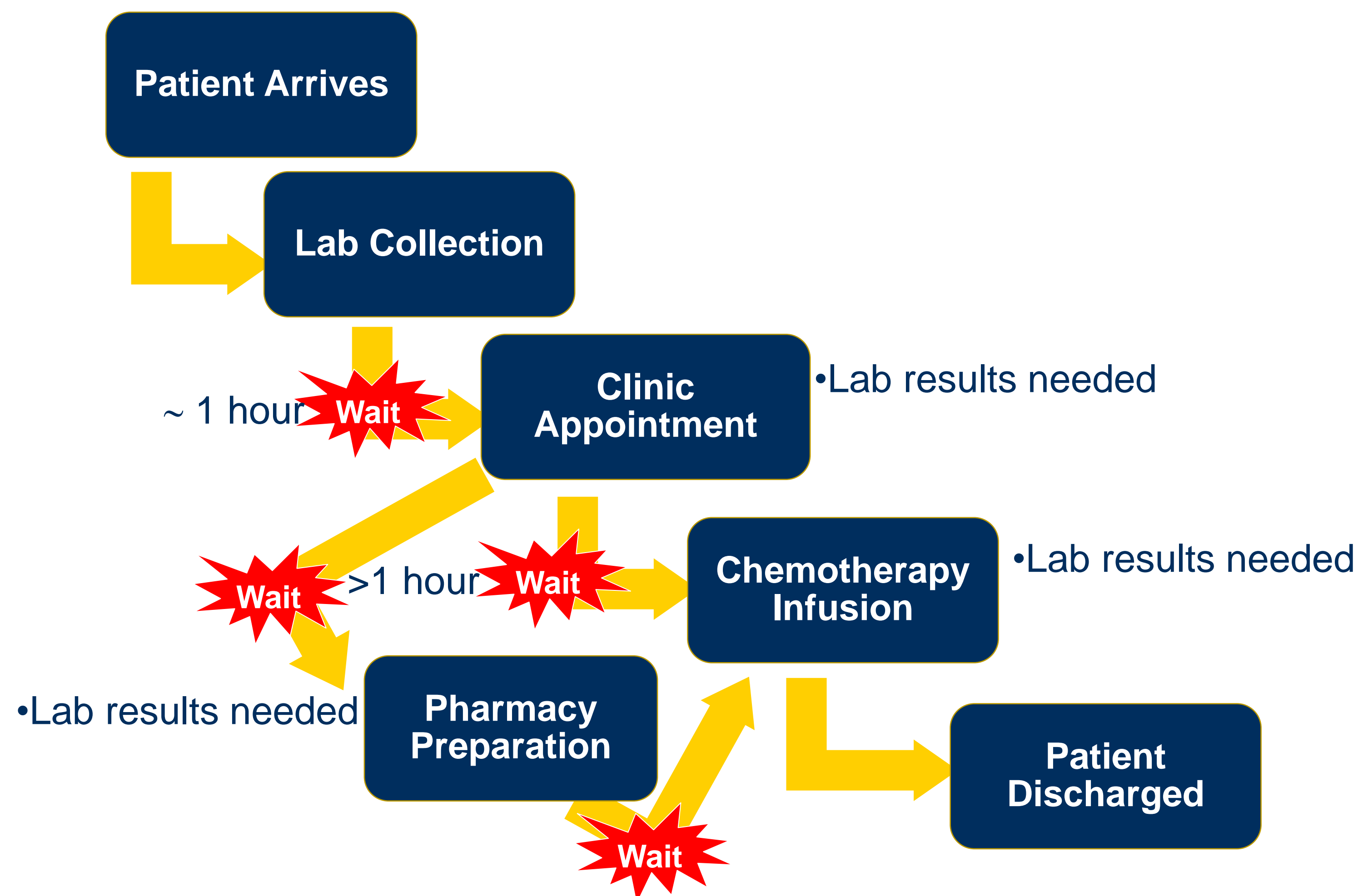
Improving Patient Flow in an Outpatient Infusion Center

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Introduction

- Chemotherapy treatment demand exceeds ambulatory infusion capacity at University of Michigan's Comprehensive Cancer Center
- Receiving an infusion is a complicated process involving multiple departments with the potential for many process delays
- Frequently patients cannot proceed in the process due to a delay in receiving lab results
- Goal: Reduce delays in receiving lab results to improve patient flow through the outpatient chemotherapy infusion center

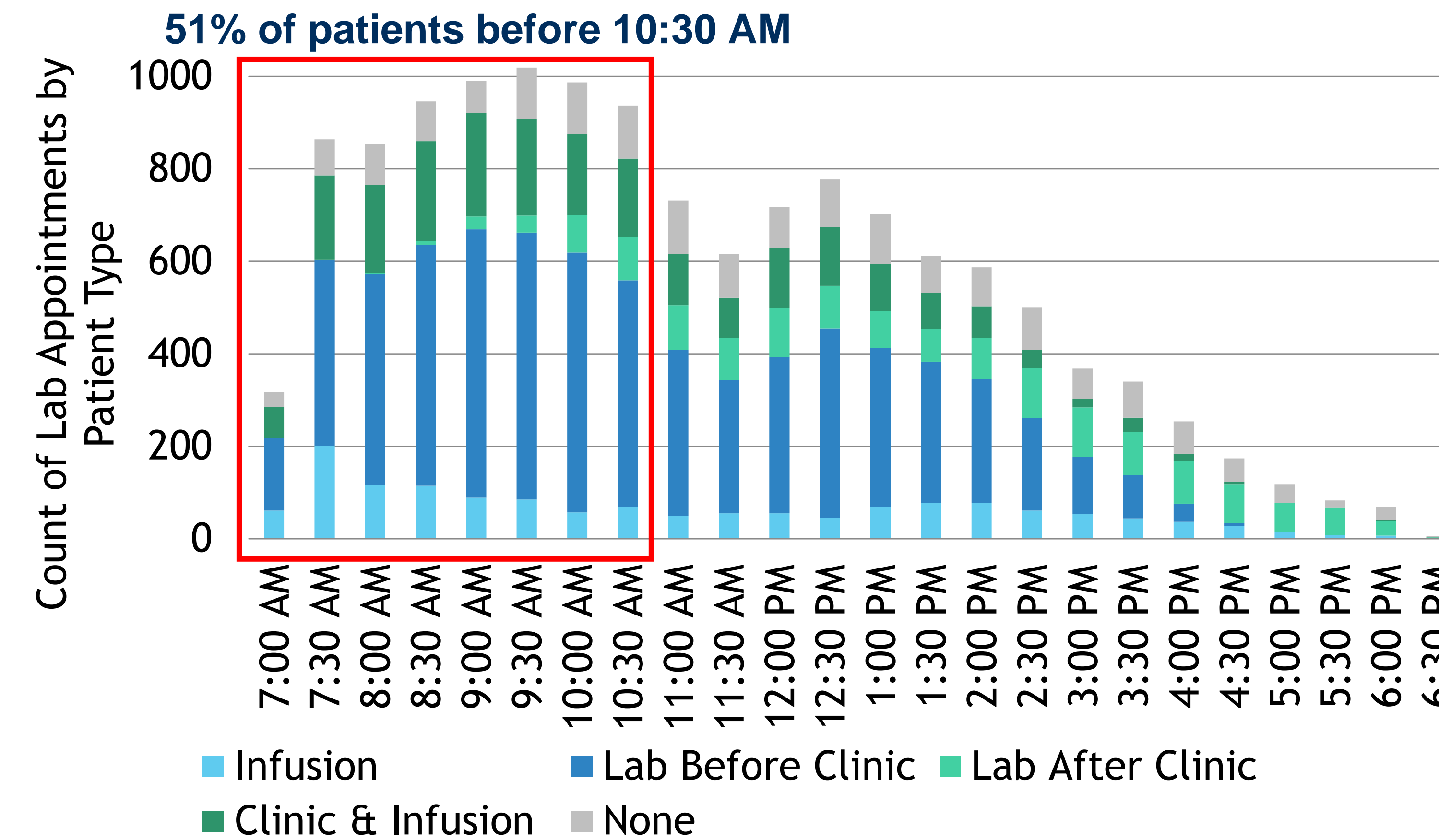
Infusion Process



Methods

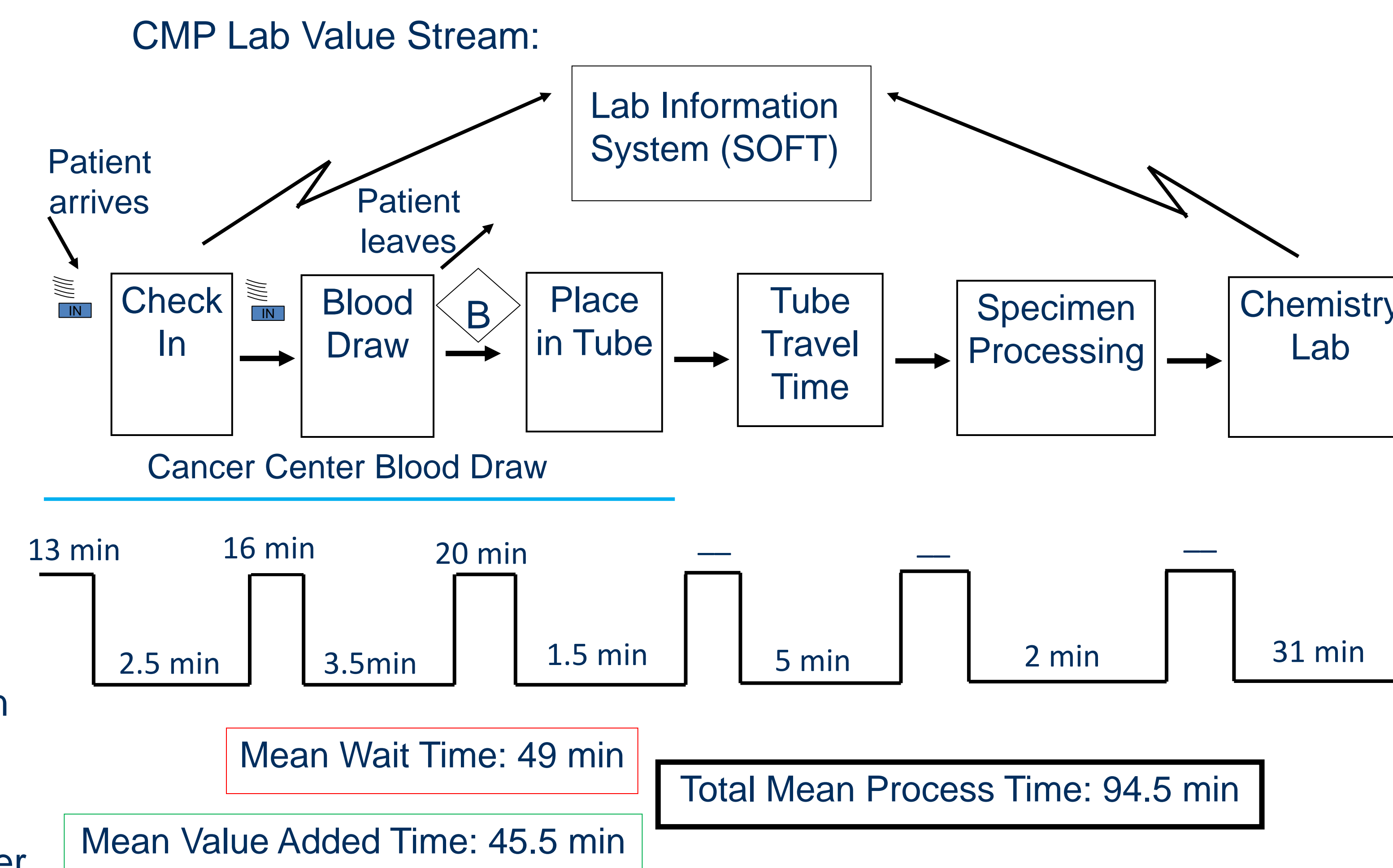
- Observations**
 - 75+ hours of observation
- Data Analysis**
 - Administrative appointment data, electronic health record data, lab information system data, patient demographic data
- Value Stream Mapping**
 - Mapped processing for three frequently drawn infusion labs (CBCD, CMP, Type & Screen)
- Travel Time Analysis**
 - Calculated patient travel time to Cancer Center and satellite lab facilities to assess whether decoupling lab visits would be feasible
- Analysis & Recommendations**
 - Currently planning a pilot of proposed recommendations

Lab Draw Station Data Analysis Results



- Morning bottleneck exceeds lab draw station capacity and creates delays that propagate throughout the day
- Majority of patients utilizing the Cancer Center lab are patients only going to a clinic appointment (not an infusion appointment)
- Phlebotomist staffing peaks at 2 PM which is misaligned with patient demand

Value Stream Mapping Results



- 52% of total process time is wait time
- Delays occur in front end process of blood draw rather than lab processing
- Current scheduling protocols mandate 1 hour between lab appointment and any following appointment
- Target turnaround time of 1 hour is not being met due to delays in blood draw

Travel Time Analysis Results

- A potential solution to reducing delays in blood draw is to uncouple lab visits from following appointments meaning labs would be drawn the day before the scheduled appointment
- Google Maps API was used to calculate patient travel time to the closest of any 9 of the UMHS satellite lab facilities

Driving Duration	Percent of Patients to Closest Lab Facility	Percent of Patients to Cancer Center
Less than 15 min	32%	10%
15 – 30 min	20%	19%
30 – 60 min	23%	36%
1 – 2 hours	15%	22%
2 – 4 hours	7%	9%
Over 4 hours	3%	4%

- With 32% of patients within 15 minutes of a lab draw facility uncoupling lab visits could be a feasible option for a significant amount of patients

Conclusions

- Current infusion process is subject to significant delays due to labs
- Labs are delayed mainly in the blood draw portion of the process
- There is potential to reduce delays in blood draw
- Uncoupling lab visits can be a solution to reduce patient wait time on the day of appointment and to potentially reduce the Cancer Center Blood Draw's peak workload in the morning

Future Work

- Currently creating a plan to pilot the idea of uncoupling lab visits for an appropriate subset of patients
- Working with blood draw management and front line staff to implement process improvements to reduce delays such as reengineering processes, adding staff, and reducing batching

Acknowledgment

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