

Saving More Hearts by Saving More Time

Reducing the Turnover Time in the Cardiac OR of Johns Hopkins Medicine

TEAM: Laxmi Sahithya Udtha, Zhonghan Pan, David Dalavai, Changhao Liao under the guidance of Veronica Natale in affiliation to the Heart and Vascular Institute at Johns Hopkins Medicine

What's Turnover Time?

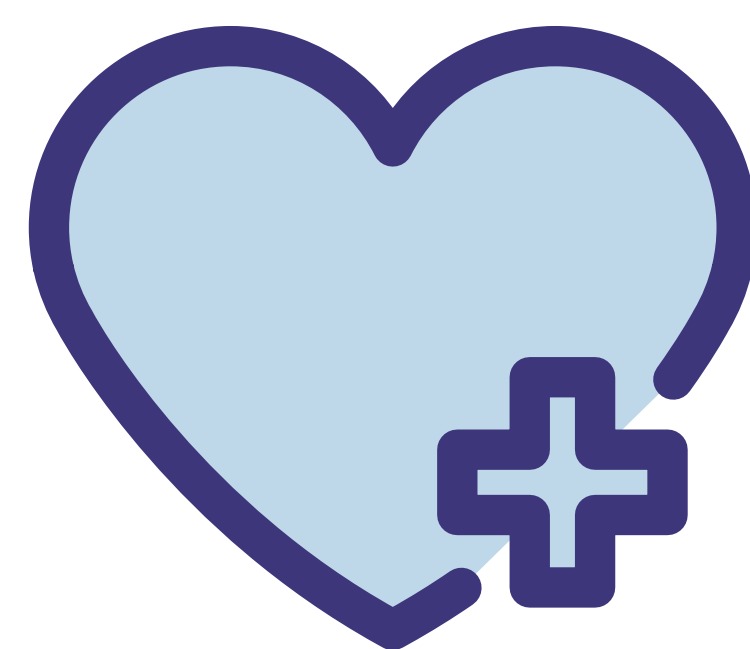
Turnover time is the duration between when a patient is wheeled out after surgery and when the next patient is wheeled in. During this time period, the various personnel in the OR work toward cleaning and ensuring the required tools & equipment are ready for the next procedure.

The average turnover time for the Cardiac Surgery OR was **67 minutes**, which is nearly double in comparison to other ORs at the hospital.

We worked together to provide solutions to reduce this time to just under **43 minutes**, which minimizes non-value-added waiting time and improves overall process efficiency.

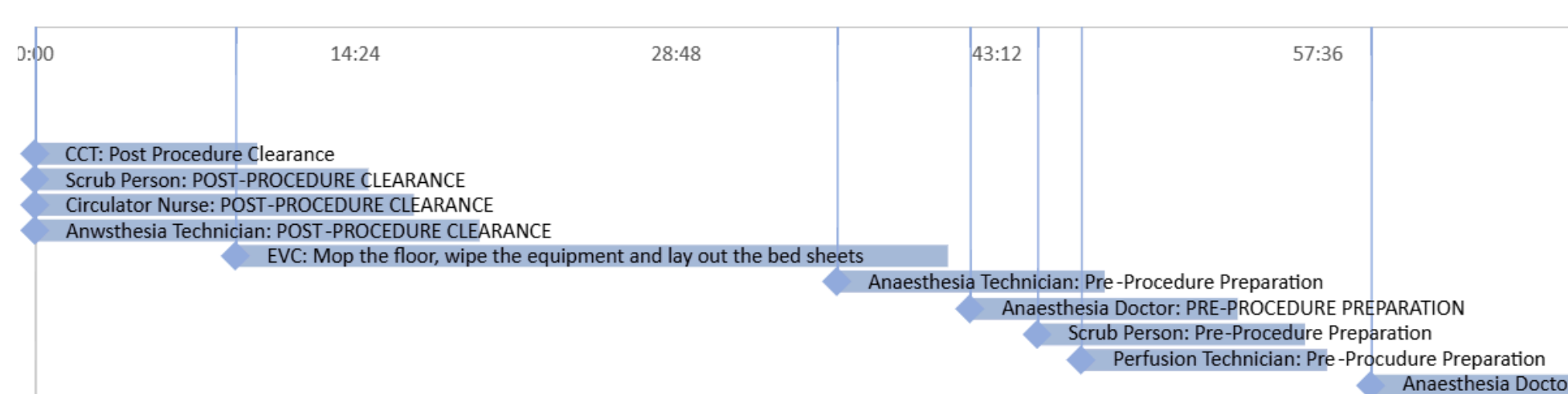
Study Basis

- This project is based on **7 weeks** of field observation, where we shadowed the turnover procedure in the Cardiac OR & timestamped each step of the process.
- This includes at least **8 turnover observations** and **4 full cardiac surgery turnovers**.
- Through sustained observation of the real workflow, the team identified the key process issues contributing to turnover inefficiency.



Observation

TIME

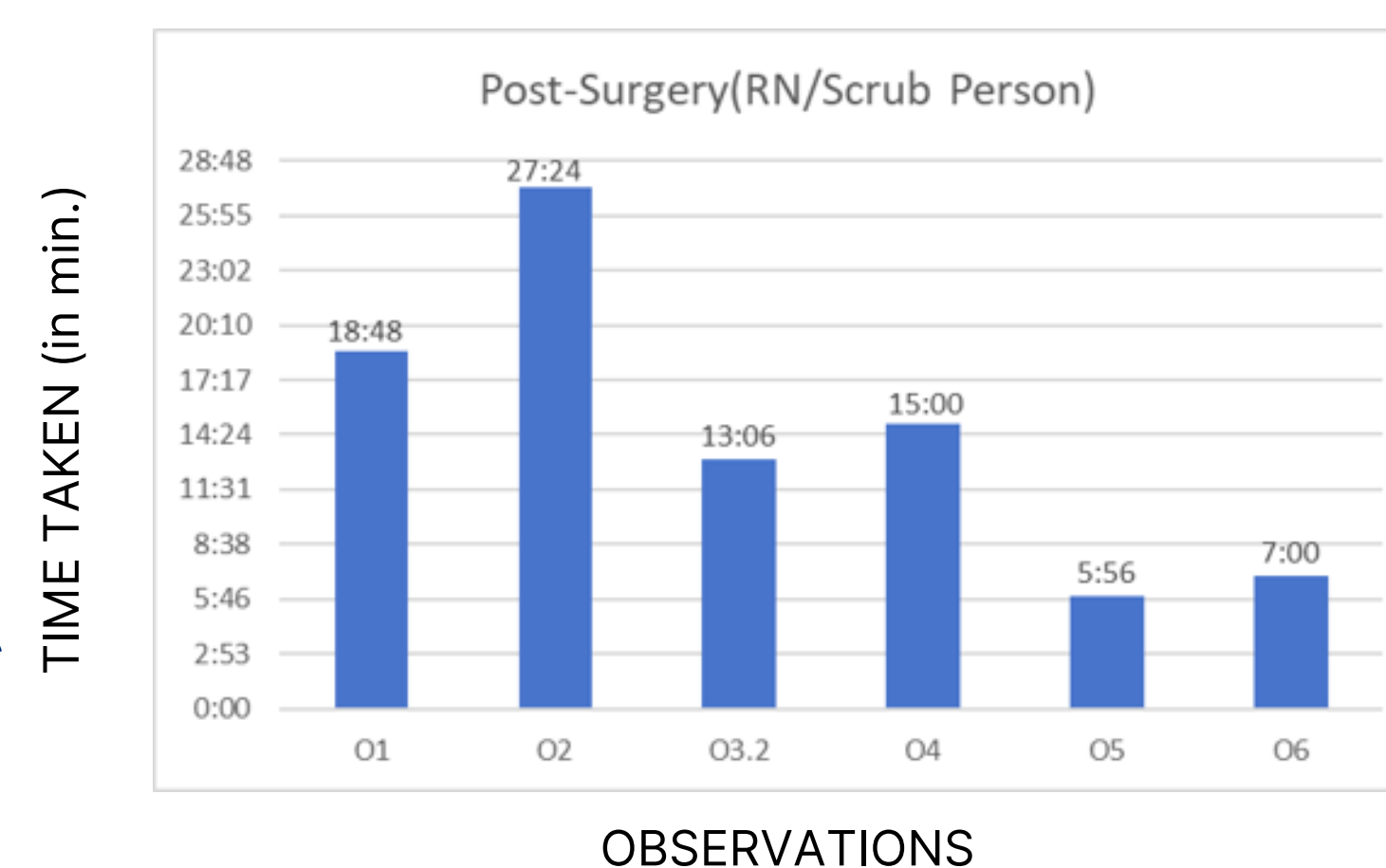


Marking the time that each team takes to complete their tasks in the Cardiac OR

1

FINDING 1, OWNERSHIP GAPS:

- During turnover, multiple roles are involved, including the RNs, the Perfusionist, the Anesthesiologists, and the EVC, or environmental cleaning staff.
- What we found is that teams are **unclear regarding owning the process**. There's **no designated leader** to initiate turnover after the patient leaves, so tasks are undertaken by the teams separately, instead of the entire OR as a whole.
- This unclear ownership thus also creates **time differences**, i.e., the same task takes significantly longer depending on which role is doing it and how many people are involved. Without standardization, each turnover plays out differently, making it impossible to hit a consistent target time.



Time taken by a team changes upon the individual's interpretation of the process

2

FINDINGS 2, COORDINATION GAPS:

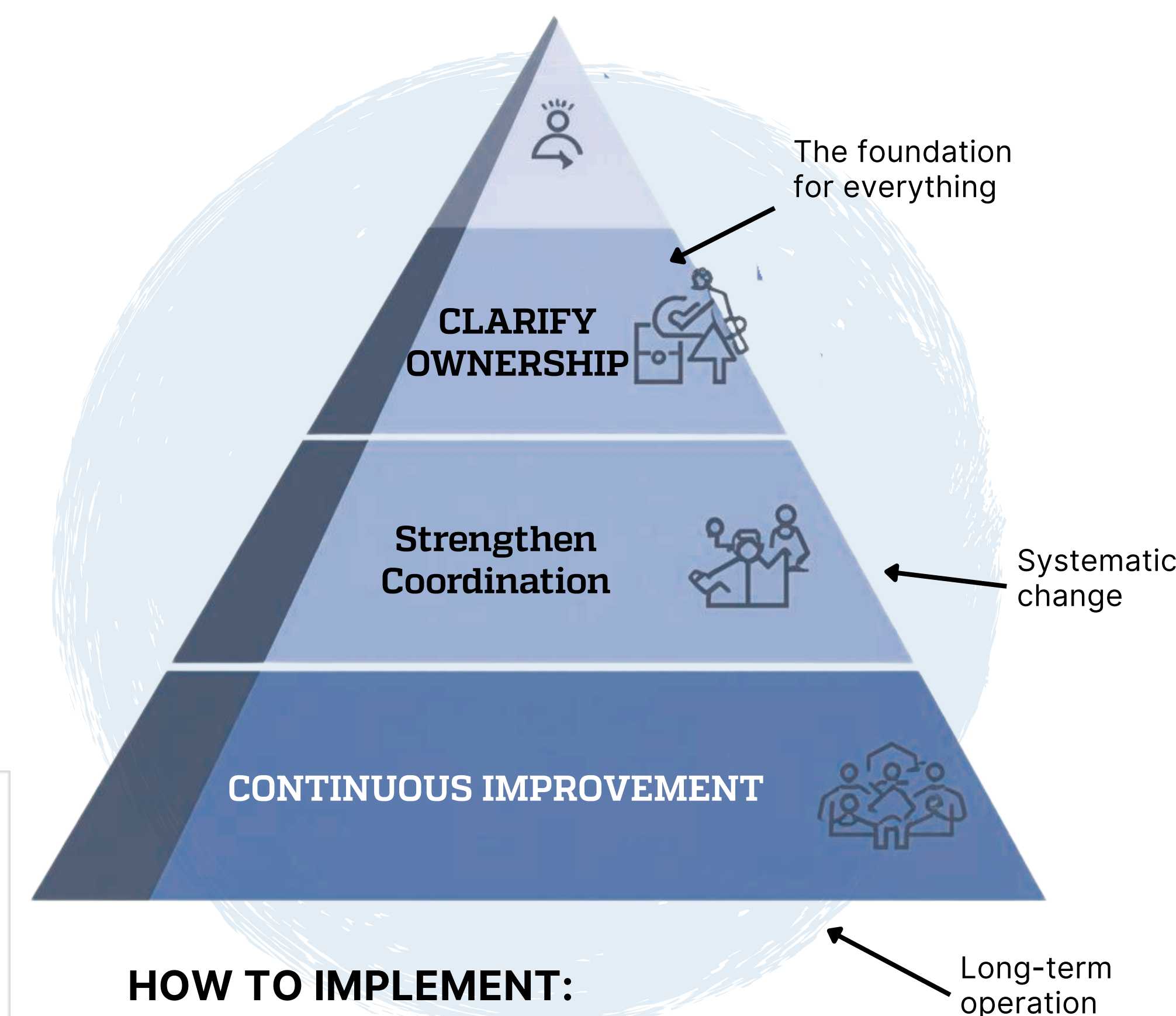
- Ownership gaps are not the only issue; coordination gaps are also a key driver of prolonged turnover time.
- In 2 of our 8 observations, **staff lateness caused avoidable delays**: a 6-minute late arrival by EVS added 6 minutes to turnover time, and a 20-minute late arrival by an anesthesia technician unnecessarily prolonged turnover.
 - Some delays appeared to stem from staffing constraints**. Follow-up review showed that the EVS team had only two staff members, and the late arrival occurred because work in another room was still in progress.
 - We also found that **limited staffing not only contributed to late arrivals, but also affected task duration**. The same task took 30 minutes when completed by one person, but only 20 minutes when completed by two, resulting in a direct time savings of 10 minutes.

as a result
14 MINS
of time are

$$67 - 14 = 53 \text{ MINS}$$

caused by avoidable waiting due to **late arrivals, slower task completion under limited staffing, and underuse of available staff during ongoing work**.

IMPLEMENTATION PLAN



HOW TO IMPLEMENT:

This project recommends focusing on **three-step actions**: clarifying role ownership during turnover, improving real-time coordination and pre-scheduling, and creating accountability mechanisms that support **continuous improvement and long-term adoption of standard work**.

3

Solutions:

- Clarify Ownership:** RN and scrub person prepare the room for EVS by removing trash bags and consolidating movable equipment. This reduces EVS handling and movement during cleaning and can save up to **6** minutes.
- Improve Coordination:** Use an EPIC pre-scheduling model to improve real-time coordination before turnover begins. By identifying next-day case demands in advance and aligning staffing with expected workload, teams can reduce late arrivals, improve staff utilization and task sequencing, and conservatively reduce turnover time by an average of **8** minutes.
- Support Long-Term Improvement:** Quality circles or professional training can spread high-efficiency practices, such as parallel cleaning and pre-op preparation, which could conservatively reduce turnover time by **10** minutes.

$$67 - (6+8+10) = 43 \text{ MINS}$$

Conclusion

We believe cardiac OR turnover is longer than most other surgical turnovers not only because it requires more instruments and more complex cleaning, but more importantly because of **limited standardization**. Efficient practices already exist: in our observations, the fastest turnover was completed in 38 minutes. Our plan therefore focuses on standardizing responsibilities, coordination, and workflow at the system level to sustain high-efficiency practices. Under a conservative estimate, this approach could reduce average turnover time to below **45** minutes while supporting stable, long-term improvement.