

## Project Title

Precipitating Significant Reductions in Turnaround Time for Hearing Tests – A  
Workflow Overhaul

## Project Lead and Members

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## Organisation(s) Involved

Ng Teng Fong General Hospital

## Healthcare Family Group Involved in this Project

Medical, Allied Health, Nursing, Healthcare Administration

## Applicable Specialty or Discipline

Otorhinolaryngology

## Aims

The ENT-Audiology QI Project Team intends to reduce instances of excessively long wait times for patients requiring hearing test. Specifically it aims to **increase** the percentage of patients who have a total turnaround time **(TAT) < 1 hour from 50% to 75%**.

## Background

See poster appended/ below

## Methods

See poster appended/ below

## **Results**

Revision of workflow reduces the patient's waiting time

## **Lessons Learnt**

A key success factor was the buy-in from stakeholders from the start of the project. The rationale and benefits of such projects should be communicated and well-understood by all stakeholders involved. This allows QI initiatives to be planned and implemented quickly.

## **Conclusion**

See poster appended/ below

## **Project Category**

Care & Process Redesign, Access to Care, Turnaround Time, Quality Improvement, Workflow Redesign

## **Keywords**

ENT Clinic, Turnaround Time, Audiology Hearing Test & ENT Consultation

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# PRECIPITATING SIGNIFICANT REDUCTIONS IN TURNAROUND TIME FOR HEARING TESTS – A WORKFLOW OVERHAUL

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- SAFETY
- QUALITY
- PATIENT EXPERIENCE
- PRODUCTIVITY
- COST
- TEAMWORK
- COMMUNICATION

## Define Problem, Set Aim

### Problem/Opportunity for Improvement

In the months of Nov 2018 through April 2019, of the Clinic A54 patients who required a Audiology hearing test and an ENT consultation, only 50% had a total journey time of less than 1 hour. This is below the SOC journey time target of 1 hour for all patients. 17% of the patients had a total journey time of more than 1.5 hours, resulting in two instances of Service Quality feedback and potential loss of revenue from patients who did not wish to wait.

### Aim

The ENT-Audiology QI Project Team intends to reduce instances of excessively long wait times for patients requiring hearing test. Specifically it aims to **increase** the percentage of patients who have a total turnaround time (TAT) < 1 hour from 50% to 75%.

## Establish Measures

### Primary Outcome Measure

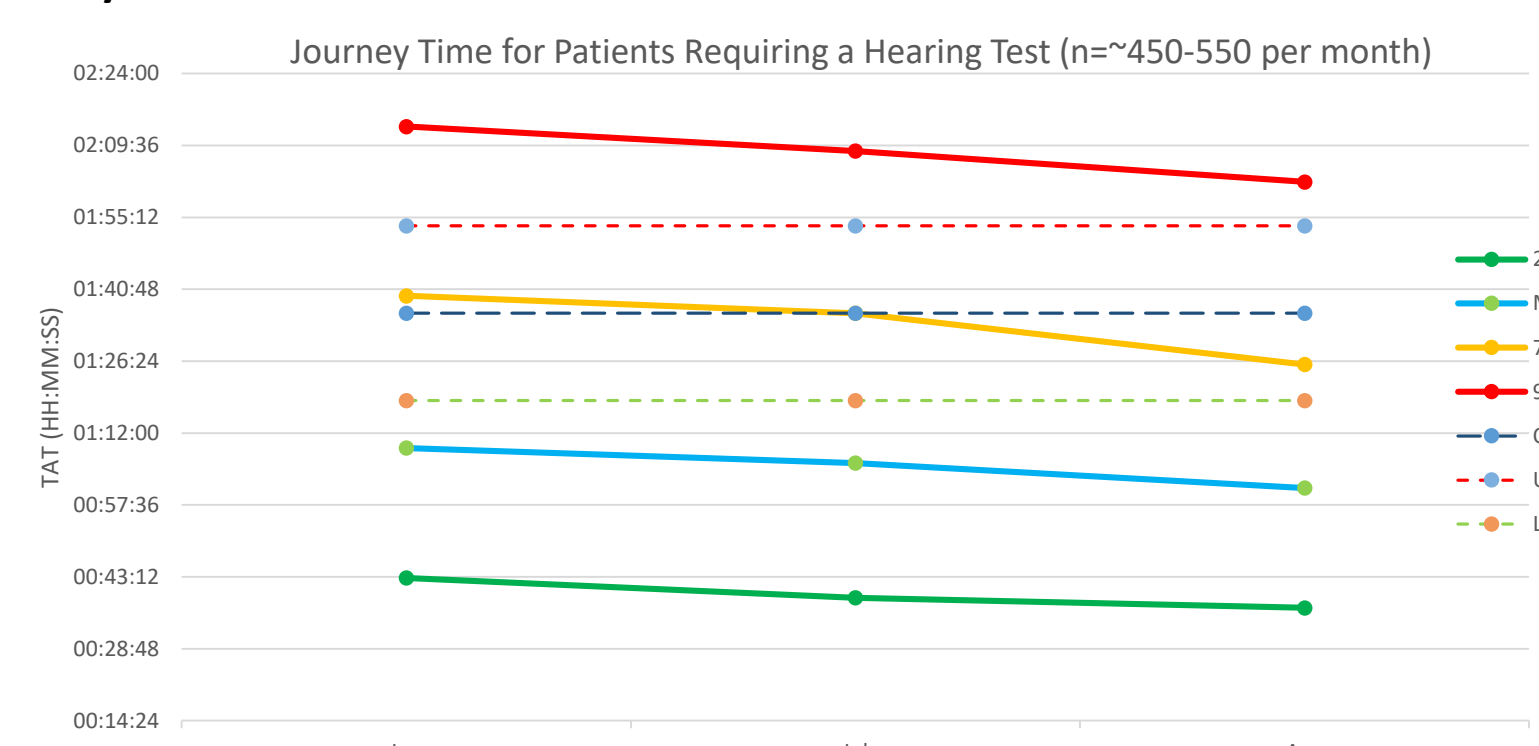


Figure 1. Journey time for patients requiring a hearing test

The journey time for patients requiring a hearing test was tracked from Jun 2019 to August 2019 (Figure 1). The journey time for the 75<sup>th</sup> percentile was **1hr 36min**. The location waiting time in the Audio queue was also tracked for the same period, with the 75 percentile waiting as long as 17 min (see Figure 8).

## Analyse Problem

### Existing Process

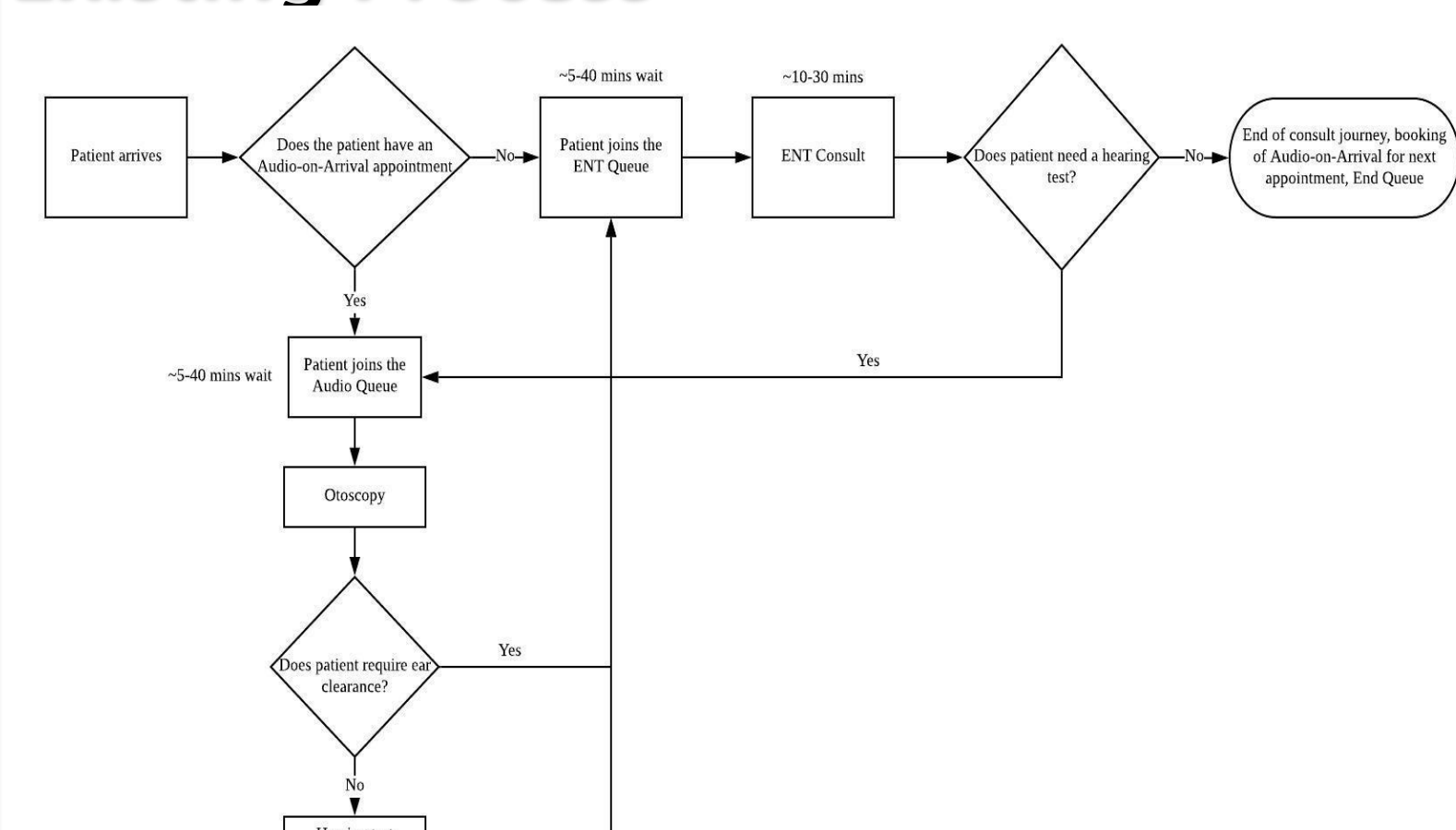


Figure 2. Existing ENT clinic workflow  
 Figure 3. Root Cause Analysis

The existing clinic workflow (Figure 2) requires significant patient movement and resulted in patients repeatedly waiting in multiple queues. This contributed to the high total journey time. A root cause analysis was conducted and key contributing causes were identified (Figure 3).

Stakeholder representatives from ENT physicians, nurses, audiologists and patient service associates voted for the causes which they thought contributed most significantly to high total journey time. These causes were ranked and a Pareto chart was used to visualise the most impactful causes (Figure 4).

### Root Cause Analysis & Pareto Chart

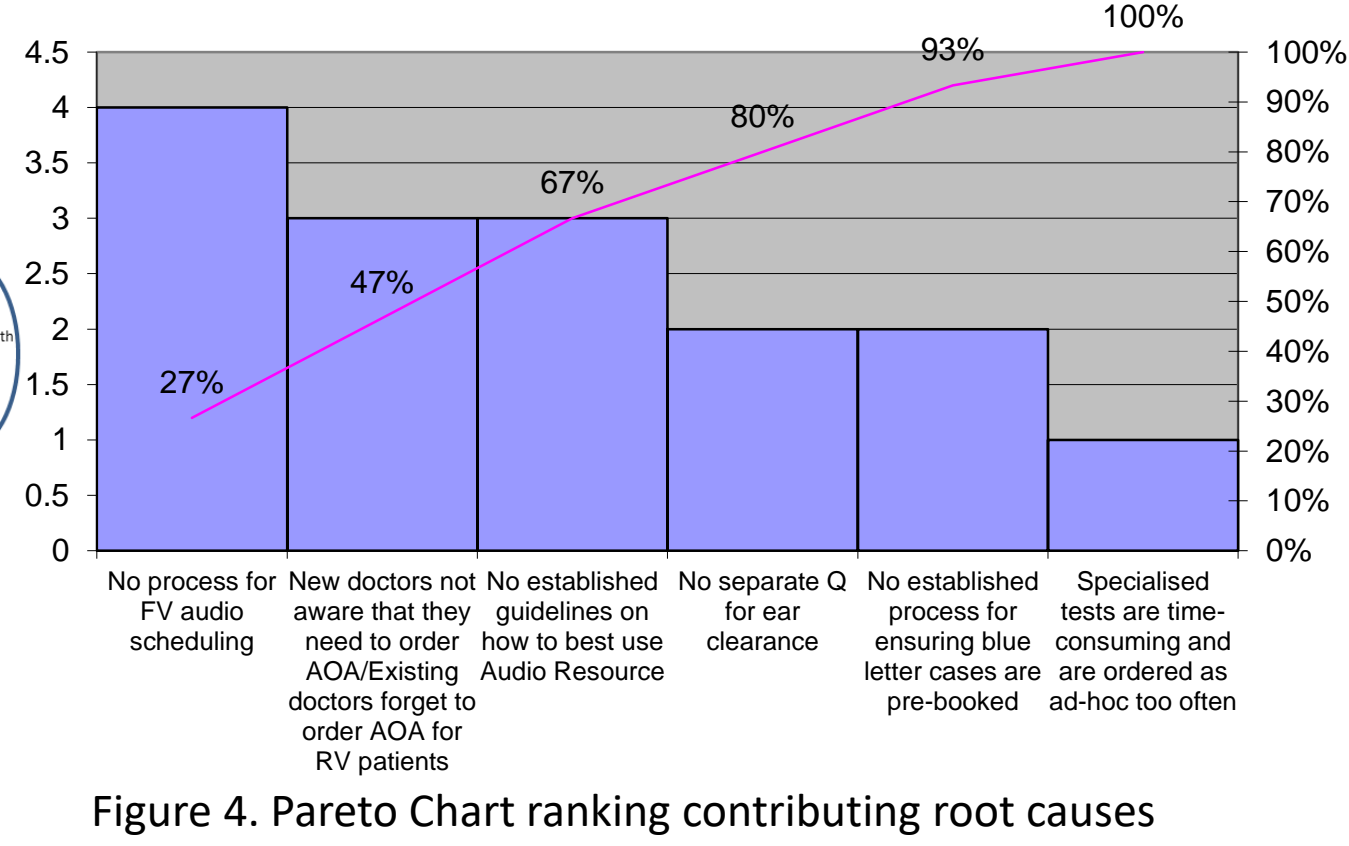
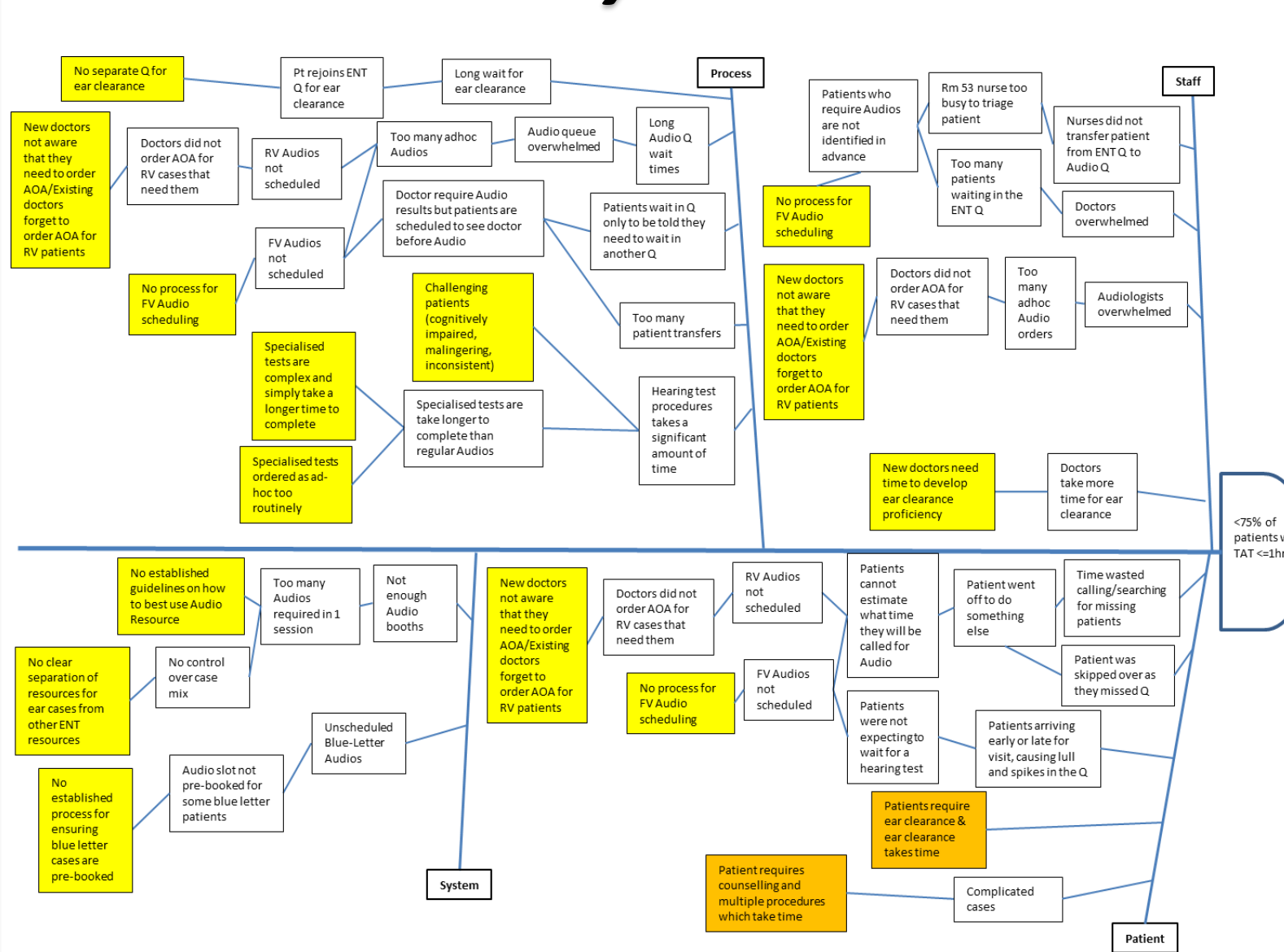


Figure 4. Pareto Chart ranking contributing root causes

## Select Changes

Root Cause	Potential Solutions
No process for FV Audio scheduling	PS1 Work with Contact Centre + A&E to develop process for FV Audio-on-Arrival PS2 Get nurses to screen through all patients the day before. Book and call patients for FV Audio-on-Arrival
New doctors not aware that they need to order AOA/Existing doctors forget to order AOA for RV patients	PS3 Remind all new and existing doctors on the need to order and schedule their RV Audio-on-Arrival PS4 Reject all unscheduled RV Audios
No established guidelines on how to best use Audio Resource	PS5 Modify Audio Resource to segregate types of Audio bookings to improve clarity on how they should be used PS6 Remind all users of Audio Resource on how to book the Resource correctly

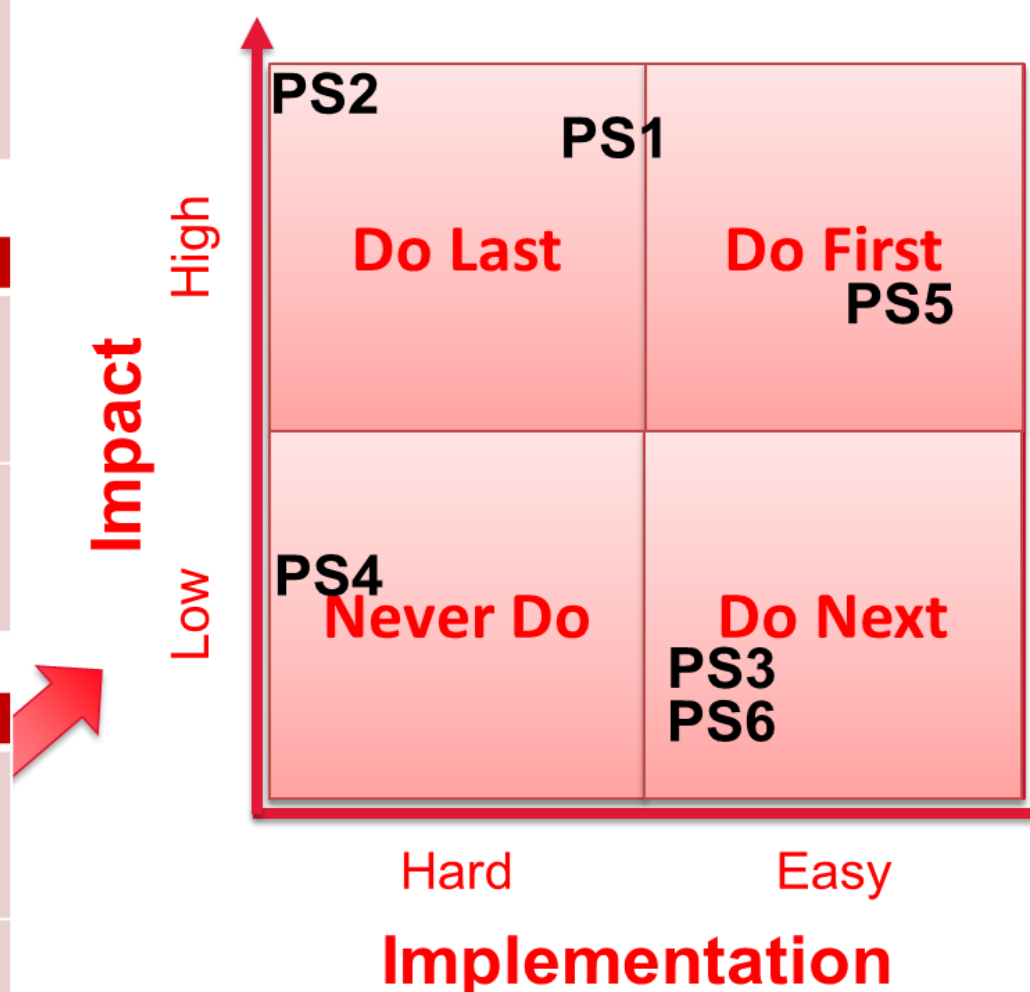


Figure 5. Potential Solutions

Solutions were proposed to tackle each of the identified causes and priority was given to solutions which were high-impact and easy to implement.

PS5, PS1 and PS2 were all considered to be of significant impact but PS5 and PS1 were more feasible to execute immediately. PS2 required significant manpower commitments, which while effective, was not efficient for the clinic's operations.

## Test & Implement Changes

PLAN	DO	STUDY	ACT
What is the aim of this cycle? What do you need to do before you execute the test change? (Who, What, Where, When)	Was the test change carried out as planned?  What are the feedback & observations from participants?	What are the results? Use run charts to illustrate.  What did you learn from this cycle?	What is the conclusion from "Study"?  What is your plan for the next cycle (adopt / adapt / abandon)?
<b>Cycle 1</b> <ul style="list-style-type: none"> <li>Prepare an updated Audio Resource which accurately reflects appointment duration, copes with clinic demand and segregate different bookings. Make more slots available for pre-booked Audio-on-Arrival.</li> <li>Have Contact Centre pre-book patients for Audio-on-Arrival 20-60 minutes before the appointment.</li> </ul>	<ul style="list-style-type: none"> <li>Updated Audio Resource was prepared in EMR</li> <li>Communicated proposed new arrangements to Contact Centre colleagues. From 1 Sept 2019, progressively more patients booked into Audio-on-arrival for ENT FV.</li> </ul> <p>Feedback and observations</p> <p>Audiologists:</p> <ul style="list-style-type: none"> <li>Patients referred from A&amp;E are being missed out. They need to be pre-booked as A&amp;E is a main referral source</li> </ul> <p>Nurses:</p> <ul style="list-style-type: none"> <li>Sending patients for audio when audio has been completed</li> <li>Triaging process cannot be totally eliminated – other sources of referrals still exists</li> </ul>	<ul style="list-style-type: none"> <li>Message did not reach A&amp;E Service Ops personnel in Contact Centre – A&amp;E referrals had no audio pre-booked</li> <li>There were many other loose sources of referrals: Internal referrals, private walk-ins, GP referrals, SAF referrals.</li> <li>Some reduction in wait time</li> <li>There was better visibility of expected workload by audiologists and less triaging work required of nurses. These positive aspects were not reflected in the metrics tracked (TAT).</li> </ul>	<p>Adapt the changes in cycle 1:</p> <ul style="list-style-type: none"> <li>Contact the other main referral source to set-up FV AOA arrangements</li> <li>Remind all doctors to included scheduling instructions for PSAs if they require RV AOA.</li> <li>Re-brief all nurses on the new arrangements for FV AOA, i.e. patients will arrive in their consult rooms with audio results ready.</li> <li>Have audiologists write EQMS remarks that the audio has been done so that nurses are kept aware.</li> </ul>
<b>Cycle 2</b> <ul style="list-style-type: none"> <li>Contact the other main referral sources to set-up FV AOA arrangements while reviewing workflow with stakeholders to familiarise them with the new processes.</li> </ul>	<ul style="list-style-type: none"> <li>Communicated proposed new arrangements to A&amp;E Service Ops colleagues.</li> <li>Reminded all stakeholders of changes to workflow</li> </ul>	<ul style="list-style-type: none"> <li>Further reduction in wait time</li> </ul>	<p>Adopt the changes in cycle 2.</p>

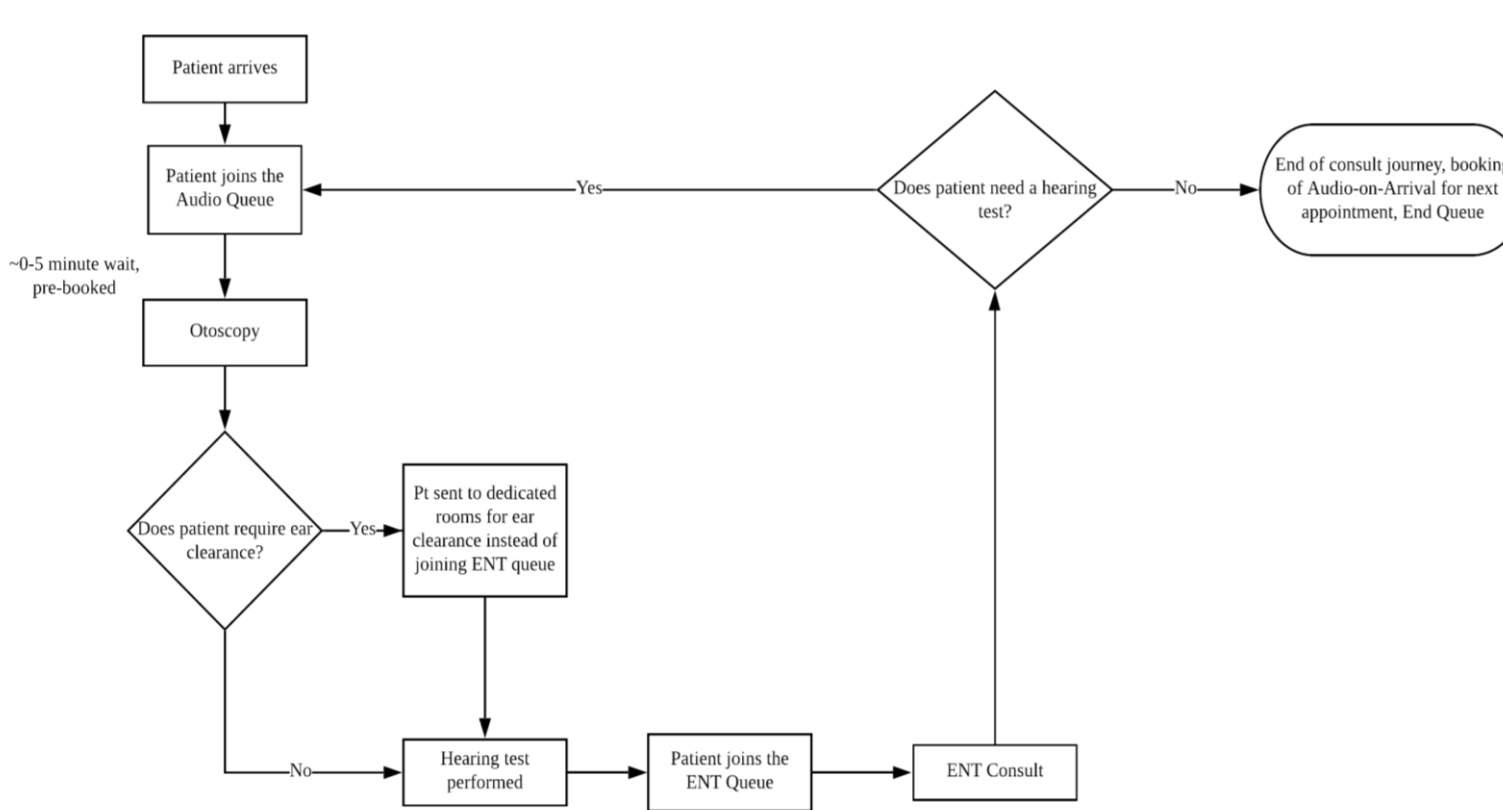


Figure 6. Revised ENT clinic workflow

Figure 7. Primary Outcome Measure

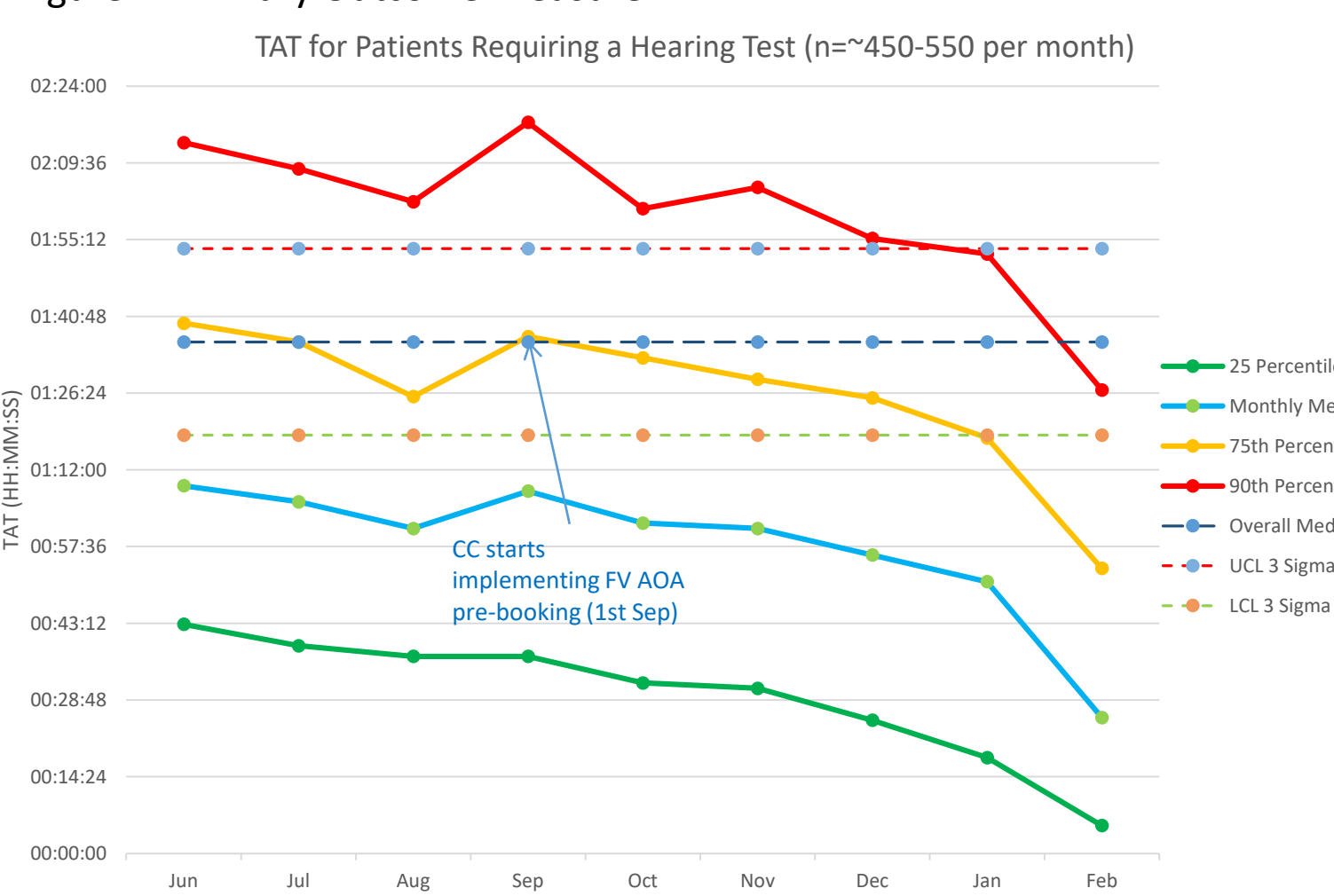
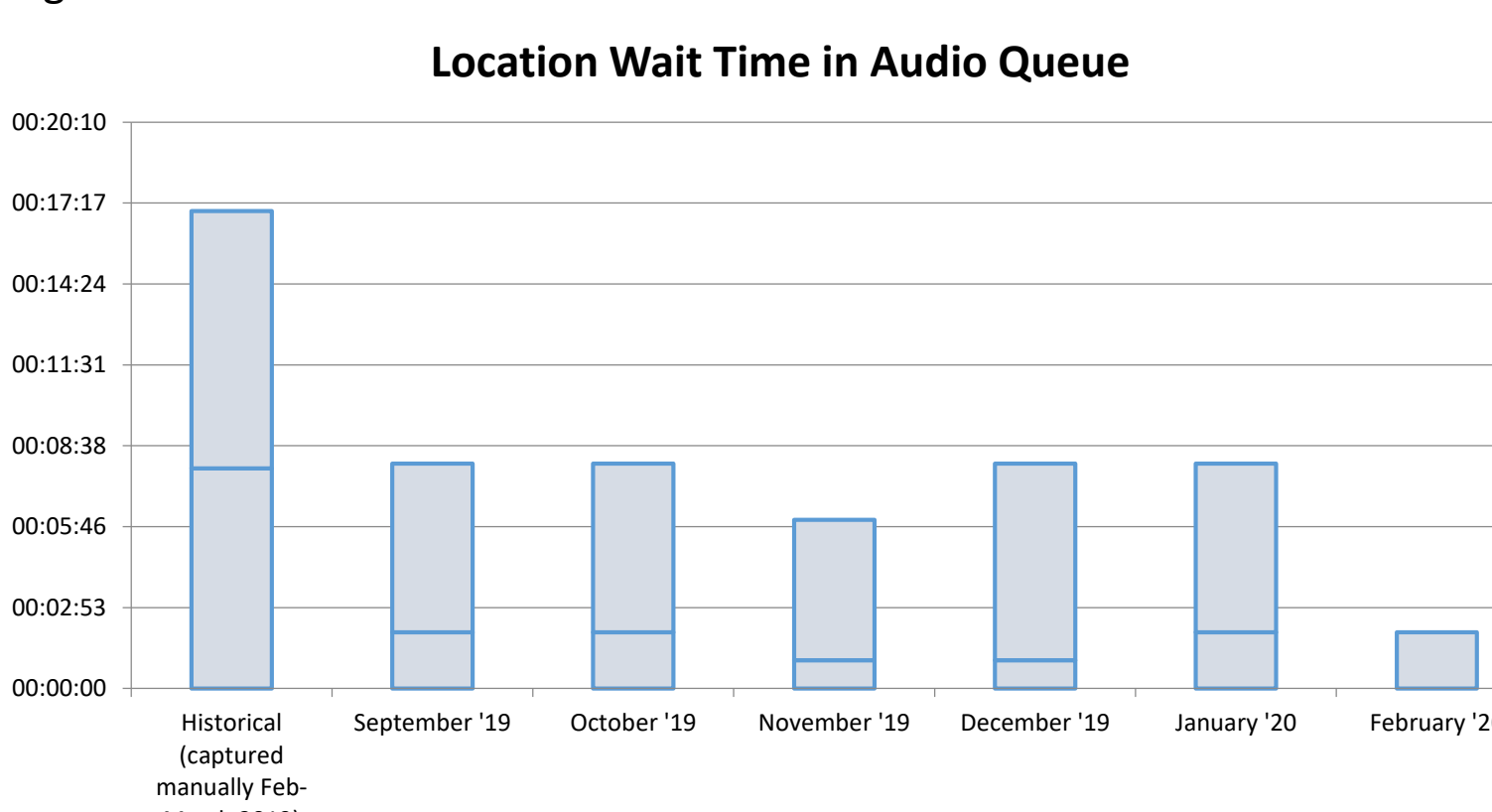


Figure 8. Additional Outcome Measure



In the revised clinic workflow, patients would arrive prior to ENT consult for Audio-on-Arrival (AOA). The majority of patients wait only once in each of the two queues – the Audio Queue and ENT Queue (Figure 6). This was a significant simplification of the existing clinic workflow where patients had to wait multiple times in the two queues. Patients also had greater visibility of the number of expected stops and expected waiting time.

A persistent downward trend in the total turnaround time (TAT) was observed in all tracked percentile levels (Figure 7) and the 75 percentile figure was able to reach the 3-sigma lower control limit in January 2020. In addition, **in February 2020, the aim of having more than 75% of patients complete their journey within an hour was achieved.** The median location waiting time in the Audio Queue was also drastically reduced by 70% (Figure 8). This meant a greater proportion of value-adding time in clinic, which translated to a much improved patient experience.

These changes have also become enablers of efficiency for clinic staff. Nursing staff no longer spend time triaging patients for hearing tests while physicians would review the patients only once, facilitated by having results on-hand during initial contact.

## Spread Changes, Learning Points

### Spreading Change and Key Learnings

To ensure that the changes implemented were sustainable, briefings and reminder emails were used to communicate changes at the various levels. These frequent communications helped to reduce confusion during the transition window. Additionally, as part of spreading changes, the findings from the project was shared with colleagues from NUH who were keen to explore if such gains could be realized across the OneNUHS family.

A key success factor was the buy-in from stakeholders from the start of the project. The rationale and benefits of such projects should be communicated and well-understood by all stakeholders involved. This allows QI initiatives to be planned and implemented quickly.