

# Reducing Total Fasting Time in Neurosurgical Patients Undergoing Tracheostomy Tube Change: Is A Routine Post Procedure CXR Necessary?

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## 1. Introduction

Intubated Neurosurgical patients commonly require a tracheostomy if they failed to be extubated. Tracheostomy tube change (TTC) is performed in the day by Medical Officer in charge according to the TTC workflow to ensure patient safety (Figure 1).

In Phase I of our project, by delaying the onset of fasting from 0600h to 1000h there was a 19.1% reduction in median total fasting time from 602 mins to 487 mins.

In Phase II of the project, we reviewed the need for a routine Chest X-ray (CXR) post TTC change in our neurosurgical patients as shown in Figure 1.

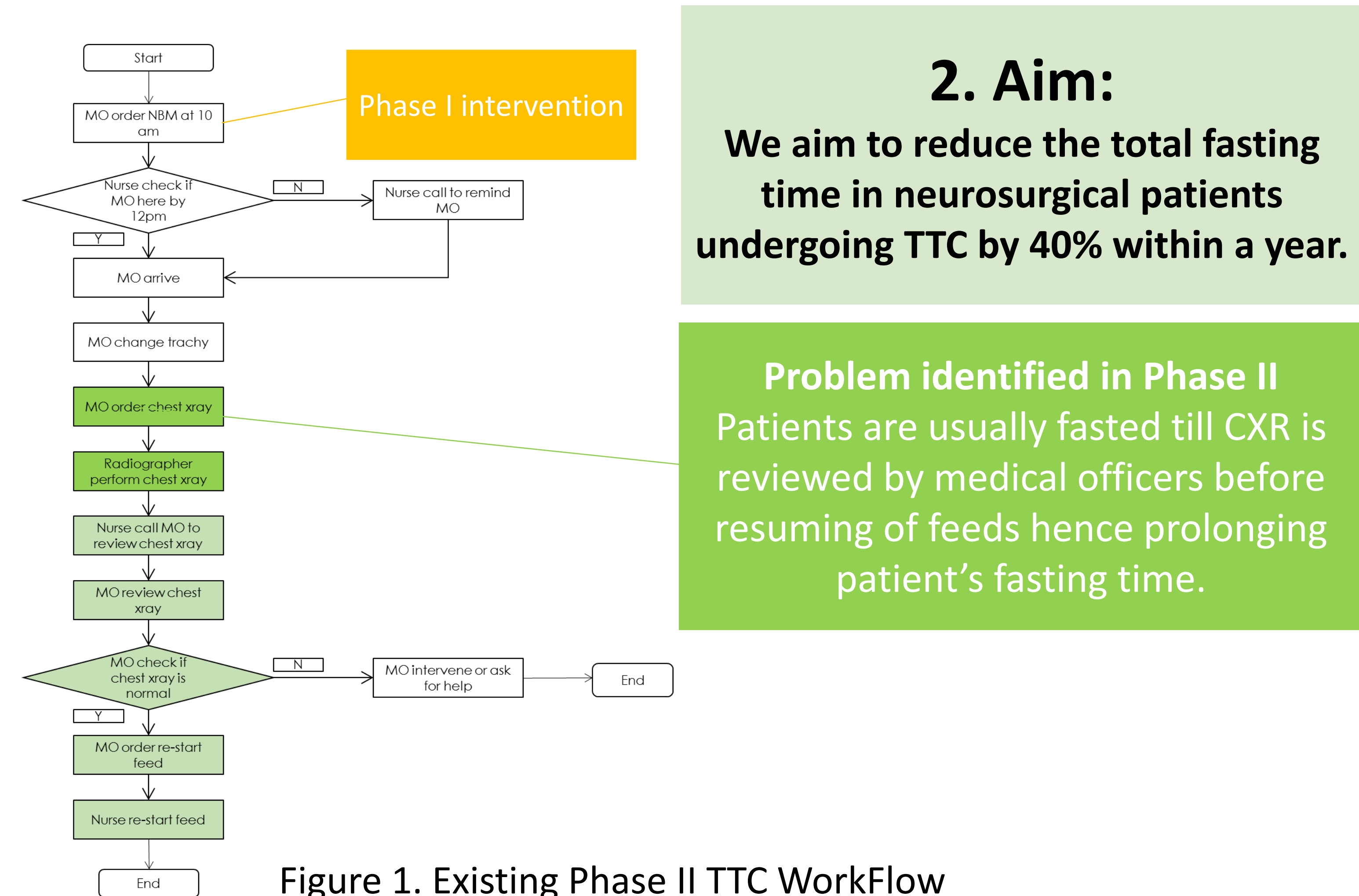


Figure 1. Existing Phase II TTC Workflow

## 3. Methodology

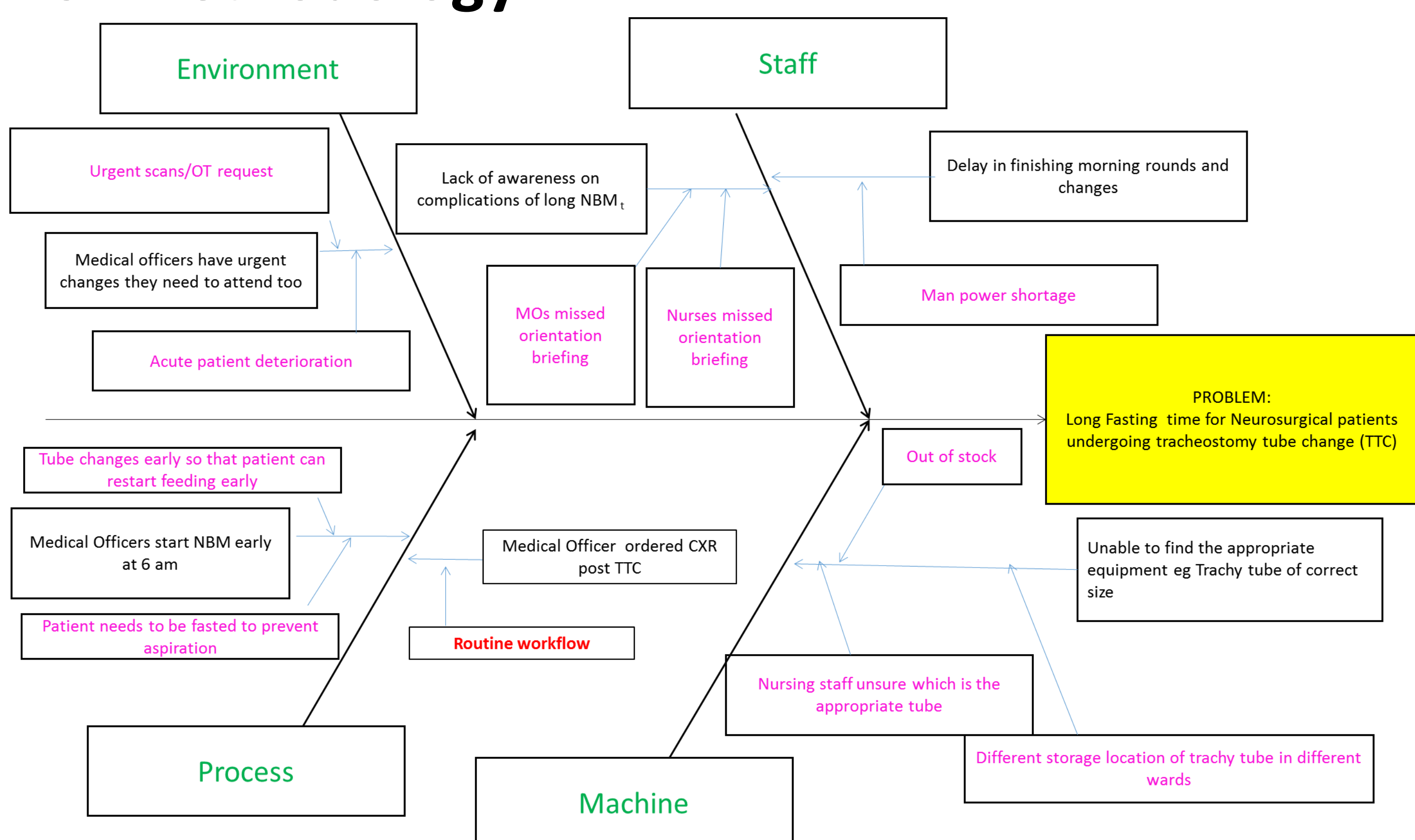


Figure 2. Cause and Effect Diagram for Phase II project

In Phase II, we re visited our Cause and Effect Diagram (Figure 2), and identified the cause for delaying of the early resumption of feeds was waiting for routine CXR to be done.

The team looked into the studies that have shown that routine CXR post tracheostomy change is not necessary.<sup>1-3</sup> Thus, we retrospectively reviewed CXR from previous post TTC neurosurgical patients from Dec 2009 to March 2015 and found that there were no reported adverse events or changes in patients' clinical status due to post TTC.

The step of ordering routine CXR was removed from the workflow with permission from Head of department.

## 4. Results

With the removal of routine CXR (phase II intervention) being introduced, we have seen a reduction in the total fasting time from Patient 35 onwards (Period from 20th April 2015 to 21st March 2016).

From the **baseline median of 602 mins**, a shift was observed, and resulted in **current median of 360 mins. 40% reduction** in median total fasting duration was achieved.

In addition, this intervention has resulted in earlier resumption of feeds for our patients and a cost saving of S\$116.74 per patient (costing based on a non- subsidized, portable CXR). Patients are also not subjected to unnecessary radiation exposure from CXR.

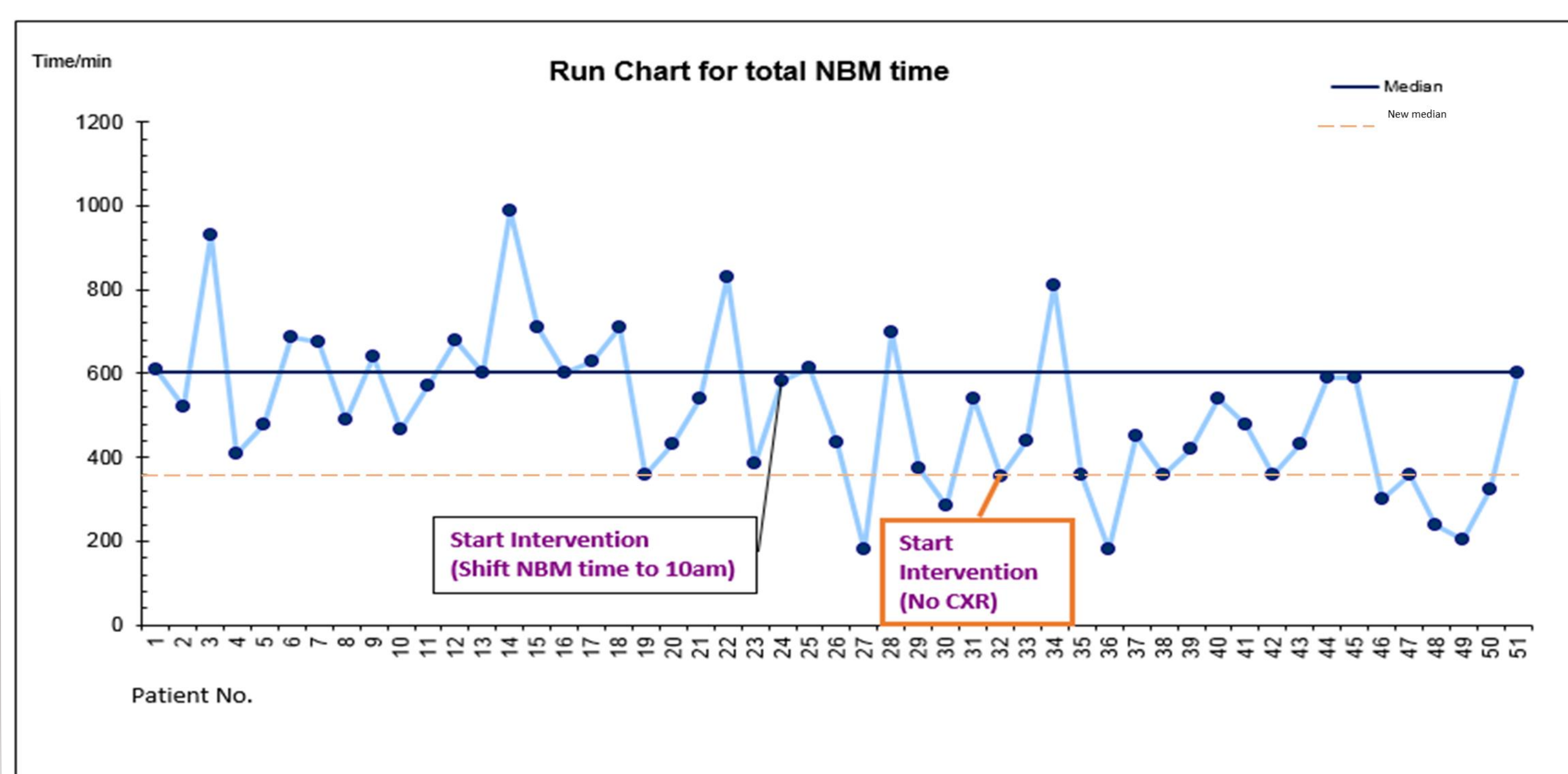


Figure 3. Total Fasting time (Phase I & II)

## 5. Conclusion and future work

Removing the needs of post TTC has helped to reduce total fasting time and has allowed patients to restart feeds earlier. Radiographic examination should, however, be performed after technically difficult procedures or if the patient experiences clinical deterioration post TTC.

Significant cost savings and minimization of radiation exposure can be achieved when chest radiography after tracheostomy is performed exclusively for clinical indications.

By removing routine CXR post TTC, patient is able to resume their feeds earlier and thus help to further reduce the total fasting time.

## 6. References

1. Donaldson, D. R., Emami, a J., & Wax, M. K. (2000). Chest radiographs after dilatational percutaneous tracheotomy: are they necessary? *Otolaryngology--Head and Neck Surgery : Official Journal of American Academy of Otolaryngology-Head and Neck Surgery*, 123(3), 236–9.
2. Tobler, W. D., Mella, J. R., Ng, J., Selvam, A., Burke, P. a, & Agarwal, S. (2012). Chest X-ray after tracheostomy is not necessary unless clinically indicated. *World Journal of Surgery*, 36(2), 266–9.
3. Yeo, W., Phua, C., & Lo, S. (2014). Is routine chest X-ray after surgical and percutaneous tracheostomy necessary in adults: a systemic review of the current literature. *Clin Otolaryngol.* 2014 Apr;39(2):79-88.