

Chest Drain Insertion In Trauma

Have we improved? - A 2020 Retrospective Study

Jenni Scott • Maria Brand • Andrew D MacCormick

Middlemore Hospital, Counties Manukau District Health Board (CMDHB)



INTRODUCTION

Tube thoracostomy (TT) in thoracic trauma is a common, often life saving procedure executed by many specialties. Complications associated with TT are frequent and are a significant cause of morbidity and mortality. One of the many factors affecting complication rates is the technical capability of the operator. Balhorn and MacCormick's retrospective audit at CMDHB, from 2012 – 2014, assessed indications for, demographics of patients requiring and complications associated with tube thoracostomy.¹

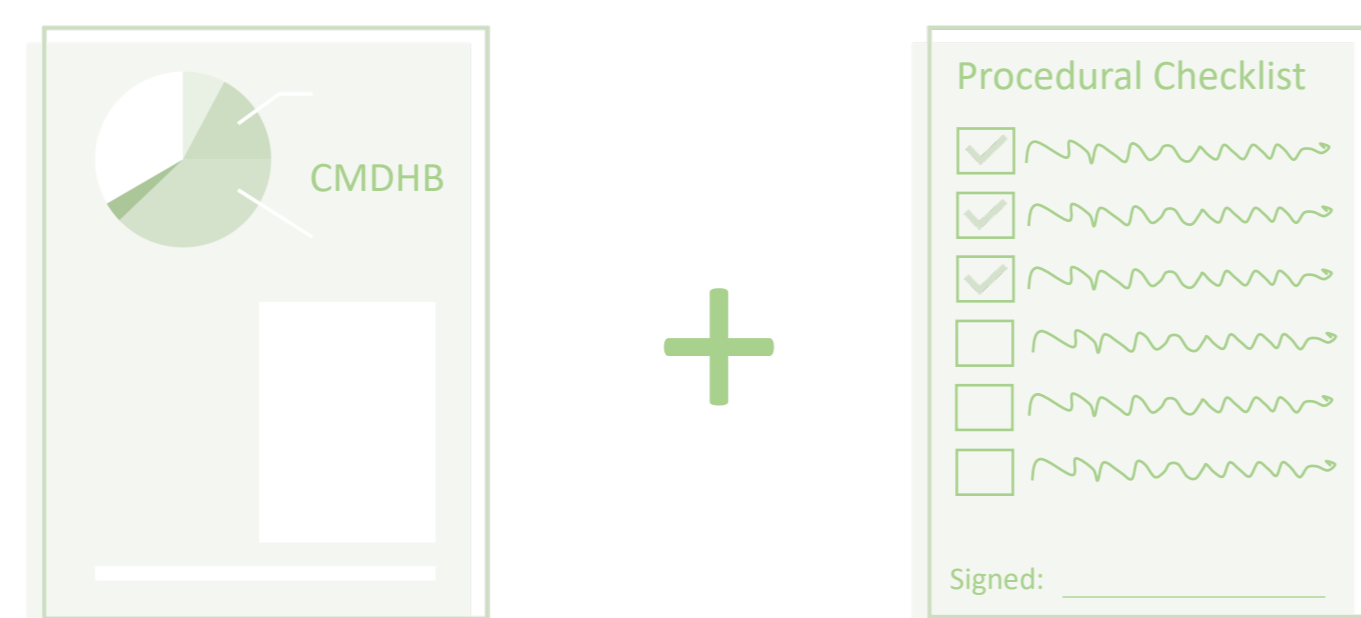
2012-2014 Audit Key Findings



With the goal of decreasing complication rates, CMDHB introduced a TT guideline and procedural checklist in July 2018.

CMDHB Guideline 2018

- ❖ Indications for Insertion
- ❖ Preparation for Insertion
- ❖ Directions for:
 - ❖ Open tube TT
 - ❖ Seldinger tube TT



AIM

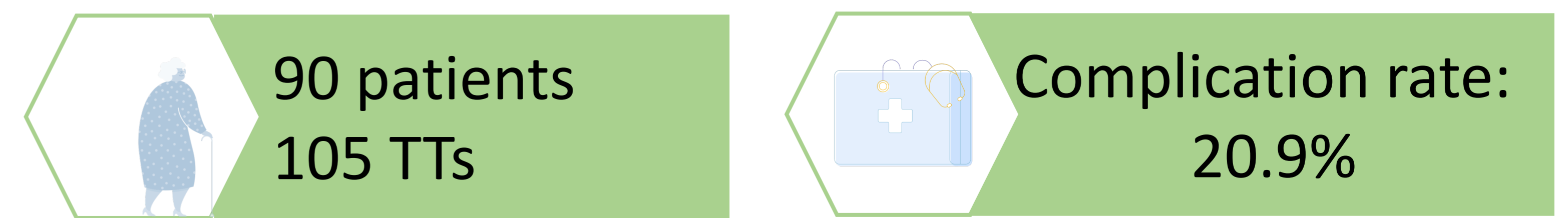
1. Assess if the 2018 CMDHB Guidelines + Procedural checklist were effective at reducing complication rates.
2. Evaluate differences in complications across specialties and seniority of the proceduralist

METHOD

The study population consisted of all trauma patients, over 16 years old presenting to CMDHB, from July 2018 – July 2020, with a diagnosis which may require a TT; pneumothorax, haemothorax, haemopneumothorax or tension pneumothorax (N=202). Those with a TT in situ on arrival or whose presentation was not secondary to trauma (e.g. spontaneous or iatrogenic pneumothorax) were excluded.

Data collected from electronic and physical patient notes included patient demographics, diagnosis, interventions and complications secondary to TT. Complications were grouped into positional (required manipulation of position), insertional (neurovascular injuries or intra-parenchymal insertion) or infective (wound infection, empyema).

RESULTS



There were a total of 22 complications; 16 positional, 4 insertional, 2 infective; with a rate of 20.9%

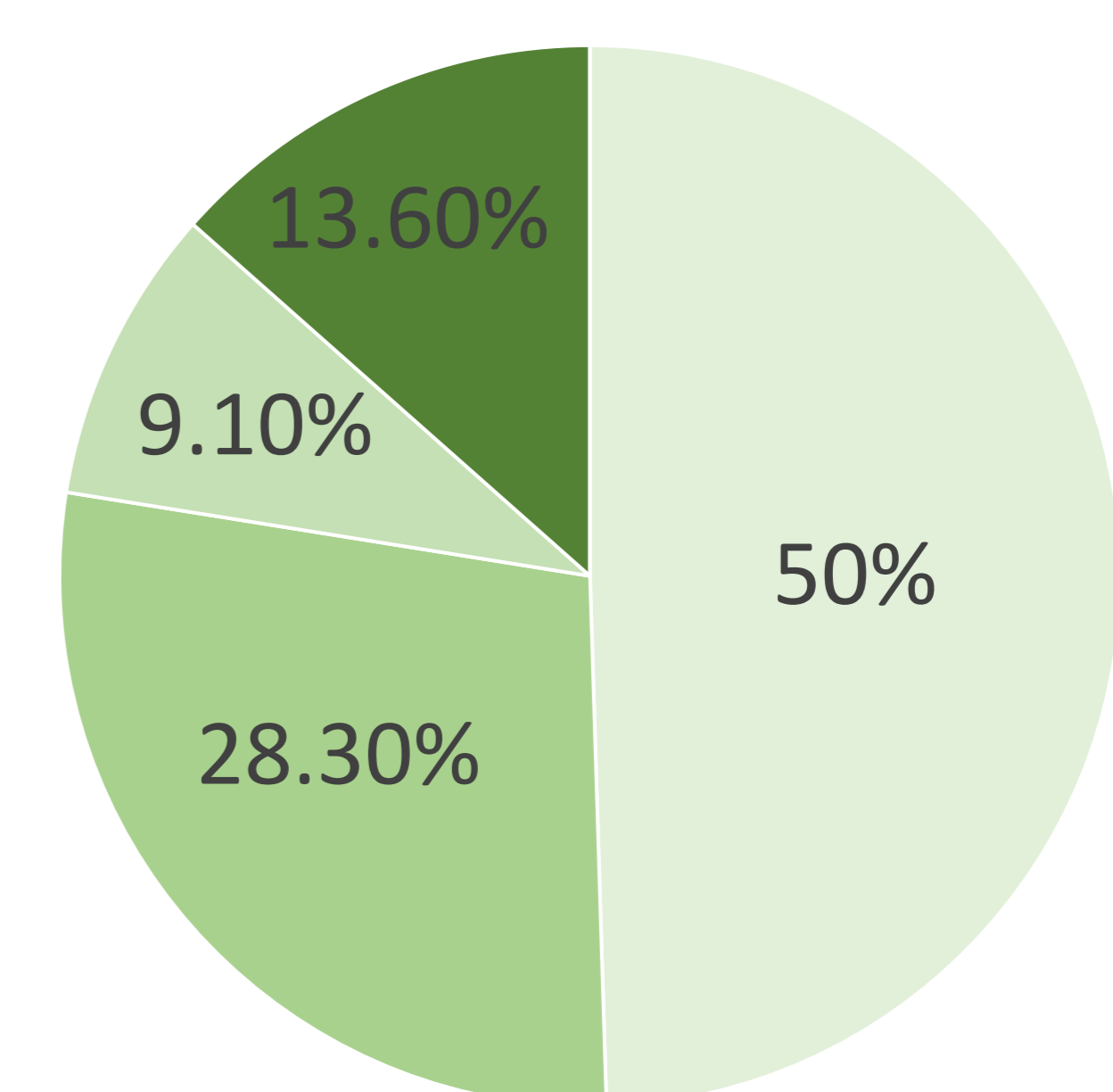
Men had higher rates of injuries, TT and complications from TT. NZ European was the most common ethnicity (50%), but Māori patients had a higher rate of TT insertion (51% vs. 44%, $p < 0.2$). Pacific Island patients had the highest complication rate at 37.5%.

Most injuries occurred secondary to a blunt mechanism; however penetrating injuries were more likely to require a TT (69% vs. 40.5%) and had higher rates of complications (28% vs 18.8%). Motor vehicle accidents (MVA) were the most common type of trauma to occur. However, patients presenting due to non-accidental injury were more likely to have a TT (65.7%) compared to falls, MVA and accidental injury ($p < 0.03$).

22 patients had occult diagnoses (CT only), of which 3 TTs were placed; 2 for haemothorax, 1 for pneumothorax. The median injury severity score (ISS) for those who had a TT was 17, but there was no difference in the ISS of those who did and did not have complications.

Total Complications

- General Surgery
- ED
- ICU
- Not documented



50% of all complications were by General Surgical registrars, but the rates of complications per specialty and seniority were highest in ICU house officers (50%), followed by ICU registrars (33.3%). 7.6% of chest drains that were inserted had insignificant information to determine who put in the chest drain, for which the complication rate was 37.5%.

CONCLUSION

The overall complication rate has not significantly reduced since the last audit despite introduction of a TT procedural guideline and checklist. This may be due to poor uptake of the guideline, which is not mandated. ICU had the worst TT complication rate, followed by General Surgery.