Assessing the likely impact of implementing a new ACS diagnostic algorithm based on 0h/1h high sensitivity troponin

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Introduction

- Current CTM UHB Chest pain guidelines are based on a 0h/3h algorithm utilising high sensitivity troponin T (hs-cTNT).
- Data from large multicentre studies shows that in patients with Acute Coronary Syndrome (ACS) levels of cardiac troponin rise rapidly (within 1 hour)[1,2].
- The European Society of Cardiology (ESC) have produced new guidance that supports the use of a 0h/1h algorithm allowing for an earlier "rule out" strategy[3].
- In 2020 St Thomas' Hospital implemented a new 0h/1h algorithm for ruling ACS in or out[4]
- We expect upcoming NICE guidance to also reflect this change.

Aim

To establish the potential impact of adopting a new 0h/1h algorithm for ACS diagnosis locally similar to that implemented in Guys and Thomas's hospital.

Method

- Retrospective observational study using troponin results on samples collected throughout the period of 2020-2022 (inclusive).
- Collected from the laboratory computer system covering Prince Charles and Royal Glamorgan hospitals.

References

1. Rubini et al. One-hour rule-in and rule-out of acute myocardial infarction using highsensitivity cardiac troponin I. Am J Med 2015; 128: 861–870.
2. Reichlin et al Prospective validation of a 1-hour algorithm to rule-out and rule-in acute myocardial infarction using a high-sensitivity cardiac troponin T assay. CMAJ 2015; 187: E243–E252.
3. Byrne et al. ESC Scientific Document Group 2023 ESC Guidelines for the management of acute coronary syndromes European Heart Journal, Volume 44, Issue 38, 7 October 2023, Pages 3720- 3826
4. Couch LS et al Rapid risk stratification of acute coronary syndrome: adoption of an adapted European Society of Cardiology 0/1-hour troponin algorithm in a real-world setting. Eur Heart J Open 2002;oeac048

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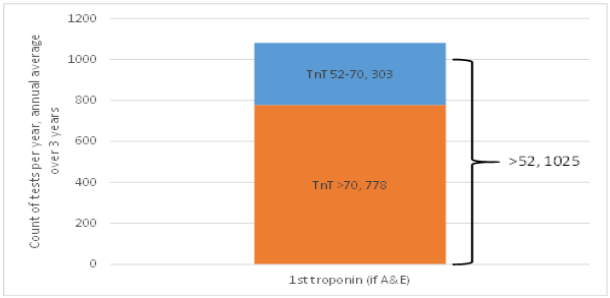
Results

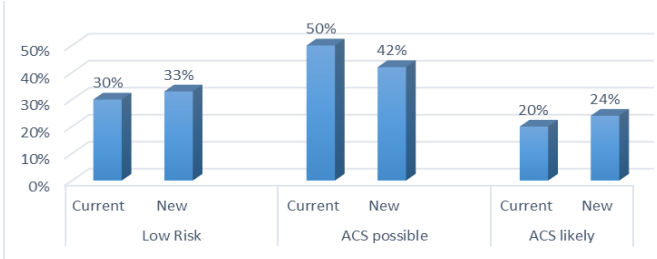
- 7154 troponins taken 3 hours apart and 209 samples taken 1 hour apart were analysed
- Utilising a cut off of hs-cTNT >52ng/L would result in an increase of an average of 303 patients per year designated "ACS likely"

Graph showing the impact of reducing the 'ACS likely' cut off from 70 to 52



- Repeat hs-CTNT at 1 h rather than 3h would result in 3% increase in patients identified as "low risk"

Graph showing proportion of patients assigned to respective ACS categories based on current and proposed new algorithm



Conclusions

- Applying the new algorithm could result in an average of 6 more patients a week designated "ACS likely".
- The average wait for inpatient coronary angiogram is 5-6 days. This may therefore have a significant impact on the number of inpatient bed days.
- Utilising a repeat troponin for ACS possible patients at 1h rather than 3 hr there is a 3% increase in patients identified as low risk who may be discharged sooner. This may help reduce pressures at the hospital front door