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Background

- Cardiac troponin is useful where Acute Coronary Syndrome (ACS), or select cardiorespiratory disorders, are suspected. However, it can be elevated for many other reasons.
- Often, elevated troponin is interpreted and treated as ACS even if other clinical features are unsupportive, which can be harmful due to the increased risk of bleeding¹. Furthermore, unnecessary troponin testing can lead to increased workload and financial cost, as well as prolonged patient stay².
- The clinical context should be carefully considered before requesting a troponin. Thorough history taking and recognition of cardiac risk factors (e.g. diabetes, hypertension, smoking, family history, and obesity), are important considerations in assessing the risk of ACS.

Aim

We aimed to: 1. Improve proportion of appropriate troponin requests (i.e. working diagnosis of ACS or reasonable alternative: myocarditis, pulmonary embolism); and 2. Improve recording of cardiac risk-factors.

Methods

- This quality improvement project identified patients with an admission troponin in Forth Valley Royal Hospital's admissions unit. A proportion of baseline troponins were initially requested by ED
- Clinical presentation, documentation of risk factors, ECG findings, and subsequent diagnosis and management were recorded
- Appropriateness of troponin requests were retrospectively adjudicated using the criteria above
- Audit findings were disseminated back to the department and education sessions were delivered between cycles, with a focus on rationalising the requesting process. It was reinforced that troponin should ideally be sent following medical review and that cardiac risk factors should be clearly recorded in admission documentation.

Results

- A total of 52 patients were included in this analysis. Three cycles of data were collected (baseline n=20, cycle 1 n=15, cycle 2 n=17).

Figure 1. Total study population: Initial presenting complaint

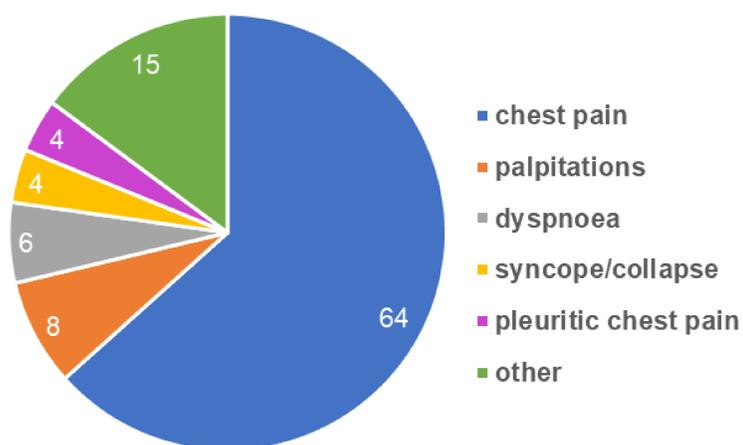


Figure 2. Documentation of Cardiac Risk Factors

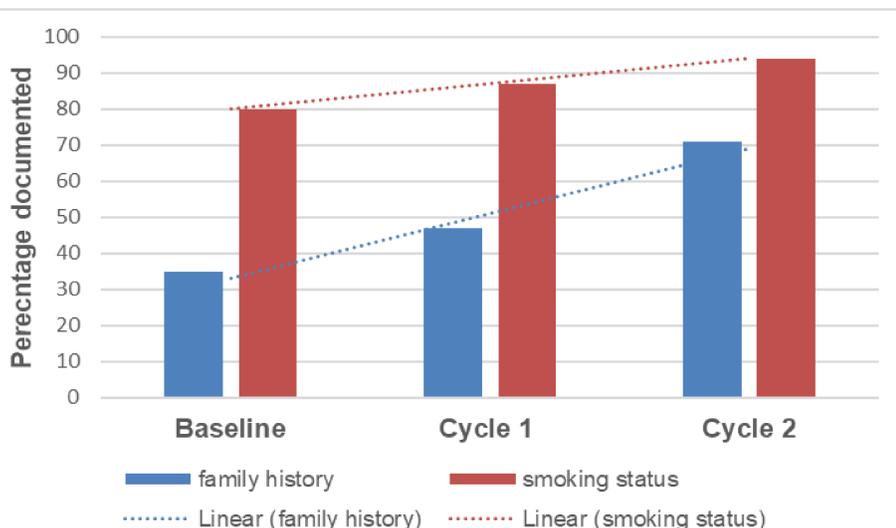
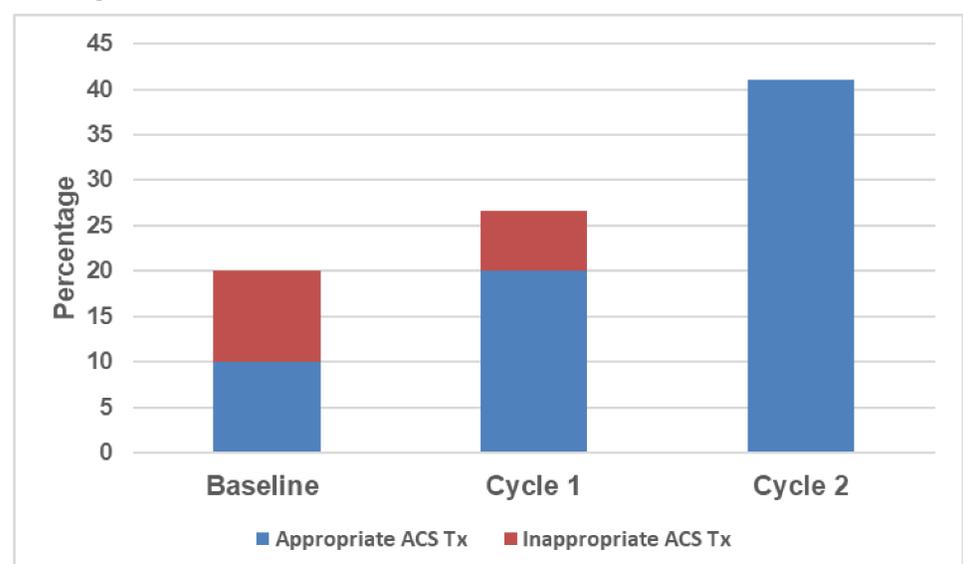


Table 1. Other Clinical Indicators influencing troponin appropriateness

	Baseline	Cycle 1	Cycle 2
ECG Changes			
Ischaemic (%)	15	13	25
Non-Ischaemic (%)	10	0	10
Differential diagnosis			
Ischaemic chest pain or reasonable cardiac differential (%)	50	67	76

Figure 3. Percentage of patients who received DAPT and Fondaparinux



Summary

- At baseline, 50% of troponins were appropriate, increasing to 66% in cycle 1, and 76% in cycle 2
- Recording of family history and smoking status improved following intervention. At baseline, family history was recorded in 35% of cases and smoking status in 80% of cases. In cycle 2, recording of family history and smoking status increased to 71% and 94% respectively
- At baseline, 10% of patients (n=2), inappropriately received full ACS treatment, while in cycle 1, this was 6.7% (n=1). In cycle 2, there were no cases of incorrect administration of ACS treatment

Conclusion

Troponin is unhelpful where ACS or other specified cardiorespiratory conditions are unlikely, and may be harmful. Targeted education improves cardiac risk-factor recording, and appropriateness of troponin requests by encouraging clinicians to think about how they will act on a result. Inappropriate ACS treatment was also reduced.

References

1. Morrow, A., Ahmad, F., Steele, C., McEntegart, M. and Murdoch, D. (2018). Treating the troponin: adverse consequences of over-treatment of elevated troponin in non-coronary presentations. *Scottish Medical Journal*, 64(1), pp.10–15.
2. Meng, Q.H., Zhu, S., Booth, C., Stevens, L., Bertsch, B., Qureshi, M. and Kalra, J. (2006). Impact of the Cardiac Troponin Testing Algorithm on Excessive and Inappropriate Troponin Test Requests. *American Journal of Clinical Pathology*, 126(2), pp.195–199.