Improved risk stratification, management and follow up of High Risk and Low Risk Cardiac Chest Pain Presentations to A&E

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Background:

1. Kingston A&E rules out ~20 ACS patients / day and admits ~50 ACS patients per month

2. Low risk chest pain pathways identified as priority by NHS England & NHS Improvement

3. However, at Kingston, in November 2019:

- There was no low risk chest pain pathway

- There was also large variation in clinical practice in the follow up for patients at low risk of ACS, with no dedicated clinic for such patients; no risk stratification to decide who follow up should be with; insufficient resources to perform urgent outpatient CT coronary angiography in low risk patients when indicated; and no audit trail for the number of patients that are required to be followed up

- No visible 0-3 hour troponin rapid rule out approved pathway in A&E, resulting in large variation in clinical practice, with some clinicians still using 12 hour troponin rule out

- We were in the lowest performing tertile of DGHs in South London in transferring ACS patients through the Inter-Hospital transfer process. Problems included a lack of awareness of who could refer ACS patients to Tertiary Hospitals, unreliable ambulance transport resulting in delays and cancellations, and inefficient nursing/medical communication between Kingston and Tertiary Hospital
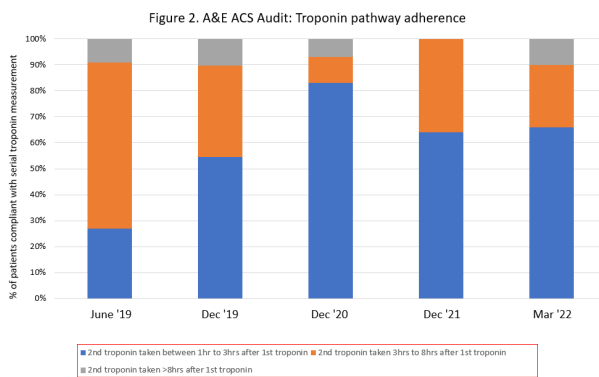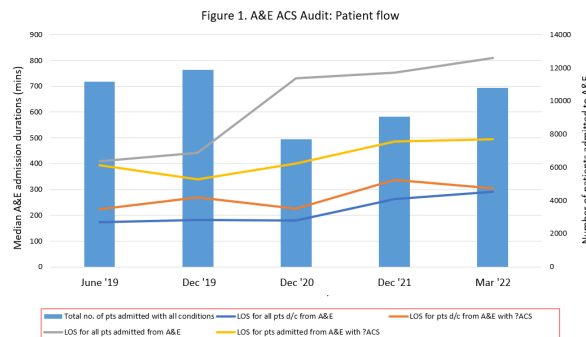
OBJECTIVES

1a. Implement high and low risk chest pain pathways incorporating ESC rapid rule out hs troponin pathway (troponins taken at 0 hours +/- 2 hours post admission), with extensive guidance on management of ACS.

1b. Establish and imbed discharge pathways (i.e. GP vs ACS Hot Clinic vs RACPC), based on risk stratification with symptoms & HEART score.

2. In patients with/at high risk of ACS, to expedite PCI at a local Tertiary Hospital, by: i) reducing the time to referral of such patients onto the electronic telelogic inter-hospital transfer (IHT) system; and ii) improving transport and communication portals with tertiary PCI-capable hospitals.

PROGRESS

I negotiated, after liaison with Kingston Head of Transport, a new ambulance provider for inter-hospital ACS transfers (Mar '20), and created new mobile phone app communication portals with Kingston ward and tertiary centre cardiac catheter laboratory staff.

I oversaw a retrospective audit of acute medical admissions with ? ACS, performed in Dec '19, which demonstrated the potential utility of HEART score to facilitate safe discharge of low risk patients to an ACS hot clinic.

I co-wrote high and low risk chest pain pathways with David Wilson, A&E Consultant. Pilot of draft pathway in A&E (Nov '20). I ratified into trust guidance after presentations at clinical effectiveness (July '21) and medicines (Feb '22) committee meetings. Pathways laminated and distributed across A&E, Acute Admissions Unit and Cardiology (Feb '22).

I co-appointed an ACS nurse at Kingston (Sept '21), and oversaw a prospective audit of RACPC referrals in (May '21) which demonstrated ~8 suitable referrals for an ACS hot clinic per week (which were inappropriate RACPC referrals).

Successful £21k award received for ACS pathway implementation from South London Healthcare Innovation Network (HIN): to fund additional ACS nurse post, and data solution to set-up and run ACS Hot clinic.

Additional IHT link with Royal Brompton Hospital negotiated Oct '21. CTCA capacity uplift due May '22 through acquisition of new CT scanner.

METHODS: 1. RETROSPECTIVE AUDIT OF A&E ADMISSIONS

We set out and performed a retrospective analysis of patients presenting to A&E with cardiac sounding chest pain. We analysed data of the 1st 50 patients a month for baseline months of June '19 and Dec '19; then Dec '20 and Dec '21; and also Mar '22 to assess any effect of education and distribution of laminated pathways in Feb '22. Inclusion criteria: >18 years old, cardiac sounding chest pain. Exclusion criteria: ST Elevation Myocardial Infarction (STEMI). The audit department gathered retrospective data from patients coded in A&E with the diagnosis of ACS, together with the laboratory's troponin data. Patients having their 2nd troponin between 1-3 hours after their 1st were classified as following the up-to-date pathway. This decision was made as it would pass the troponin CQUIN. Patients were otherwise classified as having a 2nd troponin between 3-8 hours/>8 hours. Length of stay (LOS) in A&E and in hospital was measured, and benchmarked against the LOS and number of patients presenting to A&E for all conditions. Time to follow up and to 1st OP investigation noted. Eligible patient data was analysed in Excel.

Figure 1. A&E ACS Audit: Patient flow

Legend:
- Total no. of pts admitted with all conditions
- LOS for all pts d/c from A&E
- LOS for pts d/c from A&E with ?ACS
- LOS for all pts admitted from A&E
- LOS for pts admitted from A&E with ?ACS

Figure 2. A&E ACS Audit: Troponin pathway adherence

Legend:
- 2nd troponin taken between 1hr to 3hrs after 1st troponin
- 2nd troponin taken 3hrs to 8hrs after 1st troponin
- 2nd troponin taken >8hrs after 1st troponin

Table 2. Inter-hospital transfer data

Six Month Period	Kingston Angiography / PCI Transfers	% Referred within 2 Days of Admission	Median Days: Referral to Procedure	Median Days: Procedure to Discharge
Apr 19 - Sep 19	64	56%	4	2
Oct 19 - Mar 20	65	66%	5	1
Apr 20 - Sep 20	73	75%	3	1
Oct 20 - Mar 21	70	77%	2	1
Apr 21 - Sep 21	106	71%	5	1
Oct 21 - Mar 22	96	70%	3	1

ACKNOWLEDGEMENTS

METHODS: 2. PROSPECTIVE AUDIT OF IHT TRANSFERS

Prospective patients referred from Kingston on the telelogic IHT system were analysed on a rolling 6-monthly basis from April '19 (commencement of data collection). Number of referrals; and median times (days) for admission to referral / referral to procedure / procedure to discharge were noted. Eligible patient data was analysed in Excel.

RESULTS

1. Over these five analysis periods, 70% (584/834) of patients were excluded as, on review of patient records, A&E clerking did not suspect ACS (therefore A&E coding was inaccurate). 56% of the included 250 patients were male, with age 64±24 years (median±IQR), and HEART score 4±3 (median±IQR). The % of patients requiring either inpatient angiography or CTCA varied from 14% (Dec '21) to 34% (Mar '22). LOS in A&E (both for patients directly discharged, and those admitted) is shown in Figure 1: overall LOS (in patients with ?ACS) increased despite ACS pathway implementations, but LOS also significantly increased for all patients presenting to A&E due to COVID and escalation pressures. Median inpatient LOS was 1 day across all analysis periods. Figure 2 shows an improvement in the % of patients with troponin pathway adherence with ACS pathway implementations, but this was most notable in Dec '20. Cardiology follow up was arranged in 27% of patients after 29±37 days (median±IQR), and cardiac anatomical or functional stress testing arranged in 14% of patients after 44±30 days (median±IQR).

2. From Apr '19 to Mar '22, there were 474 IHT referrals made (Table 2). % of patients referred within 2 days improved with ACS pathway implementations, and has been reasonably sustained despite ~50% uplift in IHT referrals since Apr '21. Median time from referral to procedure has improved, but was adversely affected by volume of referrals in Apr-Sep '21. Median time from procedure to discharged has remained constant.

CONCLUSIONS

1. Coding of high and low risk chest pain patients needs to be improved to allow easier data monitoring: this will require discussions with business intelligence (BI) team alongside training A&E doctors to better risk stratify patients according to our pathway. Regular nurse training needs to be undertaken to embed the importance of hs troponin pathway adherence. Outpatient investigations and follow up were slow, and remain a target: use of HIN £21k award to recruit additional ACS nurse to set up hot clinic to improve this, and improve LOS.

2. Improvements seen in the speed of referring patients on IHT system were encouraging. Recent deterioration in performance likely related to increased IHT referrals, and ward physician associate vacancy since Oct '21. Recruitment to this post, alongside continued IHT training through ACS nurse provision will help improve this. The additional IHT link with the Royal Brompton Hospital since Oct '21 has undertaken 15% of IHT referrals, and has helped with increased demand. Same day discharge pilots post PCI are being developed for each linked tertiary centre.

REFERENCES

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