Audit & Quality Improvement

A Completed Audit Cycle of Airway Equipment on Resuscitation Trolleys at the Royal Oldham Hospital

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Aim

This audit was prompted by facing repeated situations with unsatisfactory airway equipment on resuscitation trolleys across our hospital. We inspected all the resuscitation trolleys to check the compliance with the UK Resuscitation Council standards (¹).

Methods

Three snapshot checks of resuscitation trolleys took place in three consecutive years 2011, 2012 and 2013. Both basic and advanced airway equipment checked according to the Pennine Acute Hospitals NHS trust policy (²). A standard re-usable blade was used to test the fibre-optic laryngoscope handles.

Results

70%, 41% and 34% of the trolleys did not meet the minimum standards of two working laryngoscopes in the first, second and third audit respectively.

In the second audit, we found 37% of the trolleys did not have adequate number of blades; this was reduced to 27% in the third audit cycle.

3.7% of trolleys in 2012 had every piece of equipment as recommended by the Resuscitation Council, that witnessed an almost a four-fold increase to 15% in the following audit cycle.

Most of the trolleys were disorganized, equipment was scattered between drawers, with additional unnecessary equipment blocking the drawers. We also found two trolleys blocked by chairs and rendered inaccessible.

Conclusion

Suboptimal number of trolleys met the resuscitation council guidelines despite clear guidance on the minimum standard of equipment. Some improvement has been achieved following feedback but we still have not reached the target.

The presence of incompatible blades with laryngoscope handles and significant lack of other necessary airway equipment represent a major hazard with direct impact on patient safety.

References

2. Pennine Acute Hospitals NHS trust policy – Adult resuscitation box/trolley contents and layout – trust resuscitation policy EDC015 V5.2
Audit & Quality Improvement

An analysis of CTPA requests in the AMU department

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University Hospital of North Staffordshire

Aim

Pulmonary embolism is a medical emergency. The overall mortality ranges from 3.5-25%. There might be very few signs and symptoms and therefore a high index of clinical suspicion is required.

The requests for CTPA have been increasing as it is the gold standard for diagnosing PE.

The aim of this audit was to see if there has been clear documentation of Wells score in patients presenting with a clinical suspicion of PE and to determine whether D-Dimer and/or CTPA requests were appropriate.

This audit also looked at CTPA in providing alternate diagnosis.

Methods

Retrospective analysis of 88 CTPA requests for a period of 3 months from April-June 2013 in the AMU department at UHNS. Data was collected from the request forms and PACS system.

Results

Only 48.86%(43/88) of the CTPA requests from AMU had pre-test probability score assessed and documented.

D-Dimers were requested appropriately in 88.8%(16/18) of low/intermediate risk probability cases.

However D-Dimer was done inappropriately in 96%(24/25) of high probability cases.

Only 53.4%(47/88) had an erect PA CXR film done.

Out of the negative CTPA results for PE 53.4%(31/58) did not have pre-test probably assessed or documented.

Alternate diagnosis and explanation for the patient's presentation was found in 62.1%(36/58) of negative CTPA requests. This included effusion (27.7%), consolidation (25%), emphysema (19.4%), malignancy (13.8%), inflammatory (8.3%) and miscellaneous findings (5.5%).

Conclusions/Recommendations

All patients with a clinical suspicion of PE should have a pre-test probability done. This should be clearly documented in the admission notes and in the CTPA requests.

All D-Dimer requests should be accompanied by a pre-test probability score thereby reducing inappropriate D-Dimer requests.

Through proper assessment and documentation of pre-test probability, the number of inappropriate D-Dimer and CTPA requests could be greatly reduced. This would also avoid unnecessary exposure of patients to radiation and direct the resources where it is needed the most without compromising patients' safety.
Audit & Quality Improvement

An audit of the adequacy of documentation and consent for adult diagnostic lumbar puncture by medical trainees.

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Queen Elizabeth Hospital King's Lynn NHS Foundation Trust

INTRODUCTION:

Good record keeping is essential and, according to GMC guidance Good Medical Practice (2013) (paragraph 19-21), a fundamental part of a doctor’s duties. 1

There were concerns that patients undergoing diagnostic lumbar puncture (LP) in our Trust were not being adequately consented and that documentation of the process was poor.

AIM:

To determine:

-whether medical trainees were formally consenting patients for LP.

-whether the procedure was adequately documented.

If results were sub-optimal undertake intervention to improve this.

METHODS:

A retrospective audit was conducted.

Patient records were randomly selected from a clinical coding list and collected by the audit department.

-Criteria and Standards

-100% patients should have eight essential components of the procedure recorded (as determined by the Trust’s LP Working Party).

-100% should have a consent form completed.

RESULTS:

-Result of 1st cycle:

-29 records

Consent:

-6% (n=2) had consent forms.

Documentation:

Overall, documentation of the procedure was poor and often difficult to read.

(See Figure 1)
-Intervention:

-A LP training scheme for all medical trainees including the importance of consent and documentation.

-Introduction of a care bundle and procedure sticker (see Fig 2), containing the eight essential components, to be completed and entered into the patient record.

-Result of 2\textsuperscript{nd} cycle:

-25 records selected from LPs performed after intervention.

  Consent:

-76\% (n=19) had consent forms.

  Documentation:

(See Figure 1)

CONCLUSION:

-Introduction of a care bundle with procedure sticker improves documentation.

-Training improves the completion of consent form for LP.

-This approach could easily be applied to other medical interventions.

REFERENCES:

\textsuperscript{1}General Medical Council (2013) Good Medical Practice London, General Medical Council, paragraphs 19-21
THROMBOLYSIS IN ACUTE ISCHAEMIC STROKE, A DISTRICT GENERAL HOSPITAL EXPERIENCE

Fraser Brown, Mohammad Iqbal
South Tyneside NHS Foundation Trust

AIMS:

Time is a key factor in the assessment and treatment of acute ischaemic stroke. The aims of this audit were to identify the time intervals between the CT scan, Alteplase bolus dose administration and the infusion administration in patients diagnosed with an acute ischaemic stroke and to determine how treatment of acute ischaemic strokes is delivered within the trust.

METHODS:

Data was collected on 26 patients admitted to South Tyneside District Hospital between 25/4/12 and 11/4/13 diagnosed with an Acute Ischaemic Stroke and who received appropriate thrombolysis. One patient was excluded as the kardex was missing from the case notes. Information was gathered from the admission notes, drug kardex and Radiology Centricity service.

RESULTS:

25 cases were included in the final analysis, with all patients received a CT scan and and thrombolysis within 4.5 hours. For the CT scan to treatment time interval, the median was 34 minutes and the mean was 46 minutes. Only 12% of patients received the bolus dose within 15 minutes and 8% waited over an hour following the scan. For the bolus to infusion, The median bolus to infusion time was 10 minutes and the mean was 11.8minutes. 43% of patients received the infusion within 5 minutes of the bolus and two patients waited over 30minutes.

CONCLUSION:

The data suggests delays between the key stages of investigation, bolus delivery and infusion. There was no clear reason in the data for this delay but a clearer stroke thrombolysis pathway may improve treatment delivery.

REFERENCES:

Audit & Quality Improvement

ANEURIN BEVAN HEALTH BOARD END OF LIFE ADMISSIONS AUDIT

James Davies, Debbie Jenkins, Emma Mason, Meg Williams
Aneurin Bevan Health Board

AIM

Advance care planning (ACP) is fundamental to providing high quality care to those approaching end of life\(^1,2\). The aim of the study was to explore whether palliative patients with an unscheduled admission had an ACP in place.

METHODS

A retrospective cohort of patients who died within 48 hours of admission across Aneurin Bevan Health Board in South Wales for 1 month (mid April-mid May 2012) was identified. Patients who died from a sudden and unexpected cause were excluded. The remainder of patients were assessed using the clinically validated ‘surprise’ question\(^3,4\) and classified palliative if the answer was ‘no’. The case notes were reviewed and data collected on a standardised collection proforma.

RESULTS

Of 50 patients in the original cohort, 34 were sudden and unexpected, with the other 16 deemed palliative (3 were discarded due to incomplete data). 69% were admitted out of hours. 77% had a performance status of 3 or above (100% from nursing homes had a performance status 4). 100% had recent admissions prior to death (median = 3), but only 2 had an ACP.

CONCLUSION

A proportion of patients nearing end of life are dying in hospital. Our study has highlighted the absence of ACP for the majority of these patients, and missed opportunities during their multiple previous admissions. The emphasis on ACP appears focused on the community setting\(^2\), but a cultural change within secondary care may facilitate a wider appropriate use of the ACP.

REFERENCES

1. General Medical Council. Treatment and care towards the end of life: good practice in decision making 2010

2. Royal College of Physicians London. Concise Guidance to Good Practice number 12: Advanced care planning 2009


Audit & Quality Improvement

Prospective Audits of Initiation of Non-invasive Ventilation at University Hospital Ayr Hospital to inform a Regional Post-Graduate Training Programme.

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Introduction:

Chronic Obstructive Pulmonary Disease (COPD) accounts for one in eight emergency hospital admissions [1]. Non-invasive ventilation (NIV) is widely used to treat acute type two respiratory failure in such patients, improving mortality by up to 50% [2]. We hypothesised our practice in NIV initiation falls short of standards set by the British Thoracic Society’s (BTS) guidelines [3] and aimed to inform a post-graduate education programme.

Method:

Two prospective audit cycles each of 30 patients at University Hospital Ayr; the first August – December 2012, second May – September 2013. Patients started on Bi-level Positive Airways Pressure NIV from A&E or wards were included. Parameters audited: patient selection, diagnosis, NIV set up, ABG monitoring, and documentation of 1) NIV prescription 2) clinical plan should NIV fail, and 3) discussion with consultant. Transfer time from A&E to Medical High Care (MHC) was noted. Initial results presented at medical and A&E meetings, junior doctors made aware of BTS guidelines and an updated “Initiation of NIV” protocol was distributed. Data stored and analysed using Microsoft Excel.

Results:

Improvement was seen in NIV set up but documentation remained poor. See Figure 1 and Table 1 (of uploaded copy) for results.

Conclusion:

Our standards remain sub-optimal despite initial interventions. We therefore believe education for nursing and medical staff is paramount to improve our service and needs to be repeated at medical staff changeovers; we are designing such a training programme.
Audit & Quality Improvement

Weekend Patient Flow Quality Improvement Project

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Ulster Hospital Dundonald

Aim

Maintaining patient flow at weekends is of crucial importance, and particularly challenging given reduced staffing. An electronic system is used in the Ulster Hospital to identify potential discharges but criteria for discharge are not always well defined. We aimed to improve quality and clarity of weekend handover and, consequently, discharge rates.

Methods

We devised a handover sticker which could be placed in patient notes following Friday’s ward round to summarise the current admission with objective, goal based criteria for discharge. We sought feedback from junior doctors regarding what extra information would aid weekend discharges, amending the sticker accordingly. The stickers were then placed in the notes of sixty AMU patients during December 2013, with a further questionnaire distributed in January to assess user response.

Outcomes

Responses were obtained from 20/44 doctors. Of those who had used the sticker, 100% agreed that the weekend handover sticker made it easier and quicker to carry out their weekend review. All respondents agreed that the sticker would make them more confident to discharge a patient over the weekend, and all agreed this handover process should be extended to other medical wards. Improvements suggested included addition of ‘suitable to outlie’ and ‘nurse-led discharge’ sections.

Conclusions

Staff response to this project was extremely positive. Placement of a clear summary with discharge criteria in patient notes streamlined the weekend review process and improved junior doctor confidence. We aim to extend the usage of this sticker across other medical wards with amendments based on the feedback obtained.
Implementing effective measures to rapidly treat severe sepsis is challenging. In the UK promotion of sepsis six in the first hour is the current National objective. (2,3) Audit of a busy AMU revealed that only 1 patient in 30 received sepsis 6 in 1 hour (4).

Aims

To implement a multidisciplinary sepsis working group (SWG) to improve management of severe sepsis

Methods

The SWG is a multidisciplinary team (MDT) formed in July 2013. It implemented a holistic programme to diagnose and treat severe sepsis. This approach involved: a sepsis management tool (SMT), lanyard card, posters, sepsis trolleys, rolling teaching, antibiotic guidelines, sepsis ward champions, world sepsis day participation, e-learning module, media support and motivating for a trust sepsis nurse (image 1)

Outcomes

Re-audit of severe sepsis cases (July to September 2014) receiving the sepsis 6 care bundle in 1 hour revealed an overall improvement of 3 to 11% (5). Patients receiving 5 or 6 elements of the care bundle increased from 13% to 57%. All patients with severe sepsis received antibiotics in both audits but time of first hour administration improved from 10% to 70% (image 2)

Conclusions

Following this work a sepsis referral site has been set up to urgently review sepsis cases, the SMT is part of the clerking proforma and a sepsis nurse for the trust has been approved.

A multidisciplinary approach facilitates ongoing evaluation of severe sepsis identification and management. This has resulted in a dynamic proactive approach to this serious problem which is an ongoing project.


3. Ron Daniels; Surviving the first hours in sepsis: getting the basics right (an intensivist's perspective); J Antimicrob Chemother 2011; 66; suppl 2:ii11-ii23.


Aim

Pulmonary embolism (PE) is a common acute cardiorespiratory condition that can often be safely investigated and managed in an ambulatory setting. We examined the characteristics of patients referred with suspected PE to our Ambulatory Day Unit (ADU) to establish the effectiveness and safety of this pathway.

Method

We retrospectively reviewed referrals to ADU with suspected PE over a two year period. In cases with confirmed PE the presenting symptoms, treatment, and 30-day outcomes after diagnosis were examined. Alternative diagnoses were determined and number of inpatient bed-days saved estimated.

Results

299 patients were referred with suspected PE. Referrals were made from secondary care (78%) and primary care (22%). PE was confirmed in 109 patients (36%) (Figure 1). The most common presenting symptom in patients with confirmed PE was dyspnoea (51%) (Figure 2). The majority of patients were discharged on an oral vitamin K antagonist (84%). Two of the patients with confirmed PE (2%) were admitted to hospital due to large clot burden but neither received thrombolytic therapy and both had good outcomes. No other complications were noted. A total saving of 735 inpatient bed-days was estimated.

Discussion

Low risk PE patients can be managed safely in an ambulatory setting. In 2/3 of patients, PE was excluded and thus inappropriate admissions were avoided. Documentation of alternative explanations for symptoms in patients without PE was lacking and needs improvement. With increasing numbers of acute medical admissions, there remains scope to increase our ADU workload for conditions such as low risk PE.
Audit & Quality Improvement

Assessment of Physical Activity in Hospital and Junior Doctors’ Awareness of Current Guidelines.

Alice Tipton, Emma Davies
NHS

AIM:

Four lifestyle factors are recognised to lead to health inequality; smoking, alcohol, obesity, physical activity (PA). Smoking, obesity and alcohol consumption are usually assessed on admission to hospital; but not PA. Physically active people have 20-30% reduced risk of premature death and up to 50% reduced risk of chronic diseases.

In 2009 the national health promotion in hospitals audit recommended;

- All trusts ensure they are aware of community weight loss and PA programmes and establish referral processes to the programmes.
- The standard set was 35% of people should have their PA level assessed and 45% of physically inactive should have health promotion delivered.

This audit compared the practice at Doncaster Royal Infirmary with the national standard and the level of knowledge already present in junior doctors.

METHODS:

Data were collected from 40 sets of MAU/medical short stay patient notes in February 2014 on the following;

- Age
- Gender
- Presenting complaint
- Smoking status/advice
- Alcohol history/advice/treatment
- Mobility level/assessment
- PA level/advice.

Subsequently a survey was carried out anonymously asking junior doctors what knowledge they had of current PA guidelines.

RESULTS:

63% patients had smoking status recorded (standard (S) = 100%)

60% patients had alcohol consumption recorded (S = 95%)

72% patients had mobility level recorded (S = 90%)

18% patients had PA level recorded (S = 35%)
0% smokers received smoking cessation advice (S = 35%)

100% harmful drinkers received health promotion (S = 50%)

0% of physical inactive people had health promotion on PA (S = 45%)

With respect to the junior doctors questionnaire; out of 46 respondents.

85% knew there were guidelines regarding PA.

56% knew these guidelines were produced by the government.

22% knew the amount of PA recommended for adults.

20% knew the amount of PA recommended for people over 65.

**CONCLUSION:**

This audit demonstrates deficiency in documentation of, and health promotion for PA and mobility. Likely this is linked to lack of knowledge on behalf of the junior doctors. The auditors have subsequently provided information to all the junior doctors regarding the health promotion and PA. We will reaudit to demonstrate the impact of the above.
Aim

Clinicians are aware of management of common conditions; despite this, incident reporting within the hospital highlighted quality of care provided was suboptimal. This led to the development of care bundles for common medical emergencies presenting to acute medicine. Based on best evidence available, the aim was to provide optimal quality of care and reduce complaints.

Methods

To date 18 bundles have been developed-17 for conditions and 1 procedure-based. The bundles are accessible via the intranet, with a single page sticky label design (see example). The bottom half provides a guide to evidence-based management for the condition which can be stuck into the patient notes. The top half is collected providing a clear audit trail thus supporting clinical governance.

Outcomes/Results

Started in August 2013; number of bundles used to date is 734. Three specific bundles were audited (using 25 sets of notes pre and post introduction) to assess the quality of care. The bundles chosen were community acquired pneumonia (CAP), acute coronary syndrome (ACS) and the lumbar puncture procedure. The key findings were:

CAP-average length of stay reduced by 1 day, and sputum and blood culture rates increased significantly.

ACS-more than 75% of patients have their GRACE score assessed on admission.

Lumbar puncture-better information was provided ensuring informed consent, complications reduced, and documentation greatly improved.

Conclusion

Standard of care improved with the use of the care bundles. Additionally, the bundles received positive feedback from trainees, the specialities, and improved documentation for Clinical Coding.
Audit & Quality Improvement

The “Dummer’s” Guide to Med Rec

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¹NHS Lothia, ²NHS Lothian

Introduction:

Medicines reconciliation(aka Med Rec) is defined as a list of a patients medications, confirmed with evidence from at least 2 sources, one of which ideally should be the patient that has clear instructions as to whether each medication is to be continued stopped or withheld and should be signed and dated. Errors have been shown to have the potential to cause significant harm to patients and are a frequent cause of re-admission to hospital.

Method:

We undertook a snapshot audit of the medicines reconciliation of patients on admission to the acute medical receiving unit. The following data was recorded: list of medications present or absent; whether 2 sources were used: which sources; instructions as to medication continuation; accurately prescribed; the number of drugs in total; signature and date present; grade of reconciler; time of reconciliation. We collected data on 44 patients, implemented an education programme and re-audited following this programme. The programme consisted of a series of posters titled “the Dummer’s Guide to Med Rec” which showed in 6 easy steps how to accurately complete the medicines reconciliation.

Results:

After the education programme there was an increase from 11% of the patient having a med rec completed correctly to 34%.

Conclusions:

This audit shows that education of doctors in the importance and process of medicines reconciliation can make improvements in the quality of med rec which will have subsequent benefits to patient care. We used these results to further target an ongoing education programme for junior doctors and inform an ongoing review into admission documentation.
Audit & Quality Improvement

Audit on the Quality of Prescribing at the Acute Medical Admissions Unit at Cheltenham General Hospital

Elisabeth Cook, Leela Gill
Cheltenham General Hospital

AIM

This audit aims to assess the legal and clinical quality of prescribing on acute medicines admissions – Acute Care Unit C (ACUC). The majority of prescribing errors occur when patients are first admitted to hospital\(^1\). EQUIP found an average error rate of 8.9\% for all prescribers\(^1\), with others showing that educational interventions benefit prescribing\(^2\). Currently Foundation Year (FY) doctors at Cheltenham General Hospital have a general induction including prescribing according to the Policy for Ordering, Prescribing and Administering Medicines (POPAM), and a rotation-specific induction for ACUC.

METHODS

Data was collected on ACUC over five days (total 50 charts and 450 prescriptions). Drug charts were assessed using a data collection form for legality and completeness as per POPAM and clinical appropriateness. Ethics approval was not required.

OUTCOMES/RESULTS

Of charts audited, 84\% had suitable patient identifiable details and 96\% had completed allergy sections (both n=50). For legal aspects, 94.67\% were considered complete; of clinical appropriateness, 97.56\% were considered correct (both n=450). The FY1 error rate was 7.22\% (n=97); the highest error rates were for Core Trainee year 1 (CT1) doctors (25.55\%, n=137) and Specialist Registrars (25.36\%, n=138).

CONCLUSION

Prescribing is generally good. The high error rate of CT1 doctors and registrars requires targeted educational interventions as well as FY doctors (error rate comparable with EQUIP)\(^1\). Recommendations include presentation of audit results to ACUC medical staff and discussion of education/support required and type of feedback preferred, an additional prescribing education session for new acute medicine doctors, and re-audit with personalised peer-compared feedback.

REFERENCES


Audit & Quality Improvement

Developing an electronic mortality tracker: Improving upon standard reporting indices

Anna Austin, Natalie Powell
East Surrey Hospital

Aim

Despite high adjusted mortality rates, the abundant warnings of sub-optimal care came too late for Mid Staffordshire NHS Trust (1). Inpatient mortality factors cannot necessarily be elucidated by haphazardly structured local mortality meetings and standardised indices. Alternative methods of data collection and analysis are needed.

Methods

An electronic mortality database linked to the admission system was developed. Each death undergoes preliminary electronic review, including categorisation to identify the most unexpected. Such deaths are then subject to quarterly detailed multidisciplinary review. Six months of data was analysed since the system became operational and recommendations collated.

Results

The system identified 603 deaths for which 483 had preliminary reviews completed. Graphs and charts allowed easy analysis by variables including day of the week, length of stay and patient age to track trends over time. Mortality was higher for those ≥75yrs and for length of stays over 8 days. No significant variation was seen in the numbers of deaths on weekdays (14.0%) compared to weekends (14.4%) nor in hours (56%) versus out of hours (44%). MDT recommendations created a permanent online record of key problem areas including frequency of physiological parameters and adherence to surviving sepsis proformas.

Conclusions

An electronic database allows mortality to be tracked in a meaningful and transparent way and adds value to standardised mortality measures. It allows clear identification of local issues relevant to mortality that can prompt responsive action to improve patient safety. Such systems can promote both clinician and organisational learning for the benefit of patient care.


Audit & Quality Improvement
Safety owned by junior doctors: tripled handover compliance sustained for 6 months

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Ysbyty Gwynedd

AIM

A lack of quality handover can lead to adverse events and increased workload.

We aimed to show higher compliance with standards through formalisation of handover processes.

METHODS

We developed local criteria for quality handover (see figure 1) based on the RCP standards. As escalation and resuscitation plans might not need to be known for every job, we agreed that a minimum of 4 out of 6 standards should be met for each handover. We implemented a written proforma which incorporated these elements and established a formal meeting for weekend handover, so that any ambiguous or missing information could be clarified.

We are providing ongoing education and feedback to junior doctors regarding quality handover including discussions on the wards and Grand Rounds presentations. We also developed an intranet web page for easy access to the guidelines and proformas. Juniors have had opportunities to feedback on the process, increasing their sense of ownership of the project.

OUTCOMES/RESULTS

We carried out an audit of handover before and after the implementation of the above processes. These are summarised in figures 1 and 2. Initially only 29% of handovers met the minimum standards agreed, rising to 91% after our changes were introduced - particularly demonstrating improvements in the provision of clinical information and escalation planning. Improvements were sustained over 6 months.

CONCLUSION

All aspects of handover showed significant improvements and the changes have been sustained. A key factor has been the involvement of junior doctors at all stages of the process.
Audit & Quality Improvement

An audit of the implementation of high-sensitivity cardiac Troponin I testing (hs-cTnI), a chest pain pathway and the opening of a Clinical Decisions Unit (CDU)

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Aim:

As hs-cTnI testing becomes increasingly sensitive we can detect “normal” levels. This can be used to aid the immediate exclusion of Acute Coronary Syndrome (ACS)(1). Patients with higher hs-cTnI levels need further evaluation(2). We have implemented a pathway based on the latest evidence(1)

Methods:

All patients presenting with “chest pain” to the ED in October 2013 had immediate clinical assessment, ECG and (0 hour) hs-cTnI testing with repeat (6 hour) testing if indicated. Low-risk (against inclusion/exclusion criteria) patients were admitted to CDU and high-risk patients are admitted to AMU. Rapid Access Chest Pain Clinic (RACPC) and an Atypical Chest Pain Clinic are also available.

Results:

529 patients presented with “chest pain” (56% Male, 44% Female). 257/529 (48.5%) had ACS excluded by clinical history, examination and ECG. 132/529 (25.0%) had ACS excluded with 0 hour hs-cTnI interpreted in clinical context; none of which had a myocardial infarction, symptom driven revascularisation, readmission for ACS or death within 30 days. 51/529 (9.6%) were admitted to CDU, none of which had ACS and only one of which was eventually admitted to AMU. Rapid Access Chest Pain Clinic (RACPC) and an Atypical Chest Pain Clinic are also available.

Conclusion:

A chest pain pathway, hs-cTnI testing and CDU have been successfully implemented. Medical admissions for ACS have reduced by 67.3%. All patients with ACS were still successfully identified.

References:


Audit & Quality Improvement

Drink Driving: Are acute physicians serving the public?

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¹NHS, ²NHS Greater Glasgow and Clyde

AIM

Drink driving causes 280 deaths per year in Britain.¹ Previous audits have highlighted that healthcare professionals have poor knowledge of DVLA guidelines.² We wished to establish whether doctors were giving appropriate advice to hospitalised patients who abuse alcohol.

METHODS

We distributed questionnaires to doctors working in the medical department of a busy district general hospital to ascertain their knowledge of DVLA rules for alcohol-related diagnoses. A prospective case note audit determined whether driving histories were taken and appropriately acted on. Education was given and the audit cycle was closed.

RESULTS

Multiple-choice questions required the respondent to identify the DVLA rules for a number of medical conditions. 50 responses were returned. Correct answers for ‘alcohol dependence’, ‘persistent alcohol misuse’ and ‘single alcohol related seizure’ were given by 12%, 6% and 22% of respondents respectively. 30% of those questioned believed there was no specific DVLA guidance about at least one of these conditions.

In the initial audit, 4% (1/25) of patients admitted with an alcohol-related diagnosis had a driving history documented. None had been given advice about driving. Following our intervention this improved to 64% (16/25).

CONCLUSION

Despite being a significant cause of morbidity and mortality, doctors are unfamiliar with DVLA guidelines and do not give appropriate advice about driving to alcoholic patients. This raises significant concerns for public health and could have medico-legal consequences. We have demonstrated that educating staff and raising local awareness can improve the safety of our patients and other road users.


Audit & Quality Improvement

Introducing Ward-Based OptiflowTM (Nasal High-flow Humidified Oxygen) in a District General Hospital: Safe and Effective for Many Conditions

Jack Carmichael, Elizabeth Spires, Josip Stosic, Anna Blackburn, Valerie Foley
James Paget University Hospital

Introduction:

The James Paget University Hospital NHS Foundation Trust (JPUH) admits around 10000 acute medical emergencies annually. In addition to our established ward-based NIV service, we identified a clinical need for enhanced ward-based oxygen delivery; particularly for those presenting with community-acquired pneumonia (CAP).

Aim:

We evaluated the safety and effectiveness of Optiflow™ in acute clinical areas at the JPUH.

Method:

Optiflow™ was introduced to the JPUH in July 2013 along with parallel implementation of staff training, audit and escalation guidance.

We analysed data of physiological responses (oxygen fraction, respiratory rate, pH, pCO2, pO2) pre- and one hour post-Optiflow™ initiation. We surveyed staff using a questionnaire.

Outcomes:

- We observed no adverse patient events associated with Optiflow™ use in patients presenting with CAP.
- Optiflow™ was safe in patients with underlying COPD. In this group, Optiflow™ use did not cause alveolar hypoventilation (mean pCO2: 5.44kPa vs. 5.28kPa after 1hr on Optiflow™).
- Patients tolerated Optiflow™ well. They found it easy to eat and drink on Optiflow™.
- Staff commented on ease of use of the equipment.
- The initial scope was rapidly expanded to other patient groups: COPD, pulmonary oedema, pulmonary fibrosis, palliative needs and post invasive ventilation as a weaning tool.
- Having seen the benefits of Optiflow™ across the clinical spectrum, we have acquired eight machines to meet our service demands. We predict around 150 patient episodes/year based on 68 cases in the first six months.

Conclusion:

Optiflow™ safely and effectively delivers ward-based optimised oxygen therapy for a wide range of acute medical conditions.
Audit & Quality Improvement

Are CTPA’s requested appropriately in the acute setting and how accurate is clinical diagnosis assisted by the Wells score? A prospective study.

Sophia Antoniou, Hsiu Tzu Tung, Shelley Srivastava
Imperial College Healthcare NHS Trust

Aims

This study investigates our compliance with NICE guidelines in ordering Computerised Tomography Pulmonary Angiogram (CTPA), and assesses clinical accuracy and the Wells Score (1). Clinical difficulties in diagnosing Pulmonary Embolism (PE) and concerns regarding their significant morbidity may mean more patients receive unnecessary radiation: a CTPA is approximately 750 chest radiographs (2).

Methods

This prospective study over two months, in a London teaching hospital, reviewed data of all medical and oncology patients who had a CTPA within four days of admission. Clinical diagnoses and risk scores were recorded according to national guidelines.

Results

A CTPA was carried out on 63 patients (65% female); 12 had confirmed PE (19%). In 35 (55%), guidelines were not followed: 29 did not have D-dimers. Of those with PE, 58% were detected despite a low Wells Score.

Clinical suspicion alone diagnosed 19% of PE. Clinical suspicion associated with a likely Wells score (> 4), detected a PE in 5/11 (45%). In cases with an unlikely score (≤ 4), 13% of PE (7/52) would have been missed, if D-dimers had not been used. 21% of patients with an unlikely Wells score and positive D-dimer had a PE.

Conclusions

PEs remain difficult to diagnose. Clinical skills may not be accurate, our detection rate was 19%, and 58% had a low Wells score. Wells scoring alone had a poor PE detection rate in this group. More research and a better scoring system may be required to assist the diagnosis of PE, to minimise radiation and contrast risks.

References


2) Davies HE et al. (2011) The risks of radiation exposure related to diagnostic imaging and how to minimise them. BMJ 342: d947
Audit & Quality Improvement

Telemetry usage on acute medicine

Amina Rezgui
Stepping Hill Hospital Foundation Trust

Aim:

Telemetry channels are a limited resource and during medical on calls we noted it was sometimes difficult to find a free telemetry channel, which meant patients waiting for a channel.

The audit was carried out to decrease unnecessary telemetry usage and to increase the number of documented reviews to ensure telemetry was being used efficiently.

Methods:

Using the American college of cardiology guidelines we audited 42 acute medical patients on telemetry over a two week period. We looked at the indication for telemetry, who was starting telemetry, how long was spent on telemetry and if it was being reviewed. We re-audited 6 months later after developing local guidelines, creating a telemetry sticker and presenting our findings to doctors and nursing staff.

Results:

Most patients were on telemetry for the correct indication, but were on it for unnecessarily long periods. In audit 1, 6 patients were on telemetry for >5 days and none of these patients were having a documented daily review. In the re-audit most patients were spending <24hrs on telemetry and only 1 patient was on telemetry > 5 days and it was being reviewed daily.

The most significant outcome was that in audit 1 only 31% of patients received a daily review, after the changes we made 58% of patients had a documented daily review.

Conclusion:

Telemetry patients are high risk patients so reviewing their channels is crucial. As telemetry is a limited resource by creating guidelines and implementing these changes we ensured a more efficient service.
Audit & Quality Improvement

Antibiotics - to hesitate or de-escalate?

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Aim

Sepsis is a major cause of morbidity and mortality in the modern NHS. However, with recent concerns raised by the World Health Organisation with regard to antimicrobial resistance we need to be more judicious in the use of broad-spectrum agents. We wanted to assess whether our antibiotic use was appropriate as per local guidelines and whether Consultant review impacted on duration and de-escalation of therapy.

Method

We audited the charts of 50 consecutive acute medical admissions. An assessment proforma was created using Sharepoint software. We looked at a number of factors associated with antibiotic prescribing including allergy status, indication for therapy, compliance with local guidelines and outcome of consultant review on de-escalation and duration.

Results

Compliance with local guidelines was poor at only 70%. However, following Consultant review compliance increased to over 90%. Less than half of all antibiotics prescribed had a review date or duration documented. Furthermore the indication of antibiotic therapy was documented on the prescription in less than 10%.

Conclusion

Despite improving compliance with local guidelines senior review does not have an impact on de-escalation or duration of antibiotic therapy. Understanding that we must treat sepsis early with broad cover, we must continue to improve our de-escalation practices due to real concerns regarding increasing antimicrobial resistance.
Audit & Quality Improvement

An audit investigating whether Aintree Acute Medical Unit met the 100% target for the second Clinical Quality Indicator set out by the Society of Acute Medicine

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¹University of Liverpool, ²Aintree University Hospital, Liverpool, ³Gloucestershire Hospitals

Aim:

To conduct an audit investigating whether Aintree Acute Medical Unit (AMU) met the 100% target for all patients to be seen by a competent clinical decision maker within 240 minutes of arrival to the AMU set out by the Society of Acute Medicine.

Methods:

85 cases were taken on the first and 79 cases on the second audit cycle. Data was collected from patient case notes and the hospital computer database. Patient’s admission time and initial clerking time in the AMU were noted. There was an effort to increase junior medical staffing in AMU between cycles. Data analysis looked at the median and maximum times, along with the percentage of patients seen within 240 minutes. Further preliminary analysis of the second cycle data was also conducted.

Results:

In the first cycle 66% of the 85 patients were seen within 240 minutes (Mean time, 276 minutes; Maximum time, 1353 minutes). In the second cycle 76% of the 79 patients were seen within 240 minutes (Mean time, 285 minutes; Maximum time, 717 minutes). Further analysis showed that patients’ admitted outside working hours had a significantly longer waiting time (254 minutes, StdDev ±202), compared to those admitted inside working hours (93 minutes, StdDev ±56) with t-test p=7.01x10⁻⁶.

Conclusion:

There was an improvement in the percentage of patients seen within 240 minutes, potentially associated with increased junior staffing, however the 100% target was still not met. Initial evidence indicates a statistically significant difference between patients admitted inside compared to outside of working hours.
Audit & Quality Improvement

Safer Clinical Systems: Proactively designing safety into the Electronic Patient Pathway

Anu Trehan
Salford Royal Hospital

**Background:**

In 2011 Salford Royal successfully bid to be one of the pilot sites for the Safer Clinical System (SCS) project funded by The Health Foundation. The project team aimed to proactively identify hazards and subsequent risks in the prescribing pathway for patients admitted to Emergency Assessment Unit (EAU).

**Safety Claim (Aim):**

95% of medical patients admitted to EAU have 100% accurate prescriptions at 24 hours.

**Methods:**

In the diagnostic phase we used tools validated in other high risk industries, but not used previously in NHS and identified 4 routes to harm.

We collected data prospectively to measure all 4 harms and our safety claim and used SPC charts to measure progress.

Following this we had an intensive options appraisal and selected 6 interventions designed to improve the pathway. Planning the interventions required us to study human factors and culture.

We did not “act” until after these stages were complete. However we found the 6 original interventions were not achievable in their intended format and needed constant modification through PDSA cycles and some interventions were not achievable by our project team and needed Executive Board support.

**Results:**

We achieved sustained improvement from 66% of patients having a 100% accurate prescription at 24 hours to 82%. Our SPC chart has been attached to the Trust performance dashboard by the Executive with support for our more complex interventions.

**Conclusion:**

Systematic diagnostics in combination with quality improvement techniques can be used by clinical teams to make complex pathways safe in the NHS.
Audit & Quality Improvement

Bad NEWS. Can we prevent patients becoming more unwell in our medical departments? A quality improvement project of deteriorating patients

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1NHS Royal Alexandra Hospital, Paisley, Scotland, 2Acute Medical Unit, NHS Royal Alexandra Hospital, Paisley, Scotland

Introduction

Early recognition and intervention of deteriorating patients, by incorporating a simple management tool to the already established NEWS assessment, can help to reduce and ultimately prevent associated morbidity and mortality.

Method

Quality improvement project Acute Medical ward over a 3 month period performed weekly. Documentation of date/time; NEWS; fluid balance chart; plan documented; discussion with nurse in charge; resuscitation status; ceiling of therapy and consideration of sepsis in patients with NEWS >5 were considered to represent a basic standard of care.

Using the model for improvement methodology, a memory aid sticker, to improve adherence to the standard, was tested with colleagues and introduced. Data was collected pre and post introduction of the memory aid to assess whether adherence to the standard improved with the memory aid.

Results

The overall compliance with the bundle has improved to 80% with education sessions, however most patients were not getting ceiling of care or resuscitation status documented.

Conclusion

A memory aid sticker proved a useful tool in achieving and maintaining a basic standard of care for all patients with NEWS > 5. Although not wholly comprehensive, it acts as a vehicle to improve upon basic management steps for deteriorating patients. There remains difficulty with addressing resuscitation status and ceiling of care and special consideration should be given to these criteria at first Consultant contact.
Audit & Quality Improvement

Are we safe in the initial management of suspected Pulmonary Embolism? A local audit at Hillingdon Hospital

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The Hillingdon Hospital NHS Foundation Trust

Aim

The consequences of delay in the management of Pulmonary Embolism (PE) are potentially fatal (1). The National Institute for Health and Care Excellence (NICE) recommends immediate interim anticoagulation (IIAC) if PE is suspected and diagnostic imaging (DI) is not immediately available (1). We aimed to measure compliance with this guideline.

Method

125 patients were investigated for PE between April and July 2013. We recorded the following data:

- 2-level Wells' score
- D-dimer
- Time taken from suspicion of PE to DI
- Whether IIAC was given

Doctors were re-educated and the audit loop was closed in January 2014.

Results

96/125 (76.8%) patients were managed appropriately in the first cycle (48 DI; 48 IIAC). The remaining 29 did not receive immediate DI or IIAC, of whom 4 (13.8%) were confirmed to have a PE.

44/64 patients with a likely Wells' score had a D-dimer test compared to 34/61 patients in the unlikely Wells’ group. 5 patients received DI following a negative D-dimer result.

In the second cycle 27 of 29 (93.1%) patients were managed appropriately (20 DI; 7 AC).

Conclusion

In the first cycle the management of a significant minority deviated from national guidelines, putting patients at risk.

The D-dimer test was frequently requested inappropriately in the likely Wells group. Furthermore, D-dimer test omission in the unlikely Wells group is likely to have contributed to excessive diagnostic imaging incurring unnecessary cost.

Staff re-education around these key areas was an effective measure in improving adherence to the guideline by 16.3%.

References

Audit & Quality Improvement

An Audit on Hyperglycaemia in Acute Medical Admission and Follow Up at Barnsley Hospital

Imran Mohammed¹, Ahmad Maatouk², Subhash Rana², Kumar Rajiv¹
¹Barnsley Hospital NHS Foundation Trust; ²Barnsley Hospital Foundation NHS Foundation Trust

AIM:

The aim of this audit is to design a structured pathway to detect potential diabetes in patients passing through AMU. The American Diabetes Association consensus recommends all inpatients with newly discovered hyperglycaemia (random plasma glucose >7.8mmol/L) should have fasting glucose and Hba1c performed. However, at present the follow up is haphazard and the opportunity of early diagnosis may be missed. Therefore we propose an innovative pathway where we recommend primary and secondary care partnership, figure 1.

METHODS:

Data was obtained randomly from medical records of patients on AMU in 2011-2013. Non-diabetic patients with RBS>7.8 were included. We performed re-audit in January 2014 following introduction of care pathway and junior doctor education and compared with data over 3 years, figure 2.

OUTCOME/RESULTS:

In October 2011, out of 84 selected patients, 7 (8.3%) had hyperglycaemia of >7.8 but no action was taken. In April 2012, out of 24 patients, 3 (15%) had hyperglycaemia. All 3 had FBS but none had Hba1c. In November 2013, out of 23 patients, 5 had hyperglycaemia. Only 1 (20%) had FBS but none had Hba1c. In January 2014, out of 100 patients, 14 (14%) had hyperglycaemia. 10 (75%) had FBS and Hba1c (3 had confirmed diabetes)

CONCLUSION:

This audit demonstrates missed opportunity to act in patients admitted with elevated blood sugar levels. Secondary care is focussed on sick patients hence hyperglycaemia is often overlooked by clinicians. But implementation of a structured pathway and awareness has led to improvement in detection of diabetes and their follow up in acute setting.

REFERENCES


3. ADA. I. Classification and Diagnosis. Diabetes Care 2011;34(suppl 1).
INTRODUCTION

With an ageing population and medical advances, the demand for critical care services increasingly outweighs the availability of resources. We have previously described medical and non-medical factors influencing critical care admission (1-3).

OBJECTIVES

We aimed to establish whether non-medical factors influenced admission more so than known medical factors.

METHODS

Prospective enrolment of acute patient referrals to a predefined case report form including referral data, physiological parameters (EWS), LOS, demographic and functional status, dependency and comorbidities. A set of single variable logistic regression analyses adjusted for age and sex was performed to identify predictors of escalation to critical care.

RESULTS

Between 12th November 2013 and 22nd January 2014 280 patient referrals were made to critical care, of which 135 (48.9%) were accepted. The majority of referrals came from Medicine (106, 38.0%). Median age was 65 years (IQR 50-75), median LOS prior to referral was 0 days (IQR 0-2), 168 referrals (60%) were out of hours. Age, gender, bed availability and comorbidities had no influence on acceptance to the unit. Conversely, frailty scoring (OR=0.78, 95% CI 0.66-0.93, p=0.006), exercise tolerance (OR=1.00, p=0.027), self-caring status (OR=3.03, 95% CI 1.61-5.68, p=0.001), being housebound (OR=0.27, 95% CI 0.15-0.50, p<0.001), wheelchair bound (OR=0.27, 95% CI 0.10-0.70, p=0.007) and outreach involvement (OR=0.28, 95% CI 0.12-0.64, P=0.03) were predictors of likelihood of admission. Medical referrals were least likely to be accepted (OR=0.33, 95% CI 0.18-0.60, p<0.001) over other specialities.

CONCLUSION

Although medical comorbidities influence the decision making process for critical care admission, functional status is the strongest predictor of escalation of care. Outreach involvement reduces admission rates and origin of referral may impact on likelihood of admission.

REFERENCES

1. Tridente, Factors affecting critical care admission to a UK University Hospital ISICEM 2012
2. Trident, Functional status as a predictor of admission to critical care in acutely unwell patients ESICM 2012
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Audit & Quality Improvement

Improving the Quality of Care of Elderly Patients by using an innovative Dementia Delirium Six (DD 6) Care Bundle in the Medical Assessment Unit (MAU)

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AIM:

Assessing acutely ill elderly patients in front door acute medicine can be challenging as up to one in three may have delirium which may coexist with underlying dementia. Care bundles have long been recognised as a systematic method of measuring and improving the quality of care processes. We developed a novel DD6 bundle for elderly patients attending our MAU by prioritising six key elements of their care which are evidenced based, widely accepted as good practice and locally applicable.

METHODS:

All elderly patients (age greater than 65 years) presenting to our MAU had six elements of care based on evidence and logic that has to be completed 100% of the time in each patient using a sticker based approach. The six elements being 1) cognitive screening for dementia and or delirium using the 4AT test 2) medicine reconciliation 3) sepsis screening 4) involvement of carers or family 5) discharge planning 6) determination of cardio pulmonary resuscitation status. The process measures included compliance to all the six components of the bundle.

RESULTS:

Compliance with the whole DD 6 bundle gradually improved over four months from zero to 100 % using the Institute of Health Improvement model of improvement. Reinforcement through regular staff education, weekly team huddles and run charts ensured sustained reliability and compliance.

CONCLUSION:

The DD 6 bundle produces improvement in the delivery of evidence-based care to acutely ill elderly patients attending MAU. Giving care more reliably ensures the equity of care.

REFERENCE:

1. Institute for Healthcare Improvement. Raising the bar with bundles: treating patients with an all-or-nothing standard. April 2006. www.ihi.org/IHI/Topics/CriticalCare/
Audit & Quality Improvement

Urinalysis: Is it used optimally in an acute setting?

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1University College London, 2Centre for Clinical Pharmacology, UCL

Aim

· Urinalysis is commonly used in an acute setting to diagnose UTI. There are currently no guidelines available detailing indications for urinalysis, nor how to interpret and apply its results. Furthermore, health professionals receive little training in performing urinalysis.

· Aim: to survey clinicians’ knowledge of the indications for, and interpretation and limitations of urinalysis, and to assess whether healthcare professionals perform urinalysis accurately.

Methods

· Survey of doctors at the Acute Medical Unit (AMU) of University College Hospital London (UCLH) during April 2013.

· Direct observation of UCLH healthcare staff performing and interpreting urinalysis.

Outcomes/Results

· 18% of 40 doctors surveyed failed to identify nitrites and leukocytes as the two most important indicators when investigating suspected UTI, with 10% stating that they would not use either as a diagnostic indicator for UTI.

· None were able to correctly identify the impact of 10 common confounders upon urinalysis results, with half being unable to identify a single one.

· Of 20 healthcare professionals observed performing urinalysis, the majority failed to interpret the results at the correct time intervals, frequently reading all components simultaneously. The average participant interpreted the leukocyte component at half the specified time of 120 seconds.

Conclusion

· Gross inconsistencies in clinicians’ knowledge of urinalysis were apparent.

· Performance of urinalysis varied widely and rarely correlated with equipment manufacturer guidelines.

· Healthcare professionals would benefit from additional training in the correct use and interpretation of urinalysis. Evidence based guidelines on use of urinalysis would be desirable.
Audit & Quality Improvement

Improving communication between phlebotomists and doctors on AMU

Shopnara Khanam, Kaniseya Nadarasa
BLT

AIM

Short stay patients on the acute medical unit (AMU) should be discharged within 48 hours of hospital admission. Having an efficient phlebotomy service will reduce delays in obtaining blood results and therefore facilitate the patient’s journey from admission to discharge. We aim to improve the communication between phlebotomists and doctors through education and introducing a phlebotomy form.

METHODS

An initial pre-intervention study was conducted over a one week period in September 2013. We used the Cerner computer system (CRS) to identify a total of 59 patients with phlebotomy bloods requested. A data sheet was used to record whether bloods were taken and if a delay in management or discharge. A folder was created containing a phlebotomy form of patients who had bloods requested, indicating whether the bloods were taken, and if not the reason for this. Phlebotomists were educated in the use of the forms and ensuring AAU was a priority ward for taking bloods over general wards. This was then re-audited in November 2013.

OUTCOME/ RESULTS

Pre-intervention results: 20/59 patients not bled (34%). Of the 20 not bled, 3 patients had a delay in discharge (15%) and 12 (60%) had a delay in management. In the post-intervention group, 10/52 patients were not bled by the phlebotomist. However doctors were aware of this from reviewing the phlebotomy form, thus this did not delay management or discharge planning.

CONCLUSION

On educating phlebotomists and doctors, as well as introducing a phlebotomy form to be kept on AAU, there has been a significant improvement in the communication between doctors and phlebotomists resulting in more patients being bled and the earlier retrieval of blood results. This has led to improved patient care and more patients being discharged, thus in a busy AAU ward ensuring more efficient use of NHS beds.
Audit & Quality Improvement

St Thomas’ Acute Medicine Model is a cost effective alternative to A&E.

Kevin O’Kane¹, Charlotte Masterton-Smith², Terence Gibson²
¹, ²St Thomas’ Hospital

AIM

St Thomas’ AAU is the only one in the UK which is subject to the Government’s ‘4-hour target’. We compared the clinical activity, bed occupancy, medical staffing and index medical cost per visit of patients attending AAU and A&E Majors.

METHOD

We recorded bed occupancy & number & grade of doctors hourly on 5 consecutive days (09-17.00) with the same consultant in AAU & A&E & calculated the doctor/patient ratio for each time point.

Index medical cost (a surrogate for cost/visit) was calculated from the salary mid-point for the mean number of doctors of each grade across all time points for the two areas and expressed as a ratio of AAU medical cost/A&E medical cost corrected for the mean ratio of patients between the areas.

RESULTS

<table>
<thead>
<tr>
<th></th>
<th>AAU</th>
<th>A&amp;E Majors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bed occupancy</td>
<td>88%</td>
<td>56%</td>
</tr>
<tr>
<td>p=3.7x10⁻⁷</td>
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<tr>
<td>Finished Consultant Episodes</td>
<td>21.6(±4.0)</td>
<td>29.4(±4.7)</td>
</tr>
<tr>
<td>Mean no of consultants</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Mean no of registrars</td>
<td>0.87</td>
<td>2.33</td>
</tr>
<tr>
<td>Mean no of juniors</td>
<td>2.07</td>
<td>4.3</td>
</tr>
<tr>
<td>Mean ratio pts/drs</td>
<td>1.74</td>
<td>1.4</td>
</tr>
<tr>
<td>Index medical cost/pt</td>
<td>0.53</td>
<td>1</td>
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</tbody>
</table>

Table 1: Summary data

CONCLUSION

Every patient seen in AAU is assessed by a registrar and/or a consultant in Acute Medicine such that they receive a senior specialist opinion early in the patient pathway. The beneficial effect of such an opinion in reducing medical admissions has been demonstrated previously (Gibson & O’Kane, 2009¹). This study provides further evidence that the St Thomas’ Acute Medicine Model is an efficient and cost effective alternative to being seen in A&E.

REFERENCE
