

# **ANNE HOLLMAN MEDAL 2013: PRESENTATION ABSTRACTS**

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Michelle Williams ST1, South East Scotland

## **CHEST RADIOGRAPH (CXR) CONFIRMATION OF NASOGASTRIC TUBE (NGT) PLACEMENT AND DOCUMENTATION IN PATIENT NOTES**

Muhammad Gowdh, Nazleen; Green, Allan; Gomersall, Lesley.

**Background:** CXR misinterpretation of NGT placement has resulted in death and patient harm. This is classified as a 'never event' by the National Patient Safety Agency (NPSA).

**Aims and Objectives:** To assess the quality of CXR for NGT placement and compliance of radiological reports and documentation in patient notes with national guidelines.

**Results:** An audit of 50 cases was performed in 2011 followed by a re-audit in 2013. Images were centered lower and exposure was increased thus improving image adequacy from 39% to 74%. CXR for NGTs were fast-tracked to the reporting radiologist which improved timeliness of reports from 26% to 54% of cases reported within 24 hours. National guidelines outline a specific format to the radiological report which includes assessment of NGT and tip position with recommendations for immediate removal of malpositioned NGTs. A poster with these recommendations was distributed resulting in an increase in compliance (14% to 42%). Documentation in the notes drastically improved (33% to 64%) with increased use of NGT stickers, however, a lack of documentation of the assessor's grade persisted.

**Conclusion:** Improvements in image quality, reporting and documentation was achieved though the use of simple measures hence improving service quality and patient safety.

**PLUS ÇA CHANGE, PLUS C'EST LA MÊME CHOSE:  
INCREASED INVESTIGATION AND INCIDENCE OF SYMPTOMATIC PULMONARY  
EMBOLI IN THE ROYAL INFIRMARY OF EDINBURGH**

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### Aim

Examine the rate of radiological investigation of suspected acute pulmonary embolism (PE) at the Royal Infirmary of Edinburgh over the past decade, including the incidence and severity of PE.

### Methods

Retrospective review of radiology records for computed tomogram pulmonary angiography (CTPA) and perfusion scans (Q-scans) for suspected acute PE between 1st April 2002 and 1st April 2012. Final year cohort of positive CTPAs categorised using modified Miller score. Comparison with data from earlier years, published previously.

### Results

111% Increase in total investigations (CTPA and Q-scans) over 10 years. Incremental large increase in number of CTPAs (706 to 2020 scans per year) and modest decline in Q-scans. Increased number of acute PE diagnosed, annual incidence rose from 147 to 426, but no change in pattern of PE severity. An older population of patients are being diagnosed with PE.

### Conclusion

As predicted, a major increase in radiological investigation of suspected acute PE was observed, consisting of CTPAs. Unexpectedly, a near-commensurate increase in PEs is also observed. Furthermore, the popular hypothesis<sup>3</sup> that we diagnose an increased proportion of smaller emboli is not supported by our data. The pattern of PE severity has not changed over a 10-year period.

## **RETROSPECTIVE AUDIT OF DELAYED DIAGNOSIS OF HYDRONEPHROSIS IN ACUTE KIDNEY INJURY**

Dreisbach J, Puttagunta S

### **Background**

NCEPOD recently highlighted patient harm associated with delayed diagnosis of hydronephrosis in acute kidney injury (AKI).

To the authors' knowledge, this is the first audit of delayed ultrasound diagnosis of hydronephrosis with AKI.

### **Standard and Target**

Renal Association guideline: 'all patients with AKI and suspected renal tract obstruction should have ultrasound  $\leq 24$  hours'.

Target  $\geq 90\%$ .

### **Methodology**

Single center retrospective collection of consecutive cases of hydronephrosis from ultrasound reports over a 24-month period; inclusion required concurrent AKI.

Time intervals between AKI onset and ultrasound calculated.

Ancillary data collected to identify associations with delays.

### **Results**

162/6,491 renal ultrasounds reported hydronephrosis; 50 cases had concurrent AKI, meeting the inclusion criteria.

Delays, the majority significantly  $\geq 24$  hours, were observed in 48% ( $n=24/50$ ), 33% ( $n=8/24$ ) of which progressed in AKI severity.

The most time-consuming delay was between AKI diagnosis and ultrasound request. Furthermore, inadequate request card information was strongly associated with delays.

### **Conclusion**

A time-critical diagnosis was significantly delayed, with suggestion of potential harm, in a large proportion of patients.

### **Interventions**

Results presented locally.

## **TRAUMA IMAGING AT ROYAL INFIRMARY OF EDINBURGH – HOW ARE WE DOING AND CAN WE IMPROVE?**

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### **Background**

The benefits of formalised trauma networks are recognised. Radiology plays an increasingly important role in the diagnosis and management of traumatically injured patients. The Scottish Trauma Audit Group (STAG) have imaging standards for time to CT scan in traumatically injured patients.

### **Methods**

We retrospectively assessed our compliance with STAG imaging standards over a nine month period (January 2012 – September 2012). We additionally assessed our provision of timely reports in line with RCR guidance.

## **Results**

73 eligible CT scans were included in the study. Median CT acquisition time was 67 minutes (IQR 45-88). In the group who met the standard of 60 minutes to scan, the median time was 43 minutes (IQR 35 – 52 minutes), and in the group not meeting the standard, the median times was 84 minutes (IQR 72-106 minutes). Adequate documentation of provisional report delivery only occurred in 6% of cases.

## **Conclusions**

Our times to scan acquisition are broadly in-line with national standards and the published times from other centres. We are falling below the standards on urgent/provisional report documentation. We have made several important systematic changes in our institution to improve our service.

## **RADIATION DOSE REDUCTION IN COMPUTED TOMOGRAPHY MYOCARDIAL PERFUSION WITH DIAGNOSTIC ACCURACY COMPARED TO FRACTIONAL FLOW RESERVE AND INVASIVE CORONARY ANGIOGRAPHY**

Williams MC, Dweck MR, Misadraee S, Golay SK, Weir N, van Beek E, Reid J, McKillop G, Uren N, Newby DE.

### **Purpose**

We assessed the application of radiation dose reduction techniques on computed tomography myocardial perfusion imaging (CTP) for the diagnosis of coronary heart disease.

### **Methods and Materials**

Participants underwent rest and adenosine stress CTP using a 320-multidetector scanner. Radiation dose reduction techniques included iterative reconstruction, tube current adjustment based scout attenuation and half-segment reconstruction.

Participants in the dose reduction group underwent invasive coronary angiography and obstructive disease was defined as a stenosis greater than 70% or FFR less than 0.8.

### **Results**

For 28 patients before and 28 after introduction of the protocol there was no difference in gender, body mass index, heart rate or z-axis collimation. There was a reduction in tube current (467 mA (449,485) vs 318(245,392),  $p < 0.001$ ), tube voltage (100% at 120kV vs 33%,  $p < 0.001$ ) and DLP at rest (224 mGy.cm (210,238) vs 141(109,173),

p<0.001) and stress (604(486,722) vs 232(177,286), p<0.001). There was no difference in image noise at rest and a small increase during stress (27(22,32) vs 38(33,43), p=0.001). There was no difference in subjective image quality. The per patient sensitivity, specificity, negative and positive predictive values were 95%, 84%, 86% and 94%.

### Conclusion

This protocol led to a 60% reduction in CTP radiation dose, while maintaining image quality.