



**Content:** We present CT imaging from three separate incidental findings of gastric diverticula simulating adrenal masses.

**Impact/relevance/discussion:** Adrenal nodules and masses are common incidental findings on CT, and may be benign or malignant. Whilst some lesions can be characterised on a single study as a benign adrenal adenoma, many are classed as indeterminate and require additional imaging, such CT (with and without IV contrast) or MRI. Gastric diverticula are a well-recognised cause of an adrenal 'pseudomass'. Familiarity with this entity is important for radiologists as it may prevent misdiagnosis and unnecessary further imaging. Use of multi-planar reformatting, or the presence of gas or oral contrast within the presumed adrenal lesion, can confirm the diagnosis.

## Clinical: GI and hepatobiliary

### P088 Is further imaging indicated after acute diverticulitis?

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**Purpose:** Acute diverticulitis is a common surgical admission. CT is a very sensitive investigation to confirm the diagnosis and assess for complications. There is an increasing trend for follow up imaging on these patients at an interval after their acute event. We explore if, who, when and how follow up should be performed in these patients.

**Method:** We performed an extensive literature search on Pubmed, looking at malignant potential, different imaging techniques and timing of any investigations.

**Results:** The American Society of Colorectal Surgeons suggests that follow up should occur 6-8 weeks after the resolution of an acute attack in patients with abdominal pain and colonic wall thickening using colonoscopy or CT colonography (CTC). However, they admit that evidence for this time interval is lacking.

The majority of studies assessed the use of direct colonoscopy after CT confirmed diverticulitis. However, a study has suggested that patients found CTCs less uncomfortable, with a good correlation between findings on CTC and colonoscopy.

In uncomplicated diverticulitis, studies have indicated that there is no increased risk of malignancy above the background population and further imaging is not recommended.

Multiple studies suggest an increased risk of malignancy with complicated diverticulitis - with one study suggesting increases of 4x with perforation, 7x with abscesses and 18x with fistulas.

**Conclusion:** Uncomplicated diverticulitis does not carry an increased risk of colorectal malignancy. Follow up imaging should be arranged for those with a more complicated picture. CTC may offer a safe and effective follow up tool but further studies need to confirm this.

### P089 Comparison between combination and Gastrograffin only preparations for CT colonoscopies

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**Purpose:** To compare Gastrograffin only preparation to the traditional Bisocodyl, low density Barium and Gastrograffin combination for CT colonoscopies. To also assess the acceptability of the Gastrograffin only preparation regime for patients.

**Methods and materials:** Data was collected from the CT colonoscopies of 100 patients from each group. Six areas of the colon were assessed and a scoring system used to evaluate the volume and tagging of stool and fluid. 124 patient satisfaction questionnaires were collected from those who were given the Gastrograffin preparation.

**Results:** Using the t-test, stool and fluid volume and tagging showed no significant difference between the groups. There was increased variability in fluid volume in the Gastrograffin group but a more consistently high quality of fluid and stool tagging.



Out of the 124 patients who filled in the questionnaire, three could not take Gastrograffin. The reasons given were: severe diarrhoea and the bottle being difficult to open. 102 patients would be prepared to take Gastrograffin again and 10 would not. 111 patients had diarrhoea, making this the most common side effect.

**Conclusion:** There was increased variability in the amount of fluid present within the colon of those in the Gastrograffin group. The quality of fluid and stool tagging was more consistent in those who had taken the Gastrograffin preparation. The survey suggested that although side effects were common, this form of oral preparation was relatively well tolerated and safe. As such, the standard preparation prior to CT colonoscopies has been changed to the Gastrograffin preparation regime.

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#### **P090 CRAC Tool™. A self audit tool for advanced practice for CT colonography services**

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As an advanced practitioner radiographer undertaking CT colonography, I am required to undertake on going audit of my practice. This poster presents the audit tool system & method I have developed to help effectively manage, simplify and reduce the time involved by automation of various aspects of the processes of auditing my CT colonography outcomes and practice.

My approach was to initially find an IT solution, as there were no suitable products available on the market, I have since developed my own suite of CTC self audit management tools. The audit tool software application will aid CTC advanced radiography practitioners with the management and evidencing of their required audit activities. The software was originally designed and developed specifically to cater for CT colonography audit management.

The audit tool will reduce the need for dedicated specialist audit personnel that are often required for time-consuming data collection and for processing data into a usable informative format. An early version of the tool has been in trial with success for over one year. The tool automates the production and reporting of the CTC advanced radiography practitioner's accuracy, specificity, sensitivity and positive predictive values, negative predictive values and prevalence statistical output information.

The poster will present the tool, elements and example output information from my own practice with one years statistical outcomes data produced for my CTC practice using the CRAC Tool™. Further development and widespread adoption of such software would reduce the amount of valuable time spent by clinical staff collecting, collating and producing accessible meaningful and timely output data. The audit tool produces and provides a snapshot of performance for immediate review by any practitioner using the latest version.

The tool can also provide useful health informatics, and evidence useful for service accreditation and professional accountability purposes.

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#### **P091 Pictorial review of the early signs of invasive colorectal cancer on contrast enhanced computed tomography**

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**Background:** Colorectal cancer is the second most common cause of cancer death after lung cancer in the UK. Earlier detection can allow treatment with curative intent and improve prognosis. Optical and virtual colonoscopy are widely used in screening for detection of colonic polyps and in those presenting with features strongly suggestive of colorectal malignancy. However, contrast enhanced computed tomography is still performed to investigate non-specific abdominal symptoms and to exclude any significant bowel related mass. Hence, a significant number of colorectal cancers are still identified on contrast enhanced CT.

**Content:** In our centre we have identified several signs, which when present in tandem, raise suspicion of colorectal cancer. These include circumferential or eccentric wall thickening >3mm, focal wall enhancement, peri-colonic fat stranding, a cluster of >3 local lymph nodes, enlarged lymph nodes >10mm in short axis and an intra-luminal mass.



**Impact:** We propose careful evaluation of the bowel on all CT abdomen studies despite lack of bowel preparation, and the presence of 2 or more of the above described features should warrant optical colonoscopy.

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**P092 The sensitivity and specificity of CT colonography in the diagnosis of colonic polyps in a symptomatic cohort**

Tom Meagher; [Jonathan Jenkins](#); Sarah Johnson; Lokesh Saraswat

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**Aims:** To evaluate outcomes in a cohort of patients having CT colonography for symptomatic indications including altered bowel habit, weight loss or bleeding.

**Content:** 295 consecutive CT colonographies were assessed from 2012. Follow up included a review of subsequent imaging on radiology management system over three years and of endoscopy records. Endoscopy records were used to identify patients where either a flexible sigmoidoscopy or colonoscopy were performed within 3 months of the CT. The agreed standards were sensitivity greater than 75% and specificity greater than 95% for polyps >1cm.

**Outcomes:** 70 of 295 patients had colonoscopy within 3 months of CTC. The sensitivity of CTC for all polyps was 64%, specificity 82%. Sensitivity for polyps greater than 1cm in size was 90% and specificity 84%. A total of 14 polyps were confirmed by endoscopy, five of which were not detected by CT. CT missed one polyp greater than 1cm, measuring 25mm. Sensitivity for neoplasms was 100%, specificity 95%. All five neoplasms were diagnosed by CTC and confirmed by endoscopy. For combined neoplasms and polyps >1cm the sensitivity was 93% and specificity 84%. Subsequent diagnoses included myeloproliferative disorders (3), pancreatic neoplasm (2), prostate carcinoma and mesothelioma.

**Discussion:** Symptomatic patients referred for CTC are a disparate group. Patients are frequently older presenting challenges for CTC and may have diverticular disease which may limit detailed assessment.

**Conclusion:** CTC met the audit standard for sensitivity of detecting polyps greater than 1cm in size – 90%. Specificity fell below the agreed standard at 84%.

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**P093 Small bowel obstruction on CT: a guide for the radiology trainee**

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**Aims/objectives:** We present a pictorial review of the causes of small bowel obstruction and describe a systematic way of interpreting the imaging findings.

**Content:** We provide examples of common and uncommon causes of small bowel obstruction with illustration of key radiological signs. These include; extrinsic causes such as hernias, extrinsic masses (carcinoid tumours, appendicitis, metastases); intrinsic causes (adenocarcinoma, Crohn's disease, intussusception), mesenteric ischaemia and malrotation.

**Relevance/impact:** Small bowel obstruction is a common surgical emergency which represents up to 20% of all surgical admissions with abdominal pain. It is not unusual for patients with suspected small bowel obstruction to present out of hours meaning it is the role of the radiology trainee to review such cases, highlighting the importance of a systematic approach in interpretation.

**Outcomes:** Although plain abdominal radiograph is a low cost first investigation used in the emergency departments, it is only diagnostic in approximately half of cases. CT has now been established as the imaging modality of choice for confirming the diagnosis. CT provides essential pre-operative information regarding the site and cause of obstruction. It can also identify associated complications such as perforation.

**Discussion:** Accurate interpretation of imaging findings in patients with suspected small bowel obstruction is crucial for optimal patient management.

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#### P094 How not to miss dying bowel

[Cairine Probert](#); [Ramya Dhandapani](#); [Sumita Chawla](#); [Anbu Nedumaran](#); [James Arthur](#); [Ashok Katti](#)

*Aintree University Hospitals NHS Foundation Trust*

**Aims:** To highlight different causes of small bowel ischaemia and the associated signs that may be missed when reporting CT scans of the acute abdomen.

**Content:** We present cases demonstrating a variety of causes of small bowel ischaemia and highlight what to look for when diagnosing it. We include causes of acute ischaemia such as arterial or venous thrombosis, closed loop obstruction, acute superior mesenteric artery syndrome and chronic ischaemia.

**Relevance:** Small bowel ischaemia is an important cause of acute abdominal pain that can be diagnosed with CT and which needs prompt diagnosis and treatment. There are many causes of small bowel ischaemia and these present with different imaging findings on CT scans of the abdomen. Some of the findings can be challenging to identify and therefore confidently diagnose small bowel ischaemia. If a radiologist is not aware of what to look for then cases of small bowel ischaemia may be missed, resulting in poor patient outcomes.

**Outcomes:** Readers should be able to identify small bowel ischaemia and its cause when reporting CT of the acute abdomen and help clinicians regarding appropriate treatment options including laparotomy.

**Discussion:** Small bowel ischaemia is a critical diagnosis and must not be missed on CT scan. We hope the readers will be confident diagnosing small bowel ischaemia on CT and identifying the cause after reading our poster depicting various case examples with causation factors and signs of bowel ischaemia with surgical correlation.

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#### P095 Is MRI small bowel imaging being used appropriately? Auditing the first six months of the new small bowel MRI service at the Countess of Chester Hospital

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*The Countess of Chester Hospital NHS Foundation Trust*

Small bowel MRI (SBMRI) is the gold standard for assessing disease extent and activity in small bowel Crohn's disease (SBCD).

A new service was started at the Countess of Chester Hospital in January 2014 for the benefit of CD patients. The initial local standard stated that "SBMRI should be reserved for patients with either known CD (to assess for complications/activity) or for those in whom there is a strong suspicion of SBCD".

In total 50 requests were received and all were scanned. These can be broken down as follows: 18% were carried out on patients with known CD and 64% on patients with suspected Crohn's disease; 18% of scans were for non-CD patients, but these were deemed to be appropriate.

The results indicate the need to streamline referrals for new CD diagnosis as 56% of the scans carried out on patients with suspected Crohn's disease were normal. Previous imaging and/or endoscopy did not appear to improve the diagnostic success rate.

The results of this audit produced new guidelines that aimed to sieve out those patients who likely have IBS rather than IBD. This is to be done by checking a simple faecal calprotectin level, which, if negative (<50 µg/g), effectively rules out IBD, negating the need for further imaging and invasive diagnostic procedures.

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#### P096 Oropharyngeal dysphagia resulting in aspiration

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*University Hospital of Wales*

We present a pictorial review of a wide variety of underlying causes for oropharyngeal dysphagia resulting in aspiration: mechanical and obstructive benign and malignant causes, neurological, neuromuscular, and iatrogenic causes.



Each case was demonstrated on videofluoroscopic assessment, and specific management plans were produced collaboratively with the speech and language team.

Dysphagia is a common problem, with reported incidence of up to 40%. This is often subdivided into high (oropharyngeal dysphagia) or low (oesophageal dysphagia). The patients may present with varying clinical symptoms, but laryngeal penetration or aspiration may not always be accompanied by symptoms of choking or coughing.

As demonstrated in our pictorial review, the underlying aetiology of oropharyngeal dysphagia with aspiration is very broad, and not always immediately apparent. However, an accurate diagnosis with the aid of videofluoroscopy is essential to guide definitive management for each patient.

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### **P097 Variants of pancreatic duct anatomy**

[Emer McLoughlin](#); [J.A Abdulkarim](#)

*George Eliot Hospital NHS Trust*

The aim of this poster is to review the embryologic development and normal anatomy of the pancreas and pancreatic ducts and to describe anatomic variants of these structures. In particular, we will demonstrate a pancreatic duct anomaly we have encountered not previously described in the literature.

The pancreatic duct system shows a wide spectrum of anatomic variations which can be seen on radiologic examination. MRCP is the primary imaging modality for the investigation of suspected developmental anomalies of the pancreas and pancreatic duct. MRCP allows noninvasive depiction of the course and drainage pattern of the pancreatic duct and can easily identify developmental anomalies of the pancreas. MDCT is also useful in identifying anomalies of the pancreatic duct and pancreas. An understanding of the embryologic development and normal anatomy of the pancreas and biliary tree is required to identify this group of disorders.

Anatomical variants of the pancreatic duct are most often detected as incidental findings in asymptomatic patients. However, some of these anomalies may be a cause of recurrent pancreatitis or gastric outlet obstruction. Recognition of these anatomical variants is important to guide management of these conditions, facilitate surgical planning and prevention of intraoperative ductal injury.

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### **P098 Hepatocellular Carcinoma (HCC) presenting at a district general hospital - imaging characteristics, compliance and what matters**

[Noor Dawn Assaf](#); [Anthony George](#); [Andy Planner](#)

*Great Western Hospital*

**Purpose:** To review the imaging features of all HCC diagnosed within our department. To also assess diagnostic criteria, and the value of complying with the Barcelona liver imaging criteria.

**Methods and materials:** Retrospective data was collected from the scans and pathology results of 28 consecutive patients who had been diagnosed with HCC between 24/04/2009 - 29/09/2014.

**Results:** The mean age at diagnosis was 70 years. 9/28 (32.1%) had a background of cirrhosis with 12 having an elevated AFP. All 28 patients had at least one lesion greater than 2 cm, with a mean size at diagnosis of 6.5cm. 9 had multifocal liver lesions and 2 had distant metastases. Only 13 patients (46.4%) had either a dedicated triple phase CT or MRI liver, of those, 12 (92.3%) displayed arterial enhancement with rapid portal phase washout. 14 patients had portal venous imaging only and 1 had an unenhanced study. All demonstrated hypoattenuating lesions. 18 patients went on to have a biopsy (16 liver and 2 metastases). Out of the 10 patients who were not biopsied, 9 fully met the Barcelona imaging criteria.

**Conclusion:** The majority of HCC patients presenting did not have cirrhosis or an elevated AFP, but all had low attenuation portal phase lesions that were greater than 2cm. 12 cases complied with Barcelona imaging criteria and in these cases the need for biopsy was avoided in 75% (9/12) of patients in this group. A biopsy was necessary in 18 patients to allow medical treatment and exclude other malignancies.

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**P099 Hepatic artery aneurysm - a case study: Do radiologists rely too much on the previous?**

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**Introduction:** Hepatic artery aneurysms (HAA) account for nearly one fifth of all visceral artery aneurysms. The incidence of hepatic artery aneurysm has been on the rise due to the increasing numbers of imaging studies and biliary procedures being performed. The classical presentation comprising of abdominal pain, obstructive jaundice and hemobilia, has been reported in only one third of the cases. While the vast majority of cases remain asymptomatic, those which present clinically are the ones which rupture, which have an estimated mortality of 40%.

**Content:** A 90yr old lady presented with abdominal pain, jaundice and obstructive liver function tests to the ultrasound department. She had been imaged over two years with the same finding of a large calcified liver cyst which had not significantly grown in size. This same description had been reported by a number of different radiologists over the 2 year period. On the most recent ultrasound scan doppler flow was applied which showed the classic yin-yang sign for aneurysm. The patient had an urgent MRCP which confirmed the finding and its secondary compression of the CBD with intrahepatic biliary duct dilatation. The patient was not a candidate for intervention and so the case was conservatively managed.

**Relevance and discussion:** This case illustrates the importance of being aware of HAA as a possible differential diagnosis in patients presenting with abdominal pain, jaundice and cystic appearances on ultrasound imaging. Also on reflection as radiologists do we need to question our reliance on previous imaging and reports.

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**P100 Inside out - a pictorial review of intussusception in all ages and areas**

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*Great Western Hospital*

We aim to create a poster aimed at educating radiographers and students about how to identify the different forms of Intussusception in patients of all ages. We will include a selection of images from a variety of modalities, such as computed tomography and ultrasound, showing the different radiological features of Intussusception. We have examples of ileocolic, ileoileal, colonic and stomach intussusception. Intussusception occurs when one segment of bowel is pulled into itself (or a neighbouring loop of bowel) by peristalsis [1]. It is the most common cause of intestinal obstruction in children between 3 months and 6 years. Classical symptoms at this age include vomiting, abdominal pain and bloody stools [2]. In adults it accounts for only 1% of obstructions and only 5% of all intussusceptions [3]. Symptoms in adults are the same as those of other bowel obstructions.

It is important for radiographers to recognise the signs that indicate intussusception and to understand the significance of the pathology. In busy departments this knowledge can enable the team to issue prompt reports for any inpatients and stop outpatients from leaving the department without further review when required. Ideally, the poster will create a more knowledgeable diagnostic radiography department and enable better service for patients who may be suffering with the condition.

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**P101 What about the whirl?**

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**Learning objectives:**

- Recognise characteristic CT appearance of the mesenteric “whirl sign”.
- Understand mechanisms of abnormal rotation.
- Differentiate radiological appearances of underlying causes.
- Identify radiological features of potential complications.

**Background:** The mesenteric whirl sign has a characteristic appearance on CT and relates to abnormal rotation of bowel around the mesentery. The whirl sign is recognised in small and large bowel volvulus, internal hernias and closed loop obstruction.



**Findings:** The whirl is best appreciated when the axis of rotation is perpendicular to the transverse scan plane but with the benefit of CT reconstruction, images can be optimised for demonstration of the whirl in any plane. The underlying cause and potential complications can also be identified.

Small bowel volvulus is rare but a life threatening surgical emergency. It can arise from post-operative adhesions or hernia, the fixed point acting as a pivot for rotation.

In closed loop obstruction, a bowel segment is occluded at two points. The narrowing at the root of the obstruction predisposes to twisting and resultant volvulus.

In both settings, the twist mechanism impedes the vascular supply with subsequent risk of bowel ischaemia/infarct.

**Conclusions:** We highlight the importance of recognising the mesenteric whirl sign in the acute setting. Prompt investigation and early surgical management is critical. CT is the modality of choice and allows evaluation of the underlying cause and exclusion of serious complications.

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### P102 Pictorial review of peritoneal disease

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**Aims/objectives:** The abdominal cavity extends from the diaphragm to the pelvic floor, and is lined by a serous membrane known as the peritoneum. The peritoneum is a large serosal membrane; peritoneal folds suspend the various organs contained in the abdominal cavity. The peritoneum comprises of two layers; the parietal (lining of the abdominal cavity) and the visceral layer (enveloping organs). Within this potential cavity only trace of physiological fluid should be found. The peritoneal cavity and the specialized peritoneal folds, known as mesenteries, are important disease sites in the abdomen.

**Relevance/impact:** We present a selection of cases demonstrating different pathologies including peritoneal tuberculosis, lymphoma, mesothelioma and malignancy in order to highlight relevant pathology and differential diagnosis in a systematic way.

**Outcomes:** Using characteristic examples of the above presentations as well as an overview of common differential diagnosis, we aim to provide an approach to identifying and diagnosing peritoneal disease.

We hope this will facilitate a clearer understanding and enrich the ability of the clinical radiologist to formulate rational differential diagnoses.

**Discussion:** The peritoneal disease and the pathway of spread often proves tricky; but with consolidated knowledge and understanding clinical radiologists can improve their interpretation skills.

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### P103 SeHCAT testing in suspected bile salt malabsorption

[Hilary Matthews](#)<sup>1</sup>; [Ghada Al-Bahrani](#)<sup>2</sup>; [Jackie James](#)<sup>2</sup>

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This educational exhibit provides a synopsis of everything a radiographer, radiologist or gastroenterologist should know about SeHCAT testing in suspected bile salt malabsorption.

We summarise all aspects of SeHCAT testing in the clinical setting, including a recap of the features of bile salt malabsorption and indications for referral for SeHCAT testing, basic pharmacology of the SeHCAT molecule and physiology of the enterohepatic bile salt circulation, what the testing procedure actually involves, interpretation of test results and available treatment options.

We include a review of 100 patients, for whom clinical follow up was available, referred to our unit for SeHCAT testing over a 3 year period, examining the correlation of percentage SeHCAT retention with clinical response to bile acid sequestrants in this patient cohort.



Results show some correlation between %SeHCAT retention and response to sequestrants, although a number of patients did not respond as predicted (either improving with sequestrants despite 'normal' SeHCAT retention, or failing to improve with sequestrants despite 'abnormal' SeHCAT retention).

SeHCAT testing is a useful tool in the investigation of suspected bile salt malabsorption but, as in many clinical situations, results and expected response to treatment may be confounded by a variety of factors.

## Clinical: Paediatrics

### P104 Assessing practice and timing of neonatal cranial ultrasound in a district hospital

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*Mid Yorkshire Hospitals NHS Trust*

**Background:** Cranial ultrasound is used widely in neonates for detection and monitoring of pathology. The indications are diverse, and the frequency and timing of follow-up scans can be difficult. Within our unit we are guided by a regional modification of the British Society for Paediatric Radiology Guidelines, 'Technical Standards - Neonatal Cranial Ultrasound Scans'. We sought to establish our current practice relating to technical quality and timing of scans in order to guide departmental process.

**Methodology:** Retrospective analysis of all cranial ultrasounds performed over a 6-month period (n=147) within our district hospital. Each examination was assessed with reference to the information labelled on the scans, and technical quality of images. All premature (<33 weeks gestation) infants having their first cranial ultrasound within a 6-month period (n=23) were assessed in relation to the timing and frequency of scans.

**Results:** The technical quality of scans performed within our unit was excellent; the majority of examinations contained the recommended information (86-100%) and imaging views (88%). Most first cranial ultrasound examinations were undertaken at the recommended time, however 96% of patients did not follow the recommended plan for subsequent studies and only 50% had the recommended 36-week scan. The cause is multifactorial; appropriately trained staff not always available, and incorrectly timed clinical referrals.

#### Outcomes:

- Results presented locally.
- Further sonographers trained to perform cranial ultrasound to improve the service.
- Consideration of use of a proforma to guide scan timings and referrals.
- Encouragement of clinician scanning.

### P105 Paediatric head injuries and computed tomography: are we following NICE guidelines?

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*Altnagelvin Hospital*

**Introduction:** Head injuries are a leading cause of mortality, accounting for 15% of deaths in children aged 1-15. Computed tomography has been documented as the primary investigation for clinically significant head injuries. However several studies have attributed higher rates of lifetime cancer risk to patients who receive irradiation at a young age. Recently NICE published updated guidelines for management of paediatric head injuries, emphasising risk stratification of high risk children requiring imaging whilst minimising radiation exposure in lower risk patients. We aim to assess adherence to this guidance within the hospital.

**Method:** This retrospective audit reviewed all paediatric patients admitted over a consecutive three month period with head injuries. Case notes and electronic records were analysed, assessing documentation of clinical findings and indications for CT brain. We subsequently evaluated adherence with NICE guidance CG176.

**Outcomes:** 27 patients were admitted for neurological observation over a three month period. 14 patients (52%) received a CT brain however 6 patients (22%) met NICE criteria for CT. One scan out of 14 showed a significant abnormality. Interestingly, 9/27 patients (34%) had no initial GCS score documented on admission notes.