



# WJMER

**World Journal of Medical Education and Research**

An Official Publication of the Education and Research Division of Doctors Academy

**The 8<sup>th</sup> International Medical Summer School  
Manchester: A Report**

**Paediatric Surgical Intervention In Sierra Leone:  
A Retrospective Study of 204 Patients**

**Controversies in Management of High Energy Tibial Plateau  
Fractures: A Systematic Review**

**Are We Selecting Patients Appropriately for ITU Following Major  
Abdominal Operation? – A Retrospective Review**

**Abstracts from the 7<sup>th</sup> International Academic and  
Research Conference 2017**

**DOCTORS ACADEMY**



BETTER EDUCATION. BETTER HEALTH.

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## Introduction

The World Journal of Medical Education and Research (WJMER) (ISSN 2052-1715) is an online publication of the Doctors Academy Group of Educational Establishments. Published on a quarterly basis, the aim of the journal is to promote academia and research amongst members of the multi-disciplinary healthcare team including doctors, dentists, scientists, and students of these specialties from around the world. The principal objective of this journal is to encourage the aforementioned, from developing countries in particular, to publish their work. The journal intends to promote the healthy transfer of knowledge, opinions and expertise between those who have the benefit of cutting edge technology and those who need to innovate within their resource constraints. It is our hope that this will help to develop medical knowledge and to provide optimal clinical care in different settings. We envisage an incessant stream of information flowing along the channels that WJMER will create and that a surfeit of ideas will be gleaned from this process. We look forward to sharing these experiences with our readers in our editions. We are honoured to welcome you to WJMER.

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## **WELCOME**

It is with great pleasure that we bring you the fourteenth edition of the World Journal of Medical Education and Research (WJMER). This edition assembles a variety of intellectually-stimulating articles, as well as the abstracts from the Doctors Academy 7<sup>th</sup> International Academic and Research Conference which took place at the University of Manchester, United Kingdom on 5<sup>th</sup> August 2017.

The opening article by Heap discusses the International Medical Summer School, a highly acclaimed and reputed event that provides a sound platform for enthusiastic and motivated undergraduate students from around the world to expand their horizons and learn new skills. In an attempt to evaluate the impact of the Summer School on the intellectual development of the delegates, Heap examines the feedback collected from those who attended the 2016 event. Conclusions are also drawn regarding the preferred and most effective teaching method at an event of this kind.

Kwasau explores the paediatric surgical procedures that are undertaken in a hospital in Sierra Leone. The article offers a detailed account of the various procedures, as well as discusses the post-operative outcomes for children undergoing surgery in this country.

Realising the surgical challenges associated with high energy fractures of the tibial plateau, Osborne and Barry compare the different treatment options. They analyse the existing literature pertaining to this field and explores the advantages and disadvantages of each procedure. The conclusion aims to propose the most effective option.

The final article by Batt and Vincent highlights the necessity for utilising the ITU resources appropriately and efficiently. The study analyses the demographics of patients who were admitted to the ITU following either an elective or an emergency laparotomy. The authors conclude that the decision to admit a patient to ITU is dependent on that person's individual clinical needs. In addition, the need to conduct further research in this area in order to prevent the superfluous expenditure of resources is emphasised.

The abstracts from the 7<sup>th</sup> International and Academic Research Conference follow the aforementioned articles. These abstracts broach a variety of fascinating topics and highlight the ground-breaking research currently being conducted by medical students and junior doctors throughout the world.

We sincerely hope that you find each article in this edition informative, interesting and enjoyable to read.

With very best wishes,

**Ms Karen Au-Yeung**  
Editor

**Ms Rebecca Williams**  
Associate Editor

**Professor Stuart Enoch**  
Editor-in-Chief

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## The 8th International Medical Summer School, Manchester: A Report

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**WJMER, Vol 14: Issue 1,  
2017**

### Abstract

**Introduction:** The International Medical Summer School is an annual not-for-profit event that aims to equip undergraduates from countries around the world with the clinical and professional acumen necessary to enter their chosen specialty. The 2016 Summer School was attended by 170 students from 63 universities in 24 countries.

**Methods:** Feedback was collected from delegates retrospectively via online survey using 5-point unipolar rating scales. This report details the structure of the Summer School, before recounting and analysing feedback collected from the delegates.

**Results:** Overall feedback on Summer School content, career relevance, and meeting objectives was extremely positive with 43%, 40%, and 41% rating these categories as excellent respectively. Amongst the Summer School's diverse teaching methods, workshops and lectures were received more favourably than the World University Anatomy Challenge and experiential Model WHO Assembly.

**Conclusion:** The feedback is used to generate a number of conclusions about the Summer School's effectiveness as a teaching method and insights into the learning preferences of delegates. Further, a number of recommendations are made to guide future enquiry.

### Key Words

Medical Summer School; International Medical Event; Workshops; World University Anatomy Challenge; Model WHO Assembly

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### Introduction and Aims of the Summer School

The International Medical Summer School is an annual event that welcomes undergraduates from numerous countries to the University of Manchester. It aims to equip students with the clinical and professional acumen necessary to enter their chosen specialty by providing insight into the training structure and working reality of competitive specialties, as well as opportunities to develop clinical skills and interact with specialist clinicians. These specialty-specific components are complemented by career guidance on academic aspects of a career in medicine, including Ethics and Research, as well as professional development and portfolio. Delegates are further provided with opportunities to enhance their portfolios as the winner of the World University Anatomy Challenge, and this year as 'Best' and 'Commendable' delegates in the Model World Health Organization (WHO) Assembly.

The Summer School took place from Monday 1<sup>st</sup> to

Friday 5<sup>th</sup> August 2016 and received 176 delegates from 63 universities in 24 countries. The event was supported by 140 volunteer faculty, comprising of consultants and junior doctors.

### The Week Itself

The five-day event saw delegates engage in various educational activities, including practical workshops and experiential learning events underpinned by more didactic lectures. Each evening, delegates were invited to network with each other and faculty at socials organised to allow them to experience Manchester's vibrancy and cosmopolitan atmosphere.

### Monday

Delegates separated into three streams according to their interest in Medicine, Surgery, or acute specialties. Consultants then delivered a series of 'A Day in the Life of..' lectures to each third, thus providing valuable insight into a range of specialties to develop each delegates' understanding of their own career intentions.

### **Tuesday and Wednesday**

For the next two days, the delegates were streamed into eight groups according to their preferences. In these streams, delegates attended workshops and lectures that detailed core theoretical content and essential practical skills relevant to their chosen and related specialties.

### **Thursday**

The fourth day piloted a new design in response to feedback from previous delegates requesting a greater proportion of interactive sessions. In the morning, delegates entered screening rounds for the 5<sup>th</sup> World University Anatomy Challenge. Then 'Global Health Emergency Day' began. In the weeks before the Summer School, delegates received a briefing document to outline the key players and actions involved in humanitarian response. At the Summer School, it was announced that delegates would work together to mount the healthcare response to a novel disaster; a coastal earthquake in Rio de Janeiro, Brazil. Delegates received three lectures on natural disasters, culture of medical humanitarian organisations, and maternal and neonatal global health to further prepare them. After this, Manchester Model United Nations Society facilitated a Model WHO Assembly where delegates could apply the theory in real time to prioritise and initiate the healthcare response to the disaster. This experiential learning event provided an insight into global health challenges outside that offered by mainstream medical curricula.

### **Friday**

Friday consolidated the previous day's humanitarian theme with a lecture on surgery with Merlin and Medicines Sans Frontières, before moving into academic domains. Delegates were lectured on Medical Ethics & Law, Scientific Publications, and Translational Research to broaden their understanding of medical careers. Delegates later participated in knock-out rounds and finals of the 5<sup>th</sup> World University Anatomy Challenge.

### **Feedback**

Shortly after the Summer School electronic forms were designed to collect feedback according to a 5-point unipolar rating scales and distributed to the delegates. Delegates were required to complete the form to receive certification that they had completed the Summer School. Both quantitative and qualitative data were collated and summarised to produce tables of descriptive statistics for numerical summary and pie charts for graphical representation of responses to different teaching methods. Responses underwent chi-square testing to demonstrate independence.

### **General Feedback**

Global feedback was positive with 43% respondents rating Summer School content as excellent, and the rest as very good. Delegates perceived the Summer School to be relevant to their prospective careers with 40% rating it very relevant and 60% most relevant. In addition, 41% of respondents described the Summer School as 'most certainly' meeting their objectives, with the other 59% choosing 'certainly.' These positive remarks support the Summer School as an effective way to teach medical undergraduates. The workshops received the most positive feedback overall, followed by the lectures, then the less traditional learning events including the World University Anatomy Challenge and the Model WHO Assembly.

### **Workshops**

Rating	Frequency	Yates' p-value
Excellent	485	<0.01
Very good	214	<0.01
Average	30	<0.01
Fair	3	<0.01
Poor	0	<0.01

**Table1:** Overall rating frequencies for workshop feedback



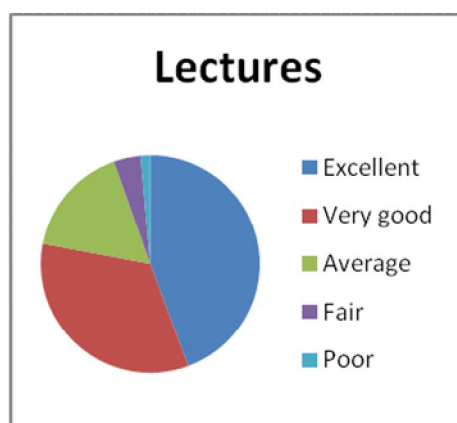
**Figure 1:** Feedback on overall content of workshops

The practical workshops were well received by delegates, with 66% rated as excellent and 29% rated as very good overall. There were 30 average (0.04%) ratings and 3 fair (0.004%), but no poor ratings. The responses can be further subdivided into 62.68% opening presentations rated as excellent, 63.16% equipment rated as excellent, and 60.88% skills learnt rated as excellent. The remaining 39.03% skills learnt were rated as very good, indicating that the workshops provided

delegates with an effective means of developing their clinical skills. All eight streams attended the surgical skills workshop and gave it the most positive feedback across the board, with 68.88% rating the presentation as excellent, 75.63% rating the equipment as excellent, and 74.38% rating the skills learnt as excellent. The airway management, anaesthetics, ECG, and chest drain insertion workshop was only available to two streams, but received impressive feedback with 79.5% rating the presentation as excellent, 65% rating the equipment as excellent, and 68% rating the skills learnt as excellent. All workshops performed well, but in general workshops with lower faculty-delegate and equipment-delegate ratios were more favourably rated by delegates, as well as workshops with more realistic equipment such as animal tissue, suggesting delegates perceived greater benefits from workshops where they had more instructor attention, but also workshops that were more realistic and clearly transferable to actual clinical practice.

Rating	Frequency	Yates' p-value
Excellent	1365	<0.01
Very good	1034	<0.01
Average	511	<0.01
Fair	123	<0.01
Poor	44	<0.01

**Table 2:** Overall rating frequencies for lecture feedback



**Figure 2:** Feedback on overall standard of lectures

Feedback on lectures was largely favourable with 40% rating the general academic standard of lectures as excellent, 45.5% as very good, 13.5% as average and 1% as fair. These figures can be dissected to elucidate all streams delivering equally high standards: 49.22% 'Acute and other specialty' lectures were rated excellent followed by 49.15% and 46.27% of those with medical and surgical

subject matter respectively. In total, there were 123 fair ratings and 44 poor ratings, but more attention is paid to this later. The highest accolades were for the academic careers lectures with 67.33% rated as excellent and 32.67% as very good. Global health and humanitarian levels received a respectable 45.25% excellent feedback and 54.75% very good feedback. Highlights included lectures on 'A Day in the Life of a Plastic Surgeon,' 'Common Psychiatric Conditions and Management,' and 'Gynaecological Disorders and Malignancies,' all three of which were rated as excellent by over 75% of respondents. The diversity amongst these favourite subjects suggests that delegates welcomed instruction in clinical as well as academic areas, from both within and without the traditional undergraduate curriculum.

### Anatomy Challenge

Rating	Frequency	Yates' p-value
Excellent	354	<0.01
Very good	265	<0.01
Average	129	<0.01
Fair	10	<0.01
Poor	17	<0.01

**Table 3:** Overall rating frequencies for Anatomy Challenge feedback



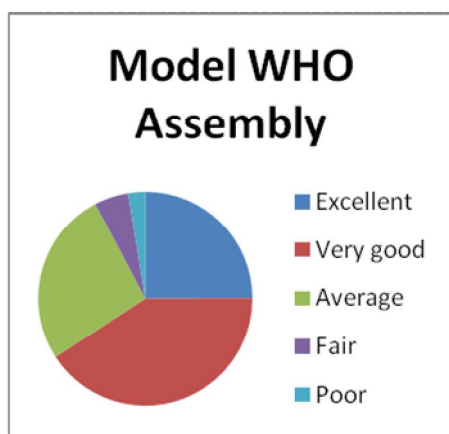
**Figure 3:** Overall feedback on Anatomy Challenge

Respondents were requested to feedback on the 5<sup>th</sup> World University Anatomy Challenge in the following areas: standard of screening questions, structure of competition, as well as how interesting it was. 41% rated screening questions as excellent with 59% rating them as very good. Regarding structure, 43% rated the challenge as excellent and 57% very good. Finally, 45% rated the interest level as excellent with 55% rating it a very good. This positive feedback suggests that the World University Anatomy Challenge is not only adequately challenging but also an engaging teaching and learning method for medical undergraduates.

### Model WHO Assembly

Rating	Frequency	Yates' p-value
Excellent	193	<0.01
Very good	317	<0.01
Average	205	<0.01
Fair	40	<0.01
Poor	20	<0.01

**Table 4:** Overall rating frequencies for Model WHO Assembly feedback



**Figure 4.:** Overall feedback on Model WHO Assembly

The Model WHO Assembly received less favourable feedback than other educational activities throughout the Summer School, but nonetheless performed positively overall. Feedback was collated in the following domains: topic, structure, interactivity, panellists, and panellist responses to questions. The topic for the experiential learning session (Coastal Earthquake in Rio de Janeiro, Brazil) was rated most highly with 27% excellent and 73% good, followed by the expert panellists and their responses to questions, each receiving 26% excellent and 74% very good feedback. The structure and interactive aspect of the session also received good feedback with 23% and 21% excellent ratings and 77% and 79% very good feedback respectively. This is encouraging feedback for a topic and teaching method outside mainstream medical curricula and supports its efficacy in meeting its objectives of introducing undergraduates to Global Health and Humanitarian Response.

### Comments from Delegates

Sixty-eight respondents provided free text feedback and this qualitative data underwent content analysis into thematic units. These themes were then used to inform interpretation of quantitative data and shed further light on positive and negative responses.



**Figure 5:** Word cloud weighted to represent relative frequencies of themes in free text feedback

Theme	Frequency
Workshops	25
Organisation	23
Teaching and learning	22
Lectures	22
Overall experience	21
Enjoyment	16
Committee and faculty	10
Networking	7
Model WHO Assembly	7
Anatomy Challenge	5

Free text feedback reflected positively on the Summer School's organisation, the committee and faculty, the enjoyment and overall experience, as well as the available teaching and learning opportunities. In particular the workshops, which for many were the highlight of the week. Most importantly, delegates reported not just how much they learnt and how good the teaching was, but also described the relevance and motivating qualities of the experience.

However, there were some constructive suggestions about the organisation and delivery of the educational content that merit further exploration: there was a discrepancy in delegates perceptions of timings and resources allocated to workshops. Invariably, delegates requested more time for workshops as group size and time constraints had prevented some delegates from practicing all skills. However, other delegates raised the issue of lecturers not having time to finish their didactic sessions. One delegate requested an entire additional week in order to participate in more sessions. It is clear from the feedback that delegates thoroughly enjoyed the sessions that they could attend, and it would not be unreasonable to surmise that this feedback results from unrealistic expectations as to what can be achieved at a five-day summer school. For example, one delegate requested an 'in-hospital' session observing surgery, when

arguably this is something to observe on clinical placements during undergraduate studies, not at Summer School. Having said this, workshops are clearly the delegates preferred method of learning and should feature prominently in any future configuration of the Summer School.

At times, last minute cancellations affected delegate satisfaction with lectures. There was also concern between delegates who preferred lecturers to focus on working life and career pathways, and delegates who wished to hear more about clinical cases; just as there was angst between those who enjoyed interactive and experiential learning sessions and those who did not and requested more workshops. Delegates who commented that they did not enjoy certain aspects of the programme did not qualify their statements and so it is not possible to understand whether their feedback represents a shortcoming of the Summer School to meet its educational objectives or whether their preferences are a product of familiarity and individual learning styles. Interpreted in the light of quantitative data that the Summer School was relevant and met the delegates' own learning objectives, it could be suggested that the Summer School was effective despite improvements that could be made to delivery. It is clear that no one design will please every delegate, nonetheless these comments provide

useful insight into how to improve the Summer School.

### Conclusion

In conclusion, the Summer School's overwhelmingly positive feedback reflects the sheer scale of learning opportunities it offers and the effort and attention to detail put into the event by organisers and faculty. Lectures and workshops were marginally preferred to less traditional teaching methods, but it is beyond the scope of this report to speculate as to whether this was due to delegates preferring teaching methods that they have grown used to at medical school, or because the content of the lectures and workshops was perceived as more directly relevant to their studies and future careers. More attention could be paid to survey design to elicit delegate preferences for new educational components. The feedback on skills learnt in the workshops demonstrates the capacity of the Summer School to effectively develop the delegates' clinical skills. However, further enquiry should be undertaken to compare delegate confidence levels before and after each session in order to elucidate this further. Feedback was not collected anonymously and, whilst the Summer School is a unique event clearly well received by delegates, it should be noted that this lack of anonymity may influence respondents to feedback more positively.



*Image 1: Some Attendees of the 2016 International Medical Summer School.*



*Image 2: Participants Practicing Laparoscopic Skills*



*Image 3: Participants Being Taught Basic Surgical Skills*



*Image 4: Workshop on Orthopaedic Skills.*



*Image 5: Delegates Participating in Ultrasound Workshop.*



## Paediatric Surgical Intervention In Sierra Leone: A Retrospective Study of 204 Patients

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*WJMER, Vol 14: Issue 1, 2017*

### Abstract

**Introduction:** There is growing evidence that childhood surgical conditions, especially injuries, are common in developing countries and that poor care results in significant numbers of deaths and cases of disability. For paediatric purposes, it appears that there are four areas where efforts should be focused. Special attention should be given to defining a cost-effective package of surgical services, improving surgical care at the community level, strengthening surgical education, and surgical care should be an essential component of child health programmes in Sierra Leone.

**Aim:** The main aim of this study was to establish the Burden of Paediatric Surgical Conditions, Types of Paediatric Surgical Procedures and determine the Postoperative Outcome in Sierra Leone.

**Method:** Visited Connaught Hospital to interview staff and review theatre logbook for the period of one year. A data collection tool was used to obtain the number, age, sex, types of paediatric surgical conditions and procedures on all patients 0 to 15 years at Connaught Hospital Operating Theatre (CHOT) from 1<sup>st</sup> June, 2015 to 30<sup>th</sup> June, 2016.

**Conclusion:** Inguinal Hernia is the commonest paediatric surgical condition in Sierra Leone. The number of paediatric surgical procedures at CHOT is higher in males than females. The highest number of paediatric surgical procedures is in the youngest age-group (0 - 4 years). Common paediatric surgical conditions managed at CHOT are: Inguinal Hernia, Hydrocele, Appendicitis and Osteomyelitis. 93% success rate of paediatric surgical procedures at CHOT.

### Key Words

Paediatric Surgical Conditions; Paediatrics; Sierra Leone; Inguinal Hernia

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### Introduction

**Background:** Paediatric surgery arose in the middle of the 20<sup>th</sup> century as the surgical care of birth defects required novel techniques and methods, and became more commonly based at children's hospitals. One of the sites of this innovation was Children's Hospital of Philadelphia. Beginning in the 1940s under the surgical leadership of C. Everett Koop, newer techniques for endotracheal anaesthesia of infants allowed surgical repair of previously untreatable birth defects. By the late 1970s, the infant death rate from several major congenital malformation syndromes had been reduced to near zero.

Perhaps the most significant advance associated with the surgical care of children during the past century has been the realization that "children are not small adults". Rather, children develop distinct surgical conditions, present unique anaesthetic challenges,

and have special perioperative needs. Moreover, the consequences of paediatric surgical conditions may be lifelong since they affect children at critical times during development.

**Justification:** There is no defined essential package of paediatric surgical services based on the epidemiology of childhood surgical diseases and on the estimated need and expense of surgical care including both preventive and curative services in Sierra Leone. With regard to surgical services, the programme should define which operations are appropriate, the level of the health system at which they can be performed, and the level of training required in order to carry them out. The package might include injury prevention, routine screening of neonates for congenital anomalies, simple protocols for the management of uncomplicated paediatric surgical conditions, and criteria for referring children to secondary or tertiary facilities.

Health policy in Sierra Leone cannot reflect the surgical needs of children until there are data demonstrating that paediatric surgical conditions are a significant public health problem. There is a major need for data on the epidemiology of paediatric surgical diseases, the morbidity and mortality associated with poor surgical care, and the cost of paediatric surgical services. Support for research on these matters could perhaps be given by WHO, UNICEF, and other international agencies. Information on paediatric surgical conditions in Sierra Leone can be expected to become increasingly important as evidence-based methods are used to a greater extent in the allocation of resources. In the absence of data demonstrating that paediatric surgical conditions are a problem, it would be unreasonable to expect resources to be allocated for paediatric surgical care. In the Global Burden of Disease (GBD) study<sup>12</sup>, childhood surgical conditions were underrepresented. Of 58 major paediatric surgical diagnoses recorded at the main government referral hospital in the Gambia only 21 were included in the analysis. Of course, the GBD methodology cannot include all diagnoses but a GBD study focusing solely on the paediatric age group might offer the best prospect of resolving this matter.

The issue is not whether selected children can receive surgical care but whether children in general have access to appropriate surgical services. Only a small fraction of children in Sierra Leone have access to basic surgical care. Long distances from hospitals and prohibitive transportation costs prevent the timely treatment of paediatric surgical conditions. Travelling to a hospital may take several days, during which time the patient's condition may deteriorate, leading to increased operative risk and mortality. Disease processes are often far advanced when a patient reaches the hospital, such that there may be pathological consequences threatening survival. It is also worth noting that children are often referred after folk medicine or traditional remedies have failed.

### Burden of Childhood Conditions

**Injuries:** Injuries are the commonest surgical condition affecting African children. For children in Africa who survive the first four years of life, injury becomes the most likely cause of disability and death, a situation that remains true until the fourth decade of life<sup>6</sup>. In a recent review of injuries and noncommunicable diseases in developing countries, childhood disability-adjusted life years (DALYs) related to injuries were the highest in sub-Saharan Africa<sup>7</sup>. DALYs related to injuries were higher among males than females and among children aged 0–4 years than among those aged 5–14 years.

That injuries are a significant cause of death and

disability among African children should not be surprising, since, in most established market economies, they are the leading cause of death and disability for the age group 1–19 years. In low-income countries also, especially those that have recently become industrialized and motorized, injuries are an important health problem. Even in those countries with the lowest incomes, injuries comprise one of the leading causes of death among adults and are a major cause of disability in most age groups<sup>8–13</sup>.

In rural East Africa, injuries (40 000 episodes and 100 deaths per 100 000 of the general population annually) rank third in importance behind diarrhoea and malaria<sup>14</sup>. Mortality rates associated with injury are even higher in urban areas of Africa. For example, one community survey in an urban area of Uganda indicated that the annual mortality rate attributable to injury was 217 per 100 000<sup>13</sup>. The lifetime risk of dying from an injury in urban Uganda was 10% for both males and females and was twice as high as the risk of maternal death<sup>15</sup>. In Ghana the all-age, annual, non-fatal injury rate has been estimated at 7.6 per 100<sup>11</sup>.

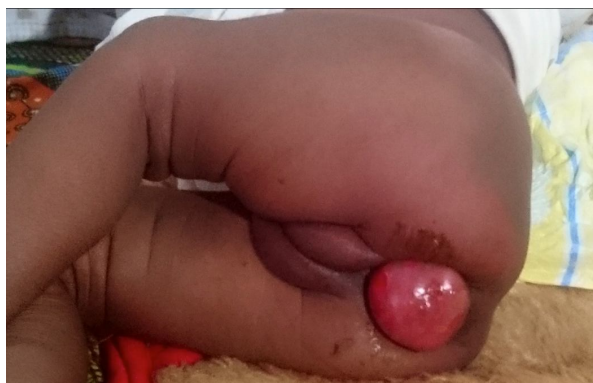
Road traffic accidents, falls, burns and accidental poisoning are the commonest categories of childhood injuries. Child safety is seen as a relatively low priority, and it can be expected to remain so in the foreseeable future in the face of poorly maintained roads, large numbers of old vehicles, inadequate law enforcement, and overloaded public transport systems. Hundreds of thousands of children are permanently disabled in Africa every year as a consequence of injuries and poor trauma care.

Armed conflicts also take their toll<sup>16</sup>. During 2000, a total of 11 major wars were being fought in Africa, involving half the countries in the continent and 20% of the population. It is estimated that 120 000–200 000 child soldiers aged 5–16 years are currently participating in such conflicts. Children involved in armed conflicts sustain bullet and shrapnel wounds, as well as burns and land mine injuries, all of which require surgical care. In Africa, landmines are responsible for killing or injuring 12 000 people a year, many of them children.

Childhood injuries also place a significant burden on health services. At the main government referral hospital in Banjul, injuries accounted for almost half the paediatric surgical admissions<sup>4</sup>. In Lilongwe, Malawi, 9.7% of all paediatric admissions were related to accidents; 27% of cases were burns and scalds, and 32% were fractures, usually caused by falls<sup>17</sup>. A household survey suggested that 21% of urban children and 15% of rural children would suffer an accidental injury each year and that half of them would visit health centres. At Baragwanath

Hospital, Johannesburg, 25% of paediatric surgical admissions are related to injuries<sup>3</sup>.

**Congenital abnormalities:** Congenital abnormalities are another common and underreported paediatric surgical condition. A recent study from an urban centre in South Africa showed the incidence of congenital anomalies at birth to be 11.8 per 1000 live births<sup>18</sup>, with central nervous system, musculoskeletal, and cardiovascular anomalies being the commonest. Extrapolation from other studies conducted in developing countries indicates that the cumulative incidence of severe congenital abnormalities may affect up to 85 per 1000 children by the age of 5 years<sup>19</sup>. The impact of congenital anomalies on childhood morbidity and mortality in Africa is unknown. Neonates with surgical conditions are especially problematic, most notably in emergency settings. In Zaria, Nigeria, 38% of neonates developed postoperative complications and the overall mortality 30.5%<sup>20</sup>. Inguinal hernias, genitourinary and anorectal malformations,



**Figure1:** Intussusception Protruding from the Anus in a 2 day old baby girl Admitted at Connaught Hospital.

meningomyeloceles, and cleft lip and palate are the commonest congenital anomalies requiring surgical repair in Africa.

**Surgical infections:** Surgical infections pose another threat to African children. Abscesses, pyomyositis, and osteomyelitis are common in tropical regions of Africa, and their increased incidence is most probably related to malnutrition or immunosuppression associated with parasitic infections. Surgical infections, particularly chronic osteomyelitis, are a significant burden on health services. At the main government referral hospital in Banjul, for example, osteomyelitis accounted for 7.8% of paediatric surgical admissions and 15.4% of total inpatient days<sup>4</sup>. The number of hospital days taken up by osteomyelitis was second only to that for burns.

#### **Statement of the Problem**

Despite increasing awareness of the unmet burden of surgical conditions, little information is available

on surgery in children worldwide<sup>21</sup>. It has been estimated by WHO that 85% of children in low-income countries are likely to require treatment for a surgical condition by the age of 15 years<sup>21</sup>. Many disease conditions of childhood are amenable to simple surgical intervention, but if left untreated, complications, lifelong disability or death can ensue. Uganda, a low-income country, faces considerable challenges in the provision of paediatric surgical care. Of its rapidly-growing population of 31.7 million, 49% is under 15 years of age and 88% lives in rural areas<sup>3</sup>. Uganda's population demographics, expenditure on health care and health-care outcomes are typical of low-income countries in sub-Saharan Africa. Postgraduate training opportunities for physicians are limited; only 10 trainees complete postgraduate training in surgery in the country each year.

There is only one paediatric referral hospital in Sierra Leone- Ola During Children's Hospital (ODCH), a government facility located in Freetown, Western urban area. All surgical cases at ODCH are referred to Connaught Hospital, another government facility also in Freetown, Western urban area. Connaught Hospital serves as the primary referral hospital for many other health facilities in the country. In addition to the expenditure on medication, there is the cost of transportation, feeding and accommodation which discourages many from seeking health care in the hospital. Furthermore, the Ebola Virus Disease (EVD) outbreak exposed the wide breach of Infection Prevention and Control (IPC) protocols which led to the demise of some health workers; Thus, making hospitals no go area for patients because they thought albeit erroneously that they could also die while seeking care in such facility<sup>22</sup>. This perception is gradually changing with the introduction of the Free Health Care Scheme for the under five's and the recent inclusion of paediatric surgery into this programme. Notwithstanding, there is an influx of paediatric patients who require surgical intervention.

#### **LITERATURE REVIEW**

**Definition:** Paediatric surgery is a subspecialty of surgery that involves surgical procedures on children up to the age of 15. Paediatric age limit is higher in developed countries owing to greater availability of resources, compared to low-income countries like Sierra Leone. These surgeons cope with wide physiological differences between each of the age groups from newborns through to near-adults, as well as specific set of skills and professional attitudes for dealing with children and their families.

Where other specialties are concerned with a particular technique or area of the body, paediatric surgery is the only surgical specialty that is defined

by the patient's age rather than by a specific condition and deals with the diseases, trauma and malformations from the foetal period to teenage years.

The routine workload is very broad as paediatric surgeons deal with all conditions in this age group, though there are some conditions innate to children. Most consultants develop experience and skills across the breadth of surgery, but there is an increasing trend for consultants to develop further specific expertise in areas of special interest.

**Epidemiology:** The most important issue surrounding the surgical care of children in developing countries is the burden of surgical diseases on paediatric populations<sup>1</sup>. Epidemiological data on this subject are scarce.

The pattern of paediatric surgical diseases in sub-Saharan Africa provides an insight into this as it has the greatest disparities in health care and is the one most familiar<sup>2</sup>. Pattern of diseases and the availability of resources vary between regions of the world, but sub-Saharan Africa epitomizes many of the challenges inherent in attempting to provide surgical care for children in developing countries.

The available information suggests that surgery patients are responsible for approximately 6–12% of all paediatric admissions in sub-Saharan Africa<sup>3</sup>, although the proportion may be higher in some urban areas. At the main government referral hospital in Banjul, the Gambia, surgical patients accounted for 11.3% of paediatric admissions<sup>4</sup>. The commonest admission diagnoses were injuries, congenital anomalies, and surgical infections, accounting for almost 90% of paediatric surgical admissions. At the rural Ahmadu Bello University Teaching Hospital, Malumfashi, northern Nigeria, paediatric surgery represented 6.6% of the paediatric workload and 9.6% of all operative procedures<sup>5</sup>. The most frequent operations performed in this hospital were for congenital anomalies (40%), infections (22%), and traumas (21%).

#### **Consequences of Poor Surgical Care:**

Inadequate surgical care for children in many developing countries has had tragic consequences. The impact on child health remains poorly defined, but it is likely that poor surgical care contributes significantly to the high disability rates in these countries. In Uganda, for example, 12% of households reported a disability related to injury<sup>15</sup>. Any of the disabilities that result from injury could either be prevented or corrected if surgical care were improved.

The most common disabilities associated with injuries relate to mismanaged burns, fractures, and

dislocations. Many of these complications result from late presentation because of poor access to surgical care.

**The Principle Subspecialties of Paediatric Surgery:** As a medical discipline that involves the care of many organs and physiological systems, paediatric surgeons perform surgery for a very wide range of conditions including:

**Neonatal Surgery** – routine antenatal ultrasound scanning means that patients are getting younger and younger. For some conditions, such as gastroschisis (a birth defect hole in the abdominal wall) and congenital diaphragmatic hernia, paediatric surgeons now provide antenatal counselling for parents in conjunction with obstetricians and specialists in foetal medicine. They plan the care of the mother and child from delivery to subsequent surgery.

**Paediatric Urology** – Few people realize that urinary tract and genital abnormalities are the third most common congenital abnormality in children, ten times more common than cleft lip or palate. Certain urological conditions, such as hypospadias, are frequently present at birth or in young people. Hypospadias, a crippling deformity of the male genitalia that prevents normal urinary and sexual function, occurs in approximately one in every 150 boys. Other urological conditions such as urinary incontinence and bladder and kidney malformations require specialized care, yet there are very few medical personnel worldwide trained in paediatric urology.

**Paediatric Oncology** – childhood cancers are different from those developed by adults. Leukaemia remains the most significant in children. Others include: Burkitt's lymphoma, Wilm's tumour, non-seminomatous germ-cell tumours (teratomas, yolk sac tumours) and non-germ-cell tumours (interstitial cell tumours) of the testis.

Other areas of surgery also have paediatric specialties of their own that require further training during the residencies and in a fellowship:

- **Paediatric Emergency Surgery** - surgery involving foetuses or embryos (overlapping with obstetric/gynaecological surgery, neonatology, and maternal- foetal medicine) for conditions where incidence of irreversible tissue damage and risk of survival are likely. These include: prolonged labour, premature rupture of membranes and late presentation to the hospital.
- **Paediatric Cardiothoracic Surgery** - surgery on the child's heart and/or lungs, including heart and/or lung transplantation.
- **Paediatric Nephrological Surgery** - surgery

on the child's kidneys and ureters, including renal (kidney) transplantation.

- **Paediatric Neurosurgery** - surgery on the child's brain, central nervous system, spinal cord, and peripheral nerves.
- **Paediatric Hepatological (liver) and Gastrointestinal (stomach and intestines) Surgery** - including liver and intestinal transplantation in children.
- **Paediatric Orthopaedic Surgery** - muscle and bone surgery in children.
- **Paediatric Plastic and Reconstructive Surgery** - such as for burns, or for congenital defects like cleft palate not involving the major organs.

#### **Common Paediatric Surgical Conditions:**

What percentage of the paediatric population in sub-Saharan Africa can be expected to require surgical care during childhood? In an attempt to answer this question, an investigation was carried out on the number of children in Banjul who sought care for surgical conditions at the main government hospital during 1997<sup>23</sup>. Surgical conditions were defined as all injuries (e.g. fractures, lacerations, head injuries and soft tissue injuries), correctable congenital anomalies (e.g. inguinal hernia, clubfoot), surgical infections (e.g. abscesses and osteomyelitis), and other conditions requiring surgical care. The annual presentation rate for all surgical conditions was 543 per 10 000 children aged 0–14 years. A total of 46% of children presenting with surgical conditions required surgical procedures, 68.2% of which were classified as minor. The estimated cumulative risk for all surgical conditions was 85.4% by the age of 15 years. Although based on a small paediatric population and a relatively short period of time, the data suggest that a significant proportion of children living in urban areas of sub-Saharan Africa require surgical care at some time during childhood.

- **Infantile Hypertrophic Pyloric Stenosis:** characterized by hypertrophy of the pylorus, with elongation and thickening, eventually progressing to near-complete obstruction of the gastric outlet. Occurrence of 2 to 3.5 in 1000 live births with rate varying from region to region. Affects males than females (4:1 to 6:1). Approximately 30% occur in firstborn children.
- **Hydrocele:** A hydrocele is an accumulation of peritoneal fluid in a membrane called the tunica vaginalis, which covers the front and sides of the male testes.
  1. **Primary Hydrocele** - also called idiopathic hydrocele, develops slowly and becomes large and tense. Primary hydroceles may be classified as follows:
    - a. **Vaginal Hydrocele** - This surrounds the testes in the layers of the tunica vaginalis and

does not connect with the peritoneal cavity.

- b. **Congenital Hydrocele** - This is associated with a hernial sac. It connects with the peritoneal cavity.
  - c. **Infantile Hydrocele** - This extends from the testes to the deep inguinal ring. It does not connect with the peritoneal cavity.
  - d. **Hydrocele of the cord** - This lies along the cord anywhere from the deep inguinal ring to the upper scrotum. It does not connect with either the peritoneal cavity or the tunica vaginalis. A similar swelling may develop in the female and is known as a hydrocele of the canal of Nuck.
2. **Secondary Hydrocele** - tends to be small and lax, secondary to inflammation or tumour of the underlying testes, and occurs in the younger age group.
    - **Appendicitis:** an inflammation of the appendix.
    - **Acute abdomen:** an emergency that requires immediate surgical intervention. It is also called surgical abdomen. Mostly due to rupture of a viscus- appendix and peptic ulcer perforations are common, especially on late presentation to hospital.

#### **Common Elective Paediatric Surgical Procedures:**

- **Pyloromyotomy:** for correcting the narrowing of the opening between stomach and intestine (Infantile Hypertrophic Pyloric Stenosis).
- **Herniotomy:** surgical treatment of congenital inguinal (groin area) hernia in both male and female. It is done through an incision over the external inguinal ring and excision of the hernial sac at the neck. It is not necessary to open the external oblique aponeurosis as the internal and external inguinal rings are almost superimposed on each other.
- **Hydrocelectomy:** also known as hydrocele repair, is a surgical procedure performed to correct a hydrocele. There are two surgical techniques available for the Hydrocelectomy and both are performed at Connaught Hospital. They are:
  1. **Lord's technique** - Hydrocele surgery with plication of the hydrocele sac.
  2. **Jaboulay's technique** - Hydrocelectomy with excision of the hydrocele sac.
- **Orchidopexy:** Orchidopexy is a surgery to move an undescended testicle (cryptorchidism) into the scrotum and permanently fix it there. Orchidopexy also describes the surgery used to resolve testicular torsion which is a surgical emergency.
- **Mayo's repair:** Repair of umbilical (belly-button) hernia.

#### **Common Emergency Paediatric Surgical Procedures:**

- **Appendicectomy:** excision of an inflamed appendix.
- **Laparotomy:** an exploratory abdominal midline

incision for emergency surgical conditions such as acute abdomen.

## 1 METHODOLOGY

**Topic:** Paediatric Surgical Intervention in Sierra Leone.

**Aim:** To establish the Burden of Paediatric Surgical Conditions, Types of Paediatric Surgical Procedures and determine the Postoperative Outcome in Sierra Leone.

**Specific Objectives:**

1. Determine the Number of Paediatric Surgical Procedures at Connaught Hospital Operating Theatre from 1<sup>st</sup> June, 2015 to 30<sup>th</sup> June, 2016.
2. Determine the Types of Paediatric Surgical Conditions at Connaught Hospital.
3. Determine the Types of Paediatric Surgical Procedures and Postoperative Outcome at Connaught Hospital Operating Theatre.
4. Determine the Age and Sex Distribution of Paediatric Surgical Patients Managed at Connaught Hospital.

**Research Questions:**

1. How many paediatric surgical procedures in a year?
2. What are the common paediatric conditions that require surgical intervention?
3. What are the common paediatric surgical procedures?
4. What paediatric surgical conditions are prevalent in a particular age group?
5. What paediatric surgical conditions are prevalent in a particular sex group?

**Study Design:** A retrospective study aimed at analysing the pattern of paediatric surgical conditions, types of paediatric surgical procedures and postoperative outcome at Connaught Hospital, Freetown, Sierra Leone.

**Study Period:** 1<sup>st</sup> June, 2015 to 30<sup>th</sup> June, 2016.

**Study Site:** Connaught Hospital, a designated centre for major paediatric surgery in Sierra Leone.

**Sampling Procedure:** Sampling was done using existing records- in Connaught Hospital Operating Theatre logbook- of all patients on whom paediatric surgical procedures were done from 1<sup>st</sup> June, 2015 to 30<sup>th</sup> June, 2016.

**Sample Size:** Total number of patients 0 to 15 years who had surgery and were recorded at CHOT from 1<sup>st</sup> June, 2015 to 30<sup>th</sup> June, 2016 (204).

**Study Population** All patients 0 to 15 years on whom surgical procedures were done and recorded from 1<sup>st</sup> June, 2015 to 30<sup>th</sup> June, 2016 at the Connaught Hospital Operating Theatre.

**Selection of Study Population:** Visited

Connaught Hospital to interview staff and review theatre logbook for the period of one year. A data collection tool was used to obtain the number, age, sex, types of paediatric surgical conditions and procedures on all patients 0 to 15 years at Connaught Hospital Operating Theatre from 1<sup>st</sup> June, 2015 to 30<sup>th</sup> June, 2016.

**Inclusion and Exclusion Criteria:** Included all paediatric surgical patients who had surgical procedure(s) recorded at Connaught Hospital Operating Theatre within the period of 1<sup>st</sup> June, 2015 to 30<sup>th</sup> June, 2016.

Excluded all paediatric surgical patients who had surgical procedure(s) but have missing data.

**Ethical Consideration:** Ideally, an application for approval from Sierra Leone Ethics and Scientific Review Committee is required 3 months prior to the commencement of health related research involving participation of human subjects within Sierra Leone.

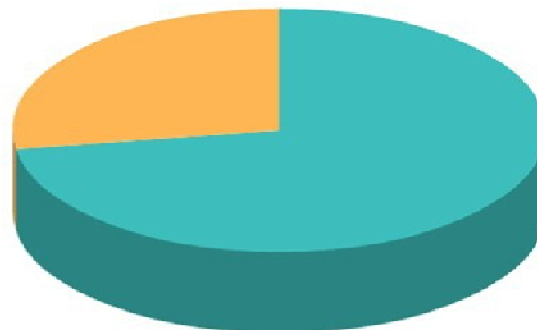
Permission to conduct this research was obtained from the Head of Department of Surgery, Connaught Hospital and the sister-in-charge, Connaught Hospital Operating Theatre. Names of patients and surgeons were not mentioned in the study to ensure anonymity. Consent from parent to take photo was obtained and face of patient was excluded for confidentiality.

**Data collection instrument/method:** Data was obtained from Connaught Hospital Operating Theatre logbook and recorded in a data collecting tool. The data collected was analysed by the use of simple descriptive statistics, summarised and represented in tables and graphs.

**Limitations:**

1. Definitive pre-/ post operative diagnoses are not stated in all cases. At times vague statements that do not give a proper description of the disease are used. For example, "Swelling L groin"- which could be a number of diseases (pyomyositis, inguinal hernia, fibrosarcoma or rhabdomyosarcoma) and "Lip damage"- a congenital abnormality (cleft lip) or as a result of trauma.
2. Surgical procedures are sometimes neither concise nor age-appropriate. For example, "excision of cyst" instead of "cystectomy" and "herniorrhaphy" (which includes repair of the posterior wall of the inguinal canal during an inguinal hernia repair in adults) instead of "herniotomy".
3. The precise age of paediatric surgical patients are not always represented in days (D) for neonates, months (M) for infants and years (Y) for those between ages 2 and 15 years.

**Fig. 2. Sex distribution of paediatric surgical patients managed.**

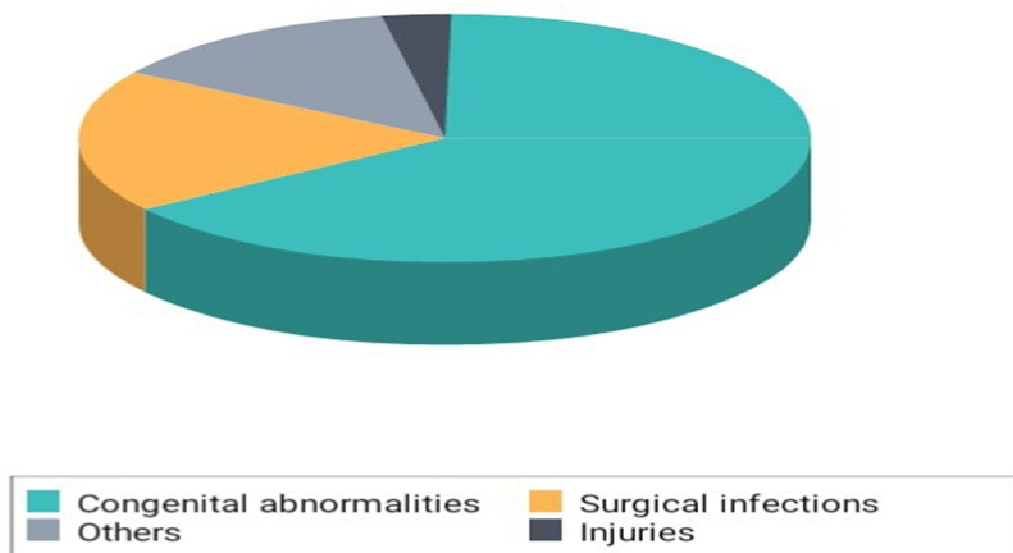


Surgical condition	Males	Females	Total	Percentage (%)
Inguinal hernia	75	10	85	41.6
Hydrocele	18	0	18	8.8
Appendicitis	5	8	13	6.4
Acute abdomen	8	3	11	5.4
Abscess	5	2	7	3.4
Cryptorchidism	5	0	5	2.5
Cleft lip	2	3	5	2.5
Umbilical hernia	0	4	4	2.0
Fracture	2	2	4	2.0
Spina bifida	1	2	3	1.5
Tumour	3	0	3	1.5
Mesenteric cyst	0	3	3	1.5
Septic arthritis	2	0	2	1.0
Lymphatic malformation	0	2	2	1.0
Anal malformation	1	1	2	1.0
Patent urachus	0	1	1	0.5
Omphalocele	0	1	1	0.5
Bladder extrophy	0	1	1	0.5
Cellulitis	1	0	1	0.5
Haemangioma	1	0	1	0.5
Pyomyositis	1	0	1	0.5
Toxic colitis	0	1	1	0.5

Uncircumcised	1	0	1	0.5
Phimosis	1	0	1	0.5
Staphyloma	0	1	1	0.5
Gangrene	1	0	1	0.5
Intestinal obstruction	1	0	1	0.5
Hirschsprung's disease	1	0	1	0.5
Cholecystitis	0	1	1	0.5
Splenomegaly	1	0	1	0.5
Splenic rupture	0	1	1	0.5
Syndactyly	1	0	1	0.5
Laceration	1	0	1	0.5
Stab wound	1	0	1	0.5
Lipoma	0	1	1	0.5
Fibroadenoma	0	1	1	0.5
Scalp cyst	1	0	1	0.5
Cystic hygroma	0	1	1	0.5
Occipital hygroma	1	0	1	0.5
Tongue tie	1	0	1	0.5
Grand total	148	56	204	100

*Table 2: Types of Paediatric Surgical Conditions.*

**Fig. 3. Pattern of Paediatric Surgical Conditions**



Surgical condition	0 - 4 (years)	5 - 10 (years)	11 - 15 (years)
Inguinal hernia	67	11	7
Hydrocele	15	1	2
Appendicitis	0	3	10
Acute abdomen	0	8	3
Osteomyelitis	7	1	3
Abscess	4	2	1
Cryptorchidism	2	2	0
Cleft lip	5	0	0
Umbilical hernia	2	2	0
Fracture	1	2	0
Spina bifida	3	0	0
Tumour	1	0	2
Mesenteric cyst	2	1	0
Septic arthritis	2	0	0
Lymphatic malformation	2	0	0
Anal malformation	2	0	0
Patent urachus	1	0	0
Omphalocele	1	0	0
Bladder extrophy	1	0	0
Cellulitis	0	0	1
Haemangioma	1	0	0
Pyomyositis	0	1	0
Toxic colitis	0	0	1
Uncircumcised	0	1	0
Phimosis	1	0	0
Staphyloma	1	0	0
Gangrene	1	0	0
Intestinal obstruction	1	0	0
Hirschsprung's disease	1	0	0
Cholecystitis	0	0	1
Splenomegaly	0	0	1
Splenic rupture	0	1	0
Syndactyly	1	0	0
Laceration	1	0	0

Stab wound	0	0	1
Lipoma	1	0	0
Fibroadenoma	0	0	1
Scalp cyst	0	1	0
Occipital hygroma	1	0	0
Cystic hygroma	1	0	0
Tongue tie	1	0	0
<b>Total</b>	<b>130</b>	<b>37</b>	<b>34</b>

**Table 4:** Types of Paediatric Surgical Procedures.

Surgical procedure	Males	Females	Total	Percentage (%)
Herniotomy	59	9	68	33.3
Herniorrhaphy	16	1	17	8.3
Hydrocelectomy	18	0	18	8.8
Appendicectomy	5	9	14	6.9
Laparotomy	11	4	15	7.4
Aspiration	1	0	1	0.5
I & D	6	4	10	4.9
Sequestrectomy	4	4	8	3.9
Arthrolysis	2	0	2	1.0
Orchidopexy	2	0	2	1.0
Orchidectomy	1	0	1	0.5
Circumcision	2	0	2	1.0
Lip reconstruction	1	2	3	1.5
Cheiloplasty	1	1	2	1.0
Mayo's repair	0	4	4	2.0
Wound ligation	2	0	2	1.0
Closed reduction and P.O. P.	2	0	2	1.0
O. R. I. F.	0	1	1	0.5
Hand reconstruction	1	0	1	0.5
Amputation	1	0	1	0.5
Skin grafting	1	0	1	0.5
Closure	2	4	6	3.0
Evisceration	0	1	1	0.5
Extirpation	1	1	2	1.0
Release	2	0	2	1.0
Cystectomy	1	3	4	2.0
Splenectomy	0	1	1	0.5
Retrograde cholecystectomy	0	1	1	0.5
Total colectomy	0	1	1	0.5
Colostomy	1	1	2	1.0
Sclerotherapy	0	3	3	1.5
Biopsy	5	1	6	3.0
<b>Grand total</b>	<b>148</b>	<b>56</b>	<b>204</b>	<b>100</b>

\*I & D - Incision and drainage. \*P. O. P. - Plaster of Paris. \*O. R. I. F. - Open Reduction and Internal Fixation.

**Table 5:** Sex Distribution of Paediatric Surgical Patients in Different Age- groups.

Age group	Males	Females	Total	Percentage (%)
0 – 4 years	97	33	130	63. 7
5 – 10 years	29	8	37	18. 2
11 – 15 years	22	13	34	18. 1
<b>Grand total</b>	<b>148</b>	<b>56</b>	<b>204</b>	<b>100</b>

\* % males: 72. 5.

\* %females: 27. 5.

\* % 0 - 4 males: 65. 5.

\* % 0 - 4 females: 58. 9.

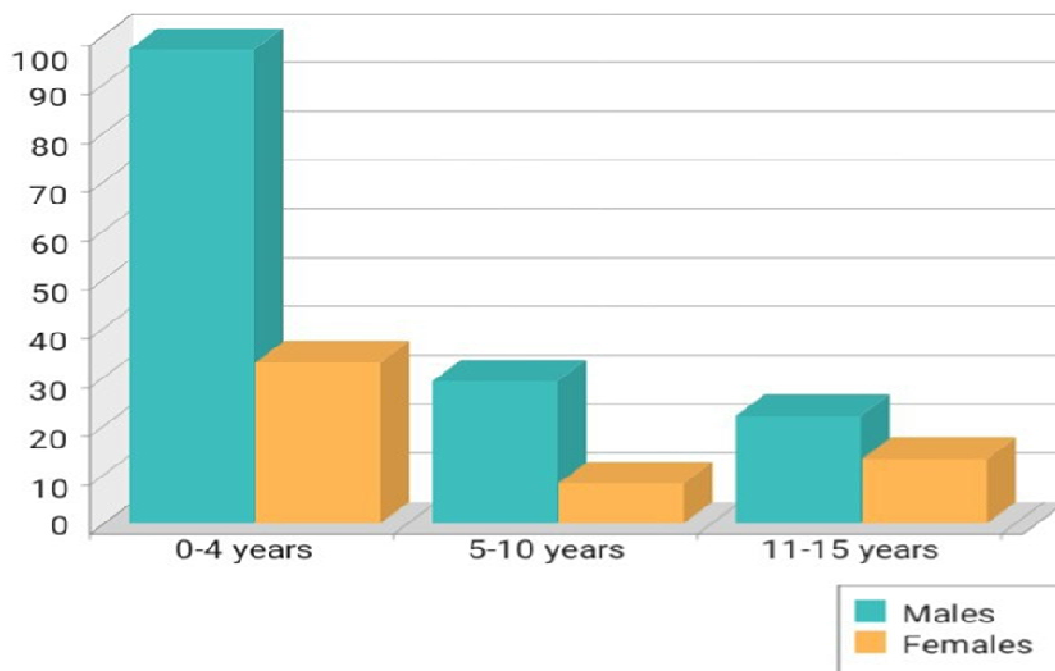
\* % 5 - 10 males: 19. 5.

\* % 5 - 10 females: 17. 5.

\* % 11 - 15 males: 15. 0.

\* % 11 - 15 females: 23. 6.

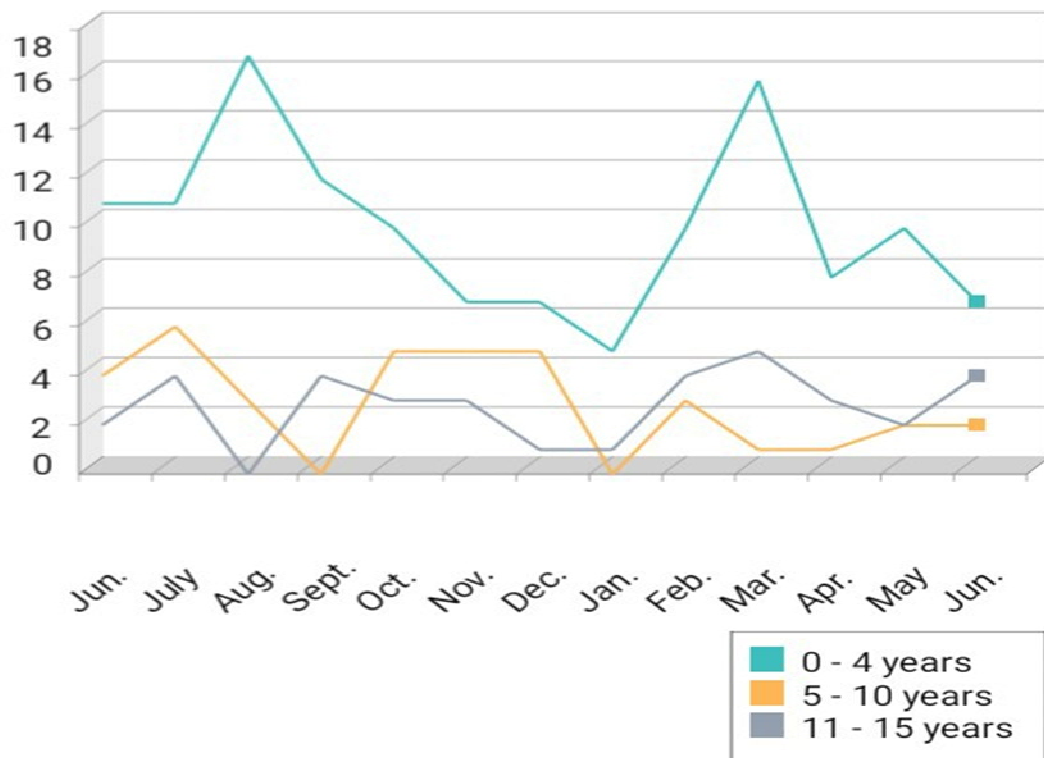
**Fig. 4. Sex Distribution of Paediatric Surgical Patients in Different Age-groups**



Month	0 - 4 (years)	5 - 10 (years)	11 - 15 (years)
June 2015	11	4	2
July 2015	11	6	4
August 2015	17	3	0
September 2015	12	0	4
October 2015	10	5	3
November 2015	7	5	3
December 2015	7	5	1
January 2016	5	0	1
February 2016	10	3	4
March 2016	16	1	5
April 2016	8	1	3
May 2016	10	2	2
June 2016	7	2	4
<b>Total</b>	<b>130</b>	<b>37</b>	<b>34</b>

**Table 6:** Monthly Distribution of Paediatric Surgical Patients in Different Age- groups

**Fig. 5. Trend of paediatric surgical procedures.**



Surgical procedure	Number	Alive	Dead
Herniotomy	69	67	2
Herniorrhaphy	17	17	0
Hydrocelectomy	18	18	0
Appendicectomy	14	12	2
Laparotomy	14	7	7
Aspiration	1	1	0
I & D	10	10	0
Sequestrectomy	8	8	0
Arthrolysis	2	2	0
Orchidopexy	2	2	0
Orchidectomy	1	1	0
Circumcision	2	2	0
Lip	3	3	0
Cheiloplasty	2	2	0
Mayo's repair	4	4	0
Wound ligation	2	2	0
Closed reduction and P.	2	2	0
O. R. I. F.	1	1	0
Hand	1	1	0
Amputation	1	1	0
Skin grafting	1	1	0
Closure	6	6	0
Evisceration	1	1	0
Extirpation	2	2	0
Release	2	2	0
Cystectomy	4	4	0
Splenectomy	1	0	1
Retrograde cholecystectomy	1	0	1
Total colectomy	1	0	1
Colostomy	2	2	0
Sclerotherapy	3	3	0
Biopsy	6	6	0
<b>Total</b>	<b>204</b>	<b>190</b>	<b>14</b>

*Table 7: Postoperative Outcome of Paediatric Surgical Procedures*

Procedure	Number	Alive	Dead
Laparotomy	2	1	1
Laparotomy	1	1	0
Release	2	2	0
Drainage	2	2	0
Stump revision	1	1	0
<b>Total</b>	<b>8</b>	<b>7</b>	<b>1</b>

**Table 8:** Surgical Procedures for Postoperative Complications

During this study period, a total of 204 patients were managed for various paediatric surgical conditions: Congenital abnormalities 133 (65. 3%) - 106 (79. 7%) males and 27 (20. 3%) females; Surgical infections 38 (18. 6%) – 20 (52. 6%) males and 18 (47.4) females; Injuries 6 (2. 9%) – 4 (66. 7%) males and 2 (33. 3%) females and; Others 27 (13. 2%). An average of 17 patients were managed on a monthly basis- 12. 3 males and 4. 7 females. The highest number of paediatric surgical procedures (22) was seen in March 2016 and the lowest (6) in January 2016. The highest number of paediatric surgical procedures was in age group 0 - 4 years (63. 7%) and the lowest in age group 11 - 15 years (18. 1%). There were no surgical procedures on female patients in November 2015 and January 2016.

## DISCUSSION

This study was designed to analyse the types of paediatric surgical conditions, procedures and postoperative outcome from 1<sup>st</sup> June, 2015 to 30<sup>th</sup> June, 2016 at the Connaught Hospital Operating Theatre (CHOT) in Freetown, Sierra Leone.

In contrast to previous study which stated that "Injuries are the commonest surgical condition affecting African children.", congenital abnormalities are the commonest paediatric surgical condition in Sierra Leone. Hence, paediatric surgical conditions in Sierra Leone are predominantly diseases. Inguinal hernia (41. 6%) was the commonest congenital abnormality in both males and females. Right-sided inguinal hernia (48) was the most frequently occurring variety. In males, this is probably due to the late descent of the testis on that side with resulting increased abnormalities. The rest were left-sided and bilateral. Other paediatric surgical conditions in Sierra Leone managed at CHOT include: Congenital abnormalities- Hydrocele (8. 8%), Cryptorchidism (2. 5%), Cleft lip (2. 5%), Umbilical hernia (2%) and Spina bifida (15%); Surgical

infections- Appendicitis (6. 4%), Osteomyelitis (5. 4%) and Abscess (3. 4%); Injuries- Fracture (2%).

Paediatric surgical diseases prevalent in males include: Inguinal hernia, Hydrocele, Acute abdomen, Cryptorchidism, Abscess, Tumour, Hirschsprung's disease, Haemangioma, and Septic arthritis. While those prevalent in females include: Appendicitis, Umbilical hernia, Mesenteric cyst, Lymphatic malformation, Staphyloma, Patent Urachus and Fibroadenoma.

In the 0 - 4 years age-group, prevalent paediatric surgical diseases were: Inguinal hernia, Hydrocele, Cleft lip, Spina bifida, Lymphatic malformation, Anal malformation, Haemangioma, Hirschsprung's disease, Intestinal obstruction, Patent urachus, Omphalocele, Bladder extrophy, Phimosis, Septic arthritis and Syndactyly. For 5 - 10 years age-group: Acute abdomen, Pyomyositis, Splenic rupture and Scalp cyst; and 10 - 15 years age-group: Appendicitis, Fibroadenoma, Splenomegaly, Cholecystitis, Toxic colitis and Cellulitis.

Paediatric surgeons are sometimes faced with multiple surgical diseases. The most common was Congenital hydrocele (6) which is associated with a hernial sac. There was a patient with Bladder extrophy, Omphalocele and Epispadias. One patient presented with Cryptorchidism and Inguinal hernia. Another had Appendicitis and a cystic tube. Paediatric surgical education should be broadly based. It should cover traumas, infections, malignancies and the common surgical diseases encountered in Sierra Leone.

Dexterity is mandatory as certain paediatric diseases were managed using different surgical procedures. Cryptorchidism was corrected using Orchiectomy, Orchidopexy, Herniorrhaphy or

Perineal contracture release. Cleft lip was repaired by Lip reconstruction or Cheiloplasty. Osteomyelitis was managed by Incision & Drainage, Sequestrectomy or Arthrolysis.

Herniotomy was the most frequently done paediatric surgical procedure at CHOT. The highest number was in the under-fives. This is attributable to inguinal hernia being the commonest paediatric surgical disease (41. 6%) with 78. 8% inguinal hernia patients in the 0 - 4 age group. This may be due to the introduction of the Free Health Care Scheme which entitles children under five years to free health services, including surgical care. Common paediatric surgical procedures at CHOT include: Herniotomy 69 (33. 8%); Hydrocelectomy 18 (8. 8%); Herniorrhaphy 17 (8. 3%);

Appendicectomy 14 (6. 9%); Laparotomy 14 (6. 9%) and; Incision and Drainage 10 (4. 9%). Certain surgical procedures were done for different surgical diseases.

Laparotomy for Acute abdomen which is caused by the highest number of surgical diseases- Ruptured appendix, Intra-abdominal haematoma, Ruptured typhoid, Multiple intra-abdominal cysts and Burst abdomen. Herniorrhaphy for both Inguinal hernia and Cryptorchidism. Sclerotherapy for Lymphatic malformation and Cystic hygroma. Closure for Spina bifida and Bladder extrophy. Release for Tongue tie and Syndactyly. Also, several surgical procedures were done for a single disease.

Herniotomy and Hydrocelectomy for Congenital hernia. Laparotomy, Appendicectomy and Herniotomy were done on a patient with Obstructed Right Inguinoscrotal Hernia. A patient with Cryptorchidism and Inguinal hernia had Orchidopexy, Herniotomy and Circumcision. 2 patients with Mesenteric cyst in the jejunum had Cystectomy and End-to-end jejunal anastomosis.

The number of paediatric surgical patients on whom Herniorrhaphy- which is inappropriate for paediatric age- was done is 17. A major problem with paediatric surgical care in Sierra Leone is that there is a general lack of knowledge on the care of children with surgical conditions. Special attention should therefore be paid to paediatric surgical education. Knowledge in this area should be increased at all levels. In this respect, village health workers should also be included, even though they might only occasionally care for children with surgical problems. There is also a clear need to train additional paediatric surgeons. Specialists in paediatric surgery are needed to manage the more difficult cases, to set practice standards, and to educate other health care providers.

The number of patients that were alive after surgery was 190 (93%). While the intentions behind sending children to developed countries for specialized surgical care are laudable, it should be noted that the funds spent on caring for a single patient in this way could easily cover the cost of several weeks of surgical teaching in Sierra Leone. Teaching visits can be of immense value to local staff and can ultimately improve the care of large numbers of patients. Moreover, visiting specialists often learn much about the realities of practising surgery in environments with limited resources.

## CONCLUSION

The surgical care of children in Sierra Leone can be improved notwithstanding the serious socioeconomic problems that the people experience. Progress can only occur, however, if poor surgical care is recognized as a significant public health problem and if communities become aware that good surgical care can improve their children's health.

The available information suggests that the best way to facilitate an improvement in the surgical care of children in Sierra Leone is to consider surgical problems within the realm of child health. If a child with pneumonia can be treated properly at a health centre in rural Sierra Leone, it should also be possible to give proper care to a child with a fracture. Both pneumonia and fracture are child health problems, and both deserve proper care.

## RECOMMENDATIONS

### Defining a cost-effective package of paediatric surgical care

The definition of surgical conditions as child health problems does not mean that there should be separate surgical services for children, nor does it imply that paediatric surgeons should care for all children with surgical problems. It does mean, however, that an agency should be given the task of improving surgical care and that the persons with the greatest interest in child health and development should be involved in the necessary research, education, and planning. Unless children with surgical problems have an advocate, surgical care is likely to remain forgotten among other health priorities.

### Improving surgical care at the community level

Although most paediatric surgery is performed at a higher level, these services should be made available to communities. The vast majority of paediatric surgical problems, *i.e.* traumas, uncomplicated congenital anomalies and surgical infections, could

be managed at primary or secondary care levels. If general practitioners or general surgeons received a degree of additional training they could probably do most of this work. In a rural hospital in Nigeria, 95% of operations were considered simple enough to be performed by general duty doctors if they had experience in general surgery<sup>5</sup>. The question arises as to whether the present system of surgical specialization is a principal cause of the decline of surgery. Rather than training paediatric surgeons, the solution for Sierra Leone may be to re-establish general surgery to deal with the operative management of common paediatric surgical conditions<sup>25, 26</sup>. The provision of basic paediatric surgical care at the primary and secondary levels requires training material to be published on the subject. The inclusion of a chapter on surgical care in the planned WHO child health pocket book is a major step forward in this respect. A paediatric surgery manual for the district hospital level would be ideal.

#### Strengthening paediatric surgical education

Paediatric surgical education could be strengthened through the work of donor organisations. Developing countries have, through various agencies, organisations, and surgical colleges, established surgical development programmes, which could teach technical skills and patient management to primary practitioners, medical students, general doctors, and professional nurses. Sierra Leone should be no exception. Transferring surgical knowledge to these groups is important because fully trained paediatric surgeons will not be available to most children in the foreseeable future in developing countries. International cooperation involves needs assessment, the establishment of appropriate local and regional training, and teaching programmes, the donation of equipment, the use of surgical journals and textbooks, assistance in research, and the provision of fellowships for young surgeons. There is also an important role for visiting surgical specialists, but in this connection it is desirable to place emphasis on transferring surgical knowledge and encouraging the development of local doctors rather than on treating patients.

#### Integration of surgical care into child health programmes

The details of how surgical care should be integrated into child health programmes, and its exact role, remain to be determined. Whatever its role, however, it should be evidence-based, cost-effective and work towards benefiting the largest possible number of children. Research into these matters is crucial. It is needed in order to arrive at a better definition of the burden of childhood surgical

conditions, to determine the best clinical practices, and to design and test prevention strategies.

The available information suggests that the improved management of congenital abnormalities should be the first priority for paediatric surgery in Sierra Leone.

#### Improve the quality of records for research purposes

Surgical admission book should be provided in the paediatric ward to determine the number of surgical admissions and the number who actually have surgical intervention.

Definitive pre-/ post operative diagnoses should be clearly stated, rather than vague statements that do not give a proper description of the disease. Surgical procedures should be concise and age-appropriate.

The age of paediatric surgical patients should be precise. Use days (D) for neonates, months (M) for infants and years (Y) for those between ages 2 and 15 year

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# Controversies in Management of High Energy Tibial Plateau Fractures: A Systematic Review

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## Abstract

**Introduction:** High energy, particularly bicondylar, fractures of the tibial plateau offer a significant challenge to the orthopaedic surgeon since they are associated with a high level of morbidity and complications post-operatively. Currently two treatment modalities are used in management of these cases: open reduction and internal fixation (ORIF) or external fixation with a circular frame. The aim of this review is to compare treatments and present any differences in outcome, plus advantages or disadvantages of either fixation, as currently there is no accepted best treatment.

**Methods:** Four databases were searched using the Boolean search terms associated with tibial plateau fractures and operative fixation. Databases searched were PubMed, Web of Science, Cochrane database and Science Direct.

**Results:** 122 papers were returned by the search. However, only six papers were directly comparing ORIF to external fixation and met the inclusion criteria.

**Conclusion:** Evaluating the literature, it seems long term outcomes of both surgical modalities do not differ significantly. Differences are notable in the short term, particularly in the rate of complications. It becomes apparent that ORIF is associated with complications of greater consequence, requiring further more invasive surgeries in comparison to circular frame fixation. Circular frame use also resulted in a shorter stay in hospital on average. On balance, external fixation with circular frame could be advantageous over ORIF due to its benefits in the short term for patient and identical outcomes long term; and should be adopted as the best practice approach.

## Key Words

Bone Plates; Tibial Fractures; Tibial Plateau; Fracture Management; ORIF

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## Introduction

The current best management of tibial plateau fractures is often subject to much debate within orthopaedic departments and literature, with the most controversy surrounding the high energy fractures. The aim of this review will be to present the current management of high energy tibial plateau fractures found in the literature and to draw conclusion on interventions with the best outcomes, should this become apparent.

## Aetiology

Fractures of the tibial plateau account for 1.3% of fractures, and are more common in men than women<sup>1</sup>. The young and the old are both affected but the mechanism of injury is significantly different between the two patient populations. Most commonly, the low energy fractures occur in the elderly secondary to osteopenia<sup>2</sup>, and can be a consequence of even simple falls in osteoporotic patients<sup>1</sup>. This is demonstrated by a higher incidence

of fractures in elderly female patients compared to male counterparts, which is in keeping with a higher incidence of osteoporosis in women than men. Schatzker I-III typically result from a much lower energy trauma than those of IV and above. Due to the lower energy mechanisms of energy, fractures are normally closed fractures and with smaller incidences of comminution. However, this does not mean the fractures are simple and of little consequence to the patient. Schatzker II fractures are most commonly associated with medial collateral ligament injuries<sup>3</sup>, demonstrating that, even with a low energy, the mechanism of injury management may not be straightforward. Given the patient population, there are a large number of postoperative complications and approximately a 17% peri-operative mortality rate<sup>4</sup>.

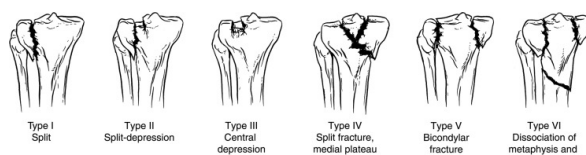
In paediatric and adolescent patients tibial plateau fractures are rare, as it is very uncommon to suffer this injury before the closing of the epiphyseal

growth plates<sup>5</sup>. In adults these injuries are due to a high energy trauma, such as a fall from height or cases of pedestrian collisions with cars. Approximately 50% of cases are the consequence of road traffic collisions, 17% are from falls and 5% from recreational and sporting activities<sup>1</sup>.

### Classification

The first hurdle in management, after initial resuscitation and stabilising of the patient, is to identify the fracture as well as the extent of damage to the joint and surrounding structures. Mechanism of injury is thought to be an initial axial loading of the joint which impacts the articular surface causing fracture. This axial loading is most commonly combined with an angular force, such as in a road traffic collision described above. The addition of this angular force means there is often damage to the metaphysis also; comminution of the metaphysis and articular surface is common<sup>6</sup>. Commonly the medial compartment is split in medio-lateral direction with the main fragment being postero-medial<sup>7</sup>. However, many other possible fracture patterns are possible, demonstrating the need for a common tool to aid classification of these fractures.

Classifying the injury also allows for reliable communication and, using a pattern based system, split between surgeons, about the need for more extensive approach for example. Classification of tibial plateau fractures was first attempted by Schatzker in 1979 and gave rise to his Schatzker classification which is used to date. He analysed the anterior-posterior (AP) radiograph of 94 patients with tibial plateau fractures and, using a pattern based system, split these into six classes<sup>8</sup>. They divided the tibial plateau fractures into: split fracture of the lateral tibial plateau (Type I); split depression of the lateral tibial plateau (Type II); central depression of the lateral plateau (Type III); split of the medial tibial plateau (Type IV); bicondylar tibial plateau fracture (Type V); and dissociation between the metaphysis and diaphysis (Type VI).



**Figure 1:** Image taken from Berkson EM et al High-energy tibial plateau fractures)

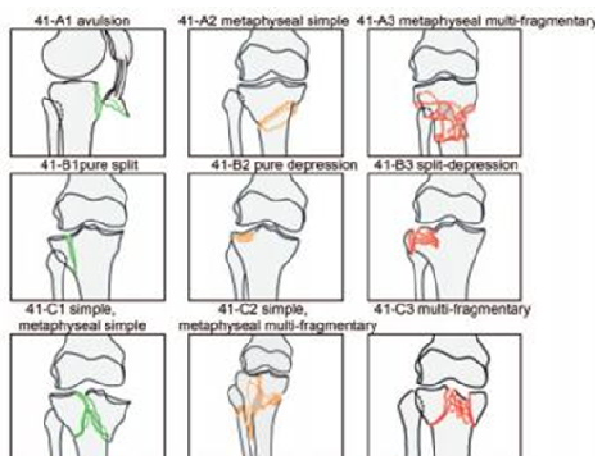
As mentioned above the Schatzker classification is based on patterns of fracture seen in a series of patients. The classification was also intended to give direction on the management of these fractures. However, with the development of locking plates, for example, the management suggested by Schatzker has been somewhat developed over the

years. External fixation or open reduction and internal fixation are the two modalities that are often used in theatres for surgical management of fractures at the higher end of the classification scale.

Five other classifications are also used to describe these fractures. The second most commonly used, however, is the AO classification<sup>9</sup>. The AO classification is used to describe a number of fracture types with different scales being used for different fracture sites. For the tibial plateau, three types are used, with each of these having 3 subtypes, the details of which are shown in Figure 2.

Type	Subtype
A: Non-articular	A1 – Avulsions
	A2 – Simple Metaphyseal
	A3 – Comminuted Metaphyseal
B: Partial Articular	B1 – Pure Split
	B2 – Pure Depression
	B3 – Split Depression
C: Complete Articular	C1 – Simple
	C2 – Articular simple, metaphyseal comminuted
	C3 – Articular Comminution

**Figure 2:** Table showing AO Classification adapted from: <http://www.orthopaedicsone.com/display/Main/Tibial+plateau+fractures++AO+classification>



**Figure 3:** AO classification of tibial plateau fractures<sup>10</sup>

Both of the above classifications have shown to be reliable in the literature and have widespread use in the management of tibial plateau fractures, with the AO classification having a greater intra/inter observer reliability when classified using plain radiograph alone<sup>11</sup>. In the literature it is also noted that the use of computed tomography (CT) increases the reliability of classification when using both the AO and Schatzker classification<sup>12</sup>.

As mentioned above, most controversy surrounds the management of the higher energy fractures. These are the Schatzker V and VI, both of which have distinct fracture patterns and a high degree of comminution is commonplace<sup>13</sup>. In addition, with an increase in energy applied to the limb, the degree of associated soft tissue damage increases. As could be expected, the prognosis becomes poorer<sup>14</sup>.

### **Management Strategies**

The initial management of high energy fractures will be focused on resuscitation and assessing the extent of associated soft tissue injuries. Measures should be taken to reduce the swelling surrounding the joint; elevation, compression and possibly joint aspiration. This should not be done in any limb in which compartment syndrome is expected; a four compartment fasciotomy should be performed as soon as possible. Delaying is associated with high rate of further complications such as injury to the common peroneal nerve<sup>15</sup>. Traction may also be considered in this early management stage either as a temporary or definitive measure in a certain number of plateau fractures. The decision can also be made as to whether to place a temporary spanning external fixator to the same effect as traction<sup>16</sup>. A temporary fixator can be a useful aid to management. It allows for some degree of soft tissue healing before a more definitive surgical fixation and, as it provides traction, it can offer more information on fracture morphology as visualisation of the site is improved on imaging<sup>17</sup>.

Definitive surgical management is often carried out at a later date than the initial injury since many patients may be unstable due to polytrauma, with many systems being affected. Once the patient is more stable and fit for surgery, there are a number of possible approaches for fixation which are broadly split into two modalities: open reduction and internal fixation or external fixation.

### **External Fixation – Circular/Ring External Fixator**

This is a definitive form of fixation in which a number of circular rings are fixed from the level of proximal fibular to distal. The first stage of this approach is to reduce the fracture components. As these are normally Schatzker V/VI, there is often a

high degree of comminution; reduction can be aided by the use of distractors. The medial plateau is generally significantly less comminuted so reduction should be started here before proceeding to lateral. Following reduction, bone grafting may be necessary to prevent collapse of the reduced articular surface. The insertion of wires can now take place, beginning with the proximal ring and proceeding distally. Once all rings are in place, reduction should be checked under image intensifier before the frame is tightened.

### **External Fixation – Hybrid Frame**

Hybrid frames are, in essence, a combination of two forms of fixation: a circular frame that surrounds the leg on a level with fibular head. The frame is then anchored by a tube that is drilled into the distal tibia. A small incision is typically made in the anteromedial aspect of the tibial metaphysis. Following this, a K wire can be inserted through the tibial cortex to allow the depressed fragments to be pushed up. This is then held in place with reducing forceps. Following this, a small lateral incision can be made and as many K wires as required can be inserted to provide adequate stabilisation of the now reduced articular fragments.

Schanz pins are then inserted into the diaphysis of the tibia and the tube that will be attached to the distal tibia is connected to these pins. Before tension is applied, reduction should be achieved and checked under image intensifier. Once satisfactory, the tube to the distal tibia is fixed before the frame is tightened.

### **Internal Fixation**

Internal fixation can be achieved by a number of means: arthroscopic assisted fixation, traditional double plating, or biologic fixation. Biologic fixation can be screw fixation, minimally invasive plate osteosynthesis, or least invasive stabilisation system (LISS)<sup>16</sup>. Approaches will vary with the chosen method but will involve an incision to gain access before reduction of the articular surface. Similar to the external fixator method described above, distractors can be used for the purpose of aiding reduction. After reduction, preliminary fixation can be done using K wires, before fixation with lag screws or positioning screws, depending on the method of fixation being used.

If LISS is being used, positioning screws will be inserted before introduction of the LISS plate. The LISS plate will be slid in constant contact with the bone in the distal direction. Once in the correct position it will be fixed to the distal tibia. The internal fixator will be inserted using a guide handle, into the epiperiosteal space between the anterior tibial muscle and the periosteum. With the use of this

plate, it is essential to dissect carefully when fixing the distal portion to avoid injury to the superficial peroneal nerve.

### **Complications**

Both open reduction and internal fixation and external fixators can result in different complications. However, some are common between the two procedures. For example, infection is a risk in both but significantly higher in ORIF up to 12% of cases<sup>18</sup>. Infection is one of the most immediate post-operative complications after intraoperative blood loss. It is a common reason for revision procedures and further unplanned surgical procedures after initial permanent fixation. Traditional ORIF approach not using the LISS involves extensive soft tissue stripping to allow for adequate exposure and, as such, is associated with higher rates of infection<sup>19</sup>. Circular fixators are not without risk of infection, most notably pin track sepsis. However, measures can be taken to reduce infection rates. The introduction of low energy insertion and a standardised post-operative care has been shown to reduce the incidence of pin track sepsis<sup>20</sup>.

A further immediate complication of ORIF is peroneal nerve palsy. As mentioned in the surgical technique section above, this is due to the course of the peroneal nerve over the end of the distal tibia where the lower part of the plate is fixed. Peroneal nerve palsy can cause significant morbidity; foot drop causes gait problems and difficulties in walking. This complication can be seen using circular fixation methods but rates are higher in ORIF<sup>18</sup>.

Long term complications that both procedures have in common are malunion and non-union. However, this is relatively uncommon<sup>21</sup>. Both methods of fixation are at risk of losing the reduction of the articular surface upon weight bearing. This can occur even with plate in situ and a further operation with its associated risks is required. With a circular fixator, however, a small adjustment can often be made to correct and avoid the need for extensive further surgery<sup>19</sup>. Associated with a change in the articular surface is joint stiffness, but is not confined to drops in the reduced surface and can occur even with a perfect anatomical reduction.

Patients consenting for permanent fixation of a tibial plateau fracture should also be warned of the following: incomplete relief of pain and a loss of

function, skin loss, post-traumatic arthritis, heterotopic ossification and compartment syndrome<sup>18</sup>. Currently in the literature there are a number of studies that compare methods of fixation of high energy tibial plateau fractures in terms of outcome. However, little conclusions are reached in what may be best practice to achieve the best functional outcome for patients. The following discussion will aim to present relevant literature on the best management of tibial plateau fractures and discuss the benefits of different surgical approaches.

### **Method**

Existing systematic reviews were read before deciding on the most relevant search terms to return results of papers that compared the two surgical methods. Following this background reading, it was decided that the terms bicondylar, tibial plateau fractures, open reduction and internal fixation, and external fixation would be used. The inclusion of bicondylar as a search term was used in the hope that papers returned would focus on the Schatzker 5/6 fracture patterns as these higher energy fractures were the debate centres. Four databases were searched using the Boolean search method to ensure only relevant papers were returned. These were PubMed, Cochrane database, Web of Science and Science Direct. The final search term entered was Tibial plateau fracture AND bicondylar AND open reduction and internal fixation AND external fixation. Once the initial search had returned the results, any papers that were not written in English were immediately discarded. However, due to a small number of papers that had made direct comparisons, a broad range of 25 years was used.

### **Results**

Searching the three databases returned 122 papers. The breakdown of the search was 15, 81, 24 and 2 for PubMed, Science Direct, Web of Science and Cochrane database respectively. Literature returned by the search was reviewed for relevance by reading the abstracts. The result was that twelve papers met the criteria of comparing two cohorts of patients with high energy tibial plateau fractures, treated with either open reduction and internal fixation or a form of external fixation. A further six were removed since they were duplicates returned by another database, leaving six final papers for analysis. The details of the papers are given in the table below.

Paper	Title	Author	Year
1	Open reduction and internal fixation compared with circular fixator applications for bicondylar tibial plateau fractures: Results of a multicentre, prospective, randomized clinical trial	Canadian orthopaedic trauma society	2006
2	Bicondylar tibial fractures: Internal or external fixation?	Kumar, G	2011
3	Open reduction and internal fixation compared with circular fixator application for bicondylar tibial plateau fractures. Surgical technique	Hall, J.A.	2009
4	Open reduction and internal fixation versus hybrid fixation for bicondylar/severe tibial plateau fractures: a systematic review of the literature	Mahadeva, D	2008
5	Outcomes following the treatment of bicondylar tibial plateau fractures with fine wire circular frame external fixation compared to open reduction and internal fixation: A systematic review	Boutefnouchet, T	2015
6	Internal versus external fixation of bicondylar tibial plateau fractures.	Malik AR	1992

### **Paper 1**

Carried out a multicentre, randomised control trial and compared open reduction and internal fixation with percutaneous/limited open fixation with a circular fixator being applied in displaced bicondylar tibial plateau fractures. 83 fractures were entered into the trial and randomised to receive one surgical procedure. Outcome measures consisted of hospital for special surgery (HSS) knee score, Western Ontario and McMaster universities osteoarthritis index (WOMAC) score, and the short form general health survey and finally recording of complication and reoperation rates. Results showed that both surgical methods provided adequate reduction, but circular fixator resulted in shorter hospital result and a faster return to function, measured by 6-month activity level ( $p=0.031$ ). The pain scores (WOMAC) measured at two years were not significantly different ( $p=0.923$ ). It is important to note that those in the ORIF group were subject to much higher significant complication and reoperation rates. The conclusion was that circular fixator is an attractive option for the higher energy, difficult-to-treat Schatzker 5 and 6 fractures.

### **Paper 2**

Presented a discussion of the different surgical modalities available for bicondylar tibial plateau fractures and attempted to devise a protocol for the treatment of these complex fractures. Protocol consisted of a CT scan after the application of a spanning external fixator, allowing for assessment of the fracture pattern. Method used to restore the articular surface was common for both modalities; chosen method being indirect reduction using traction and ligamentotaxis. If fracture pattern was stable, then the authors used internal fixation, assuming the soft tissue allowed. If it was unstable, circular

fixator was used. This choice was made as the circular frame allows for a greater fine tuning of the alignment of the tibia. Authors concluded that surgical management should be guided by the extent of associated soft tissue injury and the fracture pattern type.

### **Paper 3**

Carried out again by the Canadian Orthopaedic Trauma Society, this paper follows on from their RCT published in 2006 and Paper 1 above. It presents an updated protocol for surgical technique for both open reduction and internal fixation, and minimal invasive reduction with circular external fixator. In a closing paragraph by the authors, there is an update to the previous paper released in 2006 stating that the two methods of surgical fixation can be used in a complementary fashion. The final conclusion was much the same as the protocol of Paper 2: fractures that are unstable with significant soft tissue swelling should be treated with circular fixator. Those with less severe intra-articular fragmentation can be treated with open reduction and internal fixation. It is worth noting that the author advocates the use of the minimally invasive techniques for ORIF to prevent extensive soft tissue stripping and to avoid complications such as wound breakdown.

### **Paper 4**

This paper is the first of two review articles returned by the search. This paper also found five articles in the literature relating to its search parameters. Very similar search terms were used to locate this review. The authors, however, included laboratory studies in their article. Results of the review were six conclusions that emerged from the five papers. First recommendation was in line with the other papers above in that the soft tissue status

needs to be evaluated carefully before accepting a certain management pathway. Hybrid fixation was also reviewed in this article and was found to have very good outcomes in the short term when measured by knee range of motion and HSS knee scores. The issue of compliance and acceptance with hybrid frames was an area authors thought needed to be investigated as past case series have found acceptance of hybrid frames to be low and not just in fixation of proximal tibia. Conclusion was that long term sequelae was generally poor for both methods of fixation and further long term studies should be the focus.

#### **Paper 5**

The second review article published in 2015 returned by our search; used terms very similar to those in this paper and included five articles that made direct comparisons between open reduction and internal fixation and external fixation. External fixation method examined in this review was fine wire fixation with a circular fixator. On reviewing the literature, the authors concluded that fine wire circular fixation offered good outcomes with modest advantage in terms of soft tissue viability. The authors also concluded that there needs to be more research into the newer LISS/osteosynthesis plates to determine if they confer an advantage<sup>23</sup>.

#### **Paper 6**

Reviewed cases of tibial plateau fracture treated surgically at their centre. Retrospective in nature, it evaluated the outcomes of eight patients who underwent open reduction and internal fixation or indirect reduction and application of a Monticelli-Spinelli circular fixator. No notable difference was noted in the time to union between the two groups. In complications is where the two groups differ, most significantly in rates and severity of infection. The three patients treated with circular fixator developed pin tract infection but these resolved quickly with wound care and antibiotics. In addition, in this group no deep infections developed. This was in contrast to the ORIF group in which four of whom required further interventions. Two developed osteomyelitis requiring further treatment, a further patient with osteomyelitis needed a knee arthrodesis, and the final patient developed a chronic osteomyelitis and a subsequent varus deformity. The paper concluded that external reduction and circular fixator had a smaller incidence of significant infections and limited surgical insult to surrounding soft tissues.

#### **Discussion**

When comparing surgical interventions, the key issue to be evaluated in all comparisons is the impact of surgery on patients' quality of life and the associated morbidities, if any. As mentioned earlier,

with the higher energy tibial plateau fractures a definitive surgical intervention is most often required as most cannot be managed using a conservative approach. Different articles in the literature use different outcome measures to assess interventions. The main focus is how the knee returns to function in a biomechanical sense, the pain experienced by the patient, and the quality of life postoperatively. These can be measured by post-operative knee range of motion, HSS knee score, and short form SF-36 health status questionnaire respectively<sup>24</sup>.

It is of note that the circular fixator group seemingly return to function and weight bearing quicker than their ORIF counterparts. HSS knee scores at six months, as well as number of patients returning to pre-injury activity at six and 12 months, is greater in those treated with circular frame. However, the difference in outcome does not seem to be true by all measures. When using more objective measures such as knee arc motion there is no significant difference noted. Two years post-procedure, there is no difference in the pain, stiffness or functional ability between the two groups. This suggests that using a circular fixator allows patients to mobilise quicker post-operatively and to leave hospital sooner which, in turn, has a positive psychological effect. In essence, their short term scores in terms of pain and function could be better than their ORIF counterparts who will spend more time in hospital on average.

ORIF has a higher rate of further surgical procedures when compared to circular fixators. The multicentre randomised control trial found eighteen patients managed with ORIF required thirty seven further surgical procedures, compared to fifteen unplanned surgical procedures in sixteen patients managed with circular fixators<sup>25</sup>. These surgeries were, for a variety of different and, while it may be a subjective finding, the operations for the ORIF group were of a more extensive nature. The circular fixator group underwent procedures such as pin track debridement, knee manipulation or screw removal. The ORIF group, on the other hand, underwent incision and drainage with plate removal, osteotomy and, in one case, above the knee amputation. This may be just one study but it does show that ORIF seems to be associated with complications of greater consequence than circular frame fixators.

As a consequence of the above complications, when using open reduction and internal fixation the definitive treatment is often delayed, allowing greater time to heal and to increase the viability of the anterior structures. With ORIF a main goal is to avoid extensive soft tissue dissection and to minimise

damage to surrounding structure as this can cause devascularisation of bone fragments. This devascularisation can also create soft tissue flaps that can lead to wound breakdown<sup>25</sup>. These concerns are not as prominent, if at all, with the use of an external fixator. We may question what the advantages of internal fixation that warrant this seeming increase in risk and complications are. Much may be down to surgeon preference and the familiarity with the procedure. In terms of reduction, there seems to be little difference between ORIF and a circular fixator when comparing osseous reduction in the two different surgical groups, assuming no significant difference in demographics<sup>25</sup>.

The long term functional sequelae from tibial plateau fractures is often poor, especially with extensive intra articular damage seen in the higher energy fractures. The extent that the associated soft tissue injury contributes to poor functional outcome is unclear<sup>24</sup> and is an area for further research; the role of concurrent meniscal injury and collateral ligament injury could be key. A long term study followed up patients postoperatively, the mean follow-up time being 11 years. 286 patients were entered into study and 77% of the patients were treated operatively. Of these, 4.5% underwent a reconstructive procedure for traumatic arthritis during the follow-up period<sup>26</sup>; in comparison to 6.0% of the conservative treatment group. However, the results of this study are limited due to the inclusion of all types of tibial plateau fracture as it is established in the literature that the Schatzker V and VI bicondylar type fractures have a greater incidence of post-traumatic arthritis. Thus, attempting to make direct comparisons between operative and non-operative groups in terms of long term is often subject to confounders as higher energy fractures most often cannot be managed conservatively. Therefore, patients who are more likely to suffer from post-traumatic arthritis will fall into the operative management group. The 10-year survival in the operative and non-operative group was also calculated and these were 97% and 94% respectively.

### Conclusion

Both circular frame external fixation and open reduction and internal fixation are suitable methods for permanent fixation of high energy tibial plateau fractures. Evaluation of the status of the surrounding soft tissue is a crucial step in management and, from the literature reviewed, it seems that fine wire fixation with circular frame may prove the best option in patients with extensive soft tissue injury. If open reduction and internal fixation is still to be carried out in these patients, then it is recommended to allow the soft tissue time to heal before permanent fixation. This can be facilitated with the use of temporary spanning fixator. Evaluating the

literature, it seems that circular frame fixation has the best short term outcomes and does seem to offer some advantage in complication rates compared to open reduction and internal fixation. With no differences in long term outcome found in this review between the two methods, it seems that circular frame fixation is advantageous over ORIF due to the benefits to the patient in the short term. Further research should focus on developing surgical technique with circular frame fixation as this should be taken forward as the new best practice approach for these difficult fractures.

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## Are We Selecting Patients Appropriately for ITU Following Major Abdominal Operation? – A Retrospective Review

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### Abstract

**Introduction:** Like any other medical treatment, intensive care is a limited resource that needs to be utilised appropriately. Our study aimed to identify the demographics of patients admitted to ITU in a busy district general hospital and examine patient outcomes.

**Methods:** We performed a retrospective observational study of 1059 patients undergoing laparotomy who were admitted to ITU. We sub-classified cases by mode of admission and risk prediction scores and analysed outcomes of mortality, ITU length of stay and hospital length of stay.

**Results:** The mean age of patients who did not survive was older than those who survived, with higher APACHE and ICNAR observed in patients who died. Emergency admission was also an indicator of increased mortality. Survivors' APACHE scores were the same if they were elective or emergency admissions, although survivors' ICNAR scores were higher in emergency than in elective. Patients who did not survive had a longer length of ITU stay than those who survived, whereas elective survivors had shorter LOS ITU than the emergency survivors. Regardless of this, the hospital length of stay was the same for both elective and emergency survivors.

**Conclusion:** The most unwell patients had the highest risk prediction scores, were more often admitted in the emergency setting, required longer stays in ITU, and had less favourable outcomes. However, ITU did appear to expedite the hospital discharges of emergency patients to match their elective counterparts. Decisions around when and to which patients ITU is an appropriate intervention remains a difficult decision and one that cannot be made without full consideration of all aspects of patient factors.

### Key Words

ITU; Intensive Care; Laparotomy

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### Introduction:

Major abdominal surgery, both open and laparoscopic, are commonly performed operations in both emergency and elective settings. Such highly invasive procedures carry with them significant investment, both in terms of time and resource. It is estimated that 30,000-50,000 emergency laparotomies are performed in the UK each year, at the cost of approximately £13,000 per patient.<sup>1,2</sup> However, across the world, it is estimated that one in six patients will die within a month of surgery.<sup>3</sup> It is for this reason that many initiatives in the UK, and indeed across the world, are focused on reducing the morbidity and mortality with laparotomy, improving outcomes. The National Emergency

Laparotomy Audit (NELA) has been set up by the Royal College of Anaesthetists to outline key standards to improve the quality of care for patients undergoing these procedures. One such standard is the use of a pre-operative mortality and morbidity score founded on the principle of providing individualised risk assessment and subsequent individually tailored care. The most frequent surgically adopted of these is P-POSSUM, though later in the course of the patients care other scoring systems such as APACHE are utilised in critical care. Our aim was to review a series of data assessing outcomes after major abdominal surgery and identify demographic trends in how patients were treated.

### **Methods:**

A retrospective observational study of ITU patients undergoing major abdominal operations between 2007 and 2015 was performed and cross referenced with a database kept by the general surgical department. Patients whose data was incomplete or who had conflicting information between the two data sets were excluded. A master list was created from these data and subsequent analysis was performed. There were no exclusion criteria based on age, gender, or type of surgery. T-tests were used to analyse the remaining data.

### **Results:**

1059 patients were identified between 2007 and 2015. The mean age was 72.9 years (+/-15.5 years) and there were 524 female patients compared to 535 who were male. There were 182 deaths across all patients (17.15%). 218 patients were admitted electively compared to 841 who were emergency admissions. The mean age of patients who died were older (77.25 years vs 71.77 years,  $p<0.01$ ) and had higher APACHE and ICNAR scores compared to those who survived (17.9 vs 12.3 and 20.0 vs 12 respectively,  $p<0.01$ ). Deaths were also more frequently as a result of an emergency admission rather than an elective one (19.9% vs 6.9%). Perhaps interestingly, patients who died had a longer length of stay in ITU than those who survived (5.68 days vs 3.6 days,  $p<0.01$ ). The mean length of stay of all survivors was 21.08 days regardless of the nature of their admission. Contrary to what would have been expected, there was no difference in hospital length of stay between elective and emergency survivors (18.57 days vs 21.84 days,  $p$  not significant) but elective survivors had a shorter length of stay in ITU than their emergency counterparts (2.87 days vs 3.80 days,  $p=0.02$ ). Survivors' APACHE scores were no different regardless of whether they were elective or emergency admissions (12.68 vs 12.25,  $p=0.2$ ) although their ICNAR scores were different (10.4 vs 12.44,  $p<0.01$ ). The APACHE and ICNAR scores were consistently higher in patients who died compared to those who survived, regardless of their mode of admission (elective vs emergency; Apache 14.47 vs 18.18,  $p=0.02$  and ICNAR 12.67 vs 21.63 respectively,  $p<0.01$ ).

### **Discussion:**

#### ***Mean age of patients who died was older than those who survived***

Advanced age is thought to be associated with a poorer prognosis in critically unwell patients.<sup>4</sup> However, it is important to note that any studies involving outcomes of elderly patients in the critical care setting may be skewed due to selection bias, as particularly invasive treatments, including admission to intensive care, are often withheld in this cohort.

In our data, patients who were admitted to ITU, and died, were older than those who survived (mean age 77.25 years vs 71.77 years respectively,  $p<0.01$ ). Similar findings are well documented across the board in medical literature, with one particular study reporting that, independent of severity of illness, Acute Physiology Score, admission source, diagnosis and comorbidity, age greater than 70 years old is associated with an additional 2% increase in mortality.<sup>5</sup> However, when discussing the influence of age, one must remember that it is not chronological age, per se, that influences outcome but rather the associated features such as degrees of frailty and physiological reserve that impact on 'biological age'. In this way, age may be seen as a surrogate marker for frailty and may not be an independent predictor of mortality.<sup>6</sup> Indeed, frailty, in this context relating to functional status before admission to hospital, has been shown to be a very strong independent predictor of hospital outcomes amongst elderly patients and it is unsurprising that impaired functioning in daily life is more prevalent in the elderly.<sup>4, 7</sup> It is therefore unsurprising that a new Emergency Laparotomy and Frailty Study (ELF) has been launched this year, with results expected in 2018.<sup>8</sup>

#### ***Patients who died had higher APACHE and ICNAR scores***

#### ***Emergency admissions more frequently had less good outcome***

The Acute Physiology and Chronic Health Evaluation (APACHE II) is one of several severity-of-disease classification systems used in the critical care setting in the UK. A recent systematic review concluded that APACHE demonstrated the best and most consistent discriminator of individual outcomes of a varied group of patients undergoing laparotomy when used either pre or post operatively.<sup>3</sup> Our data set revealed that patients who died had higher APACHE II scores compared with the survivors (17.9 vs 12.3,  $P<0.01$ ). Similarly, the ICNAR (Intensive Care National Audit and Research) score was higher in those who did not survive compared to those who did (20.0 vs 12.0,  $P<0.01$ ). This result confirms what would be generally expected with more critically unwell patients having a lower survival probability. Similarly expected is that those who were admitted as emergency patients showed a higher mortality compared to their elective counterparts (19.9% vs 6.9%,  $P<0.01$ ) which perhaps could relate to reduced opportunity for pre-operative optimisation amongst the emergency group.

#### **Survivors' APACHE scores were the same even if they were elective or emergency. Survivors' ICNAR scores were higher in emergency than in elective**

In our data set, mode of admission made little difference to APACHE scores in those who survived. In the emergency group, survivors' APACHE scores were not significantly different to the scores of those who were admitted in the elective setting (12.68 vs 12.25,  $p=0.2$ ). This is not what was expected to be observed and is different to what is seen in other similar studies where APACHE scores were higher in those with emergency admissions (<sup>9</sup>). However, mode of admission did change the ICNAR score where we observed that survivors' ICNAR scores were higher in the emergency patients than their elective counterparts (12.4 vs 10.4,  $p<0.01$ ). This is more in keeping with what we would expect to see as we know, from above, that those who were admitted as emergency had less favourable outcomes. Does this therefore imply that in our dataset ICNAR has been shown to be a better prognostic tool than APACHE? Whilst the information here would seem to suggest this, as far as we are aware there have been no other formal studies performed for comparison to validate this outcome. The closest similar evaluation that was found compared ICNAR to POSSUM and concluded that the ICNAR model was the superior risk prediction model when analysed by ROC curve comparison and went on to discourage the use of APACHE and favour the use of ICNAR in the emergency laparotomy setting.<sup>10</sup> Further studies will be needed if this question is to be robustly answered.

***Those who died had a longer length of ITU stay than those who survived***

***Elective survivors had shorter LOS ITU than the emergency survivors***

It is not difficult to believe that the most unwell patients require the most intensive treatments and, as represented above, those with the worst risk prediction suffer the worst outcomes. It is therefore no stretch to understand that the most unwell also require additional time for input, here represented by length of stay in the ITU. In this study patients who did not survive, when not subdivided by mode of admission, spent longer in the department than those who survived (5.68 days vs 3.6 days,  $p<0.01$ ). When sub-classifying this further, it was also apparent that elective survivors had shorter length of stay in ITU than the emergency survivors (2.87 days vs 3.80 days,  $p=0.02$ ). This reinforces the notion that patients with less significant clinical demands may represent those who are relatively easier to manage and undergo a less stormy recovery in the immediate ITU post-operative period than those with higher demands. These less demanding patients, with lower risk prediction scores, may require less ITU intervention than their more complex counterparts, and thus have an expedited return to the ward resulting in a

shorter length of stay in ITU. Conversely, those with higher demands, emergency patients, higher risk prediction scores and requiring longer length of stay in ITU represent a cohort ultimately less likely to survive. Does this therefore imply that the longer you require ITU treatment the worse outcome you may expect, representing length of stay in ITU as a negative prognostic indicator? Certainly in other studies, increased ITU length of stay was associated with higher APACHE score and emergency admission, both being independent predictors for increased ITU length of stay.<sup>9</sup> Interestingly, in those who were admitted to the ITU for greater than 21 days, APACHE score was observed to plateau.<sup>9</sup>

***Length of hospital stay of all survivors was the same, regardless of emergency or elective admission***

When considering patients who survived a successful discharge from hospital, it was apparent that total length of stay in hospital was similar for both those admitted elective and as an emergency (18.57 days vs 21.84 days,  $p$  not significant, mean 21.08). What this seems to suggest in combination with the above is that, whilst the total hospital admission remains the same between elective and emergency patients, the location of their stay is proportionally different. It can be concluded that elective patients spend shorter time in ITU and longer on the general ward whereas emergency patients spend longer in ITU and proportionally shorter time on the general ward. Does this therefore imply that the ITU admission expedites time to discharge for the emergency cohort, matching the elective counterparts? Would keeping the elective cases on ITU longer also expedite their hospital discharge and represent a reduction in the total hospital admission length of stay? If so, would this be an economically viable idea to help free up bed space in the hospital and ease bed pressures and could this be reproduced in ward based high care settings? More studies are needed!

**Conclusion:**

Appropriate patient selection to ITU is a challenging and difficult decision. Who is appropriate? Who is not? The ability to affect outcome, both positively and negatively, is not something to be taken lightly. There is no doubt that intensive care does make a difference to patient outcomes and, if, as suggested above, longer ITU stay does expedite hospital discharge and reduces overall length of hospital stay in emergency patients, will a similar observation be seen electively? If elective patients had longer spells in ITU, would their whole hospital stay be even shorter?

As we have seen, patients who did not survive had longer length of stay in ITU. Are we in a situation of

'once in, all in'? Do we need to improve at identifying when things are not progressing and when we are fighting a losing battle? Or, does this simply reflect something that is widely accepted – those who are sicker, with higher risk prediction scores, have higher demands and longer treatment requirements, with longer length of stay in ITU? Such patients inherently are at higher risk of not surviving and therefore skew the data.

In conclusion, what we need is a more in depth review of these particular cases; ones with the long ITU length of stay and see if any trends can be identified to better highlight the patients who are most appropriate for ITU intervention.

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**Abstracts from the 7<sup>th</sup> International Academic and Research Conference  
5<sup>th</sup> August 2017, University Place, University of Manchester**

***Winners in Individual Categories  
Oral presentations***

***First Prize  
Category: Clinical and Basic Science Research***

**Identification of Genes in Congenital Heart Disease**

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**Background**

Congenital Heart Disease (CHD) is the most common birth defect worldwide and, despite medical and surgical advancement, is still a large contributor to neonatal mortality and morbidity (Bruneau et al, 2014). However, in the vast majority of CHD cases, there is no attributable cause identified, necessitating a large area of essential research.

**Aim**

To use whole genome sequencing and variant filtering strategies to identify a rare, damaging and likely causative variant in each family in our study cohort of 108 families affected by CHD.

**Methods**

Families with CHD underwent genome sequencing. A bioinformatic pipeline identified DNA variants and computer software programs VarSifter and Intergrative Genomics Viewer were used for viewing, filtering and validating variants in each CHD family. Following this, online pathogenicity scoring tools, mouse and human phenotype databases, and current literature was used to narrow down variants in each family to a single most likely causative variant.

**Results**

Through analysis of 30 families, five families were identified with a variant in a gene currently associated with a syndrome as the most likely causative variant. However, each of these families were cases of isolated Congenital Heart Disease without features of the associated syndromes.

**Conclusion**

Whole genome sequencing can be used to identify potential causative genes in Congenital Heart Disease and could provide novel genes or associations not previously reported to further knowledge of the aetiology of Congenital Heart Disease.

**Winners in Individual Categories**  
**Oral presentations**

**Second Prize**  
**Category: Clinical and Basic Science Research**

**Defining the Role of CD46 in the Activation of Effector CD4+ T Cells in Crohn's Disease**

**Cockroft A**, Pavlidis P, Arbore G, Powell N  
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**Introduction**

Crohn's disease (CD) is an immune-mediated disease of the gastrointestinal tract. T helper-1 (Th1) and T-helper-17 (Th17) subsets of effector CD4+ T-cells are known to drive disease pathogenesis. CD46, a complement regulatory protein and co-stimulatory molecule, is involved in activating Th1 cells and inducing a phenotypic switch to T-regulatory type 1 (Tr1) cells to control the inflammatory response. Defective CD46 signalling contributes to disease states in multiple sclerosis and rheumatoid arthritis.

**Methods**

FACS isolated CD4+ T-cells from the blood of 13 CD patients and 12 healthy donors (HD) were stimulated with anti-CD3, anti-CD3/CD28 and anti-CD3/CD46, in the presence of IL-2. The level of cytokines produced was measured via CBA.

**Results**

Patients with CD produced on average more IFN- $\gamma$ , TNF- $\alpha$  and IL-17A than HDs under all stimulatory conditions. Anti-CD3/CD46 was the strongest stimulus for the production of Th1 and Th17 associated cytokines in CD; significantly increasing cytokine levels compared to anti-CD3 and anti-CD3/CD28 stimulation. The IFN- $\gamma$ /IL-10 ratio significantly decreased upon anti-CD3/CD46 stimulation in both HDs and CD. The ratio of IFN- $\gamma$ /IL-10 was higher in patients with more severe disease.

**Discussion**

The increased levels of IFN- $\gamma$ , TNF- $\alpha$  and IL-17A found in patients with CD supports the knowledge that CD is a Th1 and Th17 mediated disease. Co-stimulation with CD46 was found to be the strongest activator for the effector function of these cells, obtaining the highest levels of cytokine production. In severe disease states, there were greater levels of IFN- $\gamma$  produced compared to IL-10, suggesting impaired CD46 induced switching from a Th1 to a Tr1 phenotype.

**Conclusion**

The abundant levels of pro-inflammatory cytokines produced upon anti-CD3/CD46 stimulation and evidence of dysregulated T-cell plasticity provides reasoning to target the CD46 pathway when developing novel therapeutics for CD.

**Winners in Individual Categories**  
**Oral presentations**

**Third Prize**  
**Category: Clinical and Basic Science Research**

**Endoscopic Sphincterotomy in Young Patients Under 50: What Are the Long-Term Outcomes?**

**Prathivadi Bhayankaram N**, Deakin M  
University Hospital of North Staffordshire, Stoke-on-Trent, United Kingdom

**Background**

Endoscopic sphincterotomy is a procedure used to treat gallstones in the biliary ducts. An estimated fifteen percent of the UK population have gallstones, with the majority of patients being women. Gallstones in the biliary tree can cause complications such as cholangitis and pancreatitis, which can lead to high morbidity and mortality rates. Endoscopic sphincterotomy involves endoscopic retrograde cholangio pancreatography and transection of the Sphincter of Oddi to remove gallstones. There are few studies on long-term follow-up of patients after endoscopic sphincterotomy.

**Methods**

In our centre, a study was undertaken in 2002 examining outcomes of endoscopic sphincterotomy in 42 patients under 50 years, 76% of whom were women. The aim of the current project was to examine the long-term outcomes in these patients by examining the case notes up to 2016 to determine the proportion of patients who had further outpatient appointments, procedures, investigations, and outcomes of death or malignancy.

**Results**

In 2016, the cohort had a mean age of 55 and mean follow-up of 25 years since endoscopic sphincterotomy. Two patients required further endoscopic sphincterotomy for recurrent stone disease. Eight patients had died; three of these were women. Mean age of death was 44 years in women and 55 years in men. Of these deaths, two (both women) were due to pancreatic adenocarcinoma.

**Discussion**

To our knowledge, this is the first cohort study of endoscopic sphincterotomy with such a lengthy follow-up period. Our results suggest endoscopic sphincterotomy is a safe and effective long-term treatment option. However, there may be an association between undergoing this procedure and developing hepatobiliary cancer in later life. Further population studies are needed to further investigate this possible association.

**Conclusion**

Long-term follow-up of patients having endoscopic sphincterotomy before 50 years of age suggests that this is safe and effective long-term. Further research should focus on the possible association with development of hepatobiliary cancer in later life.

**Winners in Individual Categories**  
**Oral presentations**

**First Prize**  
**Category: Clinical Audit**

**Overtreatment of Asymptomatic Bacteriuria: How Can We Prevent It?**

**Wong YL**, McEwen J, Orange G  
Ninewells Hospital, Dundee, United Kingdom

**Introduction**

Orthopaedics routinely screen for ASB (Asymptomatic Bacteriuria) as historical evidence suggested its link with higher risk of prosthetic joint infections. Despite recent publications that concluded otherwise, it has been noted that a proportion of orthopaedic patients have been treated for ASB due to pre-operative screening of UTI (Urinary Tract Infection) prior to elective and non-elective surgical procedures mainly among hip and knee arthroplasties.

**Aims**

This closed-loop audit aims to eliminate the overtreatment of ASB, to optimise patient safety, and to reduce the costs associated with the investigations and treatment of ASB.

**Methodology**

A retrospective study of 121 patients was conducted from February 2016 to August 2016. Data was retrieved from electronic request system on the number of positive urine cultures, their indications, whether catheter was in-situ and the organisms cultured, if any.

Randomised study of 46 case notes was then studied to identify the appropriateness of antimicrobial treatment in accordance to the UTI Local and National Guidelines. Similarly, the cost associated with the number of unnecessary urine culture sent and the inappropriate treatment of ASB was investigated. (Note that each urine culture = £14.24).

Initial auditing revealed marked over-investigation of ASB including unnecessary urine culture sent, which has led to inappropriate UTI treatment. A UTI screening tool was developed with expert multidisciplinary team input and implemented within the department. A re-audit was carried out following a month of implementation.

**Discussion**

Of the 121 urine cultures sent, only 57 were positive. 81% were unnecessary as patients were asymptomatic. Among the 46 case notes studied, 19.6% of the patients were inappropriately treated for UTI. Following implementation, significant reduction in urine cultures was noted (M

= 17 to M = 8). Further to that, ward nurses have also picked up UTIs on admission when screening for UTI.

**Conclusion**

Routine dipstick testing on admission prompts unnecessary urine culture, contributes to wastage, and also risks unnecessary antimicrobial treatment of ASB. The significant numbers of urine culture sent by ward nurses can be eliminated by not performing routine dipstick testing. Diagnosis of UTI should be made according to the presenting signs and symptoms rather than routine dipstick testing which is costly and time-consuming.

**Winners in Individual Categories**  
**Oral presentations**

**Second Prize**  
**Category: Clinical Audit**

**The Quality of General Surgery Operation Notes in Accordance with the Royal College of Surgeons: A Closed Loop Audit**

**Hodhody G**, Al-Khuzaei SA, Goh YM, Toe K  
Milton Keynes General Hospital, Milton Keynes, United Kingdom

**Aims and Objectives**

Operation note writing is crucial in documenting surgical procedures and provides information for post-operative care. The content of these notes has a role in remuneration for services provided and legal implications. Quality of operation notes has been a cause for concern in healthcare and, hence, the Royal College of Surgeons has developed guidance to maintain standards<sup>1</sup>. 18 domains have been identified as essential requirements in operation note writing in accordance to the Good Surgical Practice (GSP) 2008<sup>1</sup>. The aim of our study is to assess compliance of our unit's operation note writing with the GSP.

**Method**

All patients who had undergone emergency or elective surgical procedures over a one- week period were identified. The operation notes were assessed against the 18 parameters stipulated by GSP guidance. Compliance to GSP was analysed and presented at the local departmental meeting where a departmental operation note template was suggested. This audit loop was closed following implementation of changes three months later.

**Results**

A total of 82 patients were included in this study period (47 in first audit cycle, 35 in re-audit). Initial compliance to GSP standards was low at 44%. Surgeon name and operation performed were 100% completed. Overall compliance to RCS Guidelines was poor (44%); marked by date and time (2%) and antibiotic prophylaxis use (2%). Following implementation of changes, we noted a 19% absolute increase in compliance to GSP (total compliance 63%) with marked improvement noted in 11 of 18 domains e.g. post-operative care instructions (62% to 94%). There was a clear disparity between written and typed notes.

**Conclusion**

Educating the department on the standards set by RCS has shown an improvement in compliance. There is scope for an electronic management system with typed operation note templates to improve compliance and outcomes.

1. The Royal College of Surgeons of England. Good Surgical Practice. 2008.

**Winners in Individual Categories**  
**Oral presentations**

**Third Prize**  
**Category: Clinical Audit**

**Improving the Compliance of Extended Venous Thromboembolism Prophylaxis in Cancer Surgery – A Completed Audit Cycle**

**Brydon PJ**, Stockton L, Knight K, Lindley S  
Royal United Hospital, Bath, United Kingdom

**Background**

In 2010 the National Institute of Health and Clinical Excellence (NICE) produced updated guidance, which recommended the administration of an extended course of low molecular weight heparin (LMWH) as venous thromboembolism (VTE) prophylaxis in patients who undergo major abdominal or pelvic cancer surgery. We conducted an audit to assess the compliance rate to this standard at the Royal United Hospital (RUH) in Bath.

**Methodology**

Phase 1: Retrospective data was collected for all patients that had elective abdominal cancer surgery between October 2015 and January 2016.

Phase 2: Implementation of four interventions.

1. A poster was designed to highlight the importance of extended VTE prophylaxis and was placed on the General Surgical Wards at the RUH.
2. An educational session on extended VTE prophylaxis was delivered to all Foundation doctors during their induction week.
3. Inclusion of post-surgical VTE prophylaxis plan on the operation note written by the operating surgeon.
4. Ward Pharmacists labeled appropriate drug charts with a written reminder to highlight the need for extended VTE prophylaxis.

Phase 3: Retrospective data was collected for all patients who had elective abdominal cancer surgery between August 2016 and December 2016.

**Results**

Pre-Intervention: 74% (26/35) of patients that underwent abdominal cancer surgery were administered extended LMWH prophylaxis.

Post-Intervention: 94% (34/36) of patients that underwent abdominal cancer surgery were administered extended LMWH prophylaxis.

**Discussion**

The primary objective of the audit was to make junior medical and pharmacy staff aware of the NICE recommendation. The introduction of visual reminders in the form of a poster and the labeling of drug charts has served as a simple yet effective way of improving awareness and compliance.

**Conclusion**

The completed audit cycle has demonstrated an improvement in patient care by ensuring post-operative cancer patients receive extended LMWH prophylaxis to reduce the risk of VTE.

**Winners in Individual Categories**  
**Oral presentations**

**First Prize**  
**Category: Clinical and Patient Related Work**

**Jejunal Adenocarcinoma and Crohn's Disease: More than Co-Incidence?**

**Smith FS, Makhija R**  
Addenbrooke's Hospital, Cambridge, United Kingdom

**Background**

Primary small bowel cancer is a rare type of gastrointestinal malignancy, with an estimated incidence of 1300 new diagnoses per year in the UK, of which 40% are adenocarcinoma. Patients with Crohn's disease are at increased risk of developing primary small bowel cancer. We present the first case report of a patient with metastatic jejunal adenocarcinoma at the point of initial presentation and diagnosis of Crohn's disease.

**Case Report**

A previously well, middle-aged female was admitted with small bowel obstruction. She had no history of previous abdominal surgery and no family history of malignancy or inflammatory bowel disease. Computerised tomography imaging demonstrated marked dilation of a long loop of small bowel with appearances suggestive of strictures at either end associated with mesenteric lymphadenopathy. A clinical diagnosis of Crohn's disease was consistent with the history, imaging findings and a significantly elevated faecal calprotectin result. Due to failure to respond to medical therapy, exploratory laparotomy was performed and the obstructing stricture resected. When histology revealed invasive adenocarcinoma, she was returned to theatre to excise the remaining non-obstructing strictures that had been left in situ. Staging CT and ovarian biopsy confirmed distal metastasis.

**Discussion**

Review of the literature revealed 30 previously reported cases of jejunal adenocarcinoma in Crohn's patients; of which seven cases were fully described. The literature suggests that, among patients with previously diagnosed Crohn's disease, there is a mean latency of 21 years prior to the development of jejunal adenocarcinoma.

At present, there is no routine screening programme in place for detection of SBA in Crohn's patients in the UK. This may change in the future with development of sensitive and specific intestinal malignancy biomarkers and technological advancements.

**Conclusion**

Clinicians should have heightened suspicion of small bowel malignancy among patients with Crohn's for two or more decades.

**Winners in Individual Categories**  
**Oral presentations**

**Second Prize**  
**Category: Clinical and Patient Related Work**

**Reactivation of Pulmonary Tuberculosis Following Treatment of Myelofibrosis with Ruxolitinib**

**Varma P**, Dhakal B, Hari P  
Medical College of Wisconsin, Milwaukee, USA

**Introduction**

Janus kinase (JAK) inhibitors, such as ruxolitinib, are widely used due to their efficacy in decreasing constitutional symptoms and splenomegaly in patients with myeloproliferative neoplasms.

**Clinical Findings**

In our case, we describe the reactivation of pulmonary tuberculosis (TB) in a retired physician while on treatment with ruxolitinib. He initially presented with anaemia and massive splenomegaly. Other symptoms included night sweats and weight loss. A bone marrow biopsy confirmed myelofibrosis and he was started on 20mg twice-daily ruxolitinib for symptom relief. A prior screening chest X-ray did not show any lung involvement.

**Investigations and Management**

Three weeks after initiation of therapy, the patient was admitted to hospital with high-grade pyrexia and night sweats. Lymph node biopsy of a cervical node identified necrotising granulomatous inflammation and acid-fast bacilli and cultures were positive for mycobacterium tuberculosis. A chest CT demonstrated bilateral lung nodules and left sided pleural effusion. Ruxolitinib was discontinued and the patient was started on the standard anti-tuberculosis therapy for nine months with rifampicin, isoniazid, pyrimethamine and ethambutol. Ruxolitinib was re-introduced after six months for symptom relief and he remained on rifampicin and isoniazid. At follow up, there was significant symptom improvement and the patient remained without need of a transfusion.

**Discussion**

Ruxolitinib primarily acts by inhibiting the JAK signal transducer and activating the transcription (STAT) pathway. This leads to depressed T helper cell type 1 response and a decrease in production of cytokines, which play a key role in prevention of reactivation and control of TB infection.

We also review the literature on opportunistic infections following use of ruxolitinib.

**Conclusion**

Our case highlights the importance of screening for latent TB in patients from highly endemic areas prior to start of therapy with ruxolitinib.

**Winners in Individual Categories**  
**Oral presentations**

**Third Prize**  
**Category: Clinical and Patient Related Work**

**Case Report: A Rare Presentation of Right Iliac Fossa Pain**

**Sultana A**, Saad A, Goh YM, Toe K  
Milton Keynes General Hospital, Milton Keynes, United Kingdom

**Background**

Duplex appendix is a rare congenital abnormality with incidence of two in 50,000. Unusual presentation of this congenital abnormality can lead to delays in diagnosis and management.

**Case Report**

A 42-year-old male presented with a two-day history of right iliac fossa (RIF) pain and raised inflammatory markers. He underwent diagnostic laparoscopy where a normal appendix was seen. He was treated with antibiotics; an appendicectomy was not performed. He re-presented several years later with similar symptoms. Diagnostic laparoscopy and appendicectomy was performed which was histopathologically confirmed as normal appendix. His symptoms did not improve after surgery with localised guarding in the RIF, pyrexia, tachycardia and raised inflammatory markers. An ultrasound scan was unremarkable. Computed tomography abdomen revealed a collection from which extended a tubular structure ending in the terminal ileum. A third diagnostic laparoscopy was performed. The small collection was not identified and conversion to midline laparotomy revealed a second necrotic friable appendix leading to a retrocaecal and retroileal cavity (abscess). This was confirmed on histopathology to be a gangrenous appendix with secondary peritonitis. He was discharged from hospital several days post-operatively.

**Discussion**

Classified by the Cave-Wellbridge classification, dual appendix is a well described rare congenital abnormality. Often recognised incidentally at surgery, it should be considered as a differential diagnosis in patients with negative diagnostic laparoscopy for RIF pain.

Radiological studies are often not useful aids in making the diagnosis of duplicate appendix. Overlooked, it may extend length of hospital stay or lead to readmission to hospital, affecting patients' quality of life and increasing economic burden.

**Conclusions**

Dual appendix should be considered as a cause of recurrent RIF pain after appendectomy especially when no other obvious cause for symptoms is found and often radiological investigations are not good enough in picking dual appendix.

**Winners in Individual Categories**  
**Oral presentations**

**Forth Prize**  
**Category: Clinical and Patient Related Work**

**A Review of Infected Arthroplasty by Listeria Monocytogenes and Case Report**

**Gillon CHM**, Hook Z, Mohammed M  
Lister Hospital, Stevenage, United Kingdom

**Background**

Listeria monocytogene infection is a rare complication of prosthetic joint replacement, with an estimated annual incidence in Europe of 4.7 per million. It is associated with significant morbidity, resulting in extended antibiotic therapy and multiple operative procedures.

**Case Study**

A 79-year-old male presented to ED with increasing pain in his right knee and difficulty weight bearing. He had had a right knee replacement 17 years previously. On examination, he had a large effusion with restricted range of movement. Plain XR of the knee revealed loosening of the tibial stem and initial blood tests showed raised inflammatory markers. A diagnosis of prosthetic knee joint infection was made and the patient underwent a two-stage revision of the knee with antibiotic treatment (teicoplanin and gentamicin). This treatment was complicated by an acute kidney injury. Tissue culture at five days revealed heavy growth of listeria. He completed a six-week course of high dose amoxicillin (2g QDS).

**Discussion**

Listeria is a rare cause of prosthetic joint infections, where the causative organisms tend to be staphylococcus, streptococcus or gram negative bacteria. Systemic infection usually arises from a food source and the majority of patients are immunocompromised. Other risk factors include neoplasia, diabetes and increasing age. Within the literature, listeria infection of prosthetic joints is treated with a combination of two-stage revision and antibiotic therapy for 6-12 weeks (amoxicillin and gentamicin).

There are cases reported in the literature of chronic listeria joint infection, the main symptoms of which are repeated relapsing episodes of painful joint swelling, with or without repeated positive cultures for listeria.

**Conclusion**

Listeria infection of prosthetic joints is an increasing problem due to the rising number of elderly and immunocompromised patients. Early diagnosis and treatment is essential to improve prognosis, and long term follow up is warranted to monitor for recurrence.

**Winners in Individual Categories**  
**Poster presentations**

**First Prize**

**Exploring the Perceived Stigma Felt by Patients with Epilepsy Living in Sub-Saharan Africa**

**Wilkes RL**, Hunter E, Walker R  
Royal Albert Edward Infirmary, Wigan, United Kingdom

**Background**

High rates of epilepsy in Sub-Saharan Africa make it a major health issue. Due to the negative perception associated with epilepsy, overcoming stigma surrounding the disease is a great burden. Cultural beliefs and lack of knowledge mean association with negativity and isolation of patients by relatives and communities.

**Methods**

This was a follow up study of the Hai epilepsy study. A mixed methods approach was undertaken combined with collection and analysis of quantitative and qualitative data. Data entry was carried out simultaneously alongside data collection. The 15 patients scoring highest on the Kilifi Stigma Scale were selected to be analysed in detail about their answers.

**Results**

205 patients with epilepsy, or their carer, completed an interview and scored a Kilifi Stigma Score. Variables, which had changed relating to socio-demographic data from initial data set, were updated. There were six main themes which emerged from the answers of the 15 participants relating to beliefs regarding seizures, mistreatment of patients with epilepsy, contribution to society, and effects on social support of patients with epilepsy and positive thinking.

**Discussion**

The study found that patients with epileptic experiences are consistent with long-held views that they carry a heavy burden including their stigma affecting socio-economic status. Although patients manage their condition well, it is the treatment they receive and the community which impacts greatly on their life.

**Conclusion**

Epilepsy is a significant problem worldwide with one of the greatest impacts of the condition being the stigma a patient can experience which is very traumatizing and depressing. An increased awareness by the community in understanding what epilepsy is could help to improve the well-being and socio-economic status of patients with epilepsy.

**Winners in Individual Categories**  
**Poster presentations**

**Second Prize**

**Hip Fractures: Is there a 'Weekend Effect'?**

**Sexton N**, Cheung G, Sargazi N  
Royal Liverpool University Hospital, Liverpool, United Kingdom

**Introduction**

The 'weekend effect' is a phrase used to refer to the possible increased risk of mortality that weekend admission to hospital infers on patients. The debate has intensified since the health secretary declared there were 6000 avoidable deaths per year attributable to the difference in care received between weekday and weekend admission. Hip fracture patients are an elderly population with a high risk of morbidity and mortality and are an appropriate cohort to study as the acute management can considerably affect outcome.

**Aims**

This study aims to establish if day of admission affects 30 day mortality in patients admitted to a university teaching hospital for surgical repair of a femoral neck fracture.

**Methodology**

We retrospectively reviewed all hip fractures between March 2014 and April 2016. This comprised 859 patients in total, of which 97% progressed to surgery (F:M ratio = 5:2, Age range 33-101). Weekend admission was classed as Friday midnight until Sunday midnight. Data was collected from the departmental and national hip fracture database (NHFD) and statistically analysed.

**Results**

Overall, hip fracture 30-day mortality rate was 7.5% over the two years when including all hip fracture patients and 6.7% for those who were surgically managed. This study found no significant difference in 30 day mortality for those admitted at the weekend rather than on a weekday ( $p=0.132$ ). This persisted for surgical patients after adjustment for age and ASA grade.

**Discussion**

These mortality rates are suggestive of a high standard of care. Care is consultant-led, patients follow a hip fracture pathway, and access to theatres remains constant throughout the week. Ultimately, this means that patients are receiving uniform treatment from the most senior clinicians irrespective of day of admission.

**Conclusion**

This study found no adverse risk associated with weekend admission and does not support a weekend effect for hip fracture patients.

**Winners in Individual Categories**  
**Poster presentations**

**Third Prize**

**A Re-Audit into the Management of Soft Tissue Knee Injuries after the Addition of an Extended Scope Physiotherapist into the Emergency Department**

**Cole KL**

Cardiff University, United Kingdom

**Background**

This study re-audits the management of soft tissue knee injuries in a South Wales hospital after an extended scope physiotherapist (ESP) was introduced into the emergency department (ED) in 2016. Their role was to triage orthopaedic patients and formulate appropriate management plans. This audit focuses on the effect that this new model of care has had on discharge statistics, waiting times, and the surgical conversion rate (SCR), whilst exploring the benefits that this could have on patient outcomes and their pathway from ED to discharge.

**Methods**

This retrospective cohort study analyses the patient pathway of 364 patients with soft tissue knee injuries that presented to the ED, and therefore the ESP clinic, between June 2016 and March 2017 (10 months).

**Results**

64% of patients seen by the ESP were discharged with no further investigations, compared to just 8% in the previous study. The percentage of patients referred to orthopaedics dropped from 92% to 12%, with an average waiting time of 36 days. The average waiting time for MRI was 21.5 days, compared to 35.7 days in the previous study. All patients reviewed by a consultant underwent imaging before their clinic appointment. The SCR increased from 25% to 69%.

**Discussion**

**The** significant reduction in referrals to fracture clinic shows the ability of ESPs to manage patients independently, and the dramatic increase in the SCR demonstrates appropriate selection for orthopaedic referral. These factors, along with reduced waiting times for imaging, demonstrate that the addition of an ESP has led to a more efficient patient pathway.

**Conclusions**

This study supports the use of ESPs as orthopaedic triage in UK EDs as the results suggest an improvement to the pathway of patients with acute musculoskeletal injuries. This model could therefore be used to help alleviate the growing demand on orthopaedic services.

## Oral Presentations

### *Category: Clinical and Basic Science Research*

#### **Role of PMCA4 in Cardiac Remodelling Post Myocardial Infarction**

**Abrar R**, Cartwright EJ  
University of Manchester, United Kingdom

##### **Background and Objectives**

There is increasing evidence to suggest that plasma membrane calcium ATPase 4 (PMCA4) is a regulator of key pathophysiological processes in the heart. It was recently demonstrated that global knockout of PMCA4 (PMCA4<sup>-/-</sup>) is protective against cardiac hypertrophy and heart failure. However, PMCA4 has not previously been investigated in the context of MI which is a key risk factor of heart failure. This study aimed to determine the role of PMCA4 as a potential mediator of cardiac remodelling one week post MI.

##### **Methods**

MI was surgically induced in genetically engineered PMCA4<sup>-/-</sup> mice and wild-type (WT) controls. Electrocardiography confirmed MI and echocardiography evaluated cardiac structure and function. Cardiac hypertrophy, inflammation and fibrosis were assessed by molecular and histological techniques one week post MI.

##### **Results**

PMCA4<sup>-/-</sup> mice showed no difference in gross cardiac structure, function and infarct size one week post MI. However, interestingly, PMCA4<sup>-/-</sup> mice displayed a significantly reduced acute inflammatory response to MI compared to their WT counterparts, with mRNA expression of IL-6 displaying a 22.2 fold greater increase in WT compared to PMCA4<sup>-/-</sup> mice ( $p < 0.0001$ ).

Fibrotic response was also significantly reduced in PMCA4<sup>-/-</sup> mice, with mRNA expression of COL3A1 showing a 52.3% greater increase one week post MI in WT compared to PMCA4<sup>-/-</sup> mice ( $p < 0.05$ ). No such change was detected in cardiac hypertrophy.

##### **Discussion**

This study provides preliminary data to indicate that PMCA4 ablation may play an important protective role in attenuating early adverse cardiac remodelling post MI. PMCA4 has previously been implicated in the regulation of NF $\kappa$ B and sFRP2 (involved in inflammatory and fibrotic responses respectively); these interactions require further investigation to explain the effects observed in this study.

##### **Conclusion**

Inhibiting PMCA4 may represent an exciting, novel and effective therapeutic strategy to reduce the risk of developing heart failure.

### NAFLD Fibrosis Score to Diagnose Patients without Significant Fibrosis

**Chuang YH**

University of Dundee, United Kingdom

#### Background

NAFLD Fibrosis Score has been suggested to be an accurate diagnostic tool to determine patients with or without advanced liver fibrosis, rendering unnecessary liver biopsy for identification of advanced fibrosis. This study was aimed to investigate the utility of NAFLD Fibrosis Score by comparing the possible relationships between FibroScan and NAFLD Fibrosis Score.

#### Methods

We collected a total of 132 sets of mandatory measured parameters (age, diabetes mellitus status, BMI, platelet count, albumin, AST/ALT ratio) to calculate the NAFLD Fibrosis Score and FibroScan result from 58 liver-biopsy diagnosed NAFLD patients with regular follow ups at Ninewells Hospital.

#### Results and Discussion

Our results suggest that, by applying the NAFLD Fibrosis Score, the NAFLD Fibrosis Score that lies in the range of F0-F1 was most reliable. From our study, 80% of the total collected data with FibroScan Score of F1 matched with NAFLD Fibrosis Score of F0-F1. On the contrary, results were almost equally distributed between NAFLD Fibrosis Score of F0-F2 & Indeterminate for both FibroScan score, F2 & F3. In this study, there was no NAFLD Fibrosis Score of F1-F2 in conjunction with FibroScan Score of F4 and no NAFLD Fibrosis Score of F3-F4 in conjunction with FibroScan Score of F1. This deduces the possible accuracy of the NAFLD Fibrosis Score in diagnosing patients without severe fibrosis. Based on this study, the sensitivity and specificity of NAFLD Fibrosis Score to diagnose significant fibrosis were 40% and 98.7%, respectively. Positive and negative predictive values were 0.80 and 0.93, respectively.

#### Conclusions

NAFLD Fibrosis Score constructed from routine clinical and laboratory variables can accurately predict the absence of advanced fibrosis in NAFLD, rendering liver biopsy and FibroScan unnecessary in the vast majority of the patients.

### Potassium Depolarisation Protects Cochlear Hair Cells from Aminoglycoside Antibiotics in Vitro

**Secker AD**, Kros C, Richardson G

University of Birmingham, United Kingdom

#### Background

The use of aminoglycoside antibiotics (AGs) is commonplace in the developing world and amongst certain patient groups in developed countries. Their use, and that of other drugs including cisplatin, can cause loss of hair cells from the inner ear and carries the risk of hearing loss and balance problems. The mechanisms by which these drugs cause hair-cell death are variable and complex. Their route of entry into hair cells is uncertain but, for AGs, is thought to be via the mechano-electrical transducer (MET) channels.

A screen of 160 known ion channel blockers identified 13 compounds that protect outer hair cells in mouse cochlear cultures from gentamicin-induced cell death. Of these 13 compounds, 11 were found to block outer hair-cell potassium channels. Blocking potassium channels may depolarise the hair cells and reduce the driving force for entry of ototoxins through the MET channels.

#### Methods

To test this hypothesis mouse cochlear cultures were exposed to three or five  $\mu\text{M}$  gentamicin or five  $\mu\text{M}$  cisplatin for 48 hours in the presence of 12 or 18 mM additional extracellular potassium, concentrations of potassium which were estimated should depolarise the membrane potential of the outer hair cells by 15 mV or 20 mV, respectively, from their normal resting potential of about -65 mV. Cultures were fixed, stained with phalloidin and anti- myosin7a, and hair-cell numbers were counted.

#### Results and Conclusions

High concentrations of extracellular potassium (18 mM) were found to prevent the death of basal-coil, high-frequency outer hair cells induced by gentamicin, but not that caused by cisplatin. Confocal microscopy indicates elevated extracellular potassium does not disrupt the structure of the sensory hair bundles. These results provide further evidence that AGs enter hair cells via their MET channels and suggest cisplatin may enter via an alternative pathway.

### **A Retrospective Cohort Study Investigating Antibiotic Prescribing in Very Low Birth Weight, Very Pre-term Children with Bronchopulmonary**

**Moreton WJ**, Fiaschi L, Gibson J, Tan S  
University of Nottingham Medical School, United Kingdom

#### **Background**

Despite improvements in neonatal care over recent decades, the incidence of bronchopulmonary dysplasia (BPD) remains constant. Underpowered evidence suggests that very low birthweight (VLBW), very premature babies with BPD have higher rates of antibiotic prescribing in early childhood. However, the literature lacks large-scale, modern, and nationally-representative studies.

#### **Methods**

This retrospective cohort study utilised data on 498,624 individuals from the Clinical Practice Research Datalink, Hospital Episode Statistics linked dataset. Exposure variables were birthweight, gestational age, and home oxygen therapy - a marker for BPD severity. Those on oxygen were first compared to those not on oxygen and then to normal birthweight, full-term babies. The primary outcome was the antibiotic prescribing rate; the secondary outcome was the class of antibiotic prescribed.

#### **Results**

VLBW, very preterm children discharged on oxygen were more likely to receive antibiotics than normal birthweight, full-term children (adjusted incidence rate ratio (IRR): 1.33, 95% confidence intervals (CIs): 1.30-1.37). VLBW, very preterm children on oxygen were also more likely to be prescribed antibiotics than their counterparts not on oxygen (adjusted IRR: 1.30, 95% CIs: 1.22-1.40). Those on oxygen were more likely to be male (54.39%) and had a higher percentage of congenital abnormalities than those not on oxygen and normal birthweight, full-term children (33.11% vs 15.25% and 2.46%, respectively). Broad-spectrum penicillins were the most commonly prescribed class of antibiotic.

#### **Discussion**

The strengths of this study lie in its size and relevance - since antibiotic resistance is at the forefront of public health concerns. The findings can be used to counsel families and outpatient providers about the health needs of VLBW, very premature, BPD children.

#### **Conclusion**

This study showed that low birthweight, low gestational age, and severe BPD are associated with higher antibiotic prescribing rates in early childhood and that broad-spectrum penicillins are the most commonly prescribed antibiotic in this group.

### **Factors that Influence the Specialty Choices of Medical Students and Practitioners**

Richards CE\*, Broderick M, Vogan CL  
Swansea University, United Kingdom

#### **Background**

Specialty selection by medical practitioners plays an important role in the future supply of physicians across the healthcare service. The competition ratio for entry to specialty training programmes varies greatly between medical specialty and regions, leaving some specialties and deaneries vastly oversubscribed while others are faced with difficulties in recruitment. Although vocational training forms part of the medical school teaching, it does not address all factors that influence specialty selection.

#### **Material/Methods**

We surveyed 72 attendees of our medical school careers evening (59 medical students, 13 doctors; 67% female). The survey was designed to collect information on the participants' stage of training, specialty or current specialty preference, and which factors have influenced career preferences.

#### **Results**

The highest rated factors were intellectual challenge, suits personality and job opportunities. Interestingly, factors such as role models and gender did not rank highly. 58% of students were still undecided in their specialty choice; 41% of which were penultimate year students who are within 6 months from submitting their applications to the Foundation Programme. Free text comments also suggested "greater choice in undergraduate curriculum for 2-3 week assistantships", "more scope for taster placements of chosen speciality", "small groups or one-to-one with a doctor in speciality to get further information".

#### **Discussion**

Our results demonstrate that multiple opportunities to incorporate careers advice and training into the medical school curriculum are missed and that there is scope for more exposure to specialties emphasising the top ranked influential factors in career choice. More dedicated medical careers evenings were proposed to address the realities of life in each medical specialty and advise as to how students can strengthen their applications.

#### **Conclusion**

We believe that increased exposure to career specialties emphasising these highly ranked influential factors could aid in readdressing the deficit in some undersubscribed specialties.

### What Are the Effects of Argon During Normothermic Kidney Perfusion?

Smith FS, Adams T, Hosgood S, Nicholson M  
Addenbrooke's Hospital, Cambridge, United Kingdom

#### Background

Argon has shown potential as an organo-protectant in numerous models of ischaemia- reperfusion injury (IRI). The aim of our study was to evaluate the effects of argon gas during ex-vivo normothermic perfusion (EVNP) in an experimental porcine model of kidney IRI.

#### Materials/Methods

Following a warm ischaemia time of 15 minutes, and 17 hours of static cold storage, porcine kidneys underwent 1 hour of EVNP using leukocyte depleted blood. During EVNP, kidneys were perfused with a gas composition either of 70% Argon (n=6), 70% Nitrogen (n=6), or standard 95% Oxygen (n=6) balanced with carbon dioxide. After EVNP, kidneys were reperfused with whole blood under standard conditions for three hours to assess renal function and injury.

#### Results

During 1h EVNP, the mean renal blood flow was numerically higher in the argon group ( $49.2 \pm 16.2$  ml/min/100g;  $P = 0.320$ ) compared to the nitrogen and oxygen groups ( $42.9 \pm 18.64$  and  $\pm 7.0$  ml/min/100g respectively). Other measures of renal function and haemodynamics were not significantly different between the argon and control groups during this period.

Functional parameters and inflammatory markers did not differ during reperfusion ( $p < 0.05$ ). Histological analysis revealed no significant change in morphology or hypoxia inducible factor-1alpha (HIF-1 $\alpha$ ) staining between gaseous groups.

#### Discussion

Argon did not have a harmful effect. Our model characterises only the very early consequences of IRI and methodological subtleties may account for our negative results compared to previous studies.

#### Conclusion

Our findings suggest that using 70% argon during 1 hour of EVNP does not mediate a measurable organo-protective effect in an experimental porcine model of IRI. Future work is needed to delineate the cellular signalling pathways in IRI for identification of new targets and new therapeutics.

### Non-EU Students Benefit Most from Near-Peer Assisted Learning

Iqbal SH, Galea M, Stabile I  
Mater Dei Hospital, Malta

#### Background

The aim of this study was to investigate the extent to which near-peer assisted learning affected the final practical examination results of third year medical students at the University of Malta.

#### Methods

25 Year Four students received 10 hours of training using standardised clinical histories and corresponding checklists. 53 Year Three students in a 1:2 tutor:learner ratio attended each of the 10 prepared sessions covering history-taking and examination skills in each of the body systems.

#### Results

EU and non-EU participants had higher mean clinical exam scores than EU and non-EU non- participants (77.3 vs 70.5%; 66.3 vs 47.8%). EU participants had significantly higher mean scores than non-EU students (78% vs 66%,  $p = 0.02$ ). The mean pre/post test score for doing a clinical examination increased by 29%.

#### Discussion

In spite of the small sample size, non-EU participants benefited significantly more than EU students, perhaps because they perceived the peer assisted tutoring to be less formidable than clinician-led teaching. Perceived pre/post test scores improved dramatically in doing a clinical examination, indicating that participants benefited from attending these sessions.

#### Conclusion

If used as an adjunct to formal teaching, near-peer assisted learning is particularly beneficial to non-EU students studying within the EU because it improves communication skills and instils self-confidence, as well as helps students to practice practical skills in an informal setting.

Near-peer assisted learning boosts the confidence of non-EU students allowing them to perform better in clinical exam situations. However, all participants perceived the sessions to be very helpful in improving their history-taking and clinical examination skills.

### **Paediatric Surgical Intervention in Sierra Leone**

**Kwasau H**, Kamanda J, Boima JC, Lebbie A  
Connaught Hospital, Freetown, Sierra Leone

#### **Background**

There is growing evidence that childhood surgical conditions, especially injuries, are common in developing countries and poor care results in significant numbers of deaths and cases of disability. For paediatric purposes, it appears that there are four areas where efforts should be focused. Special attention should be given to defining a cost-effective package of surgical services, improving surgical care at the community level, strengthening surgical education, and surgical care should be an essential component of child health programmes in Sierra Leone.

#### **Method**

Visited Connaught Hospital to interview staff and review theatre logbook for the period of one year. A data collection tool was used to obtain the number, age, sex, types of paediatric surgical conditions and procedures done on all patients aged between 0 and 15 years at Connaught Hospital Operating Theatre (CHOT) from 1st June 2015 to 30th June 2016.

#### **Results**

- Inguinal hernia is the most common paediatric surgical condition in Sierra Leone.
- The number of paediatric surgical procedures done at CHOT is higher in males than in females.
- The highest number of paediatric surgical procedures was on the youngest age group (0 - 4 years).
- The common paediatric surgical diseases managed at CHOT were: Inguinal Hernia, Hydrocele, Appendicitis and Osteomyelitis.
- 93% success rate of paediatric surgical procedures done at CHOT.

#### **Discussion**

A patient presented with multiple diseases: Bladder Extrophy, Omphalocele and Epispadias. Obstructed Right Inguinoscrotal Hernia required multiple procedures: Laparotomy, Appendicectomy and Herniotomy. Inappropriate procedure (Herniorrhaphy) was done for 17 patients. 190 out of 204 (93%) paediatric surgical patients were alive after surgery.

#### **Conclusion**

The surgical care of children in Sierra Leone can be improved notwithstanding the serious socioeconomic problems. Progress can only occur, however, if poor surgical care is recognised as a significant public health problem and if communities become aware that good surgical care can improve their children's health.

### **Maintenance of Medical Devices in the Health Care Sector of India**

**Gupta V**, Manaseki-Holland S, Diaconu K  
University Hospital of North Staffordshire, Stoke-on-Trent, United Kingdom

#### **Background**

Maintenance of medical-devices is of importance in optimizing-utility, encouraging cost- efficiency and enhancing quality-of-care. Existing literature reported device maintenance to be neglected and understudied in low/middle-income countries (L/MIC). This warrants exploration as these countries have recently experienced a rise in demand for devices. India is a MIC with a device market set to undergo substantive growth within a range of private and public hospitals. We explored issues regarding maintenance of medical devices in the North-West province of India, and the secondary aim was to compare maintenance between the public and private healthcare sectors.

#### **Methods**

This qualitative study used semi-structured interviews with 31 healthcare practitioners, administrators, directors and biomedical engineers from different institution sizes, in both private and public sectors. Purposive sampling using a snowball approach was used to select the participants. Interviews were audio-recorded and conducted using a validated topic guide. Thematic framework analysis employing an inductive and grounded approach was used for data analysis.

#### **Findings and Discussion**

We identified three themes that have a compounding effect in causing delayed maintenance: (i) absence of biomedical engineers (BE), (ii) poor user- responsibility/accountability for devices, procedural delay in fault-reporting, (iii) discrepancy in after-sales maintenance by companies. Quality of maintenance was found to be poorer in the public sector due to greater prevalence of these issues. We also found that, despite awareness of these problems being existent amongst decision makers, there was a lack of willingness to act, demonstrating neglect of device maintenance, particularly in the public sector. Poor maintenance then contributes to considerable device downtime, widening of the socio-economic divide, and wastage of healthcare resources.

#### **Conclusions**

Increased delegation of responsibility within the maintenance process and regulation of company service is recommended. Employment of biomedical engineers is imperative.

## Stress Perception, Cortisol Levels and the Practice of Mindfulness in First and Second Year Medical Students

Griffin J, Hearn J, Stocker C  
University of Buckingham, United Kingdom

### Background

Stress affects many medical students, impacting their wellbeing and future health. Techniques, such as mindfulness, may be effective in interrupting the pathway between stress perception and high cortisol levels.

### Aims

Explore the relationship between trait mindfulness and its effects on perceived stress experienced by medical students.  
Explore the relationship between trait mindfulness and salivary cortisol levels in medical students.

### Methods

Opportunity sampling at two time points with the two cohorts: baseline reading five weeks before the stressor (ETA exams) and stressful reading 20 minutes before the exam.  
All samples were taken in the morning, allowing for control of diurnal rhythm of cortisol levels. Participants filled out a consent and demographic form, a Stress Likert Scale and a Five Facet Mindfulness Questionnaire.  
Salivary cortisol samples were then taken from each participant and stored for later analysis. The saliva samples were then analysed using a salivary cortisol ELISA.  
Results from the tests were analysed using SPSS v23.

### Results

Four main results were found:

1. Stressful event was enough to raise both stress perception and cortisol levels ( $p=.000$ ).
2. Mindfulness has a strong correlation with stress perception ( $p=.33$ ).
3. 2016 cohort had significantly higher cortisol levels than the 2015 cohort.
4. Females had significantly higher stress perception ( $p=.000$ ) but males had significantly higher cortisol levels ( $p=.025$ ).

### Discussion and Conclusion

Further research should implement: a greater participant number, a more longitudinal study, and a qualitative questionnaire component. Mindfulness demonstrates efficacy for use in mediating effect of stress perception in medical students; the timing of its use should be further investigated. Further research into the long-term effects of mindfulness when medical students become doctors is needed.

## The Effect of Habitual Physical Activity on Metabolic Flexibility in Humans

Greenhaff P, Stephens F, Wallis JB, Wilson E, Harvey S, Fong R  
University of Nottingham, United Kingdom

### Introduction

Metabolic flexibility (MF) is the ability of the body to adapt fuel usage to fuel availability. A loss of this ability has been demonstrated in obesity and Type 2 Diabetes Mellitus (T2DM). However, the aetiology of this is poorly understood. This study aimed to prove that physical inactivity is a major determinant of metabolic inflexibility.

### Methodology

Habitual physical activity (HPA) levels of five normal-weight males (NM), five overweight males (OM) and five normal weight females (NF) were recorded for seven days prior to an inactivity intervention ( $\leq 1,500$  steps/day for seven days). Indirect calorimetry was performed pre- and post-intervention to determine changes in respiratory exchange ratio (RER) in response to an oral glucose load.

### Results

Mean RER increases 1-hour ( $\Delta RER1$ ) and 2-hours ( $\Delta RER2$ ) post-glucose ingestion were smaller in both NM and OM following exposure to inactivity, yet increased slightly in NF following inactivity.  $\Delta RER2$  was greater in NM than OM during HPA ( $0.17 \pm 0.03$  vs.  $0.13 \pm 0.03$ ), yet after exposure to inactivity  $\Delta RER2$  values were comparable ( $0.07 \pm 0.06$  vs.  $0.07 \pm 0.04$ ).  $\Delta RER1$  was significantly greater in NF compared to OM across exposure to both HPA and inactivity ( $0.13 \pm 0.02$  vs.  $0.07 \pm 0.02$ ;  $p < 0.05$ ).

### Discussion

The study was underpowered, and thus the primary aim of the study cannot be confirmed. Despite this, mean decreases in  $\Delta RER1$  and  $\Delta RER2$  in NM and OM following intervention suggest that inactivity decreases MF. Females have significantly greater levels of MF than males, and mean values suggest they are protected from the pathological effects of inactivity.

### Conclusion

Although the study was underpowered, the mean data reported strongly indicates a role of inactivity in metabolic inflexibility, and thus a repeat of the study with increased predictive power is necessary.

### **Stress Perception, Cortisol Levels and the Practice of Mindfulness in First and Second Year Medical Students**

**Griffin J**, Hearn J, Stocker C  
University of Buckingham, United Kingdom

#### **Background**

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#### **Aims**

Explore the relationship between trait mindfulness and its effects on perceived stress experienced by medical students.  
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Opportunity sampling at two time points with the two cohorts: baseline reading five weeks before the stressor (ETA exams) and stressful reading 20 minutes before the exam.

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#### **Results**

Four main results were found:

1. Stressful event was enough to raise both stress perception and cortisol levels ( $p=.000$ ).
2. Mindfulness has a strong correlation with stress perception ( $p=.33$ ).
3. 2016 cohort had significantly higher cortisol levels than the 2015 cohort.
4. Females had significantly higher stress perception ( $p=.000$ ) but males had significantly higher cortisol levels ( $p=.025$ ).

#### **Discussion and Conclusion**

Further research should implement: a greater participant number, a more longitudinal study, and a qualitative questionnaire component. Mindfulness demonstrates efficacy for use in mediating effect of stress perception in medical students; the timing of its use should be further investigated. Further research into the long-term effects of mindfulness when medical students become doctors is needed.

### **Investigating the Pathophysiology of Peripheral Vascular Disease on Skeletal Muscles**

**Crispi V**, Sfyri P, Verpooten S, Matsakas A  
Hull York Medical School, United Kingdom

#### **Background**

Obese individuals increasingly show ectopic lipid infiltration in adipose and non-adipose tissues, including the skeletal musculature. This results in an increased production of reactive oxygen species, mitochondrial deficits, and high oxidative stress which overall compromises skeletal muscle functioning. This project aimed at investigating the impact of a normal diet and a cholesterol-enriched Western diet on skeletal muscle stem cell activation, proliferation, and differentiation profiles in mice.

#### **Methods**

Wild type mice have been used as experimental models. They were divided into two groups which were either subjected to a 15-week normal or cholesterol-enriched Western diet.

Skeletal muscles (Extensor Digitorum Longus) were isolated from 23-week old male mice. Single myofibres were cultured for 24, 48 and 72 hours in cell culture medium and stained with primary antibodies for gene expression (Pax7, MyoD, and Myogenin) and nuclear staining (DAPI). Specimens have been analysed via fluorescence microscopy in order to determine the cellular oxidative capacity and changes in morphology, size, vasculature and function, alongside recognition of pathological features such as central nucleation and macrophage infiltration.

#### **Results and Discussion**

We conclude that diet-induced obesity does not affect satellite cell activation and differentiation profiles, despite the delay in proliferation. The recruitment pattern is affected as there is no evidence of an exponential rise in the HF satellite cells pool, and genetic expression is delayed. Furthermore, there are no signs of myopathy in mice, in contrast with human pathophysiology of peripheral vascular disease. Therefore, satellite cell differentiation on single fibres is independent of diet and fatty acid uptake perturbations.

#### **Conclusion**

More research should be undertaken to validate the findings from EDL in a different mouse muscle with similar contractile properties, and to assimilate the changes in the muscle fibre type composition in fast and slow twitch muscle beds and lipid accumulation in metabolically active tissues.

### Artificial Hydration: The Decisions and the Difficulties

**Kreibich AE**, Kempster P, Kane CM, Hackett J, Bennett MI  
University of Leeds, United Kingdom

#### Background

The use of artificial hydration (AH) in end-of-life care has been under increasing scrutiny in recent years. Most guidelines now state that it should be considered on an individual basis and be discussed with the patient and their relatives. It is important to better understand the difficulties perceived by healthcare professionals (HCPs) in order to fully address them.

#### Aim

To survey HCPs working in palliative care to understand their views on aspects of AH, including timing and discussion of AH.

#### Methods

We recruited and surveyed 61 HCPs with experience in end-of-life care via advertising on social media. Structured answers and free text questions were used. Data was analysed independently by two researchers using SPSS. We compared perceived differences in AH discussions with different parties using  $\chi^2$ .

#### Results

HCPs felt there is likely to be more benefit for AH in the last weeks of life compared with the last days ( $p=0.00031$ ). 86% saw discussing AH with patients as necessary. HCPs found discussing AH with relatives more difficult than with patients ( $p=0.00628$ ). HCPs felt relatives found AH discussion more distressing than patients ( $p=0.00016$ ). The major themes that emerged were that the patient's decision should be prioritised and relatives often disagree with HCP decisions.

#### Discussion

HCPs feel that AH is likely to be more beneficial in the last weeks of life rather than the last days. HCPs view discussing AH with relatives as more difficult than with patients. This appears to arise from treatment disagreements, which seem less common with patients. Decisions regarding AH can be difficult, distressing and influenced by conflicting views. Improving education and support of all involved may help improve care. Further research should focus on better understanding barriers to discussing AH with relatives and ways to overcome them.

### Mammographic Density Over Time in Women With and Without Breast Cancer

**Humphrey AE**, Harkness E, Moschidis E, Hurley E, Foden P, Bydder M, Wilson M, Gadde S, Maxwell A, Lim YY  
Royal Bolton Hospital, Bolton, United Kingdom

This study compared mammographic density over time between women who developed breast cancer (cases) and women who did not (controls). Cases had an initial negative mammographic screen and another three years later when cancer was diagnosed. Cases were matched to three controls with two successive negative screens by age, year of mammogram, BMI, parity, menopausal status and HRT use. Mammographic density was measured by VolparaTM. There was a significant reduction in percentage density in the affected breast for cases (5.2 to 4.8%,  $p<0.001$ ) and for the same matched breast in controls (4.9 to 4.5,  $p<0.001$ ). Similar results were found for the unaffected breast. After adjusting for density measures at the initial screen, case-control status was only significantly associated with fibroglandular volume in the unaffected breast (adjusted mean 45.8 cm<sup>3</sup> in cases, 44.0cm<sup>3</sup> in controls,  $p=0.008$ ). The results suggest changes in mammographic density may be less important than initial mammographic density.

### **The Effects of Graphene Toxicity on Red Blood Cells**

**Singh GV**

King's College London, United Kingdom

#### **Objective**

Graphene is a discovery that has opened a myriad of revolutionary options for today's world. I aimed to evaluate graphene's potential toxicity and subsequently expose it to red blood cells to observe any haemolytic effects. If successful, this would allow confirmation that graphene could be used as drug transport within the body. Of course, further tests would be needed for other drug-related effects.

#### **Design**

To complete an exfoliation of graphite to obtain graphene using polysorbate 20 as a surfactant.

To determine and characterise the graphene suspension created using UV-visible spectroscopy.

To observe if the prepared suspensions have a haemolytic effect on red blood cells.

#### **Methods**

The first experiment involved preparing a solution of graphite and polysorbate 20 to a concentration of 10mg/ml to exfoliate the graphite into pristine graphene by bath and probe sonication. The solutions produced were centrifuged and the supernatant's absorption was measured using a UV-visible spectrometer to observe the level of exfoliation. The second experiment involved the use of the solution prepared in the first to evaluate the effect of various concentrations of graphene on the haemolysis of defibrinated horse blood. This involved preparing mixtures of PBS, various concentrations of the prepared solution and the blood and centrifuging these repeatedly and then measuring the absorption again using another, more precise UV-visible spectrometer.

#### **Conclusion**

My research can allow further consideration of the possibility of using graphene in drug delivery due to its minimal toxicity and haemolytic effects at approximately 10mg/ml concentration. This could potentially be used to see whether there are effects on other cells in the body and whether there could be a sufficient transport system to ensure it would be delivered to the appropriate area in the body, at the right dosage, in sufficient time.

### **Elective Vs. Emergency Hernia Repairs - What Are the Implications for Hospitals and Trainees?**

**Vincent RC, Batt J**

Weston General Hospital, Weston-Super-Mare, United Kingdom

#### **Background**

Hernia operations are considered a core training opportunity for aspiring surgeons. There is a general impression that fewer hernia operations are occurring, and the nature in which they are attending has changed, particularly with the rise of treatment centers and private healthcare groups. Inevitably, the more complex, higher risk procedures are not only less suitable for training but also cost local trusts in terms of complication and length of stay.

#### **Material**

Data from 2,266 patients undergoing hernia repair over the last 10 years was retrospectively collected from a district general hospital. This was examined for nature of admission (elective vs. emergency), type of hernia repair, and length of stay.

#### **Results**

There was a general decline in the number of hernia repairs occurring each year until the last two years. The proportion of hernia repairs as an emergency rose year on year whilst the proportion operated in the elective setting fell. The average length of hospital stay was three times longer for emergency cases than for the elective counterparts. The proportion of inguinal hernias in particular were also declining over this time and showed a similar trend in their route to surgery.

#### **Discussion**

These results illustrate that we are operating on less hernias year on year. Proportionally we are more frequently in the emergency setting, which possibly reflects development of symptoms that were previously manageable but not treated in an appropriate time frame. This has a knock-on effect of increasing the length of stay and therefore cost to trusts. It also reduces suitable training opportunities for the next generation of surgeons.

#### **Conclusion**

Increasing the number of elective procedures may avoid unnecessarily long length of stay associated with emergency presentation and also provide suitable training opportunity for surgical trainees.

### Effect of Insulin Sensitisation on Diabetic Skin Integrity

**Rawther F**

University of Buckingham, United Kingdom

#### **Aim**

To determine the effect of insulin sensitisation (promoted by rosiglitazone) on collagen structure and synthesis, and adiposity in diabetes (using mouse models), using various histological methods and automated analysis. This will help comprehend skin integrity in diabetic states and thus have further implications for diabetic wound care, prevention and treatment.

#### **Methods**

Rosiglitazone was administered to leprdb/leprdb (db/db) mice. H&E, picrosirius and herovici staining were performed as standard on 4 µm paraffin sections. Bright field, fluorescent and cross polar microscopy was employed. Automated Accurate Adipocyte Quantification, Image J and Fast Fourier and Gabor Transform Based image analysis softwares were used.

#### **Results**

Rosiglitazone decreased adipocyte hypertrophy and depth but increased hyperplasia. No significant effects on collagen structure or synthesis were observed. There was significant loss of dermal depth and organization in db/db compared to lean.

#### **Conclusion**

Rosiglitazone's effect of decreasing adipocyte size helps manage diabetes better as smaller adipocytes are less diabetogenic. Rosiglitazone effects on collagen may not have been observable because it was administered in mouse with diabetic damage already, rendering any preventative rosiglitazone effects.

Future studies should be done on younger mice. Future research should also look at in vitro growth of diabetic fibroblasts in order to observe the impact of insulin sensitisation on fibroblast proliferation and migration.

### Evaluating the Impact of Regular Motivational Reminders on Mindfulness Practice in Medical Students

**Rallage HB**

New Cross Hospital, Wolverhampton, United Kingdom

#### **Background**

Studies have proven the beneficial effects of mindfulness on medical students. The process of training the mind to be mindful involves regular meditative practices. As with adherence to medication, a challenge arises in remembering to practice mindfulness.

#### **Methods**

Ten medical students undertaking a mindfulness Student Selected Unit (SSU) were invited to participate. Before the SSU, participants filled in two questionnaires: Philadelphia Mindfulness Scale and the Depression Anxiety Stress Subscale. Each participant wrote a personalised message which was later used as the reminder. Throughout the eight weeks, logbooks were emailed every Saturday to collect data regarding frequency and type of practice. After the first four weeks, personalised reminders were sent out twice a week until the end of the SSU. The two questionnaires were repeated at the end, which enabled the comparison of pre- post scores for acceptance, awareness and stress. Participants were invited to take part in semi-structured interviews.

#### **Results**

Statistical analysis of the questionnaire scores using the Reliable Change Index Calculator revealed that a majority of the changes observed in the scores are not reliable changes. Differences in group mean scores, pre-post course, were analysed using the paired sample T- test and showed that changes seen in the acceptance and stress scores were significant. Thematic analysis of the interviews highlighted that receiving regular reminders did motivate participants to practice mindfulness. Furthermore, keeping a weekly logbook and being part of a mindfulness group were supportive factors.

#### **Discussion**

This research reiterated the beneficial effects of mindfulness. Although the interview data revealed the research intervention was successful, further research involving a larger cohort is necessary to fully understand the role of the intervention.

#### **Conclusion**

The use of mindfulness within the health care system is growing rapidly. There is a place for the use of motivational reminders in mindfulness training.

### Psychological Responses to a Diagnosis of Melanoma

**Scott K**, Ismail A, Barrett J  
Sunderland Royal Hospital, Sunderland, United Kingdom

#### Background

Previous research has shown female, young, single, and less educated melanoma patients are more likely to suffer from adverse psychological outcomes (Kasparian et al, 2009). The current research aims to assess the influence of these factors on a measure of psychological well-being at time of recruitment into the study and at one-year follow-up, in a larger sample than used in previous research.

#### Methods

The relationship between demographics (gender, age, education and social deprivation), clinical features (site of primary tumour and tumour thickness) and social support (presence of spouse or partner) with the outcome measure of feelings towards the future with respect to a diagnosis of melanoma was measured. A sample of 1,820 participants from the Leeds Melanoma Cohort were recruited. 533 participants completed the outcome measure at one-year follow-up.

#### Results

Statistical analysis using t-tests and Person  $\chi^2$  tests showed at baseline female, younger, more socially deprived, and single participants were more likely to be 'worried/uncertain' about the future with respect to the melanoma. There was a significant effect of site of primary tumour. No relationship was found between education or tumour thickness and psychological outcome. At one-year follow-up, female and younger participants were more likely to be 'worried/uncertain'. There were no effects of education, social deprivation, tumour thickness, site of primary tumour, or marriage/partner status.

#### Conclusion

The identification of those most likely to have poor psychological well-being enables early interventions to be implemented in order to improve psychological and clinical outcomes.

### Risk Factors and Markers for Complications in Colon Surgery

**Stancu SM**, Iordache FM  
St Mark's Hospital, London, United Kingdom

#### Background

Colon surgery has the highest rate of post-operative complications among general surgical procedures. We aimed to determine the rate of post-operative complications following colon surgery and to identify associated risk factors and markers.

#### Material/Methods

This is a prospective observational study including all consecutive patients who underwent colon resection at a tertiary-level emergency hospital for malignant or benign conditions over a thirteen-month period. Relevant statistical analysis included parametric and non-parametric tests, with statistical significance set at  $p < 0.05$ .

#### Results

An overall complication rate of 82% ( $n=246$ ) was obtained with multiple complications encountered in 69.9% of patients ( $n=172$ ). The following seven risk factors were associated with the development of post-operative complications following colon resection: temperature  $>38^\circ\text{C}$  (OR: 0.0012, 95%CI: 0.0001-0.01,  $p < 0.0001$ ), tumour differentiation grade  $\geq \text{G3}$  (OR: 59.63, 95%CI: 3.41-1042.80,  $p < 0.0051$ ), manual anastomosis (OR: 2.01, 95%CI: 1.05-3.83,  $p = 0.03$ ), operative time exceeding the third quartile (OR: 0.43, 95%CI: 0.23-0.81,  $p = 0.0097$ ), ASA class 3  $\geq$  (OR: 0.50, 95%CI: 0.25-0.96,  $p = 0.0392$ ), peritoneal contamination (OR: 2.27, 95%CI: 1.24-6.14,  $p = 0.012$ ), and intraoperative blood transfusion (OR: 2.31, 95%CI: 1.91-4.46,  $p = 0.0127$ ).

#### Discussion

Such a high overall complication rate was obtained in our study due to the meticulous inclusion of all medical and surgical complications, even if the deviation from the normal post-operative course was subtle.

#### Conclusion

Our study confirms the high rate of post-operative complications after colon surgery. We identified the following risk factors and markers: manual anastomosis, operative time exceeding the third quartile, ASA class 3  $\geq$ , peritoneal contamination, tumour differentiation grade  $\geq \text{G3}$ , temperature  $>38^\circ\text{C}$  upon admission, and intraoperative blood transfusion.

## The Treatment of Autoimmune Thyroiditis with Selenium

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### Introduction

Autoimmune Thyroiditis is one of the most seen autoimmune diseases and affects more than 10% of females and 2% of males. Based on the studies, cause of the disease is increasing level of antibodies in the organism. There is no specific treatment modality to suppress autoimmune destruction and so replacement therapy with L-thyroxine (LT4) has been the only means of palliation. Selenium is an essential trace element and the part of antioxidant enzymes and specific proteins that protect cell from damage. We aimed to find out defense function of selenium supplement in Autoimmune Thyroiditis.

### Materials and Methods

Our research was carried out on 20 (16 women, 4 men) patients, who are diagnosed with increased level of TPOAb and TgAb. We classified the patients into two groups according to their stages of the disease, age, and sex. All the patients were required to take 200 µg selenium and patients in the later stage of disease also received replacement therapy L- thyroxine.

### Results

At baseline the mean of concentration of TPOAb and TgAb differ in Group A, which showed positive effect of treatment TPOAb ( $18150 \pm 1730$  U/ml to  $447 \pm 161$  U/ml). However, it did not have any effect in Group B ( $437 \pm 361$  U/ml). It was noticed that patients' stage of the disease had a decrease of concentration in TSH ( $36$  uIU/ml to  $32$  uIU/ml). At the end of the third month, concentration of TPOAb significantly decreased in the treatment group - up to 85.9% as compared with the beginning of the study.

### Discussion

Our results confirm that oral administration of 200 µg L-selenomethionine/day decreases serum TPOAb titers effectively. There is no relationship detected between the age and the response rate to the treatment. Thus, Se treatment seems to be effective in all age groups, but it must be kept in mind that starting treatment at an early age may save more thyrocytes. Otherwise, it may be ineffective if started later in the late, atrophic phase of the pathology.

### Conclusion

Overall, our research shows that selenium supplementation helps to protect and restore thyroid glands and may be used in the treatment of Autoimmune Thyroiditis.

## Predictive Factors in the Response to Antiviral Treatment in Chronic Hepatitis C

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University of Medicine and Pharmacy, Craiova, Romania

### Background

The presence of viral or immunological markers in the serum of patients is important to assess the etiology, level of activity, and behaviour. At the moment, interferons and nucleoside analogues are recognized and utilized as effective antiviral agents in the treatment of chronic viral hepatitis. The objectives of the research were: to evaluate the biologic and sustained viral responses in patients with chronic hepatitis C who were treated with PEG-IFN and ribavirin, and to identify the predictive factors for positive response in antiviral therapy.

### Methodology

The research was performed within the Internal Medicine Clinic of Filantropia University Hospital, Craiova from November 2010 to October 2016. 210 patients who passed all the selection criteria were selected to take part. Standard laboratory technics were used to ensure the reproducibility of the used tests: ALT, AST, fasting glucose, fasting insulin, serum iron, serum ferritin, antibody to hepatitis C virus (anti-HCV) by ELISA, detect, quantify and/or characterize HCV RNA by polymerase chain reaction (PCR).

### Results

The descriptive study shows the clinical-biochemical parameters and their role in antiviral therapy. From the total number of patients, 101 were female with a mean age of 42.7 years, glycemic -99.8 mg/dl, insulin - 13.8 µU/mL, ALT - 116.7 U/L, and 109 were male with a mean age of 43.4 years, fasting glucose 96.5 mg/dl, fasting insulin - 12.2 µU/mL, ALT 124.5 U/L.

### Discussion

We did not notice a major influence of the cytolysis or ferritin level. While the initial viral load was high, values and all the parameters which define the insulin resistance were strong negative predictors for therapeutic success.

### Conclusions

Thus, the factors which we linked to the failure of therapy in patients with hepatitis C were old age, high viral load, and insulin resistance present when treatment was initiated.

### **Is Mitochondrial Dysfunction Evident in Placentas From Women of Advanced Maternal Age?**

**Stephens KJ**, Lean S, Dilworth M, Heazell A, Jones R  
Charing Cross Hospital, London

#### **Background**

21.5% of UK newborns are to women of advanced maternal age (AMA,  $\geq 35$  years). Placental dysfunction in AMA mothers increases their risk of stillbirth. The pro-inflammatory, pro-oxidative state in the placenta and maternal serum of these women are factors known to impair mitochondrial function. Mitochondrial numbers correlate with mitochondrial DNA (mtDNA) content. Redundant mitochondria release their DNA into maternal serum. We hypothesised that mitochondrial dysfunction is evident in women of AMA.

#### **Methods**

Placental (n=15/group) and maternal serum samples (n=30/group) from uncomplicated pregnancies were compared between matched groups aged 20-30 years, 35-39 years, and  $\geq 40$  years. A second study compared these samples from appropriately grown infants with small for gestational age infants, delivered to AMA mothers. MtDNA content was quantified using q-PCR.

#### **Results**

Female newborns following an uncomplicated pregnancy showed increased placental mtDNA in women  $\geq 40$  years compared to 35-39 year olds ( $p < 0.01$ ). Maternal age had no effect on mtDNA in male fetuses. Serum mtDNA negatively correlated with maternal age ( $p < 0.01$ ,  $r = -0.07$ ). There was a negative correlation between serum and placental mtDNA, independent of maternal age ( $p < 0.01$ ,  $r = -0.57$ ). Pregnancy outcome had no effect on placental or serum mtDNA in women of AMA.

#### **Discussion**

Studies have demonstrated female fetuses compensate for an adverse environment in utero more successfully than male fetuses. Mitochondria respond to reduced function but increasing their number. Female placentas may upregulate the production of mitochondria in response to mitochondrial dysfunction in women of AMA. Reduced circulating mtDNA may reflect an increase in the placenta's requirement for mitochondria, further supported by the negative linear relationship between placental and serum mtDNA.

#### **Conclusion**

Women of AMA demonstrate abnormal mitochondrial physiology, which may highlight potential therapeutic targets.

### **The Prevalence of Overweight and Obesity in Children with Learning Disability in Edinburgh: A Cross-Sectional Study**

**Macdonald KS**

Southport and Formby District General Hospital, Southport, United Kingdom

#### **Aim**

Many recent studies discuss rising prevalence of childhood obesity. There is an established link between obesity and learning disability in adults. However, very little is focused on children. This project aimed to identify prevalence of and risk factors for overweight and obesity among children with learning disability. This was hoped to help direct resources towards interventions for this vulnerable group.

#### **Methods**

Cross-sectional analysis of BMI centiles of 254 children was performed and compared with a sample from the general population using standardised ratios.

#### **Results**

Children with learning disability were at significantly more risk of overweight and obesity than the general population. Split by sex, girls were at increased risk of overweight (including obesity), and boys just at an increased risk of obesity. There is strong evidence linking Down's syndrome with obesity. When these children were excluded to ensure that this was not a confounding factor, there was no significant difference between the remaining boys and those in the general population. Girls, however, remained at increased risk. Prevalence of overweight and obesity increased with age. We attempted to analyse the significance of different disabilities on risk. However, Down's syndrome was the only category with sufficient numbers. These children appeared to be at higher risk than those with other diagnoses.

#### **Conclusion**

Our results suggest female sex, Down's syndrome, and age are risk factors for overweight and obesity in children with learning disability. This supports past research in adults. These findings are valuable for future planning and highlighting crucial further research.

### Identifying and Validating Stroke Diagnoses in UK Biobank

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#### Background

Stroke is a leading cause of morbidity and mortality worldwide. A potentially cost-effective method for identifying stroke in UK Biobank (UKB), a large population-based prospective cohort study, is linkage to routinely-collected health records. However, the accuracy of this approach needs to be evaluated. My project aimed to assess the accuracy of routinely-collected health data in NHS (National Health Service) Lothian in identifying stroke and its subtypes in the UKB.

#### Methods

We identified UKB participants with relevant stroke codes from routinely-collected datasets. Using TrakCare (TRAK), I developed a protocol for identifying and extracting relevant information into vignettes for each participant. These vignettes were then adjudicated by experts. I calculated positive predictive values (PPVs) for various codes to assess the accuracy of coded health data against expert adjudication, and to identify the codes and data sources with the highest PPVs.

#### Results

419 and 275 participants were included, depending on which codes were used. The average time to review a vignette was 13.5 minutes. More stroke specific incident codes from inpatient data achieved a PPV of 90% for all stroke, while respective codes from GP data achieved a PPV of only 66%.

#### Discussion

The project's strengths include its systematic nature, blinding of researchers and large cohort. Its limitations include using a single data source and not assessing the effect of multiple code sources and code position. Future work should explore whether the accuracy of GP codes would improve with access to additional data, and what effect combining codes from various data sources and code position would have on the PPV. Our protocol could also be adjusted to validate other diagnoses in UKB.

#### Conclusions

I have developed a protocol for identifying and validating UKB stroke outcomes that is accurate and practical via an NHS Lothian pilot study.

### Investigating the Vaccine Potential of the Adhesin Complex Protein (ACP) of *Neisseria Gonorrhoeae*

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#### Background

One of the most common sexually transmitted diseases worldwide, gonorrhoea, caused by *Neisseria gonorrhoeae*, results in 78 million new infections yearly. Although usually treatable, the rapid spread of antibiotic resistance has called for urgent attention to fight against this "superbug". Vaccines represent an effective long-term solution, but there has been little success so far. Recently, a novel target known as the Adhesin Complex Protein (ACP) has been identified in *N. meningitidis*. It is a known adhesin shown to be capable of inducing cross-protective bactericidal antibodies. Although the homologous protein is present in *N. gonorrhoeae* (Ng-ACP), its immunogenic properties are unknown.

#### Aims

To use a murine immunisation model to characterise the biological and functional properties of antibodies to Ng-ACP.

#### Methods

Mice were immunised with purified recombinant (r)Ng-ACP with different adjuvants and delivery systems. Analyses of serum responses were made by ELISA and Western blotting. Subsequently, an assay designed to determine the complement-mediated serum bactericidal activity of gonococci was employed to investigate the immunogenic properties of antibodies generated against rNg-ACP.

#### Results

High titres of antibodies were induced against soluble and insoluble rNg-ACP using all adjuvants/delivery systems. All other adjuvants induced higher titres than saline when tested against insoluble rNg-ACP ( $P < 0.05$ ). rNg-ACP was also recognised as a 12.5kDa (soluble) or 17.5kDa (insoluble) band by Western blotting. A serum bactericidal assay using human complement showed significant killing (titre range: 64-512) against wildtype but not against knockout ( $\Delta$ ACP) P9-17 strain.

#### Discussion and Conclusion

Our data indicates that Ng-ACP is a strong candidate for inclusion in a vaccine against gonorrhoea. Future work should determine whether expression of Ng-ACP varies between strains and whether bactericidal antibodies against rNg-ACP are cross-protective. Following this, we should consider experimentation within an animal challenge study.

**Corridor Consultations: Current Practices, Motivations and Attitudes in a UK Medical School**

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**Background**

Medical students have unique access to professional opinions where their health is concerned. The purpose of this study was to investigate the use of 'corridor consultations' – informal consultations regarding personal health issues between medical students and doctors whilst on placement – at a UK medical school.

**Methods**

The study included 110 students who completed an anonymous online questionnaire regarding these behaviours. We examined how students made use of informal consultations, motivations for doing so, and attitudes surrounding the practice.

**Results**

Forty percent (44) of study participants reported to seeking personal medical advice whilst on placement. The most frequently used specialties were general practice, general medicine, and dermatology. Students used corridor consultations between 1 and <10 times. The most commonly given reasons for doing so were 'easy access without waiting' and 'reassurance'. Despite 39% of respondents reporting they felt it was an inappropriate way to seek medical attention, 96% said they would do so in the same way again.

**Discussion**

It seems medical students use corridor consultations as a triage service. Many participants justified their behaviour with the trivial nature of their concerns; they were often seeking reassurance. Fortunately, it does not appear that students are entirely replacing formal health-seeking behaviours with less formal routes as 32% went on to have a follow up with their GP. Corridor consultations are a significant practice in UK medical schools. Whilst students expressed concerns around professionalism and ethics, participants on the whole were satisfied with the outcomes of the opportunistic consultations. There are implications within this research reaching towards student support, ethics, and professionalism.

**Conclusion**

Informal health seeking behaviours are commonplace amongst medical students on placements. These 'corridor consultations' are popular because senior clinicians are easy to access, often replacing the need for GP appointments. Students acknowledge the benefits and drawbacks of seeking advice in this way.

**Category: Clinical Audit**

**Single Rooms Versus Multi-Occupancy Rooms in Medicine for the Elderly Wards: Analysing the Preferences of Patients, Staff and Visitors**

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**Background**

All new NHS hospital builds are recommended to provide 100% single rooms. Evidence is limited for what ward environments are most suited to accommodate the older inpatient populations in NHS hospitals.

**Methodology**

A cross-sectional study was performed among patients, staff and patient visitors in Medicine for the Elderly wards. Data was collected using a structured questionnaire for each of these three groups assessing the preferences of single rooms versus multi-occupancy rooms for either the inpatients themselves or for the older relatives of staff and visitors, as well as for older patients in general. Inductive thematic analysis was used to further explore the reasons behind their preferences.

**Results**

A total of 69 inpatients (mean age 86, range 72-103 years; 33% male), 48 staff and 14 visitors were surveyed. Only 20.3% of patients opted for single rooms for themselves, while 2.1% of staff and no visitors preferred single rooms for older patients in general. Those who preferred single rooms cited privacy, good sleep, and end of life care as the main reasons. A room consisting of three to five people was most preferred by all three groups, and reasons including company and social interaction were cited for preferring multi-occupancy rooms over single rooms.

**Discussion**

Older patients tend to have longer and more complicated stays in hospital, hence their requirements for hospital environments may differ from the general population. A ward design consisting of a mix of multi-occupancy rooms and single rooms may be most suitable to balance the differing needs of older patients.

**Conclusion**

For our older inpatient population, patients, staff and visitors were all in favour of multi- occupancy rooms over single rooms. Our findings suggested that alternative considerations should be had regarding future hospital ward designs to meet the needs of older patients.

**Physical Health Assessment on Admission to an Inpatient Psychiatry Unit**

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**Aims and Hypothesis**

The audit cycle assessed the proportion of physical health assessment forms completed within 24 hours admission to two inpatient psychiatric wards. Following an initial audit, interventions were implemented. We hypothesized the proportion of forms completed within 24 hours admission would be greater in the re-audit.

**Background**

Local trust guidelines state physical health forms A, B and C should be completed within 24 hours admission (target=100%). Form A includes baseline physical health measurements; form B, a body systems assessment; and form C, lifestyle screening. Completion of forms highlights areas requiring further assessment and management. Following the initial audit, results were sent to medical staff, presented at a departmental meeting, and a reminder sheet was produced.

**Methods**

The audit was retrospective and Rio IT system was the data source. No sampling was required. The initial audit included 57 patients admitted 1/9/15-1/1/16, excluding 14 patients transferred from other wards (total=43). The re-audit included 42 patients admitted 1/8/16- 31/10/16, excluding two patients transferred from other wards (total=40).

**Results (compared to initial audit)**

Form A completed within 24hrs admission for 36/40 patients, 90% (+18%) Form B completed within 24hrs admission for 32/40 patients, 80% (+38%) Form C completed within 24hrs admission for 32/40 patients, 80% (+13%)

**Conclusions**

A larger proportion of physical health forms were completed within 24 hours admission in the re-audit. Results stand below trust guidelines. However, 100% completion is unrealistic due to factors such as patient refusal. Recommendations to medical staff are to document refusals and attempt assessments again at the soonest possibility and to continue to use the reminder sheet. Promptly completed forms will ensure physical health can be assessed and managed promptly and efficiently on admission.

### **A Closed Loop Audit on Lumbar Punctures in Acute Medical Admissions Unit (MAU)**

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#### **Introduction**

Anecdotal, LPs are often not fully documented in patients' online notes and paired serum glucose sample are often omitted. Ongoing evidence has shown "newer" LP needles (Whitacre/Spottre) are less traumatic than conventional (Quincke) needles. Hence, this audit has three broad aims: to assess documentation rates of various LP components, checking of paired serum glucose, and type of LP needle used.

#### **Methods**

We retrospectively audited 100 patients over a year admitted to MAU with LP performed. Audited components include indication for LP, prior checking of platelets/coagulation and paired serum glucose, documentation of consent, number of attempts, interspace, anaesthetic, needle type, opening and closing pressure, CSF volume, and post-procedure complications. Based on the results, we implemented an online proforma LP checklist and included it in self-designed LP kits containing the necessary equipment and Whitacre needles. For re-auditing, we retrospectively audited all 28 patients admitted over 3 months.

#### **Results**

The results of the first audit showed generally poor documentation throughout, with paired glucose samples taken in only 18% of LPs and only 10.6% of documented needles used the newer Whitacre/ Spottre LP needles. In three cases, LPs were done on patients with INR  $\geq 1.5$ . Following LP kits and checklist implementation, improvements in documentation are noted generally throughout, with an increase in checking of paired glucose samples to 29% and no LPs were done on patients with INR  $\geq 1.5$  or platelets  $< 80$ .

#### **Discussion**

Improvements across audited standards were noted following implementation of the LP checklist and kits. Encouragement for uptake of the changes was further disseminated via a local department presentation.

#### **Conclusion**

LPs are common yet invasive procedures often done in admission units with potential significant complications. Hence clearer documentation with online LP proforma and LP kits with newer needles can improve patient safety.

### **Pre-Operative Fasting and Medication Administration**

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#### **Introduction**

The traditional and widely adopted approach to pre-operative fasting has been 'nil by mouth from midnight'. However, with operation delays and afternoon lists this can sometimes leave patients fasted for an extended period of time with consequences including dehydration, hypoglycaemia, nausea and anxiety. Local and national guidelines advise encouraging elective surgical patients to drink clear fluids for up to two hours pre-operatively and allowing them to eat food until six hours pre-operatively.

#### **Method**

Data was collected from 92 elective surgical patients. We noted when they last had anything to eat and drink, and when they had been told to stop eating and drinking – their 'forced' fasting time. Also noted was whether regular medications had been administered pre-operatively.

#### **Results**

Patients had a 'forced' fast of between two and 17 hours, with 'actual' fast times between four and 23 hours. The longest time that a patient spent without fluids was 19 hours.

Medication administration varied, with only 37.5% receiving regular analgesics pre-operatively and 76% receiving anti-hypertensives.

#### **Discussion**

Reasons to explain this low compliance with guidelines include incorrect pre-admission documentation, patient beliefs, and poor awareness amongst surgical ward staff.

Acknowledging the potential for changes in the theatre list and to avoid confusion, we have simplified our advice to offer patients water until 0700am/1100am and food until midnight/0730am (morning and afternoon lists accordingly). All medications, except oral diabetic medications, should be administered as prescribed.

#### **Conclusion**

To improve our compliance with local and national guidelines, we have updated pre-admission documentation provided to patients and have created a simple flow diagram to be distributed on the wards to raise awareness and simplify the guidance. This will be re-audited in order to monitor progress.

## **HIV Testing within the Emergency Department for Patients with Bacterial Pneumonia: An Audit**

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### **Background**

Late diagnosis of HIV leads to 24% of deaths from HIV. Pneumonia is a common ED diagnosis, with a mortality rate of up to 14%. Patients with HIV more commonly develop pneumonia.

### **Aim**

To identify if HIV is being tested for within the ED for patients with bacterial pneumonia.

### **Standards**

The following standards were set using BHIVA, NICE and BTS Guidelines:

All patients with bacterial pneumonia should be tested for HIV.

In moderate to severe pneumonia (CURB-65 score 2+), bacterial pneumonia should be confirmed in the form of blood culture, sputum sample, Urinary Legionella and Pneumococcal tests.

### **Sample**

Royal Stoke's ED sees 130,000 patients/year, of which 1.54% receive a diagnosis of pneumonia. From which, a random sample of 496 patients diagnosed with pneumonia during January-November 2016 was obtained. After exclusions due to mortality, n=492; predominantly consisting of White British (93.9%), females (52% n=256) with a mean age of 74.5 years (interquartile range 68-85 years).

### **Methodology**

Following collection team training, data was retrospectively collected from patients' scanned notes on whether a HIV test, CXR, and microbiological samples had been performed.

### **Results**

Overall, 80% of patients received a CXR. 222 patients (54.9%) received microbiological testing in the form of blood cultures (40.9%), sputum samples in (8.7%), Urinary Legionella (3.9%) and Pneumococcal antigen (3.7%). Of these, 45 (9.2%) had confirmed bacterial pneumonia, with 2 receiving a HIV test. Of the 45.1% with no microbiology, only 4 had HIV tests. All HIV tests were negative.

### **Discussion and Conclusion**

Pneumonia is commonly diagnosed by CXR alone. Only 9.2% of cases of bacterial pneumonia were confirmed microbiologically. HIV taking is seldom performed. Therefore, large numbers of patients remain untested.

### **Recommendations**

To provide a checklist reminder and to perform HIV and microbiological tests for patients with suspected bacterial pneumonia.

### **Massive Open Online Courses (MOOCs) and Flipped Classroom for Clinical Skills Enhancement Program - A New Intervention with Lessons to Learn**

**Maadawi EZ**

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#### **Background**

A well organized and executed clinical skills training program is an essential pillar of modern medical curricula. There is a great interest in integration of clinical skills training as early as possible to help undergraduate medical students develop the knowledge and skills that are relevant and meaningful to clinical practice.

#### **Methodology**

Grade 1 medical students were systematically enrolled in "First Aid" Massive Open Online Course (MOOC) while tracking their learning analytics online individually and as a group. The MOOC was implemented for four weeks, during which students had access to the faculty clinical skills lab guided by facilitators to practice what they learned online. A quasi- experimental 'one-group pre-test-post-test design' was conducted to compare changes in students' first aid knowledge before and after participation in the course. Acquisition of clinical and procedural skills after participation in the course was assessed using the 'one- group post-test only design'. Students' learning experiences and perceptions regarding blended learning were explored using a cross-section survey.

#### **Results**

Significant improvement in learners' retention of theoretical knowledge and practical skills was noticed, together with increased satisfaction not only with the content of the course but also with the mode of delivery and user's interface. However, students revealed a need for more personalized content that simultaneously ensures collaborative group work.

#### **Discussion**

Students showed positive attitude towards the MOOC that was used mainly for knowledge acquisition while knowledge construction and practical skills were realized at the clinical skills lab that was supported by facilitated group discussions. This learning approach was considered as flipped classroom.

#### **Conclusion**

Using blended learning that combines online and face-to-face learning methodologies with recording of learning analytics revealed significant improvement in basic clinical skill development, a finding that can be further integrated in other clinical skills enhancement programs.

### **An Algorithm for the Assessment and Investigation of Gynaecomastia. Is Current Practice Cost-Effective?**

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Sandwell General Hospital, West Bromwich, United Kingdom

#### **Background**

Gynaecomastia affects up to one third of men in the UK. There are currently no guidelines for the investigation of gynaecomastia, and practice varies widely. Our aim is to determine whether it is cost-effective to investigate these patients and to suggest an algorithm for the assessment of this condition.

#### **Methodology**

Retrospective analysis of all 165 male patients referred from primary care to a district general hospital in 2016. We analysed these consultations to identify patterns of assessment and investigation. We evaluated whether the diagnosis made on examination in primary care or by the surgeon in clinic agreed with imaging results. The costs of investigations were calculated to evaluate cost-effectiveness.

#### **Results**

The GP diagnosis of gynaecomastia agreed with imaging in 57% of cases, compared to 75% when a surgeon performed examination. 47% of patients were investigated with blood tests, although the chosen tests varied between different clinicians. 44% of these blood tests had at least one abnormality. Use of blood tests in this patient cohort totalled £3,439. 43% of patients had a mammogram, 40% had an ultrasound, and 9% had both scans. The total cost of imaging was over £18,300. Neither breast cancer nor endocrinological pathology were detected in any cases.

#### **Conclusion**

Examination is more accurate when performed by a surgeon than in primary care. Investigating all patients may not be cost-effective but a selected combination of tests may be useful. We recommend that routine use of blood tests does not add value towards diagnosis unless risk factors are excluded and a modifiable cause of gynaecomastia is suspected. We also believe that imaging should be reserved for those patients where examination for breast cancer is equivocal. We have developed an algorithm for the assessment and investigation of such patients presenting to breast clinic.

### Improving the Utilisation of the MUST Nutritional Screening Tool

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#### Background

Malnutrition in hospitalised patients has a reported prevalence of 40%, with NICE guidelines recommending that all inpatients should undergo nutritional screening within 48 hours of admission using the Malnutrition Universal Screening Tool (MUST). Patients deemed as high risk of malnutrition in regards to BMI, unplanned weight loss or acute illness presentation should be offered nutritional support via a multidisciplinary approach.

The management of malnutrition at Tameside General Hospital was audited against the above standards derived from the NICE guidelines.

#### Methods

The notes of 50 patients who presented to the Acute Medical Unit in March 2016 were randomly selected for retrospective review. Following implementation of an action plan, a re-audit of 50 patients was similarly completed. Data was collected using a standardised proforma and analysed using spreadsheet software.

#### Results

From the 50 patients initially studied (median age 69), 44/50 (88%) had appropriate screening within 48 hours of admission. However, only 1/6 (16.7%) patients deemed as high risk of malnutrition (MUST  $\geq 3$ ) were offered nutritional support. Furthermore, results demonstrated deficiencies in documentation accuracy with 7/50 (14%) patients having no MUST score documented.

Feedback highlighted practical difficulties in ascertaining patient BMI as well as logistical issues in documentation. Therein, anthropometric equipment and alternative measurement tools were made more accessible, the documentation proforma was re-designed and a nutrition education package was delivered.

Following a re-audit of 50 patients (median age 71), results demonstrated an improvement in nutritional screening to 48/50 (96%) within 48 hours. In addition, 4/7 (57%) patients at high risk of malnutrition were offered nutritional support and 9/50 (18%) assessments achieved complete documentation accuracy.

#### Discussion and Conclusion

Malnutrition can increase patient morbidity and mortality. Through implementation of several simple changes, we have improved utilisation of the MUST nutritional screening tool locally.

### Prescribing on the Geriatric Wards at St. James University Hospital (SJUH): A Re-Audit and Comparison with the Original Audit

**Ali MB**, Nisar S, Cracknell A  
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#### Introduction

Prescribing errors are amongst the most common medication-related errors in hospitals. Our original audit (May 2015) assessed whether prescribing on geriatric wards was according to standards. After educating doctors on hospital prescribing standards we repeated the audit, in October 2015.

#### Methods

A retrospective spot audit and re-audit of 35 inpatient prescription charts was conducted on geriatric wards. Standards assessed whether drug dose and frequency were written clearly, allergy status documented, drug cancellations done clearly, and prescriptions fully crossed out and re-written where required.

#### Results

Re-audit showed allergy status documentation improved from 97.1% to 100%. For 'As Required' medication, minimum doses were recorded on 65.5% and maximum doses on 49.7% of charts, as compared to 53% and 31% respectively, in the previous audit. Drug dose was specified in only 20% of cases compared to 74.3% previously. Prescriptions that required crossing out and re-writing were done correctly in only 29.7% of cases compared to 42.9% in the original audit.

#### Conclusions

Re-audit showed that educating doctors on hospital's prescribing policy improved prescribing practice. However, certain areas still need improvement. We aim to provide a structured teaching session during junior doctors' induction and turn this into a quality improvement project.

**Radiographic Assessment of Femoral Cortical Suspensory, Device Used for Anterior Cruciate Ligament Reconstruction. Is There an Association Between Non-Flush Positioning of the Device and Early Graft Failure?**

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**Introduction**

Extra-cortical suspensory fixation devices are extensively used in femoral tunnel fixation of grafts. The goal is to provide optimal graft fixation in order to promote graft healing and incorporation.

**Aim**

This study radiographically assessed the post-operative setting position of the suspensory fixation device, relative to the lateral femoral cortical surface, and investigated whether there is an association between non-flush positioning and higher anterior cruciate ligament (ACL) reconstruction failure rates.

**Method**

We retrospectively reviewed 168 patients that had single bundle ACL reconstruction in our department between 2010 and 2015, using the Endobutton CL suspensory femoral fixation device. Routine, post-operative AP knee radiographs were screened for each case for flush positioning of the Endobutton device on the lateral femoral cortex. Of the 168 patients, 107 patients were available for clinical assessment in the immediate follow-up period (mean 10 months, range four to 19 months).

**Results**

Of the 107 patients available for follow-up, 85 patients had radiographic evidence of non-flush positioning of the fixation device on the lateral femoral cortical surface. One patient presented with ACL graft failure at six months post-operatively. Four cases reported a grade

+1 Lachman test and one case with a grade 2 Lachman test following ACL reconstruction, but none of them presented with complaints of instability.

**Conclusion**

The present study demonstrated a relatively large incidence of non-flush positioning of the suspensory fixation device over the femoral cortex following graft fixation. However, there appears to be no association between this radiographic finding and a higher rate of early graft failure suggesting radiolucent material may provide sufficient stability during the graft healing process. Further studies with larger population sizes are needed in order to better define the incidence of this finding and its importance on clinical outcome.

**Improving Surgical Handover Between the Acute Surgical Receiving Unit and the Step-Down Ward in one of Scotland's Largest Hospitals through the Development of a Multidisciplinary Handover Tool**

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**Background**

The surgical department within Ninewells Hospital, Dundee lacked a formal, structured handover process for patients being transferred from the Acute Surgical Ward (ASRU) to the step-down ward. This meant that patient safety and the quality of care may have been compromised when information was not handed over between teams on these two wards. This project aimed to introduce a handover sheet to reduce the number of tasks missed due to lack of proper handover practice.

**Methods**

A questionnaire was sent out to Foundation Year Doctors working in Surgery aiming to identify the tasks which were commonly missed when patients were transferred without a formal handover. A standardised, easy-to-use medical handover sheet was created and incorporated into the already well-established nursing handover sheet, resulting in a multi-disciplinary handover sheet. We completed six full PDSA cycles (two on communication to aide handover and four on the tool itself). Each cycle involved working with staff to assess impact in the receiving ward.

**Results**

By our last PDSA cycle, 87.5% of patients transferred had a fully completed handover sheet. A follow-up questionnaire which showed that there was a significant decrease in the frequency of tasks missed at handover and that 80% of respondents felt that the introduction of a multidisciplinary handover sheet had improved patient safety and quality of care reflected this.

**Discussion**

Good handover between medical teams is multifactorial and can often be challenging. This project has shown that a simple intervention can have a significant effect on patient safety. Some challenges persist but will be addressed through continuing education and improving teamwork within the multidisciplinary team.

**Conclusion**

A simple, effective handover sheet can make a big difference in the quality of care patients presenting with acute surgical conditions receive and is also an important factor in maintaining patient safety.

### Reducing the Occurrence of Medicines Errors When Patients Transfer Between Care Providers

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#### Background

Patients transferred between care providers are at risk if there is miscommunication and unintended changes to their medicines. Guidelines exist nationally and locally to address this and the role for medicines reconciliation, the latter shown to reduce medicines errors by 70%.

#### Methodology

Data was collected retrospectively over a 15-week period in 2016 from a Nottinghamshire surgery. 52 patients discharged from hospital during this time were identified using SystmOne. Patients lacking a pre-admission repeat template or discharge summary, and admissions for mother and baby, psychiatry, physiotherapy and day surgery, defined the exclusion criteria. Applying this, 14 patients were selected for audit.

#### Results

12/14 (86%) patients had one or more medicines omitted from their discharge summary. Where medicines were stopped, started or changed in hospital, reasoning was given for 12/12 (100%), 48/54 (89%) and 3/4 (75%) medicines respectively. 10/14 (64%) patients failed to have their repeat template updated within seven days after discharge. 41/54 (76%) medicines not updated had reasoning, the most common being that medicines were prescribed for a set duration by the hospital (58%). 41/66 (62%) medicines errors originated in secondary care, mainly accounted for by incomplete discharge summaries (81%).

#### Discussion

Medicines reconciliation was effective when implemented yet potentially dangerous when neglected. All medicines that are stopped, started or changed in hospital should have clear reasoning. Where not explicit, reasoning was often implied by the patient's history, other medicines, and reason for admission. Patients with a chronic condition were less likely to have pre-admission medicines included in their discharge summary.

#### Conclusion

Medicines reconciliation should be designated to a member of the practice team, who should also update the repeat template within seven days to prevent errors. Incomplete discharge summaries without reasoning should be investigated. Review appointments would be beneficial for patients with chronic conditions.

### The Quality of General Surgery Operation Notes in Accordance with the Royal College of Surgeons: A Closed Loop Audit

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#### Aims and Objectives

Operation note writing is crucial in documenting surgical procedures and provides information for post-operative care. The content of these notes has a role in remuneration for services provided and legal implications. Quality of operation notes has been a cause for concern in healthcare and, hence, the Royal College of Surgeons has developed guidance to maintain standards<sup>1</sup>. 18 domains have been identified as essential requirements in operation note writing in accordance to the Good Surgical Practice (GSP) 2008<sup>1</sup>. The aim of our study is to assess compliance of our unit's operation note writing with the GSP.

#### Method

All patients who had undergone emergency or elective surgical procedures over a one- week period were identified. The operation notes were assessed against the 18 parameters stipulated by GSP guidance. Compliance to GSP was analysed and presented at the local departmental meeting where a departmental operation note template was suggested. This audit loop was closed following implementation of changes three months later.

#### Results

A total of 82 patients were included in this study period (47 in first audit cycle, 35 in re-audit). Initial compliance to GSP standards was low at 44%. Surgeon name and operation performed were 100% completed. Overall compliance to RCS Guidelines was poor (44%); marked by date and time (2%) and antibiotic prophylaxis use (2%). Following implementation of changes, we noted a 19% absolute increase in compliance to GSP (total compliance 63%) with marked improvement noted in 11 of 18 domains e.g. post-operative care instructions (62% to 94%). There was a clear disparity between written and typed notes.

#### Conclusion

Educating the department on the standards set by RCS has shown an improvement in compliance. There is scope for an electronic management system with typed operation note templates to improve compliance and outcomes.

1. The Royal College of Surgeons of England. Good Surgical Practice. 2008.

### **The Educational Outcomes of GI Endoscopy Programme in Malawi**

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#### **Background**

The Mersey School of Endoscopy introduced an endoscopy training programme, Teaching the Trainer (TTT), in Malawi in 2008. The teaching programme took place in four government hospitals. The programmes started off by training the participants to become trainers to sustain the number of competent and trained endoscopists in Malawi. Since there are endoscopy trainers in Malawi, the trainers are now teaching the new trainees. During training, the local trainer's outcomes are recorded using Direct Observation of Procedure or Skills (DOPS). Other quantitative measures such as Direct Observation of Training Skills, feedback forms and Malawi Endoscopy Unit Global Rating Scale were used to assess and evaluate the performance of whole units, the training programme, and whether the project has fulfilled its aims.

#### **Methodology**

This is a data analysis project that worked with Wellcome Trust Liverpool Glasgow Centre for Global Health Research, Royal Liverpool University Hospital and the Mersey school of Endoscopy. DOPS and other forms that were collected between 2010 and 2014 were analysed. The average performance scores were calculated to look at trends and to compare with other trainees.

#### **Results**

The trainees who have been trained for a period have steady improvements over the years in all centres. Lilongwe Hospital showed significant improvement in their equipment and organisation of the hospital. Criteria such as quality of care were poorly performed in all centres. Most trainees were satisfied with the organisation and contents of the programme.

#### **Discussion**

Trainees have ensured that their training was standardised. However, the participants were selected by the government and this programme might have missed people who could have been very talented.

#### **Conclusion**

This programme is very useful and effective despite having several difficulties around the collection of the forms and sustaining the appropriate equipment. Moreover, the teaching programme is looking sustainable and working very well.

### **Tackling Antibiotic Resistance in Scotland Trend Analysis of Antibiotic Prescription Data in Secondary Care**

**Robson S**

University of Edinburgh, United Kingdom

#### **Background**

The rapid emergence of antibiotic resistant organisms is now recognised as a global public health threat that endangers the efficacy of many currently used drug treatments. Antibiotic consumption is recognised as a driver of antimicrobial resistance. Surveillance of antibiotic use has been identified as a key process in shaping prescribing guidelines and managing the emergence of resistant bacteria. In this study we examined the temporal trends in antibiotic use in Scotland and the variation of prescription patterns according to geographical location and hospital class.

#### **Methodology**

Antibiotic prescription data from secondary care facilities was collected at hospital level and quantitatively analysed over a seven-year period (2007-2013). Linear regression and analysis of variance were performed to determine if the quantity of antibiotic prescribed differed over time and between individual health boards and hospital classes. Principle component analysis was conducted to assess the potential of clustering patterns in prescription data according to the number of beds per hospital, a proxy of hospital size.

#### **Results**

A significant increase in total antibiotic use was identified between 2007 and 2013 (linear regression  $p < 0.001$ ). Linear regression also identified significant upwards trends in the prescription of penicillins, tetracyclines and drugs used to manage urinary tract infections ( $p < 0.005$ ). Significant reductions were observed for cephalosporins and quinolones ( $p < 0.005$ ). We also show significant differences in the quantity of antibiotic prescribed between health boards and hospital classes, with teaching and large general hospitals found to account for the majority of prescribing in secondary care. Principle component analysis revealed distinct clustering of prescription data according to the number of occupied bed days per hospital that was conserved across a range of drugs.

#### **Discussion**

Identifying factors that drive antibiotic consumption in secondary care enables prescribing guidelines to be tailored at a regional and hospital level.

#### **Conclusion**

Further studies will improve the outcomes of future antimicrobial stewardship programmes.

### **An Audit to Evaluate Local Prescription Guidelines (With Respect to Donepezil and Memantine Therapy) in Patients Diagnosed with Alzheimer's Disease (AD)**

**Pizzuto M**, Debattista J, Ferry P  
Mater Dei Hospital, Malta

#### **Background**

Dementia is a neurodegenerative disease (70% of which is AD) which is associated with a change in behaviour, impaired reasoning and cognition. According to WHO (2008), dementia contributes to 11.2 per cent of years lived with disability in people aged 60 years and over. Locally, 6,071 individuals suffer from dementia equivalent to 1.5% of the population (2015).

#### **Methodology**

This was a survey using questionnaires, which were distributed to consultant geriatricians, psychiatrists and neurologists (the only specialists who can prescribe anti-dementia treatment) and asked them what their treatment of choice for mild-moderate and moderate-severe AD was and the reasons behind their choices. The drug options included Donepezil only, Donepezil and Memantine, or Memantine only.

#### **Results**

16 questionnaires were collected back: eight psychiatrists, six geriatricians and two neurologists (representing 60% of all local specialists in the respective areas). For mild to moderate AD, 94% answered with Donepezil only and 6% answered with a combination therapy whilst for moderate to severe AD, 25% chose Donepezil only, 37.5% a combination, and 37.5% choosing Memantine only. When asked whether they ever prescribed a combination therapy for moderate to severe AD patients, 50% said they did whilst 50% said they never did.

#### **Discussion**

When asked to elaborate as to why they never prescribed a combination therapy (of Donepezil and Memantine) in moderate to severe disease, insufficient evidence (62.5%), increased costs (12.5%) and intolerable side effects (25%) were their answers. For those who did prescribe a combination therapy, they cited a delay in initialization (50%), improvement of behaviour (25%) and decrease in functional decline (25%).

#### **Conclusion**

There was a common consensus on the treatment of mild-moderate AD (with Donepezil only) but uncertainty over the treatment in moderate-severe AD remains, despite current new evidence suggesting superiority for combination therapy.

### **Could It Have Been Spotted Sooner? Audit of Breast, Myeloma and Skin Cancer Diagnosis at Whitemoor Medical Centre**

**Chisholm AL**, Cemm N  
University of Nottingham, United Kingdom

#### **Aim**

Breast cancer, myeloma and skin cancers are some of the most common to present to general practice. However, as each can present with many different signs and symptoms, the diagnosis and subsequent treatment may be delayed by primary care. Guidance issued in the UK gives key criteria for when a patient should be referred using the two-week wait referral pathway and this study aimed to see whether this guidance was being followed at Whitemoor Medical Centre or if there were any preventable delays in primary care that could have been avoided.

#### **Methods**

A practice search identified all patients with breast, myeloma or skin cancer between September 2015 and September 2016. From the search, 18 patients were excluded due to being diagnosed before September 2015 and five were excluded due to a precancerous diagnosis, leaving 27 patients (10 breast, one myeloma and 16 skin). From this, each patient's journey was followed from first presentation to diagnosis to allow any preventable delays to be identified.

#### **Results**

Two patients were identified to have had preventable delays in primary care, one patient diagnosed with skin cancer and another diagnosed with myeloma. The patient who was diagnosed with skin cancer initially presented with symptoms which the UK clinical guidelines would recommend a two-week wait referral, whereas only a routine referral was given. The patient who was later diagnosed with myeloma presented on multiple occasions with severe back pain but only after four presentations were they sent for an MRI scan.

#### **Conclusion**

Overall, clinical guidance was being strongly adhered to at Whitemoor Medical Centre, providing patients with the best possible care. The two cases identified are significant missed opportunities that can be learnt from in the future.

### **RCEM: Severe Sepsis and Septic Shock in Adults in 2016/2017**

**Karim MJ, Simpson K**  
Diana Princess of Wales Hospital, Grimsby, United Kingdom

#### **Background**

Severe sepsis is a time sensitive condition. One study showed that, for every hour appropriate antibiotic administration is delayed, there is an 8% increase in mortality. RCEM clinical standards for severe sepsis and septic shock were revised in August 2012 and are now based on the 'Sepsis Six Bundle'. The purpose of this audit was to benchmark current performance in EDs against the standards, allow comparison nationally between peers, and identify areas in need of improvement.

#### **Methodology**

The audit reviewed patients who were diagnosed with either severe sepsis or septic shock in the ED at DPOW Hospital, Grimsby from 1st January 2016 to 31st December 2016. A standardised proforma was completed for a sample of 60 patients identified using the emergency department's information system, Symphony.

#### **Results**

Seven patients in the sample did not meet the inclusion criteria so, in total, we collected data for 53 patients. The results show that 66% of patients were reviewed by a senior ED medic and 9% by the critical outreach team. With regards to the implementation of the 'Sepsis Six Bundle', 85% and 92% of patients respectively were given intravenous antibiotics and fluids in the emergency department. However, oxygen was only recorded in 49% of cases and urine output in 32% of cases.

#### **Discussion**

In terms of benchmarking current performance in the emergency department against the standards set out by the RCEM, the audit demonstrated there were some aspects whereby more needed to be done in order to achieve, and ideally go beyond, the desired requirements.

#### **Conclusion**

The audit highlights that there is a great scope for improvement in the care provided to septic patients. The trend observed from this data will be examined further and improvement objectives will be set. A re-audit will take place the following year.

### **Does A Community Interface Rheumatoid Arthritis Annual Review Improve Patient Care?**

**McDonald J, Haigh R, Murphy D**  
Royal Devon and Exeter Hospital, United Kingdom

#### **Background**

UK national (NICE) guidelines suggest a holistic annual review to look at the impact of the disease on quality of life as well as co-morbidities. Our aim was to look at the annual reviews currently taking place in primary care to see how frequently patient co-morbidities were assessed and documented. We then implemented a formal community rheumatology interface review to assess whether this improved patient care.

#### **Methodology**

A large primary care practice was offered a community rheumatology interface review by a secondary care clinician. A search was undertaken for patients with rheumatoid arthritis (RA) who had attended for an annual review between December 2015-2016. 30 reviews were selected and we assessed how frequently DAS28, HAQ, FRAX, Q-Risk2 (CV risk assessment tool), and screening for depression were recorded. We then implemented our community rheumatology interface review and looked at if we had increased compliance with the above outcomes in standard primary care management.

#### **Results**

In patients assessed in primary care, we found that a DAS28 recorded in 0%, HAQ in 0%, FRAX in 13%, Q-Risk2 in 10%, and depression screening in 23%. In comparison, patients assessed by a community rheumatology interface clinician recorded DAS28 in 100%, HAQ score in 100%, FRAX in 100%, Q-Risk2 in 100%, and depression screening in 100%. This meant 23% were sent for DEXA scanning or started on a bisphosphonate. We discussed cardiovascular risk and starting a statin in 26%, and 23% required follow-up for mental health.

#### **Discussion**

A dedicated RA review meant we were recording and asking about all areas recommended in NICE guidelines. This highlighted potential complications and led to further investigations and management being arranged.

#### **Conclusion**

An annual review with a rheumatology interface practitioner is of benefit in holistic patient care and improved compliance with all domains of the annual review.

### **Evaluation of Attendance Rate and Sociodemographic Factors of Patients Referred to Perinatal Mental Health Services During the Two-Year Period January 2015 to December 2016**

**Dimech MA**, Zammit D, Micallef N, Felice E  
Mater Dei Hospital, Malta

#### **Background**

According to World Health Organisation statistics, approximately 10% of pregnant women and 13% of postpartum women experience a mental health disorder. With a local average of 4000 births per year, at least 400 patients should be receiving support for such problems annually.

#### **Methods**

A retrospective analysis of case notes and tickets of referral to the Perinatal Mental Health clinic, spanning from January 2015 to December 2016, was carried out to gain perspective on the sociodemographic factors influencing service use.

#### **Results**

Attendance rate in 2015 was 57.9%, increasing to 63.6% in 2016. In both years, 62% of women who attended were pregnant and 30% postpartum. The commonest patient age group was the 31-35 year range. This age group also constitutes the majority of 'did not turn up' cases (35% in both 2015 and 2016). Similar results were also obtained for patients' marital status – in both years, more than 50% were married and around 35% were single. In 2016, the number of separated women increased by 6%. The majority of patients hailed from the Northern Harbour area. While midwives referred most patients in 2015 (35.9%), obstetricians were the professionals who made the most referrals in 2016 (31.3%).

#### **Discussion and Conclusions**

Recommendations to improve the existing service would include an adapted Ticket of Referral for easier identification of urgent cases, as well as a dedicated helpline for out-of- hours advice and support. Proper training should be given to midwives and obstetricians as they are the professionals who refer most patients. Organising day seminars for GPs in order to empower them to initiate treatment until the patient is seen by a psychiatrist could be considered, along with the setting up of peripheral clinics, mainly in those localities in which the majority of patients reside, for assistance to be more accessible.

### **Utility Of Polymerase Chain Reaction (PCR) Swab In Diagnosing Acute Syphilitic Infection In The Department Of GU/HIV Medicine, Cobridge Health Centre, Stoke-On-Trent**

**Morton M**, Fernando K  
University Hospital of North Midlands, Stoke-on-Trent, United Kingdom

#### **Background**

Syphilis is a sexually transmitted infection (STI) caused by *Treponema pallidum* (TP). Syphilis in the UK is of concern, notably for a 76% rise in cases from 2012 to 2015, with a preponderance of new infections in men who have sex with men (MSM). Of those diagnosed with syphilis, a significant number have concurrent STIs including HIV. Serological testing for syphilis (STS) is the current diagnostic method of choice, but the incubation period of TP limits accuracy of STS in the acute stage. Swab-based TP PCR technology is now available allowing detection from suspicious ulcerative lesions, potentially allowing earlier diagnosis. The British Association for Sexual Health and HIV (BASHH) suggests use of this technique in certain clinical scenarios but formal guidance is awaited.

#### **Aim**

This observational study (encompassing BASHH auditable outcome measures) assesses utility of PCR swab in diagnosing syphilis and its correlation with clinical infective stage and STS results.

#### **Method**

Retrospective notes review of patients diagnosed with early syphilis (August 2015 – August 2016) based on STS and/or PCR swab.

#### **Results**

43 patients included. 9/43 (21%) had TP PCR undertaken. 8/9 (89%) swabs revealed a positive result. Of these 8, 4 (50%) had positive STS but staging indicated very early infection. The other 4/8 (50%) had negative STS at time of simultaneously taken swab.

#### **Discussion**

Our findings support use of swab based TP PCR in early diagnosis of syphilitic infection, enabling more timely treatment and partner notification.

#### **Conclusion**

STS is the current primary diagnostic method for suspected syphilitic infection. This audit demonstrates the important role of PCR swab technology in acute stage of disease. TP PCR swabs can contribute to a challenging diagnostic process and enable early detection of infection. This has potential to facilitate more timely treatment of infection and partner notification, reducing associated medical and psychosocial morbidity.

### **Change in NICE Guidelines: How It Affected Inpatient Referrals for Cardiac Devices in Severe LVSD in a Tertiary Cardiac Centre**

**Miyazawa AA**

King's College Hospital, London, United Kingdom

#### **Background**

Heart failure is a common chronic condition that impairs the heart's function as a pump to support systemic circulation. Currently, NICE advises that patients with left ventricular systolic dysfunction and an ejection fraction of 35% or less to be considered for a device (ICD, CRT-D or CRT-P).

We assessed the inpatient referral rate of patients with LVEF <35% admitted onto a cardiology ward in a tertiary centre.

#### **Methods**

Retrospectively reviewed 419 admissions onto the cardiology ward at King's College Hospital in January-March 2014. 54 patients were found to have an LVEF <35% on their trans-thoracic echocardiograms. Notes, documents and ECGs were reviewed on EPR to collect the data.

#### **Results**

28 patients (51.8%) were not referred for a device. Of these, seven (25%) patients improved in subsequent echocardiograms, four died within a few months of hospital admission, and five were having their medical therapy optimised. Five patients had the cause treated. Two patients did not fulfil the criteria for a device and two others were awaiting a repeat echocardiogram for further assessment.

10 of these patients already had a device in situ. 16 patients were referred for a device assessment. Of these 16, six had devices subsequently inserted, four no longer required a device, one was referred locally, and five had their medical therapy optimised.

#### **Discussion**

The change in NICE guidelines may have affected inpatient referral rate for devices in a tertiary centre. Although over 50% of patients were not referred for a device, they were treating the cause and optimising medical therapy.

#### **Conclusion and Recommendations**

Advised a copy of the new NICE guidelines table on the cardiology ward.

Teach the specialist nurses and junior doctors so that they can identify these patients and refer appropriately for device consideration.

### **The Implementation of NICE Cg174 in a Large Teaching Hospital**

**John BR, McMenamin M, Mercer N, Sales C**

University Hospital Aintree, Liverpool, United Kingdom

#### **Background**

Intravenous fluid management is a large part of a Foundation doctor's workload. Poor fluid management can lead to serious morbidities. NICE CG 174 was produced in response to concerns that significant morbidity is caused by the over and under prescription of maintenance IV fluids in hospitals. The quality improvement project was initiated at University Hospital Aintree Foundation Trust to improve knowledge amongst FY1 doctors in order to safely prescribe maintenance IV fluids and to ensure the correct types of fluids were available in order to do so. With help from our pharmacy department, we successfully rolled out new fluid bags that would enable this to happen.

#### **Methods**

This was a prospective study. Teaching was provided to the FY1 cohort and new "aide memoire" cards distributed to all medical staff regarding maintenance fluids. We invited all FY1s to complete a questionnaire pre and post the teaching programme. We asked questions regarding the different types of intravenous fluids that are available, what the daily fluid and electrolyte requirements for an adult are, what parameters should be monitored, as well as awareness of the guidelines.

#### **Results**

We found a substantial increase in the knowledge base in the vast majority of areas since the new fluids and "aide memoire" cards have been introduced, with a 30% improvement in answer accuracy in some cases.

#### **Discussion**

We hypothesise that this more clinical and structured approach to IV fluid prescribing in our trust should lead to a decrease in morbidity due to the under and over prescribing of intravenous fluid therapy.

#### **Conclusion**

We have successfully implemented new fluid bags into our trust and have increased the knowledge base amongst our most junior doctors in order to deliver safe prescribing of IV maintenance fluids. The same teaching is now embedded into the FY1 curriculum.

### Transfusion Request Rejection - The Human Factor

**Bahadori A**, Ng S, Kirkpatrick U  
University Hospital of Wales, Cardiff, United Kingdom

#### Background

Rejection in transfusion requests incur unnecessary time, cost and trauma to patients. Transfusion of ABO incompatible blood is a 'never event' but this awareness amongst healthcare professionals remains suboptimal. This audit aimed to highlight this and to recognise strategies to reduce rejection.

#### Method

A retrospective baseline data collection on transfusion requests was performed between 01/09/2015–14/09/2015. PDSA cycle was used to initiate intervention. A second audit was performed between 20/10/2015–02/11/2015, and finally between 31/05/2016–12/06/2016. Target measure of improvement is to increase adherence to British Committee for Standards in Haematology (BCSH) transfusion guidelines.

#### Results

Baseline measurement revealed a rejection in 8.2% (n=35) of 426 transfusion samples, highest in A&E and surgical wards (57.1%, n=20). Main reason for rejection being error in labeling (74.3%, n=26). Interventions include discussion with transfusion department, education, survey on reasons for mislabeling and email circulation of results. Survey revealed the main reason being distraction. Rejection rate from similar wards in the following cycle were 9.2% (n=45) in cycle two and 3.3% (n=25) in the final cycle. Cost of processing one G&S request is £21.88.

With an average of 35 rejections in two weeks, the potential annual cost implication exceeds £20,670.

#### Discussion

Highest rejection rates were from acute wards including SAU, MAU and A&E. High pressured working environment was associated with increased human error most likely due to increased distraction.

#### Conclusion

A significant improvement in percentage rejection to <5% post-intervention was noted in the final cycle. This highlights the importance of consistency in the application of national recommendation in sample labelling to reduce patient harm and to improve cost saving.

### An Audit on the Follow-Up of Solitary Pulmonary Nodules at Mater Dei Hospital

**Parnis T**, Gauci J, Micallef J  
Mater Dei Hospital, Malta

#### Background

Solitary pulmonary nodules (SPNs) are a common incidental radiological finding, occurring in 38% of smokers, 23% of ex-smokers and 34% of non-smokers. The aim of this audit was to evaluate whether the Fleischner Society Guidelines are adhered to in the follow-up of SPNs locally.

#### Methodology

This retrospective study includes all SPNs diagnosed incidentally on Computed Tomography (CT) between January 2013 and December 2014, excluding patients with a history of malignancy. The follow-up of the nodules was compared with Fleischner Society Recommendations (FSR) as the gold standard, which stratifies nodules based on size and smoking history.

#### Results

From a cohort of 100 patients, guideline-concordant care was found in 48%. SPNs were under-evaluated in 32% of cases, while over-evaluation occurred in 20%. From the total cohort, lung malignancy was diagnosed in 31% and the risk of malignancy increased with increasing nodule size (0% in  $\leq 4$ mm, 1% in 5-8mm, and 30% in  $> 8$ mm). The risk of malignancy was 15% in current smokers, 11% in ex-smokers and 10% in non-smokers.

#### Discussion

Solitary pulmonary nodules represent a diagnostic challenge. Our data show that the risk of malignancy increases with the size of the nodule, and this reflects international figures. Under-evaluation may delay the diagnosis of early lung cancer whilst over-evaluation may increase expenditure, radiation and also patient concern. It is the responsibility of the ordering physician to include the correct smoking history when requesting imaging. The reporting radiologist should document the size and nodule characteristics, followed by timely follow-up according to FSR criteria.

#### Conclusion

Appropriate specific booking request information and standardised medical imaging reporting systems should be implemented to ensure adequate follow-up of SPNs according to international recommendations.

### **New Paracetamol Overdose Treatment Pathway: Shorter, Safer, and Cost Saving**

**Fung EJM**, Pettie J, Sandilands E, Dear J  
Royal Infirmary of Edinburgh, Edinburgh, United Kingdom

#### **Background**

Paracetamol overdose is among the commonest medication-related poisonings worldwide. On 27th September 2015, a modified regimen of intravenous acetylcysteine (NAC) was introduced at the Royal Infirmary of Edinburgh. This study aimed to compare the length of treatment and hospital stay of the modified regimen (12-hr NAC) with the standard regimen (21-hr NAC), as well as to identify the benefits of the modified regimen in health service.

#### **Methodology**

9-months data of the standard regimen (29th December 2014 - 26th September 2015) and 9- months data of the modified regimen (27th September 2015 - 26th June 2016) were collected prospectively using audit forms. The data were collated using Microsoft Excel. The differences between proportions were analysed using Mann-Whitney U test. Categorical variables were analysed using chi-square test.

#### **Results**

250 patients treated with standard regimen and 338 patients treated with modified regimen received the full course treatment. The median (interquartile range) length of treatment of the standard regimen was 22.7 (3.2-24.1) hours and the modified regimen was 12.6 (12.1-13.3) hours [ $p < 0.00001$ ]. Less adverse drug reactions (ADRs) occurred in patients treated with modified regimen compared to standard regimen (33.1 % vs 49.6%,  $p < 0.00001$ ). 46 bed-days and £20,240 were saved for the Infirmary when the modified regimen was used during the 9- months period.

#### **Discussion**

With shorter treatment and reduced ADRs, patients were more likely to complete the full course treatment. It was projected that more patients could be discharged during daytime hours and less patients remained in the hospital overnight, thus preventing "bed blocking" and improving bed availability.

#### **Conclusion**

The modified regimen was associated with shorter length of treatment and hospital stay, and lower incidence of ADRs. Over 20,000 bed-days could be saved per annum if all paracetamol overdose patients were treated with the modified regimen in the UK, leading to a potential £9 million saved for the NHS every year.

### **Could a 'Hot Gallbladder List' Help Achieve NICE Guidelines in a DGH? An Audit on Performing Laparoscopic Cholecystectomies within Seven Days for Acute Cholecystitis.**

Roberts JE, Davies P, Reeves N, Morgan R  
Glan Clwyd District General Hospital, Rhyl, United Kingdom

#### **Background**

NICE guidelines 2015 set a quality standard of 'Adults with acute cholecystitis should have a laparoscopic cholecystectomy within 1 week of diagnosis' to reduce the systemic septic effects of acute cholecystitis and reduce readmission rates. Achieving this standard in a smaller DGH is challenging due to several factors, including reduced theatre capacity to perform laparoscopic cholecystectomies in the acute setting. A dedicated 'Hot Gallbladder' surgical list weekly could ensure that patients received a laparoscopic cholecystectomy with one week of presentation by a dedicated surgeon. This is an audit of our performance of laparoscopic cholecystectomies for acute cholecystitis, including reasons for non- compliance with NICE guidelines and an assessment of whether a 'Hot Gallbladder' list would enable us to meet the guidelines.

#### **Methodology**

A prospective audit was conducted of all patients admitted over a 12-week period with acute cholecystitis. Acute cholecystitis was diagnosed on clinical presentation, biochemistry and imaging. The primary outcome was to determine the number of patients admitted with cholecystitis and the number who were operated on within seven days.

#### **Results**

36 patients were admitted with acute cholecystitis (mean of three per week). Eight of the 36 patients underwent a laparoscopic cholecystectomy within seven days – 19.4%. There were various reasons why the patients did not undergo a laparoscopic cholecystectomy, the most common being a good response to intravenous antibiotics and subsequent booking on an elective list.

#### **Discussion**

We are not meeting the NICE guidelines for laparoscopic cholecystectomy within seven days for acute cholecystitis. Most patients are responding to antibiotics and are then booked for an elective procedure.

#### **Conclusion**

A dedicated 'Hot Gallbladder' list per week (all day) would provide the theatre time and consultant input to ensure that all patients admitted to this DGH would have the opportunity to undergo a laparoscopic cholecystectomy, achieving the NICE guideline.

### **'Nil by Mouth' Protocol in Emergency Surgical Admissions at Mater Dei Hospital, Malta. When Does Fasting Become Starving?**

**Dimech MA**, Abela JE  
Mater Dei Hospital, Malta

#### **Background**

Modern perioperative care pathways strive for early and enhanced recovery after surgery (ERAS). A retrospective analysis of fasting practices in acute surgical admissions between July to October 2016 was performed in order to determine the reasons for and quantify the length of time patients spent fasting.

#### **Methods**

Patients above the age of 18, admitted to either the Surgical Admission Unit (SAU) or Observation Ward 2 (OW2) and started on a 'nil-by-mouth' (NBM) protocol, were randomly selected and their medical records analysed. Approval was obtained from the Data Protection Office and a total of 72 records were evaluated.

#### **Results and Discussion**

Patients spent an average of 10.8 hours on a NBM diet, with 113 hours (4.7 days) being the longest time a patient was kept fasted. Only 9.7% of patients had a documented reason for their NBM status and 19.4% had no documented reversal of such status on the medical notes. The preferred fluid regimen of surgical trainees is 1 litre Hartmann's solution 8-hourly, with 62.5% of patients being started on this regime once NBM. 6.9% were ordered a non-specific 'IVI' (intravenous infusion). The majority of patients had a final diagnosis of non-specific abdominal pain, abscess, diverticulitis and appendicitis (23.6%, 13.8%, 9.7% and 8.3% respectively). 27.8% of all the patients in the study underwent a surgical intervention whilst 13.9% had an endoscopic procedure organised. 58.3% had no surgical or endoscopic intervention during their inpatient stay.

#### **Conclusion**

Changes in NBM status should be properly documented and strategies implemented to reduce unnecessary prolonged fasting times. We recommend the local application of the 'Surgical Ward Round Toolkit' issued by the Royal College of Surgeons of Edinburgh, which reminds surgeons to address their patients' feeding status and avoid iatrogenic malnutrition.

### **Effects of Syrian Immigration on Our Local Health System**

**Keskin D**, Bayam L, Yurumez Y; Erdem M; Akdemir R Sakarya  
University Education and Research Hospital, Turkey

#### **Background and Aim**

The conflict in Syria is affecting the health systems in neighbouring countries. We aimed to observe attendance of Syrian patients to the emergency department of our local hospital in the last six months and to review the hospital data.

Sakarya is a city away from Turkey's south borders and conflict zones, and it is not one of the main cities in terms of immigration. However, Sakarya had its share of patients, as well as all the other cities in Turkey, which, as a whole, welcomed the immigrants from Syria.

#### **Methods and Results**

We collected and analysed the data from the local hospital. The hospital is a state hospital, hospital service is free and there is no additional funding. 2007 patients in total were admitted to the hospital in the six months between July 2016 and December 2016. 1096 of them were male and 547 were children (boys); 911 were female, 348 were children (girls). 255 of them were admitted to hospital and 67 of them were children.

According to their presentation symptoms, the subgroups were as follow: upper respiratory tract symptoms: 620; obstetrics and gynaecology: 272; soft tissue problems: 236; acute abdomen/GI symptoms: 201; trauma/fall: 44; lower respiratory tract symptoms: 73; dizziness/vertigo/headache: 37; renal system/urinary: 35; fever: 29; heart: 25; reaction/allergy: 23; back pain: 23; ENT: 23; newborn: 22 and others.

#### **Conclusion**

Turkey has more immigration from Syria than any other country. Syrian conflict does not only effect this country but many others. Although our local hospital is away from the conflict zone with a smaller Syrian population, we are still caring for and treating many Syrians, who otherwise have no health cover. The dedication of the health staff helps them to ease their pains arising from this conflict.

### **An Audit of Preventing Mother to Child Transmission Services at Villa Maria Hospital, Uganda**

**Davis S**, Ball K, Crowther N, Natarajan M  
North Manchester General Hospital, Manchester, United Kingdom

#### **Background**

In Uganda, mother to child transmission is the second biggest contributor to HIV incidence. In 2012, The World Health Organisation (WHO) recommended antiretroviral therapy for all pregnant women living with HIV, regardless of CD4 count. Since its adoption in Uganda, there has been a remarkable reduction in the number of new infections.

#### **Aim**

To audit the provision of Villa Maria Hospital's preventing mother to child transmission (PMTCT) of HIV services.

#### **Method**

Anonymised data from between January – July 2015 was retrospectively collected using Antiretroviral, Maternity and Exposed Infant registers and audited against standards from The WHO and Ugandan PMTCT guidelines.

#### **Results**

66% of our sample did not have notes available. Of the rest, 72% of women living with HIV received antenatal antiretrovirals. 87% of mothers were on the recommended regimen. 88% of exposed infants were on antiretrovirals and co-trimoxazole from birth, and had PCR testing at six weeks. 89% were exclusively breastfed.

#### **Conclusions**

We have shown that services are promising for patients presenting to and receiving care at Villa Maria Hospital; both mother and baby have good access to antiretrovirals. However, they are unrepresentative of the many affected women living in the community who do not seek medical care. Villa Maria's PMTCT services must now focus on this group. Expanding already existing outreach programmes through more frequent trips to rural areas, education camps and wider geographical coverage is key. Locally, introducing patient identification numbers could improve record keeping. These numbers could be used across different hospitals to facilitate continuity of care between hospital and community teams and reduce loss to follow-up. This recommendation is synergistic with the increase in IT facilities planned at Villa Maria Hospital and was discussed with the IT manager and PMTCT lead at Villa Maria Hospital.

### **Does the CIWA-Ar Tool Reduce the Length of Stay and Adverse Events in Patients Withdrawing from Alcohol in an Acute Medical Unit?**

**Perumal R**, Gordon C  
Western General Hospital, Edinburgh, United Kingdom

#### **Introduction**

Without access to alcohol while hospitalised for other comorbidities, patients experiencing withdrawal symptoms are given benzodiazepines on a fixed-schedule, risking over-sedation. This study investigates whether the symptom-triggered dosing using the CIWA-Ar tool may be more effective in reducing the length of stay and adverse events in these patients.

#### **Methods**

A retrospective cross-sectional audit was done on 228 patient episodes who presented with various comorbidities to the Acute Medical Unit at the Western General Hospital in Edinburgh, United Kingdom and had a history of alcohol dependence in a six-month period from April to September 2016. They were divided into two groups based on whether the CIWA-Ar tool was used on them: 54 patient episodes in the CIWA group and 174 patient episodes in the non-CIWA group. The main end-points measured were the length of their hospitalisation and any adverse events they developed. Staff feedback on their use of the tool was also gathered with a validated questionnaire.

#### **Results**

The CIWA group was 1.2 times more likely to be hospitalised for more than seven days than the non-CIWA group (but  $p > 0.05$ ). The CIWA group was 2.5 times more likely to have adverse events than the non-CIWA group ( $p < 0.05$ ) with shaking, shivering and sweating being 4.2 times more likely in the CIWA group ( $p < 0.05$ ), but confusion and delirium was less likely (although  $p > 0.05$ ). The CIWA patients were more likely to have a complete history taken as well as given Pabrinex® and diazepam compared to non-CIWA patients ( $p < 0.05$ ). The majority of staff found the tool easy to use and was beneficial to patients but recognised that more training was necessary.

#### **Conclusion**

The CIWA-Ar tool does not decrease the length of stay or the adverse events in patients withdrawing from alcohol in an Acute Medical Unit.

### Dementia Care Plan Audit

**Presky JZ**, Selvaraasan V  
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#### Background

The prevalence of dementia is increasing and it is a complex disease to manage. Multiple allied healthcare professionals are required to provide their input to help these individuals and their families maintain their quality of life. Dementia care plans with regular reviews are important to orchestrate care for now and the future. The NICE guideline CG42 states that all patients with dementia should have a care plan reviewed at least annually and the Salford Standard 5.1 defines achievement of this aim as >90%.

#### Methodology

A search was conducted on the GP system Vision on 06/12/16 to determine the number of patients who had completed a dementia care plan review in the last 12 months. The exception criteria included patients who had moved GP surgery, patients who refused a care plan, and patients who had died.

#### Results

The number of patients with dementia at the GP practice totalled 38 and only 16 of these patients had a care plan reviewed in the past 12 months. This equals 42.11% which is significantly below the target of >90%.

#### Discussion

Multiple factors were identified and strategies put in place to address this result. The audit was presented to the practice to raise awareness and a simple and easily accessible dementia care plan template was designed. A consultation time of 30 minutes is now allocated for a review and further time assigned for home visits.

#### Conclusion

A re-audit conducted on 11/04/17 showed that 91.18% of patients had their dementia care plan reviewed in the past 12 months. This demonstrates that the implemented changes have been successful. Another re-audit is planned for April 2018 to determine if the improvement is sustained.

### An Audit Evaluating the Prescription Practices of Dapagliflozin in Type 2 Diabetic Patients in a Primary Care Practice

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#### Background

Dapagliflozin is the first sodium-glucose co-transporter 2 (SGLT2) inhibitor licensed in the UK for adults with type 2 diabetes. While trials have demonstrated its efficacy in glycaemic control, there remains a paucity of data in clinical practice. The Technology Appraisal Guidance issued by NICE in 2013 stipulates that dapagliflozin should only be continued as an add-on combination therapy with other glucose lowering drugs, including insulin, if the patient has a minimum reduction of 5.5 mmol/mol (0.5%) in HbA1c in six months. However, it should not be given to patients with an estimated glomerular filtration rate (eGFR) <60 ml/min/1.73 m<sup>2</sup>. Our aim was to retrospectively assess whether dapagliflozin was being appropriately prescribed in line with NICE guidance.

#### Methodology

We recorded the HbA1c and eGFR values of patients with type 2 diabetes (58% male, mean age 61 years) prescribed 10 mg once daily of dapagliflozin as an add-on combination therapy between January–September 2016 at a primary care practice.

#### Results

Of the 19 patients included, 18 (95%) patients had an eGFR >60 ml/min/1.73 m<sup>2</sup> and were thus initiated dapagliflozin in line with NICE guidance. 10 (53%) patients had a reduction of ≥5.5 mmol/mol at the first six-month follow-up visit. However, a further six (total 84%) went on to achieve the required HbA1c reduction at subsequent follow-up visits over 12 months after initiation.

#### Discussion

While 53% of patients prescribed dapagliflozin met the six-month NICE continuation criteria, consistent with clinical trials, this number increased to 84% at longer-term follow-up. Since the longer-term efficacy and side-effects of the SGLT2 inhibitors have not been established, this could suggest that the current NICE Technology Appraisal Guidance is still incomplete.

#### Conclusion

Our results demonstrate a continuing need for more real-world data and improved evaluation of dapagliflozin prescription in primary care.

### **Auditing the Quality of Clinical Audits by Foundation Doctors**

**Camilleri GM**

Mater Dei Hospital, Malta

#### **Background**

A clinical audit is a quality improvement process which aims to improve patient care and outcomes. Clinical audits help junior doctors improve their analytical and management skills, and audit involvement is a requirement for satisfactory completion of the Malta Foundation Programme. However, reaping maximum benefit from audits requires closing the audit loop, including re-auditing. This audit aimed to investigate the quality and completion rate of audits conducted by Foundation doctors.

#### **Methodology**

A questionnaire was distributed to all Foundation Year 2 (FY2) doctors within the Malta Foundation School in July 2016, addressing audits performed during their two-year Foundation Programme. The stage at which clinical audits were halted and reasons for lack of audit completion were addressed. The percentage of audits halted at each stage of the audit cycle was calculated.

#### **Results**

96 FY2 doctors were involved in 152 audits. Recommendations for improvement emerged from 85 audits (55.9%). Completion of the audit cycle, with re-auditing, occurred in 15 audits (9.9%). The commonest reason for failure to close the loop was the frequent rotational nature of Foundation posts, and medical audits had the highest rate of cycle completion. All 15 completed audit cycles reported improvement in patient care.

#### **Discussion**

Recommendations for change emerged from only half of clinical audits. Re-auditing, which is an essential stage in ensuring improvement in quality of patient care, was only performed in a tenth of audits.

#### **Conclusions**

Getting all Foundation doctors involved in clinical audit is good practice. However, these results highlight a lack of insight by Foundation doctors of the whole purpose of this clinical exercise, which risks being conducted solely to fulfil the requirements of one's post. Higher rates of audit cycle completion are required to ensure audits are of educational value to junior doctors and of clinical value in improving patient outcomes.

### **Urology Morning Handover and Providing Standardised Continuity of Care**

**Elana O**

Bedford Hospital, Bedford, United Kingdom

#### **Background**

As a urology FY1, I observed that morning handovers were ad hoc and erratic, with deleterious consequences for continuity of care.

#### **Methodology**

A prospective audit was performed using two analogous 21-point questionnaires, distributed to incoming and outgoing teams for 15 consecutive weekdays in July 2016 (cycle one), and 10 in January 2017 (cycle two). Incomplete questionnaires were excluded. Standards were based on RCS Safe Handover Guidance.

#### **Results**

10 complete questionnaires were received for cycle one, and 16 for cycle two.

In cycle one, handover occurred on six/eight days captured. In cycle two, handover occurred on six/seven days.

Before intervention, the incoming team comprised an FY1 at five/six handovers. No urology middle grades attended. The outgoing registrar was present at three handovers; the outgoing FY1 represented the night team at the remainder. After intervention, incoming and outgoing registrars each attended five/six handovers.

In cycle one, two handovers were reported to have been led by the outgoing registrar. In cycle two, five handovers were reported to have had a leader, unanimously identified on three occasions.

Before intervention, four/10 respondents reported that the handover environment was suitable and bleep-free. Eight/16 respondents reported likewise after intervention. Handovers consistently occurred within working hours. Satisfaction with handover length increased from 50% to 100%, as this increased from an average of 4 minutes 11 seconds to 12 minutes 35 seconds. Conveyance of the minimum data points improved from 33% to 50%.

#### **Discussion and Conclusion**

After cycle one, a formal urology handover was created by incorporating it into the existing general surgery handover. Attendance of at least one urology middle grade became mandatory.

The data demonstrates that this intervention produced considerable improvement in all domains, with handovers meeting up to three of the eight standards set. Satisfaction with handover also improved from 50% to 100%. There does, however, remain room for further progress and re-audit.

### Quality Improvement in Emergency Laparotomy at a DGH: The Impact on Care Delivered and Outcomes

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#### Aim

Outcomes following emergency laparotomy are known to be poor and a national quality improvement (QI) programme is in progress. The aim of this study is to assess the impact of a QI intervention in emergency laparotomy in an NHS hospital.

#### Method

Clinicians entered data on the National Emergency Laparotomy Audit (NELA) webtool and the results were exported from this database and analysed. The QI interventions included Consultant review <12hrs, risk assessment, Consultant delivered perioperative care, and critical care admission.

#### Results

Compliance with the QI interventions and outcomes were evaluated for the years before and after the QI intervention. 2013-2014 results: crude mortality: 14.1%; O/E mortality (P-POSSUM): 0.8; LOS (median): 11; Consultant Surgeon review <12 hours: 50%; Consultant delivered perioperative care: 85%; ICU Admission: 38%. 2014-2015 results: crude mortality: 9.6%; O/E mortality (P-POSSUM): 0.6; LOS (median): 13; Consultant Surgeon review <12 hours: 53%; Consultant delivered perioperative care: 80%; ICU Admission: 66%.

#### Conclusions

The QI intervention seems to have been effective with particular improvements in critical care admission rate. Whilst numbers are small, this may have resulted in improved outcomes with the exception of length of stay. An area for ongoing improvement is within Consultant- led perioperative care.

### Impact of Intravenous Drug Users (IVDU) on Vascular Ward

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#### Background

Intravenous drug usage is a growing recurrent socioeconomic issue that places immense pressure on a stretched out healthcare system with finite resources. Hence we aim to better understand the impact of IVDUs on a vascular ward in order to effectively manage this issue.

#### Methods

We retrospectively audited all IVDU admissions over six months. Audited components include presenting issues, duration of stay, readmission rates, treatment, antibiotic regime, radiological investigations and microbial organisms identified.

#### Results

Out of 35 admissions, 23 presented with abscesses while six presented with pseudoaneurysms, six with deep vein thrombosis/infected deep vein thrombosis, five with cellulitis and four with pulmonary emboli/septic emboli.

The average length of inpatient stay was 10.6 days, ranging from 1 to 39. 28.6% of these patients presented again with vascular issues.

In terms of radiological investigations, 22 patients had CT angiogram lower limb and 14 had USS groin/inguinal with a range of various other investigations.

The commonest microbial was Staph Aureus, followed by E coli and Enterococcus faecalis. Correspondingly there were 17 different antibiotic regimes prescribed.

#### Discussion

The impact of IVDUs can be seen from the myriad of presenting complaints, with the majority being abscesses. IVDUs often present with complex issues that require prolonged inpatient stay as seen from average of 10.6 days extending to 39 days. Interestingly, the antibiotic regimes were varied - ranging from single oral antibiotic to combination regime of several IV antibiotics such as benzylpenicillin, clindamycin, gentamicin, metronidazole and flucloxacillin. This is a potential area of improvement as an empirical broad spectrum of IV antibiotics could improve patient safety by covering the wide range of antimicrobials common in IVDUs and perhaps reduce the duration of stay and readmissions.

#### Conclusion

IVDU is a healthcare issue that, while realistically difficult to solve, could be managed more effectively with better understanding.

### **An Audit of DMARD Monitoring at Hampton Surgery**

**Wallis JB**

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#### **Introduction**

Disease-Modifying Anti-Rheumatic Drugs (DMARDs) can have profound side effects and toxicity syndromes. Thus, patients taking them require regular monitoring. DMARDs were previously only prescribed in secondary care. However, with the introduction of 'shared care' initiatives, the responsibility for this monitoring has been handed over to general practitioners. This audit looked to assess the monitoring performance of a rural GP surgery in the West Midlands.

#### **Methodology**

27 patients were identified using the practice database as being on DMARDs. Appropriate monitoring criteria were set for these drugs using National Institute for Clinical Excellence (NICE) guidance. Patient records were then searched retrospectively over a 12-month period to see if these criteria had been achieved.

#### **Results**

The five DMARDs being prescribed by the practice were azathioprine, ciclosporin, hydroxychloroquine, methotrexate and sulfasalazine. For azathioprine and sulfasalazine, monitoring standards were achieved in 100% of patients. For methotrexate, 82% of patients had been correctly monitored, and, for hydroxychloroquine, 75% of patients had been correctly monitored. 0% of patients taking ciclosporin had been monitored according to the criterion set.

#### **Discussion**

For four of the five DMARD drugs, monitoring standards were generally well achieved, in thanks to an efficient patient alert system at the practice. The patient alert system used is unable to include clinical measurements such as blood pressure recording, which forms an essential part of the monitoring requirements for ciclosporin. As such, blood pressure was not recorded within the past three months for any patient taking the drug, leading to a 0% rate of achieving the monitoring criteria.

#### **Conclusion**

To improve standards of DMARD monitoring at the practice, a review of guidelines related to ciclosporin monitoring is required for the practice doctors prior to re-auditing. An update of the patient alert system to include clinical measurements alongside biochemical results is also required.

Is Acute Care Teaching Improving Senior Medical Students' Knowledge in the Management of Acutely Unwell Adult Patients? A Questionnaire Study.

**Quek JY, Ulyatt B**

#### **Introduction**

UK medical graduates are consistently identified as being unprepared for acute care. This study explores the impact of current acute care teaching at a university hospital (2-weeks 4th Year and 4-weeks 5th Year block organised into tutorials, clinical attachments, and skills stations) on the standard of acute care knowledge among senior medical students.

#### **Methods**

An anonymous online questionnaire was devised and distributed to senior medical students (n=182) at varying stages of acute care training: not had any Acute Care blocks, only completed 4th Year block, or finished both 4th and 5th Year blocks. 10 multiple choice and single best answer questions were tested on ECG Interpretation, Acid-Base Balance, Fluids, Sepsis and Adult Life Support Algorithms, with one mark awarded for each correct answer, giving a score out of 10.

#### **Results**

There were 62 (34.1%) students in the no block group, 54 (29.7%) in the 4th Year block only group, and 66 (36.3%) in the both block group. Median scores (IQR [range]) for each group were 5/10 (4-6[1-10]) - no block, 6/10 (5-7[2-9]) - 4th Year block only, and 7/10 (6-8[3-10]) - both blocks. The score improves with progress through each block and this improvement reached statistical significance between the no block group and both block group ( $p < 0.001$ ), as well as between the 4th Year block only and both block groups ( $p < 0.01$ ).

Questions that generated the lowest correct response across the groups were: causes of metabolic acidosis, fluids used in resuscitation, and sepsis criteria. This suggests that, despite improvements, there were still gaps in knowledge.

#### **Conclusion**

Overall, acute care teaching has a positive effect on students' level of acute care knowledge. However, the study highlighted some knowledge deficiencies which should be attended to so that students are more prepared for their transition to Foundation Years.

**Category: Clinical and Patient Related Work**

**A Novel Approach to Rapid Assessment and Intervention in Limb Threatening Diabetic Foot Disease**

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**Background**

Peripheral arterial disease (PAD) is a scourge of the western world, now affecting 30 million people, with prevalence set to increase by over 50% in the next 15 years. Patients with PAD are at a 2-4% risk of amputation, and suffer five-year mortality rates of 28%. Where there is co-existing diabetes, this rises to 20-40% amputation risk, and a five-year mortality of 56%. Our region's diabetic vascular population exhibits an exceptionally high disease burden, and often presents with advanced diabetic ischaemic pathology requiring rapid assessment and intervention in order to limit limb loss. We present our experience after the introduction of our Limbs At Serious Risk (LASER) service.

**Methods**

Our LASER team (including specialists from Orthopaedics, Endocrinology, Vascular Surgery, Microbiology, and Podiatry) reviewed high-risk patients on a weekly basis in a hospital-wide ward round, and could then rapidly expedite further investigation and treatment. Patient demographics, symptomatology, co-morbidities, investigations, therapeutic intervention, and clinical outcomes were prospectively recorded.

**Results**

Over an 18-month period, we completed 198 assessments of 127 patients (male: 99, mean age: 69). Patient co-morbidities: diabetes (93.4%), hypertension (56.1%), hypercholesterolemia (22.2%), and smoking (14.1%). All patients had their medications optimised by an experienced medical consultant and were placed on appropriate antimicrobial therapy. A total of 48 revascularisations were performed (endovascular: 39, surgery: 3, combined: 6), in addition to 12 major limb and 50 toe amputations, four patients declined treatment and seven had wound debridement alone. 37 (29.1%) patients died throughout the study.

**Conclusion**

This is an extremely high-risk patient population. A multidisciplinary approach allowed rapid investigation and intervention in 59% of total assessments suggesting a labour intensive approach is required to limit limb loss and mortality.

**Urinary Schistosomiasis Presented As Bladder Malignancy with Pulmonary Metastases: A Case Report**

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**Background**

Schistosoma Haematobium is the species responsible for the manifestation of Schistosomiasis in the genitourinary tract. It is a parasitic disease which can result in acute and chronic manifestations. Schistosomiasis is the third most devastating tropical disease in the world and it is a major source of morbidity and mortality within developing countries.

**Case Report**

A 65-year-old man was referred to a 2-week-wait urology clinic after a trip to Malawi with lower urinary tract symptoms. On examination, he was found to have a smooth, regular prostate in addition to a sub-mucosal, firm lesion at the right seminal vesicle. His full blood count revealed eosinophilia.

Flexible cystoscopy showed multifocal raised lesions within the bladder and a staging CT suggested T3N2M1 multifocal bladder cancer with early T3 disease at bladder base. Multiple aggressive-appearing lung metastases with malignant-looking mediastinal lymph nodes were also found. Despite the suggestion of malignancy in the CT scan report, urinary cytology revealed Schistosoma Haematobium ova.

The patient was commenced on Praziquantel and underwent transurethral resection with negative histology for cancer.

After three months, a repeat CT suggested resolution of lung nodules and pelvic lymph nodes, and flexible cystoscopy showed complete resolution of bladder lesions.

**Discussion**

Whilst involvement of bladder is the hallmark of Schistosoma Haematobium infection, it is unusual to have pulmonary manifestation without concurrent hepatosplenic disease. Within the lungs, deposition of Schistosome eggs causes a granulomatous reaction, typically producing miliary nodules on chest radiographs. Initially, this was interpreted as lung metastases. However, given the cystoscopic findings and subsequent resolution post-treatment, this was proven otherwise.

**Conclusion**

This case highlights the importance of urinary cytology in the investigation of haematuria. Clinicians should be aware of such a differential diagnosis, especially in patients with a travel history to endemic areas.

### **Surgical Treatment for Effort Thrombosis of the Subclavian Vein**

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#### **Background**

Axillo-subclavian vein thrombosis, also known as Paget-Schroetter syndrome, forms part of the spectrum of thoracic outlet syndrome, being much less common than lower limb venous thrombosis. Over 90% of thoracic outlet syndrome symptoms are neurological, with vein thrombosis representing 3-5% of all cases. Modern management is immediate venous catheter-directed thrombolysis and surgical decompression for optimum long term patency rates.

#### **Methods**

This retrospective study of patients at one institution who underwent surgery for Paget-Schroetter syndrome over a period of eleven years examines the time to thrombolysis after diagnosis, surgical approaches used for decompression, the use of venoplasty, and long term venous patency rates.

#### **Results**

From 2006 to 2016, 18 patients were diagnosed with Paget-Schroetter syndrome. Five were transferred for treatment at a different institution until 2012. Mean age was 36 (range 22-56), with eight males and five females. 12 underwent venogram and eight received lysis, with seven undergoing preoperative venoplasty. Mean time from lysis to surgery was five days (range 1-70 days). Surgical approaches were transaxillary (n=5), supraclavicular (n=4) and infraclavicular (n=4). Eight patients received warfarin after surgery.

#### **Discussion**

Paget-Schroetter syndrome is rare but needs immediate thrombolysis followed by definitive surgical treatment. The optimum surgical approach remains uncertain due to lack of randomised controlled trials. However, the infraclavicular approach allows venous reconstruction and complete venolysis, due to better access to the anteriorly placed subclavian vein.

#### **Conclusions**

Surgical management of subclavian vein effort thrombosis at our institution saw a transition from the more traditional transaxillary approach to the infraclavicular approach in more recent years. The most recent eight patients have 100% venous patency rates on venogram at six-month follow-up and excellent limb function.

### **Acute Phlegmonous Gastritis**

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#### **Introduction**

Acute phlegmonous gastritis is a form of acute necrotizing gastritis. It is also an extremely rare and serious infectious disease resulting in rapid progression with overall poor prognosis (mortality  $\leq 60\%$ ). Predisposing factors such as mucosal injury, achlorhydria and immunocompromised states (HIV, chronic alcoholism and diabetes mellitus) have been mentioned.

#### **Case Report**

A 43-year-old female presented with sudden onset of intense epigastric pain, fever and coffee ground vomitus. There was no history of gastric surgery, peptic ulcer disease, chronic alcoholism, or any immunosuppressive state.

Clinical examination: the patient was febrile (38.3°C), hemodynamically stable, with tenderness in the upper abdomen.

Laboratory investigation revealed leukocytosis with neutrophilia and elevated ESR. Serological tests; VDRL and HIV testing came back negative.

Abdominal US and echoendoscopy revealed thickening of the stomach wall.

During upper endoscopy, the mucosa in the gastric antrum and the duodenal bulb was blackened with large areas of ulcerations, biopsies were taken. Autofluorescence imaging was performed as a wide area imaging technique and narrow band imaging was also performed to assess the extent of the inflammation, by visualising the increased calibre of the blood vessels. Sample of gastric juice was cultured, was negative for any microbes.

Conservative therapy with antibiotics and antisecretory (PPIs) was started, endoscopy with biopsies were repeated at days 7 and 30 after commencing treatment, with complete resolution of the lesions.

#### **Discussion**

Acute phlegmonous gastritis is a medical-surgical emergency which usually occurs in immunocompromised patients, and requires gastrectomy. This case is interesting due to the combination of severe gastric and duodenal lesions in a patient with no comorbidities, unknown etiology, and favourable prognosis with only medical treatment.

#### **Conclusion**

We described a case of phlegmonous gastritis with associated duodenal involvement in a normally healthy patient. Through early diagnosis and conservative treatment this patient was treated successfully.

### **A Case of Multisystem Emboli**

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#### **Background**

Arterial and venous thromboemboli are well reported in medical literature. Yet, there are few reports of patients presenting with multisystem emboli.

#### **Methods**

Clinical details were obtained from case notes. Consent was gained from the patient's next of kin.

#### **Results**

A 70-year-old lady with background of atrial fibrillation (AF), hypertension and schizophrenia was admitted with feeling generally unwell for one week. On examination, she was peripherally shut down, cold and clammy. Her ECG showed AF and a recent echocardiogram showed ejection fraction of 28%. Significant blood test results were troponin I of 1649, INR 1.5, lactate 8.1. An urgent CT indicated evidence of widespread multi-system infarcts including bilateral subsegmental pulmonary emboli, left ventricular thrombus, mesenteric artery and common iliac artery thrombi. The patient was treated with dalteparin and tazocin but sadly died three weeks after admission.

#### **Discussion**

This case highlights the importance of recognising and managing venous thromboembolism. Although the patient was on warfarin and no compliance issues were known, her treatment was sub-therapeutic, demonstrating that the pharmacology of warfarin can result in under or over anticoagulation. Had a novel anticoagulant been used, this patient may not have developed widespread emboli and her death could have been prevented.

### **Recurrent Ventricular Fibrillation Caused By Ingestion of Aconitum (i.e. Monkshood) Flowers**

**Adami F**, Paganussi P, Perone G, Bera P, Braga G, Concoreggi C  
University of Pisa, Italy

#### **Background**

Aconitum species are prevalent worldwide but poisoning by the ingestion of its flowers is extremely rare.

#### **Case Report**

The present case was one of the few cases of ingestion of raw flowers of Monkshood (*Aconitum napellus*) ever reported in Europe involving an otherwise healthy Italian male trekker of 63 years. After two hours of ingestion, the subject had profuse salivation, leading him to call for help. The rescue team arrived on the scene and found the subject to be conscious and alert, with marked hypersalivation, hyperventilation, blood pressure 120/70 mmHg and heart rate 70 bpm. The subject had paresthesia and numbness in all four limbs with no motor deficits and PERRLA. After being admitted into the ICU, the subject complained of paresthesia in the perioral area and worsening of general malaise. After a while, the subject lost consciousness due to an onset of ventricular fibrillation. Soon after the first ventricular fibrillation was treated, several other episodes followed, all of which were successfully treated with electrical cardioversion and standard antiarrhythmics. On the second day, the patient was hemodynamically stable and his general condition improved and he was discharged on the fourth day.

#### **Discussion**

This patient exhibited the life threatening ventricular arrhythmias that have been well described with aconitine poisoning in the past. He also had signs of neurotoxicity. However, the most deadly complication of aconite poisoning would seem to be the lethal ventricular tachyarrhythmias (polymorphic ventricular tachycardia, ventricular fibrillation, and the rarer bidirectional ventricular tachycardia), which are quite challenging to manage therapeutically. It has been generally reported that aconite-induced ventricular arrhythmias are often refractory to direct current cardioversion and antiarrhythmic drugs.

#### **Conclusions**

Our experience with this case demonstrates that cardioversion and antiarrhythmics can be very useful. Indeed, they would seem to have been lifesaving in this particular case.

### **Learning from a Diagnostic Error: Ulipristal for Fibroids**

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#### **Background**

Ulipristal acetate (Esmya) is an effective treatment for fibroid-related menstrual symptoms, with good safety record when used short term pre-operatively. Now licensed for long term intermittent use (instead of surgery), we need to monitor its longer term safety profile. We report an interesting case with unusual complication, which led to diagnostic error with delay in appropriate management.

#### **Case Report**

The patient presented with heavy, irregular and prolonged periods. Ultrasound showed multiple fibroids, including a submucous fibroid confirmed by hysteroscopy. Three weeks after completion of treatment with Esmya, she complained of intermittent bleeding. Repeat ultrasound showed three large cystic cavities in the uterus. Diagnosed with a failing triplet pregnancy, she underwent surgical evacuation. However, histology showed no chorionic/foetal parts and symptoms continued. The diagnostic error was explained to the patient. Hysteroscopy showed increase in size of submucous fibroid (from 2cm to 10cm). Following emergency hysterectomy, the patient recovered well. A full debrief was provided, with apologies for the inconveniences experienced.

#### **Discussion**

This case highlighted various aspects of good medical practice in recognising, managing and reporting new drug-induced complications, with an emphasis on a learning culture instead of a blaming culture. It also focused on the importance of patient information with transparency at every stage, and promoting lessons learnt from reflections, conducted in this case as a Case Review in the Specialty audit meeting.

#### **Conclusion**

Ulipristal is an effective medical treatment for fibroid-related bleeding, although generally submucous fibroids do not respond well to Ulipristal and are best resected hysteroscopically. As Ulipristal has recently been endorsed by NICE, more clinicians are likely to prescribe this drug for long term. It is therefore important to increase awareness of unreported complications through publications and for clinicians to be vigilant about other longer term side effects. Effective management of diagnostic errors can also avert complaints.

### **An Unusual Cause of Postoperative Leg Pain after Posterior Lumbar Fusion.**

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University Hospital of North Staffordshire, Stoke-on-Trent, United Kingdom

#### **Introduction**

Post-operative complications are often experienced in a specialised area of surgery that requires specific care for the intervention performed. We report the case of a 36-year-old man who underwent elective posterior lumbar spinal fusion after presenting with bilateral leg pain with associated back pain.

#### **Presentation of Case**

This 36-year-old had undergone a L5/S1 discectomy 14 years ago, which provided good symptomatic relief. On this admission, he underwent elective L4-S1 posterolateral fusion and bilateral L4/5 and L5/S1 decompression. Intra-operatively a pedicle screw had to be re-inserted after fluoroscopy confirmed a lateral breach. The patient had no major postoperative complications until the sixth day when the patient re-presented with acute leg pain and weakness. Following a local multidisciplinary meeting (MDT) an MRI showed a large haematoma at the right psoas muscle. CT angiogram confirmed a bleeding lumbar segmental vessel at the site of the previous misplaced screw.

#### **Discussion and Conclusion**

A CT angiogram confirmed a bleeding lumbar segmental vessel at the site of the previous misplaced screw and an emergency fluoroscopic guided embolisation of the vessel was performed. The patient recovered well postoperatively and was discharged home within 12 days, with outpatient follow-ups organized.

### **A Review of the Risk Factors of Esbl in Dubai Hospital, United Arab Emirates**

**Ismail HMB**, Khan A, Zuberi B  
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#### **Introduction**

Modern medicine relies heavily on antibiotics to combat infection. The increased use of antibiotics is correlated with increased incidence of resistance to them. Extended Spectrum Beta Lactamase (ESBL) is mainly responsible for the development of resistance against beta lactams. The prevalence of ESBL is high in the Middle East.

#### **Method**

Data from 150 patients who presented with UTI, pyelonephritis or urosepsis from a hospital in Dubai were collected and analysed. Information about their demographics, co-morbidities, length of hospital prior to urine cultures, exposure to antibiotics in the last three months, previous hospital admissions, MSU cultures and organisms, antibiotic sensitivity and antibiotic resistance were collected and analysed. Statistical analysis was performed to obtain relative risks and statistical significance.

#### **Results**

45 patients (male - 18; female - 27) had grown positive cultures for ESBL. The mean average age was 70.4. The average length of stay was 12.5 days. 64% of the patients suffered from diabetes, 36% of the patients suffered from Ischaemic Heart Disease (IHD), 11% suffered from Chronic Obstructive Pulmonary Disease (COPD), and 22% had a history of cerebrovascular accident (CVA). 47% of the patients had previous hospital admissions in the last three months. The only antibiotic that statistically increases the risk of developing ESBL is Ciprofloxacin, which is in accordance with other studies.

#### **Conclusion**

Ciprofloxacin and previous exposure to hospital were risk factors determining the development of ESBL. IHD is also a statistically significant risk factor. To our knowledge, this has not been described as a risk factor in developing ESBL.

### **A Case Study of the Treatment of Rectal Extrasphincteric Fistula Using Different Surgical Methods**

**Adzege FM**  
Stavropol State Medical University, Russia

#### **Background**

Fistula of the rectum accounts for 15-45% of patients in the structure of colorectal pathology. The most urgent problem is the treatment of extrasphincteric fistulas of the rectum, as the used methods for elimination have significant deficiencies, are technically complex, require high qualification of the surgeon and a high percentage of relapses (8-32%). Furthermore, anal incontinence develops in 5-83% of the operated. Men are prone to this pathology more often than women. The ratio ranges from 2:1 to 5:1.

#### **Case Report**

In the department of coloproctology at Second City Hospital, Stavropol, Russia from 2010– 2015, 91 people were hospitalized for treatment of rectal extrasphincteric fistulas. There were 72 men and 19 women. Age range: 32–77 years. Duration of the disease: two months to 12 years.

#### **Methods**

Ligature method – 32 patients, Jad-Roble method – 40 patients, Blinichev method – 11 patients, Russian method (use of Tachocomb) – 8 patients.

#### **Results**

Relapse of the disease – 11 patients:

In five patients after excision of fistula with ligature.

In four patients after operation by Jad-Roble method. In two patients after operation by Blinichev method.

#### **Discussion**

The results were evaluated taking into account relapses and anal sphincter failure. The use of the ligature method allows to achieve good results of treatment in 18.2% cases, the use of traditional plastic techniques for Jad-Roble and Blinichev in 55.9% of patients, and the implementation of the Tachocomb method allows achieving good results in 94.4% of patients.

The new method, thanks to the properties of the "Tachocomb" preparation, creates a water and airtight sealed layer and eliminates the cause of the disease, allows to reduce the number of relapses of the disease to 2.8%, and completely avoid the inadequacy of the rectal closure.

#### **Conclusion**

To reduce the trauma of the anal sphincter, operations have been developed that make it possible to separate the fistula with a minimal risk of postoperative incontinence. This is why it is possible to reduce the risk of developing an anal sphincter deficiency and even completely exclude it.

### **A Rare Case of Chylous Ascites as a Presentation of Follicular Lymphoma**

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#### **Background**

Chylous ascites is a rare form of ascites caused by interstitial lymph leaking into the peritoneal cavity. The incidence ranges from 1 in 20,000 to 1 in 187,000 admissions in large tertiary hospitals. We report a case of chylous ascites secondary to follicular lymphoma.

#### **Case Report**

A 57 year old Asian gentleman presented with a 5 day history of worsening abdominal distension, cough and shortness of breath. He had travelled to India 3 months previously, but denied any TB contacts. His past medical history included asthma and hypertension. He was a non smoker and did not drink alcohol. He was independent and working as a care home manager. On examination, he had significant abdominal distension positive for shifting dullness. There were no stigmata of chronic liver disease, no palpable abdominal masses or lymphadenopathy.

Bloods showed eGFR 56, Hb 153, platelets 202, CRP 23 and WCC 5.3. A liver screen was negative for Hepatitis A, B and C and HIV. Immunoglobulins were normal. An ascitic tap revealed chylous fluid. CT TAP demonstrated a 6 x 12 x 9.5cm mesenteric tumour and lobulated para-aortic and para-cardiac lymph nodes. A CT-guided para-aortic mass biopsy demonstrated stage 3a grade I follicular lymphoma. He was subsequently referred to haematology and commenced on R- CHOP chemotherapy as empirical treatment for high grade lymphoma.

#### **Discussion**

Causes of chylous ascites include congenital disorders, trauma, surgical complications, malignancy and infection. Malignant causes are often secondary to lymphomas. The diagnosis is made following ascitic tap and confirmed by a triglyceride concentration >200 mg/dl.

Following this, a CT abdomen is required to look for masses. Further management depends on imaging results.

#### **Conclusions**

It is important to consider lymphoma as a diagnosis in a patient presenting with new abdominal distension without a significant past medical history.

### **Tranexamic Acid in Primary Total Knee Arthroplasty – Hype or Hero? A Single Surgeon's Case Series**

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#### **Background**

Tranexamic acid (TXA) can be used peri-operatively to reduce blood loss in knee operations. This study investigates the outcomes of surgery in elective primary total knee arthroplasty (TKA), with and without intravenous TXA use. The cost-effectiveness of TXA on reducing blood loss, transfusion rate and thromboembolic event in primary TKA is analysed.

#### **Methods**

Retrospective data was collected from a single surgeon's case series of primary TKA and divided into two samples – sample 1 (40 patients from 2007-08) used intra-operative cell salvage and no TXA; and sample 2 (80 patients from 2015-16) used 1g intravenous TXA peri- operatively and no cell salvage. Statistical and cost-effective analysis of TXA intervention was performed.

#### **Results**

The mean reduction in post-operative haemoglobin levels (mg/dL) in sample 1 was 32.8±11.2 (mean±SD) and 24.9±13.5 in sample 2 (p=0.002). The mean volume (ml) collected in closed- suction drain in sample 1 was 535±271 and 288±259 in sample 2 (p<0.0001). 35/40 patients (87.5%) in sample 1 required blood transfusions (28 autologous transfusions and 7 allogeneous transfusions), compared to 5/80 patients (6.3%) in sample 2 required blood transfusions. No thromboembolic event was recorded in both samples. Total cost incurred in sample 1 was £9982 for 40 cases, compared to £1044 for 80 cases in sample 2. TXA compared to intra- operative cell salvage potentially saved £107553 for 454 primary TKA cases that were performed in 2015-16 at our hospital.

#### **Conclusion**

TXA significantly reduced post-operative blood loss and transfusion rates in primary TKA without increased risk of thromboembolic event. TXA is a cost-effective measure to reduce unwanted bleeding, need to purchase blood and number of transfusions post-operatively. TXA also saves costs incurred from safety checks, harmful events associated with blood transfusions and prolonged patient stay.

### **Radial Head Subluxation Caused by Complete Distal Biceps Tendon Rupture: A 6-Year Follow-Up**

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#### **Background**

Radial head subluxation/dislocation generally presents in Monteggia fractures or elbow dislocation. It seldom occurs in isolation with soft tissue injuries. This report presents a 6-year follow-up of a published case of radial head subluxation caused by complete tear of the biceps tendon entitled 'Findings that shed new light on the possible pathogenesis of a disease or an adverse effect'. A literature review with keywords 'radial head' and 'biceps tendon', 'tear' or 'rupture' did not yield pertinent articles.

#### **Case Report**

A 60-year-old male originally presented in 2010 with a history of sudden-onset, severe pain in his non-dominant left arm after lifting a heavy weight, associated with weakness and inability to pronate and supinate the elbow. The diagnosis of biceps rupture was confirmed by clinical examination. X-rays revealed an incongruent radiocapitellar joint with radial head sag. The patient was treated conservatively with strengthening exercises that corrected the radial head subluxation. At 6-years the patient had a stable, asymptomatic elbow with normal alignment, full range of movement and grade-5 power of flexion, extension, supination and pronation that marked an improvement since discharge. Biceps asymmetry with slightly proximal biceps bulk was noted. X-rays of the left elbow showed a congruent radiocapitellar joint with no sag.

#### **Discussion**

The medical literature does not report radial head subluxation caused by complete biceps tendon tear, and limited evidence for conservative, non-operative treatment. The patient recovered with full strength and mobility of the elbow at 6-years.

#### **Conclusion**

This case reintroduces the concept of biceps tendon rupture as a cause of radial head subluxation, and reinforces the role of strengthening exercises in its management.

Furthermore, it opens the debate on the role of the distal biceps as the posterolateral rotatory stabiliser of the elbow joint.

### **The National Student Association of Medical Research (NSAMR) Publication Pathway**

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#### **Background**

Research experience has become increasingly important for medical students. The General Medical Council and medical schools encourage students to participate in audits and small research projects as part of their curriculum. However, medical students receive little to no training on how to publish their work or on open access publishing, and face many barriers to gain that experience as there is no formal training pathway for students to follow.

#### **Description of Innovation/Development**

In 2016, the National Student Association of Medical Research (NSAMR) created the NSAMR Publication Pathway. The Pathway consists of two components: educational modules in manuscript preparation, peer review, and editing; and a free to publish, open access journal, which is authored, reviewed, and edited by medical students.

#### **Discussion**

NSAMR has now recruited 229 Peer Reviewers, 33 Section Editors and 8 Executive Editors, and has local representation at all 35 UK medical schools. The NSAMR Journal is supported by the Wellcome Trust. Furthermore, members of the NSAMR team have won national and international awards for their work. NSAMR is now in discussions with established medical journals and higher education institutions to gain accreditation for its education modules.

#### **Conclusion**

The NSAMR Publication Pathway fulfils a currently unmet need for students across the United Kingdom. It increases exposure and education pertaining to the various aspects of the publication process such as manuscript preparation, submission and peer review. These are valuable learning experiences that will better prepare medical students for their medical careers.

### **The Quality of Life in Adult Patients with Syndromic Craniosynostosis from their Perspective**

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#### **Introduction**

Clinical intuition may perceive those adults with syndromic craniosynostosis to have a lower quality of life (QOL) compared with the normative population. Classification of facial difference, standardization of cognitive capacity, and selection of an appropriate QOL measurement tool provide a less intuitive and more evidence-based method of assessing QOL in this group of patients.

#### **Methods**

Adults with syndromic craniosynostosis treated by the same surgeons underwent Whittaker Classification for facial difference by an independent observer. Neuropsychology screening ensured cognitive ability in patients for independent answering of a World Health Organization QOL questionnaire. Data analysis using descriptive and z test statistics allowed comparison to nonsyndromic adult United Kingdom data provided by the World Health Organization.

#### **Results**

40 adult patients met authors' inclusion criteria. Whittaker Classification of facial difference ranged from I (31 patients) to II (8 patients) and III (1 patient). Quality of life showed no correlation to facial difference and was better in physical, psychological, and environmental domains compared with the normative adult UK population. No statistical difference was found in the social domain. Female Apert syndrome patients had a worse QOL than males in the social domain.

#### **Discussion**

Adult patients with syndromic craniosynostosis are perceived to have a poorer quality of life than those of the normative population. This may be in part due to the surgical and nonsurgical interventions that take place in childhood and subsequently until facial growth is complete. The purpose of this study was to assess what adult patients with syndromic craniosynostosis perceived their quality of life to be without the bias of a physician.

#### **Conclusions**

The counterintuitive findings show that adult syndromic patients with similar cognitive capacity perceive their quality of life as being above that experienced in a normative UK nonsyndromic population with no correlation to the degree of facial difference.

## Poster Presentations

### Does Purinergic Signalling Modulate the Release of IL-6 And IL-11 In Human Osteoblasts and Mesenchymal Stem Cells?

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#### Background

Bone is a dynamic tissue that undergoes continuous remodelling throughout its lifetime. This process is controlled by a number of factors both autocrine and paracrine. Accumulating evidence suggests that extracellular nucleotides play an important role in this process acting on both osteoblasts and osteoclasts. Furthermore, extracellular nucleotides have been linked to cytokines expression, with studies suggesting ATP can modulate cytokine release in osteoblast cells and their precursors through interaction with their P2 receptors.

#### Methods

The effect of ATP on IL-6 and IL-11 release was measured in both SaOS2 osteoblast-like cells and hMSCs using ELISAs. Subsequent assays using DBzATP (potent P2X7R agonist) and BBG (P2X7R antagonist) looked more closely at the P2X7R. Finally, assays were produced to identify the effect of 17 $\beta$ -estradiol treatment. Results were standardised for protein and displayed as a percentage of the control. Where appropriate data was analysed using one- way ANOVA with Tukey post-hoc tests.

#### Results

ATP modulated the release of IL-6 and IL-11 in both SaOS2 cells and hMSCs. Treatment with 40  $\mu$ M ATP increased the IL-6 release in both SaOS2 cells and hMSCs. IL-11 release was decreased with treatment of 40  $\mu$ M ATP in SaOS2 cells whereas it was increased in hMSCs. The results obtained using DBzATP and BBG were, however, more varied making analysis difficult while treatment with oestrogen yielded no conclusions.

#### Discussion

Consistent with previous studies the results indicated that ATP can have an effect on the cytokine release from human osteoblast like cells or their precursors. Limitations within the study have made analysis of the role of the P2X7R more difficult.

#### Conclusion

The cytokine profile seen in this study may suggest a role for ATP in increased resorption of bone through the regulation of cytokines IL-6 and IL-11.

### How Hard Can You Blow? Brass Instruments and Lung Function

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#### Background

Playing a brass instrument requires the ability to maintain and control expiratory flow at a variety of pressures. A number of studies had previously looked into the effect of playing a brass instrument on pulmonary function, with conflicting results. This study aimed to investigate the results of pulmonary function tests of brass musicians compared to healthy non-smoking control subjects, and it was hypothesised that the brass players would have significantly better results.

#### Methodology

Spirometry measurements were performed on 106 brass players and 269 controls including peak expiratory flow rate (PEFR), forced expiratory volume in one second (FEV1) and forced vital capacity (FVC). Spirometry parameters were normalised to the subjects' age, height and gender. The maximal expiratory pressure (MEP) was also measured. As control data revealed a diurnal variation in spirometry measurements, control and brass groups were also matched on the basis of the time of day the recordings were made.

#### Results

Results showed that the male brass players had significantly greater FVC and FEV1 values compared to the male control subjects, with no difference found in PEFR results. Both male and female brass musicians had significantly greater MEP values than their counterpart control subjects. MEP was positively correlated with height. However, as the control and brass groups were well-matched for height, this is unlikely to have influenced the findings. Instead this suggests that improved spirometry and MEP measurements are more likely to be associated with playing a brass instrument.

#### Discussion

These results raise the possibility of using this type of pulmonary exercise as a basis for intervention or management of patients suffering from restrictive pulmonary pathologies, with the potential to prevent decline in or even to improve long term lung function.

### **Coronary Artery Occlusion and Ischaemic Cardiac Pain Distribution**

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#### **Background**

Coronary heart disease remains the leading cause of death in the world. Although the heart is a central organ, the perception of ischaemic myocardial pain is often lateralising, with a wide inter-individual variation. This study aims to determine a correlation between the coronary arteries involved and the area of referred pain reported.

#### **Materials/Method**

Patients admitted to Coronary Care Unit for an angiogram for chest pain were studied. The study population were questioned regarding their pain experienced during the ischaemic episode. This was recorded along with information gathered from patients' medical files.

These results were matched with the individual coronary angiograms to see the extent of occlusion of each vessel. Only those vessels with 70% or more occlusion were considered.

#### **Results**

A total of 45 patients were included in the study. Eight showed to have left sided dominance, while six patients were co-dominant. ANOVA testing demonstrated a p-value of 0.01, allowing us to reject the null hypothesis and acknowledge a relationship between the number of different areas where pain was felt and the number of arteries involved.

#### **Discussion**

The number of coronary arteries involved in ischaemic events affect the distribution of pain felt by the patients. There have not been similar studies on this topic, which may have important clinical implications as well as roles to improve the understanding of human embryology and anatomy. This area needs further research to establish a correlation between the vessel affected and the area of pain felt.

#### **Conclusion**

The higher the number of coronary arteries shown to be occluded on coronary angiogram, the larger the area of referred pain felt by the patient.

### **A Local Study on Foundation Year Trainees' and Foundation Year Educational Supervisors' Views of the Educational Impact of Multisource Feedback (Team Assessment of Behavior TAB) in the Assessment of Medical Professionalism.**

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The author set out to explore the views of Foundation Year (FY) trainees and FY educational supervisors on the educational impact of Team Assessment of Behavior (TAB) during the last four years among FY trainees in a Teaching District General Hospital (TDGH).

#### **Methods**

The author applied validated questionnaires to FY trainees and FY educational supervisors. The author then analyzed failed FY TAB assessments done over a four-year period.

#### **Results**

43 (66%) of 65 FY trainees and 19 (34.5%) of 55 FY educational supervisors responded. 62% of our FY respondents agree TAB has a positive educational impact resulting in behavioral change. Majority of FY trainees as well as FY educational supervisors agree trainees do not behave for the assessment and the resultant behaviour change is not transient.

Most trainees find TAB stressful, but mostly from the administrative aspects. 77% of FY educational supervisors believe that TAB has a positive educational value; 83% believe it is an effective tool in identifying trainees that need corrective action. While the majority (89%) of the educational supervisors sampled viewed themselves to have had adequate training in feedback skills, almost half (47%) felt they could do with more training in feedback skills. Out of a total of 263 FY trainees over four years, six (2.3%) failed TAB. Four of the six (66.7%) failed TAB due to concerns raised by assessors and two due to insufficient or incorrectly constituted returns. Most concerns (43.75%) were from the "Team Working" TAB domain.

#### **Conclusions**

TAB has educational value resulting in behavioral change. It can be further strengthened by minimizing administrative burdens to trainees and according educational supervisors opportunities for advanced training in feedback skills.

### **Treatment Charts - Are They Being Filled In Correctly?**

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#### **Background**

Treatment charts are basic inpatient documents through which pharmaceutical treatment is prescribed and dispensed. Errors in treatment charts therefore compromise patient safety.

#### **Aim**

The study aimed to measure appropriateness of ward treatment charts in both medical and surgical wards in a government hospital in Malta, the only acute teaching hospital in Malta. The hospital In Patient Treatment Chart Draft Document Policy was used as a gold standard.

#### **Methodology**

A retrospective cross-sectional study analysed 261 treatment charts over 181 days. Data was randomly collected from 16 medical (n=174, 66%) and eight (n=87, 33%) surgical wards. Wards were allocated a code to maintain anonymity. Errors in calligraphy, drug names, dosages and abbreviations were analysed.

#### **Results**

16 charts (6.13%) had no errors recorded, 160 (61.30%) had between one and three, while 74 (28.35%) recorded four to six errors. There was no statistically significant difference between the total number of errors in medical and surgical ward charts ( $p = 0.056$ ). Doses were left blank in 2.68% of charts, trade name was used in 33.33% of charts, and 5.75% of charts contained abbreviated drug names. 33.72% contained Latin abbreviations.

#### **Discussion**

Medication errors might reflect time limitations and lack of continued medical education. Drug name abbreviations might lead to the administration of the wrong drug. Latin abbreviations for administration frequency and non-standard units should be avoided.

#### **Conclusion**

The majority of charts recorded three or less errors while a third of recorded more than three. An improvement in chart documentation would enhance the appropriateness of charts in the audited hospital.

### **Radiological Biliary Manipulation Requires Prophylactic Antibiotics**

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#### **Aims**

To investigate whether radiological procedures without antibiotic prophylaxis lead to higher levels of mortality and morbidity.

#### **Methodology**

A retrospective case-note review was conducted to evaluate the service. A three-month period of all patients undergoing a percutaneous transhepatic cholangiographic procedure (PTC) at a large tertiary centre for hepatobiliary surgery was performed. Outcomes identified were the rates of sepsis, 30-day mortality, length of inpatient stay, and prescription of antibiotics.

#### **Discussion**

Over a three-month period, 11 patients with biliary tract malignancies had PTCs; 21 radiological biliary procedures being performed on them. All patients developing sepsis did not have pre-procedure antibiotics. Length of inpatient stay was longer in those developing sepsis post-procedure (25.75 days vs 14.5 days). Other authors have identified a need for prophylactic antibiotics for PTCs and our findings are in agreement.

#### **Conclusion**

Routine antibiotics prescriptions pre-procedure has been adopted in this trust due to the increased incidence of sepsis. The antibiotic regimen has been based on the local Whipple's procedure prophylaxis guidance.

### **Ionizing Radiation Is a Hazard: Is Your Imaging Request Justified?**

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#### **Introduction**

During the past few years, the extent of ionizing radiation exposure amongst patients has increased dramatically. It is often the case that non-radiologists request examinations involving ionizing radiation. Previous European studies have shown that a significant portion of various radiological examinations being requested by medical doctors were either inappropriate or unnecessary.

#### **Methods**

This study aimed to determine whether the patients' exposure to ionizing radiation is justly indicated for diagnostic or clinical management purposes, according to standards defined in the European Commission (Radiation Protection 118) Referral Guidelines for Imaging. This audit involved the investigation of 750 imaging request forms of adult patients who have had an ionizing general imaging investigation at the state general hospital between January 2016 to June 2016. The author tabulated brief clinical details from imaging request forms, namely 44 head and neck x-rays, 98 spine x-rays, as well as 420 musculoskeletal system, 140 cardiothoracic and 48 gastrointestinal system x-rays. This information was then compared to standards defined in the European Commission Referral Guidelines for Imaging to fulfill the objective outlined earlier. Data analysis was carried out by means of simple descriptive statistics.

#### **Results**

Out of a total of 750 imaging requests, 494 (66%) were considered to be indicated for clinical or diagnostic purposes. The majority of non-indicated request forms belonged to the head and neck as well as spine imaging categories.

#### **Conclusion**

Conclusions from the data analysis indicated that referring physicians possess intermediate knowledge with regards to justification of imaging criteria. Following short lectures on this topic, patients are likely to benefit from the reduction of unnecessary exposure to ionizing radiation.

### **Adverse Drug Reactions in Paediatrics with Communication Difficulties**

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Children with communication difficulties may not be able to explain their symptoms to families/carers, and adverse effects of medicines may therefore not be obvious.

#### **Objective**

To examine historically collected data on adverse drug reactions (ADRs) to establish if children and young people with communication difficulties have known risk factors for development of adverse drug reactions, and to undertake a prospective audit of outpatients clinics for ADRs in this population.

#### **Method**

Data from "Adverse Drug Reactions in Children" (ADRIC) inpatient study was reviewed. The number of medications used by children and young people with diagnoses consistent with a communication disorder (autistic spectrum disorder, learning difficulties, developmental delay) was compared with other diagnoses (appendicitis, asthma, bronchiolitis, VSD, seizure).

Prospective audit of community paediatric, psychiatry, and neurology clinics was undertaken for suspected ADRs.

#### **Results**

ADRIC data showed inpatients with communication difficulties (n=160) and other common paediatric conditions (n=743). Within the communication difficulties cohort, there were 66 suspected ADRs (28.1%) and the population used a mean of 7.57 medicines per patient. In the common paediatric condition cohort, there were 119 suspected ADRs (16.0%) and the mean number of drugs was 6.89.

There were 66 ADRs, of which 27 would have met the criteria to be reported within the Medicines and Healthcare Products Regulatory Agency (MHRA) yellow card scheme.

#### **Conclusions**

Patients diagnosed with communication difficulties have polypharmacy and may have a high frequency of ADRs compared to those with common paediatric diagnoses. Previous ADR studies have excluded children and young people with communication difficulties. Careful evaluation of this population in prospective studies is required.

### The Cost of Diabetic Charcot's Arthropathy

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#### Aims

Charcot's arthropathy is a devastating foot condition that is made more destructive by the difficulty in recognising its early signs. Of its many causes, Diabetes is acknowledged to be one of the most common. This report attempts to assess the cost of Charcot's arthropathy, and provide ideas on how to reduce these costs in both the outpatient and inpatient setting.

#### Methods

Two patients' journeys, with differing clinical experiences, were mapped out through NHS services. These journeys were then analysed and used to calculate both the average hospital costs relevant to the trust, and a lower level hospital costing specific to the patients.

#### Results

Inpatient care for ulceration in Charcot's costs more than double that of outpatient care (£4,414 and £2,003 respectively). Repeated admissions due to Charcot's lead to more than 4,400% increase in hospital costing (£778 to £34,253). Total cost of more than £88,000 for repeated admissions due to Charcot's.

#### Conclusion

Strategies to reduce these costs are vital due to both the difficult economic climate and a rise in the incidence of diabetes. A holistic approach is key, with emphasis on both patient and professional education in order to correctly diagnose and manage this condition. In addition to this provision for a specialist team, to provide comprehensive foot care at an easy to access point will lead to a reduction in overall costs.

### The Role of European Medical Students in Promoting eHealth

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#### Introduction and Problem

Electronic Health (eHealth) is the use of digital tools and services for health purposes and is the future of medicine. eHealth connects the preventive, promotive, curative and rehabilitative aspects of care and improves patient safety by limiting medical errors.

Medical students and professionals around Europe are not receiving adequate education regarding the importance of eHealth. This leads to lack of awareness, lack of trust and various misconceptions about eHealth in medicine. Furthermore, taking into consideration the benefits of eHealth, the role of healthcare students and professionals is also to educate the general population and to advocate for the implementation of eHealth tools.

#### Methods

Information about medical education on eHealth was gathered from European medical faculties and a literature review conducted. A policy paper with a number of recommendations to tackle the problem was adopted. A number of stakeholder events on a European level were attended and the views of medical students shared. Finally, through a series of online and face-to-face meetings, medical students from different European faculties were educated about eHealth and its importance in Public Health and medicine in general.

#### Results and Effects

The activities and efforts resulted in the:

- increased awareness of eHealth in students from over a hundred medical faculties across Europe
- increased advocacy on a European level through the joining of the European Commission's Stakeholder group on eHealth
- increased promotion of eHealth among patients through a number of educational campaigns in 14 different European countries and
- realisation of advocacy programs in local medical faculties that promote the implementation of eHealth literacy courses as part of the medical curriculum.

#### Conclusion

The potential benefits of eHealth in medicine cannot be overstated and, by directing our efforts and including medical students, the shift to eHealth practices in medicine can be more effective.

### Early Warning Score and Associated Physician Response Time

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#### Background

The purpose of this study was to assess whether local guidelines are being followed. Should a patient's Early Warning Score (EWS) score  $>4$ , the duty doctor is informed and response documented within 30 minutes. Should the patient's EWS score  $>6$ , the registrar or consultant should be informed and a documented plan must be in the notes within one hour.

#### Results

Following education, presentations in M&M meetings and posters, 51 patients were re-audited. The response rate showed 19% of patients scoring four were seen but 87% of patients scoring six or above. Reasons given included being present on the ward already, consistently high scoring patients and EWS hypersensitivity, a point which is a significant area for study in the future.

#### Conclusions

While performed on a surgical ward, the instability of surgical and emergency patients can be similar. Response times varied but generally improved following education.

### Analgesia in Fractured Neck of Femur Patient with a Fascia Iliaca Compartment Block Protocol

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#### Background

Fractured neck of femur is a common cause of admission among the elderly population. Many patients wait up to 48 hours before surgical intervention. During this time their pain is treated with systemic analgesia. For many frail patients, it can be difficult to balance adequate analgesia with side effects of opiates. As a result, pain can be difficult to manage pre-operatively. In addition, many of the patients admitted with fractured neck of femur have either long-standing cognitive impairment or delirium and may not be able to adequately communicate their pain levels. It is likely that analgesia in this group is often sub-optimal.

#### Objectives

Patients who experience greater pain during inpatient treatment for fractured neck of femur are at higher risk of delirium, slower to mobilise, have poorer health-related quality of life, and are more likely to report persistent pain three to six months after fracture. NICE guidance suggested that regional anaesthesia be considered for all of these patients.

#### Methods

For this project, two measures were considered. These were process measurements: regular documented pain observations, and whether a femoral nerve block or fascia iliaca block had been performed.

An initial retrospective audit of 35 patients with fractured neck of femur was conducted from patient notes. Data collected included hourly pain scores for first 10 hours from admission and nerve blocks administered.

#### Results

Baseline results showed: 35 patients (23F, 12M. Mean age 81.9y, range 60–92y). Pain score average: 4.1/10 (range 2.9–5.1). Number of nerve blocks considered: 5 (14%). Number of blocks performed: 5 (14%). Techniques included femoral nerve block and fascia iliaca block. The procedure was not clearly documented for two of the blocks performed.

We drew up a protocol and held training sessions bringing about a culture change to provide an excellent standard of analgesia for these patients.

#### Discussion

Following the initial audit, we drew up a protocol to bring a culture change. Although we assumed that once the FICB protocol was available it would be immediately utilised, it became evident that there was a training issue. Junior doctors were lacking confidence in using the technique. These difficulties were overcome by liaising with Orthopaedic and ED consultants, presenting the case for the FICB at orthopaedic departmental meetings, and setting up and delivering extra training for junior and middle grade staff.

#### Conclusion

The problem that we initially noticed was that many elderly patients in our hospital with fractured neck of femur had high levels of pain between admission and surgery. NICE guidance suggested that regional anaesthesia be considered for all of these patients, but the initial audit revealed little evidence of such consideration. In our small DGH we found that most junior doctors had no experience in performing any type of nerve block and lacked confidence in doing so. By communicating with doctors of all levels in emergency, orthopaedic and anaesthetic departments, a culture change came about where FICB was considered for all patients with fractured NOF. Key to supporting this change was a proforma that was developed to act as both aide-memoir and documentation of the block.

Education of junior doctors was vital to this culture change.

### **A Re-Audit into the Management of Soft Tissue Knee Injuries after the Addition of an Extended Scope Physiotherapist into the Emergency Department**

**Cole KL**

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#### **Background**

This study re-audits the management of soft tissue knee injuries in a South Wales hospital after an extended scope physiotherapist (ESP) was introduced into the emergency department (ED) in 2016. Their role was to triage orthopaedic patients and formulate appropriate management plans. This audit focuses on the effect that this new model of care has had on discharge statistics, waiting times, and the surgical conversion rate (SCR), whilst exploring the benefits that this could have on patient outcomes and their pathway from ED to discharge.

#### **Methods**

This retrospective cohort study analyses the patient pathway of 364 patients with soft tissue knee injuries that presented to the ED, and therefore the ESP clinic, between June 2016 and March 2017 (10 months).

#### **Results**

64% of patients seen by the ESP were discharged with no further investigations, compared to just 8% in the previous study. The percentage of patients referred to orthopaedics dropped from 92% to 12%, with an average waiting time of 36 days. The average waiting time for MRI was 21.5 days, compared to 35.7 days in the previous study. All patients reviewed by a consultant underwent imaging before their clinic appointment. The SCR increased from 25% to 69%.

#### **Discussion**

The significant reduction in referrals to fracture clinic shows the ability of ESPs to manage patients independently, and the dramatic increase in the SCR demonstrates appropriate selection for orthopaedic referral. These factors, along with reduced waiting times for imaging, demonstrate that the addition of an ESP has led to a more efficient patient pathway.

#### **Conclusions**

This study supports the use of ESPs as orthopaedic triage in UK EDs as the results suggest an improvement to the pathway of patients with acute musculoskeletal injuries. This model could therefore be used to help alleviate the growing demand on orthopaedic services.

### **Virtual Fracture Clinics: A Way of Improving Care and Reducing Costs?**

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#### **Introduction**

Fracture clinic acts as a vital safety net for detecting injuries that may require early operative intervention, which may have been missed in the emergency department. BOAST guidelines state that following acute orthopaedic injury, patients should be seen in a new fracture clinic within 72 hours of presentation.

#### **Methods**

This retrospective audit assessed the waiting times during a one-month period in a UK district general hospital with a proposed audit standard that all patients referred from A&E should be seen in fracture clinic within three days. The audit also examined the number of patients that were admitted late for surgical intervention.

#### **Results**

A total of 367 new patients referred from A&E were seen in fracture clinic during April 2010. The results showed that median waiting time to be seen in fracture clinic was 13 days with a range of 1-50 days. Only 34 patients were seen within three days. 17 patients were admitted from their first fracture clinic appointment, of which 11 patients were admitted more than 12 days after being referred from A&E (range 7-24 days).

#### **Conclusion**

The results demonstrate long waiting times from A&E referral to time seen in fracture clinic. 11 patients were admitted late from fracture clinic, at least 12 days after their initial referral. This group of patients may have experienced an adverse outcome. We introduced a consultant-led virtual fracture clinic to help tackle the problem. Every morning the on-call consultant from the day before would review notes and radiographs of all emergency department referrals to fracture clinic and decide whether to bring patients in, expedite appointment or keep current appointment. After the implementation of this VFC, the median waiting times and late admissions were significantly reduced, in turn improving patient care whilst simultaneously reducing costs.

### **Asthma Emergency Admissions Audit**

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#### **Background**

The National Review of Asthma Deaths (NRAD) found that 21% of patients who died of asthma had attended A&E with asthma in the year prior to death. 10% of patients died within 10 days of being discharged from hospital where they were treated for acute asthma, 13/19 of these patients had potentially avoidable factors in relation to their discharge and follow up arrangements.

#### **Methodology**

This audit aimed to assess the clinical assessment, management, discharge planning and follow up of patients who attended A&E or were admitted to hospital at Pennine Acute Hospitals NHS Trust (PAHNT) due to their asthma. The data was collected retrospectively using the electronic systems to review previous scanned in clerking documents, blood results, x-rays and secondary care information.

#### **Results**

Out of 143 patients audited, 26.6% had attended twice or more. Clerking documentation had limited information, only 50% documented their current asthma treatment, less than 30% included asthma control and assessing risk factors and 36% of patients had no peak flow on presentation documented. 81% of patients had no follow up plan documented on discharge and were not told to visit their GP.

#### **Discussion**

NRAD recommended that patients who have attended A&E twice or more in one year should be referred to secondary care, only 17% patients were known to secondary care in this audit. This outlines missed opportunities to intervene. The lack of proper history, assessment and grading of severity of asthma outlines that the trust is not meeting NICE or BTS Guidelines.

#### **Conclusion**

A proforma to be used in A&E has been produced to ensure these missed details are documented and to include a comprehensive discharge checklist outlining the correct follow up plan for each individual patient. Educational lectures will also be given to increase awareness of correct and safe management for asthmatic patients.

### **Audit of Post-Operative Hemocue® Monitoring for Patients with Femoral Neck Fracture**

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#### **Background**

Femoral neck fracture is the most common condition requiring emergency orthopaedic surgery in the UK. The majority of these patients are aged over 65 years with many having concomitant illnesses. Perioperative haemoglobin monitoring, including point of care testing (POCT), prompts early intervention and improves outcomes in this vulnerable patient group.

#### **Methodology**

The present study comprises a retrospective analysis of 60 consecutive patients, aged 65 and over, whom underwent surgery for a femoral neck fracture. Our analysis included patient age, operation type, pre- and post-operative haemoglobin levels, hemocue result, and the need for a blood transfusion. We compared our data to local and national guidelines and these formed the basis of our standard for comparison.

#### **Results**

We collected data from 60 consecutive femoral neck fracture cases which demonstrated the majority of whom underwent hemiarthroplasty (25 cases; 42%), followed by DHS (13 cases; 22%), long intramedullary nail (eight cases; 13%), THR (seven cases; 12%), short intramedullary nail (five cases; 8%), and dynamic cannulated screw (two cases; 3%). Average patient age was 82.3 years and we found a mean pre-operative haemoglobin of g/L and a mean post-operative haemoglobin of 103.4 g/L across our cohort. We found that only 38% of patients (23 out of 60 cases) underwent the hemocue POCT with a total of 16 cases (27%) requiring blood transfusion within this cohort. We also discovered that 10% of cases without a hemocue POCT suffered a delay in blood transfusion of at least a day.

#### **Discussion**

Our study demonstrates that only a small number of patients underwent peri-operative hemocue monitoring despite the potential need for timely blood transfusion within this patient group.

#### **Conclusion**

Hemocue checking prompts earlier transfusion and should form part of the surgical pathway for every patient undergoing surgery.

## Are Patients Treated with Disease-Modifying Antirheumatic Drugs (DMARDs) Being Monitored Appropriately in Primary Care?

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### Background

DMARDs are a group of medications that suppress the body's overactive immune system, thereby reducing inflammation and relieving related symptoms. They have proven to be effective in several inflammatory conditions including rheumatoid arthritis. The National Institute for Health and Care Excellence (NICE) guidelines have recommended performing specific tests to monitor DMARDs within a specified timeframe in primary care in order to detect signs of complications such as hepatotoxicity or myelosuppression. These include a full blood count, liver function tests, urea and electrolytes, as well as others.

### Aim

To assess whether patients who are on DMARDs were being monitored appropriately between the suitable time intervals in a primary care practice.

### Methodology

Using the Egton Medical Information System (EMIS) database, 41 patients who have been prescribed one or more DMARDs were selected in this study.

### Results

Only eight (20%) patients were found not to be monitored out of the 41 patients. Of the 33 patients who were monitored, 24 (74%) were not being monitored correctly according to guidelines set.

### Discussion

Analysis reveals that some of the patients who were not monitored did not require monitoring with the DMARD they were prescribed, such as Hydroxychloroquine. Other reasons which justified lack of monitoring included: the lack of patient education regarding the necessity of regular monitoring, and the possibility of being monitored during secondary care appointments.

### Conclusion

Monitoring patients on DMARDs is essential due to its cost effectiveness and its positive impact on patients' health.

## Prescribing Chemical Sedation in Hospital: An Argument for Case Based Ethics and Law Teaching

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### Introduction

Prescribing sedation for agitated or aggressive patients is a challenging task ethico-legally. I researched the experiences of FY1s of being asked to prescribe sedation for patients treated under Capacity Legislation at Royal Oldham Hospital.

### Method

FY1s were given a paper survey at one mandatory teaching session in March, asking whether they had been asked to prescribe sedation and what steps were taken. A second part regarding ethics teaching was included. Of 18 responses, two were excluded as the patient was sectioned under the Mental Health Act. 14/16 responses reported they had been asked to prescribe sedation.

### Results and Discussion

In 3/7 instances sedation was prescribed, capacity was not assessed. One patient was prescribed sedation despite having capacity and refusing. If a patient's capacity to decide is not being assessed, the prescription of sedation has ethical repercussions: autonomous choice should be respected, and prescribing sedation potentially in the face of that is paternalistic and breaches what is permitted by Capacity Law.

FY1s are prioritising beneficence to other patients when prescribing sedation. 8/14 requests for prescription cite 'aggression', and 6/14 cite risk to others. Only 4/14 requests were aiding treatment. 4/7 prescriptions were in part justified by 'risk to others'. Infringing a person's autonomy for the benefit of others is a serious breach of ethical principles, more appropriately dealt with through law and order than 'medical treatment'. This widespread practice breaches what is permitted by Capacity Law.

### Conclusion

FY1s must be taught on how to navigate the ethico-legal challenges raised by this complex task. However, 83% of FY1s reported not to have received any teaching on this situation. 78% of FY1s wanted ethical teaching to be 'case-based' or 'FY1 practice specific' which, if introduced, may improve adherence to the law and ethical guidelines in this and other complicated scenarios.

### **Improving the Quality of Trauma + Orthopaedic Discharge Summaries**

**Selvachandran H**

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#### **Methodology**

Initial EMIS database search included all Trauma + Orthopaedic discharge summaries received at Weaver Vale Practice for eight months (retrospective). Exclusions were discharges from other hospitals, clinic letters, and no data in EMIS. 50 discharge summaries were audited applying SIGN guidelines.

#### **Results**

Demographics, consultant, dates, referral source and admission mode 100% compliant. Overall compliance with SIGN guidance was 73%.

#### **Cycle 2 Aim**

Implement changes to comply with SIGN guidance and GP expectations.

#### **Methodology**

"Hash's T&O Discharge Summary Checklist" given to all T&O doctors in a small laminated card. The quality of the Trauma and Orthopaedic discharge summaries sent from 9th to 14th January 2017 re-assessed (retrospective).

#### **Results**

100% compliance achieved for presenting complaint, primary diagnosis, relevant investigations, operation with no acronyms, new medication, and follow-up. Over 85% compliance to state operation date and operation complicated or uncomplicated. Physiotherapy detail compliance was 56%. Poor compliance for wound management and time off work information.

#### **Discussion**

This audit was initiated to provide optimum information and comply with current guidelines. Ultimately, the audit aimed to reduce the number of unnecessary GP appointments and improve communication between secondary and primary care. As well as assessing the compliance to SIGN guidance, discharge summaries were assessed for including additional information that GPs wanted to know (wound management, time off work). Limitations were that numbers of summaries in Cycle 2 were low, but this needs to be re-audited to ensure standards are maintained.

#### **Conclusions**

Compliance to SIGN guidance has increased by 23% since implementing "Hash's T&O Discharge Summary Checklist", to an overall compliance of 96%. However, improvement is still needed in including information about physiotherapy, wound management and time off work.

### **Internet Use as a Source of Health-Related Information Among Students in Al-Baha University, Saudi Arabia 2015**

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#### **Objective**

Internet users in Saudi Arabia are about 17,397,179 and, even though health related issues have become very popular in our country, health information websites represent a small portion of all websites.

The objective was to estimate the proportion of students in Al-Baha University, Saudi Arabia, who use the internet to search for health-related information, determine their perception of internet use, and investigate their attitude to internet-related health information.

#### **Methods**

A total of 280 self-administered questionnaires were distributed to five colleges in Al-Baha University, Saudi Arabia. The students were randomly selected to complete the questionnaire. The purpose of the study was explained to the students and they were given the choice to participate or refuse.

#### **Results**

67% of the respondents used the Internet as a source of health-related information, especially disease-specific information (46.1%). 38% used the Internet monthly to look for health-related issues. 34% used the Internet to rate their hospital or doctor. 35% used the Internet to search for health-related information before visiting their doctor. 77% agreed to use the Internet (social media) to communicate with their health care provider. 42% did not prefer to use the web cam to communicate with their health care provider. There was a significant association between Internet use and type of college ( $p = 0.02$ ).

#### **Conclusion**

Internet use to obtain health-related information is relatively good among the students of Al-Baha University, Saudi Arabia.

## Isolated Acute Renal Failure due to the Retinoic Acid Syndrome in Therapy-Related Acute Promyelocytic Leukemia

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### Background

Acute promyelocytic leukemia accounts for 10% of acute myeloid leukaemia. It has specific clinical, morphological, and biological features being associated with t15;17 that leads to the hybrid gene PML/RAR.

### Case Report

Presentation: A 68-year-old man presented with symptomatic anaemia. Three years previously he was treated for colonic adenocarcinoma with chemotherapy/adiotherapy. Investigations and Management: Bone marrow analysis revealed 50% infiltration by hypergranular promyelocytes. t15;17 was identified. The patient was treated as per PETHEMA protocol. Two weeks after starting treatment, there was a progressive increase in creatinine and C-reactive protein (CRP) and the patient was feverish. Urine culture showed E. Coli and the patient was given antibiotics, but CRP and creatinine continued to rise. This was initially attributed to dehydration, aminoglycoside and contrast toxicity. Dialysis was considered but the patient responded dramatically to the introduction of dexamethasone on day 20 without need for discontinuation of All Trans Retinoic Acid (ATRA). The acute renal failure (ARF) was attributed in retrospect to the retinoic acid syndrome (RAS). The patient achieved molecular remission after the final consolidation cycle and is now on maintenance.

### Discussion

Renal failure has been documented in 39% of cases in RAS in conjunction with the other more common manifestations, 3-5% requiring dialysis and a mortality of 5-20%. In another series, the incidence of both RAS and ARF were increased with 20.7% of patients requiring dialysis and a higher mortality of 37.9%. This was attributed to late diagnosis with treatment being started 14 days after onset of ATRA. Isolated renal failure is very rare and is due to extensive infiltration by leukaemia cells.

### Conclusion

Our case the isolated ARF due to the RAS in a case of therapy-related APL responded completely to the introduction of dexamethasone without the need for dialysis even though the diagnosis and treatment were so delayed.

## Is Bariatric Surgery the Solution to Solving Rising Obesity Epidemic?

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### Background

Obesity and related illness is a major life-long condition that threatens to bankrupt the NHS. The European statistics on obesity label UK as the "fat man" of Europe (Academy of Medical Royal Colleges). Nearly 60% of adults and quarter of children are overweight (WHO, 2014).

Various systematic reviews and meta-analyses report a strong correlation between obesity and type 2 diabetes, cancer and cardiovascular disease (BMC Public Health 200099:88; Gang et al 2016 Eur J Pub Health). Traditional measures such as dieting, exercise and medications, so far, have not been able to control this epidemic. Bariatric surgery, however, seem to be showing encouraging results in terms of sustained weight loss and improving overall health of patients.

### Materials and Methods

A search was carried out to identify efficacy of bariatric surgery as one of the tools to combat obesity. Databases such as National Bariatric Surgery Registry (NBSR) and Hospital Episode Statistics (HES) were analysed.

### Results

The outcome from the NBSR registry data report 76.2% operation performed in the NHS while 22.3% were performed privately. A progressive increase in "more sick" patients undergoing bariatric surgery was observed. The report shows a decrease in average stay in the hospital from 3.7 to 2.1 days. Nearly 60% of patients lost their excess body weight in 3 years and returned to their 'normal functional state' and 65% of diabetic patients were able to stop their diabetic medications. The HES analysis report show a significantly less in-hospital mortality of <0.5% compared to other commonly performed operations.

### Conclusion

The medium term results observed support the view that bariatric surgery, if required, is a safe and cost-effective option in combatting obesity related illness particularly diabetes. It should, however, be not taken as the only means to combat obesity as a change in lifestyle is needed.

### **A Case Study of Radio-Recurrent Basal Cell Carcinoma of the Perineum**

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#### **Background**

Basal cell carcinoma (BCC) is the commonest non-melanoma skin malignancy in the world. Classically, the aetiology of BCCs includes exposure to long term UV radiation. Consequently, BCCs are typically located in exposed areas and they can be managed medically or surgically. Here we present a rare case of radio-recurrent extensive perineal BCC, requiring radical treatment involving Oncology, Plastic and Colorectal surgery.

#### **Case Synopsis**

A 72-year-old male presented with an ulcerated lesion on the perineum. He received radiotherapy for a perineal BCC 19 years previously. On examination, an extensive ulcerated lesion with rolled edges was noted adjacent to the anus. Rectal examination identified induration along the anal margin. MRI identified a 65mm lesion invading the distal internal sphincter. Biopsy confirmed an adenocystic basal cell carcinoma. The skin and colorectal multidisciplinary teams discussed the treatment options, including abdominoperineal resection or neoadjuvant therapy followed by local resection. Ultimately the patient underwent six cycles of topical vismodegib followed by a two stage surgical procedure. The first stage involved creation of a de-functioning loop colostomy to prevent contamination of the perineum post resection. The second stage involved resection of the lesion with wide margins and closure with bilateral V-Y flaps from the lower buttocks. The de-functioning colostomy was successfully reversed six months later and there has been no evidence of recurrence thus far.

#### **Discussion**

Perineal BCCs are rare and cases from the literature are sparse. Evidence to support a specific management approach is lacking. In this case the patient was managed by both skin and colorectal MDTs. Despite initial involvement of the anal margin, treatment avoided radical surgery with permanent stoma creation whilst achieving complete resection with clear margins.

#### **Conclusion**

To conclude, in this case an extensive radio-recurrent perineal BCC was successfully treated with topical vismodegib and local excision with de-functioning colostomy.

### **Delayed Diagnosis of Whipple's Disease: Blood Culture Negative Infective Endocarditis**

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#### **Background**

Classical Whipple's disease is a multi-systemic disease caused by *Tropheryma Whipplei*, that presents with a prodromal arthralgia followed by gastrointestinal symptoms of weight loss, diarrhoea and abdominal pain. It is a recognised cause of blood culture negative endocarditis and most commonly affects the aortic valve.

#### **Presentation**

A 46-year-old lady had vague symptoms for eight years, and had been undergoing treatment for Adult-Onset Still's disease. Following a year history of abdominal symptoms, arthralgia and a rash, she had a jejunal biopsy that was PAS and Whipple's DNA PCR positive. She was admitted to hospital with syncope, and was treated for pneumonia until she was transferred to ICU with CNS deterioration. During her prolonged stay, she developed bilateral gangrenous toes and an LV thrombus, for which she was anticoagulated.

#### **Investigations**

Due to ongoing pyrexia, she had a TOE which revealed a 5mm vegetation on the aortic valve with moderate to severe aortic regurgitation and severe LV systolic dysfunction.

She developed right lateral gaze diplopia and a swollen, painful right eye. This was biopsied by the ophthalmologists and confirmed Whipple's disease.

After continuing on antibiotics for six months, her CRP decreased from 278 to 42mg/L. She had a PICC line inserted and was discharged on IV Ceftriaxone, Doxycycline and

Hydroxychloroquine for a year due to high risk of relapse. Subsequently her LV function and her aortic regurgitation significantly improved.

#### **Discussion**

In spite of having presented with the classic symptoms of Whipple's, it took eight years for her to have a confirmed diagnosis. This led to a delay in her appropriate treatment.

#### **Conclusion**

Although symptoms are vague and may mimic other autoimmune diseases, it is important to consider the diagnosis of Whipple's disease and infective endocarditis in patients presenting with a symmetrical, non-deforming arthralgia and blood culture negative endocarditis.

## The Role of Medical Students in Overcoming Antimicrobial Resistance .

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### Introduction and Aim

Antimicrobial resistance (AMR) is a very serious concern in medicine and many efforts are being made to promote the proper use of antimicrobials. As highlighted in the "Action Plan against the rising threats from Antimicrobial Resistance" by the European Commission, education is an important aspect in overcoming AMR. Nonetheless, medical students do not have the necessary knowledge about AMR and also get a first-hand experience of the inappropriate use of antimicrobials through their clinical attachments. The need to educate students about appropriate antimicrobial use and to include them in the fight against AMR is evident.

### Methodology and Results

A literature review to understand the threats of AMR was carried out and the points of concern highlighted. A working group on the role of students in AMR was set up and achieved the following:

Increased awareness on the threats posed by AMR amongst medical students from 25 countries across Europe through online and face-to-face education workshops, the sharing of materials and through a number of awareness events

More appropriate antimicrobial use through advocacy among medical practitioners

Increased appreciation about the importance of appropriate antimicrobial use among patients through a number of awareness campaigns and outreaching events organised by medical students across Europe.

Improved collaboration between healthcare professionals through the development of a joint policy paper between medical, dental and pharmaceutical students.

Increased advocacy on a European level through the participation in stakeholder events.

### Conclusion

Education is the most effective way to promote the appropriate use of antimicrobials in future healthcare professionals. Furthermore, as seen in the results, by including healthcare students and student associations, there is an improvement in AMR awareness among the different groups of society. Not realising the value of educating and involving students could therefore be a missed opportunity in tackling AMR.

## A Series of Case Studies on the Novel Phenomenon of Whiplash Bladder

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### Background

We describe the phenomenon of the development of lower urinary tract symptoms (LUTs) following accidents in which there is no direct bladder trauma or pelvic fracture, and propose the umbrella term 'Whiplash Bladder'.

### Case Study

We present four cases in which women, following accidents, have experienced new onset, or worsening of, background LUTs. These symptoms include urgency, urge incontinence, coital incontinence and frequency. The patients underwent routine investigations such as renal ultrasound, x-ray, flexible cystoscopy and urodynamics. The presence of significant findings in urodynamics testing confirmed the presence of an abnormality in the bladder.

### Discussion

Overactive bladder (OAB) can be defined as 'urinary urgency, usually accompanied by frequency and nocturia with or without urgency in the absence of a UTI'. In the cases presented, there is a running theme of an accident in which the patient suffered a rapid jolting movement, after which they experienced worsening of or new onset LUTs. We propose that the mechanism may be traumatic stretching of the nerves which subserve the bladder; the abnormality in bladder function is only evidenced by urodynamics testing. Thus, 'Whiplash Bladder' is a diagnosis of exclusion which needs to be considered in similar cases.

### Conclusion

In conclusion, we propose that a new onset or worsening of LUTs can occur following a shunting incident or fall. This is currently under-recognised in literature and has clinical importance in the management of patients after accidents.

### **Case Report: Amniotic Fluid Embolism During Labour Resulting in Anoxic Brain**

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#### **Background**

Amniotic fluid embolism (AFE) is a catastrophic event that occurs during labour. AFE triggers an allergic-like reaction through entrance of amniotic fluid, fetal cells, hair, and other debris to the mother's circulation via the placental bed of the uterus.

#### **Case Presentation**

A 27-year-old female primigravida admitted through ER in labour with history of chronic hypertension, osteoporosis, known case of bronchial asthma and smoker. Routine care was given for the patient. Once cervical dilation reached 7cm, ARM was done. Thick meconium was released. Patient immediately became dyspneic and suddenly lost consciousness and became unrecordable blood pressure. CPR started and code blue announced. CPR for 10 minutes. Emergency caesarean section done. Initial diagnosis amniotic fluid embolism. Post-operative cardiologist and neurologist consultation done. Echo cardiology show: E.F 20% and dysfunction dilated left ventricle. CT scan for the brain done normal. The patient was in ventilator and was then shifted to ICU and covered by antibiotics. The ICU doctors tried weaning of the tube but not responded. After 12 days, post-operative tracheostomy done.

The patient shifted to gynecology ward. She was unconscious, not oriented, blindness spastic limbs. As result of brain anoxia.

#### **Discussion**

AFE is considered an unpredictable and unpreventable complication of labour. Incidence rates are rare however; the maternal mortality approaches 80%.

#### **Conclusion**

Several authors have reported an association between AFE and allergic patient. Thus, through review of a patient's medical history and examination, doctors will be able to predict the incidence.

### **An Exotic Abscess from Gambia**

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#### **Introduction**

Furuncular myiasis is a parasitic infection of a live mammal by fly larvae commonly seen in Africa. However, with an increase in international tourism, there is a significant rise in exotic infection in non-endemic areas which can pose a diagnostic challenge to doctors and potentially lead to delay in treatment. From current literature, only 12 cases were reported in the United Kingdom (UK).

#### **Case History**

We report an unusual case of multiple abscesses in a 32-year-old British woman presenting to the emergency department in the UK after returning from a holiday in the Gambia, West Africa. The patient did not complain of systemic symptoms and was otherwise fit and healthy with no significant past medical history. During examination, two maggots were expressed from the abscesses by applying lateral pressure to each lesion. The larvae were determined to be *Cordylobia anthropophaga*. The patient was discharged with antibiotics to prevent secondary infection with no further follow-up.

#### **Discussion**

An extensive literature review was performed to determine the number of reported cases in the UK. A better understanding of the reproductive life cycle of the species, *Cordylobia anthropophaga*, also known as 'Tumbu Fly', can facilitate diagnosis and management of this tropical infection. Most importantly, it allows tourists to take appropriate preventive measures against this tropical disease while travelling.

#### **Conclusion**

With globalization, the need for increasing awareness of tropical disease has become of paramount importance to win the battle against future epidemics.

### Access to Inpatient CT Pulmonary Angiography

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#### Background

The rapid and accurate diagnosis/exclusion of pulmonary embolism is clinically important for effective management. According to the Royal College of Radiologists, "inpatient requests for CTPA should be performed and reported within one working day of receipt and acceptance of the request form".

#### Methods

Each CTPA scan carried out over a three-month period was retrospectively recorded. We noted:

1. The date and time of vetting.
2. The date and time of scan.
3. The date and time of issue of the report.

Target: 90%

#### Results

A total of 400 CTPA scans were recorded over this period. 68.5% of scans were reported and 71% of scans were performed within 24 hours of vetting. 99.75% of scans were reported within 24 hours of the scan being performed. 79.25% of scans were reported within 30 hours of vetting. 92.5% of scans were reported and 93.5% of scans were performed within 72 hours of vetting. Average time from vetting to report, vetting to scan and scan to report was 21.04 hours, 19.39 hours and 1.66 hours respectively.

#### Discussion

We highlight scans being reported within 24 hours of vetting at a rate 21.5% lower than the target of 90%. The target rate is only reached within 72 hours of vetting. We note that the average time from vetting to scan is significantly higher than the average time from scan to report. This highlights the main limitation: the inability to perform large volumes of scans within a 24-hour period.

#### Conclusion

We therefore recommend the importance of the following changes:

1. Scrutinise the organisational aspects of the CTPA service
2. Refuse all CTPAs with a low/moderate two level Wells score for PE and a negative D-dimer or no D-dimer result
3. Increase the availability of CTPA provision
4. Identify patients suitable for outpatient pathway

### A Prudence Penalty

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#### Background

A case of a 1-year-old boy who presented to the children's assessment unit with pyrexia and ear discharge following previous diagnosis of a viral otitis media in the community with no antibiotic treatment.

#### Case Report

This infection had later progressed to mastoiditis as a result of *Fusobacterium necrophorum*. The infection progressed to infection of the left mastoid and subgaleal area, a left temporal lobe abscess and left transverse sinus thrombosis that extended into the left internal jugular vein. All of which required extensive ENT and neurosurgical input.

#### Discussion

As a result, we ask the question: Is the tidal wave of antibiotic stewardship starting to have a negative effect? Are we going to see an increase of severe infectious complications as a result of a lesser desire to treat early with antimicrobials?

#### Conclusion

We have seen a case of an infectious process that has led to serious complications by a pathogen from a novel source and raised the question of whether decreasing antibiotic use is going to see an increase in infectious complications.

Are we going to start to pay the prudence penalty?

## **The Role of Retrotransposons in Shaping the Function of the Adult Brain**

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### **Background**

Retrotransposons, or 'jumping genes', are specific sequences of DNA that can move from different sites within genomes. Whilst they were initially thought of as junk DNA, it is becoming increasingly accepted that these transposable genes play a profound role in the regulation of genomic expression and perhaps have the potential to be involved in mutagenesis and malignant disease.

### **Description of Review**

This paper explores and weighs the current evidence involving transposable genes in the functioning of the human brain and our neuronal phenotype, where they may have the potential to both disrupt and carry forward advantageous evolutionary traits. In particular, this review will focus on the mechanisms of retrotransposon activity in neuropsychiatric diseases.

### **Discussion**

Neurons differ from each other in terms of morphology and connections in an incredibly diverse combination, making each individual unique. Retrotransposed exonic sequences may have mutagenic effects, whereas intron insertions have regulatory effects of RNA polymerase and missplicing. Methylation of the promotor sequence in some types of retrotransposons can alter levels of gene expression. The Sox2 protein is an important transcription factor in the maintenance of neuronal stem cell proliferation and diversity, and has an inhibitory role in L1 retrotransposition. However, as the stem cell lineage develops its expression, it is suppressed, leading to increased L1 expression. Effects of L1 retrotransposition are therefore shown to have created degrees of genetic mosaicism during embryogenesis of neuronal cells.

### **Conclusion**

The mechanisms of neuronal diversity has recently been explored in terms of retrotransposition. Genomic sequencing projects including ENCODE have catalysed research leading to current knowledge regarding transposon location. However, the advantageous traits are less clear and easier to appreciate in an evolutionary manner. In order to cope with changes in the environment, humans and animals have adapted perhaps through changes in genomic sequencing aided by retrotransposons.

## **Investigating the Rates of Flu Vaccine Uptake amongst Children Aged 2-4 Years in a Primary Care Setting During the 2015-2016 Flu Season**

**Alhennawi N, Akhter Z, Ahmad M, Chaudhary Y**

University of Manchester, United Kingdom

### **Background**

Global studies have indicated that children are the engines of influenza outbreaks as they are the main transmitters of the virus. Therefore, the national immunisation programme has been extended to include children aged 2-4 years. Vaccinating such groups can induce herd immunity and relieve the socioeconomic burden associated with the flu. The live, attenuated influenza vaccine (LAIV) is licensed for child immunisation and has shown to be effective and well tolerated due to its various benefits including the nasal administration.

### **Aim**

To assess whether 60% or more of children aged 2-4 were vaccinated using the LAIV during the 2015-2016 flu season, based on national guidelines and standards. To explore the potential barriers and drivers to vaccination.

### **Method**

The Egton Medical Information Systems (EMIS) was used to collect data. The dates of birth were customised to document children born on/after September 31, 2010 and on/before August 31, 2013. 204 children were found to meet the criteria.

### **Results and Discussion**

Out of 204, 98 children were vaccinated, revealing a total percentage of 48% of registered children who had been vaccinated, dissatisfying the audit's standard (60%). Analysis revealed that the main vaccination barriers included the low perceived risk of flu and mechanical impediments such as the inconvenience in taking time off from school/work for children and their parents due to vaccination appointments. Drivers to vaccination included the vaccine's nasal administration and the belief that the LAIV will strengthen one's immune system.

### **Conclusion and Proposals**

Children are affected by the flu the most annually. Therefore, offering the vaccine to 100% of entitled individuals is key. To improve uptake, proposals included:

- Patient education regarding the benefits of immunisation.
- Recording parent contact details to relay vaccine reminders.
- Recording vaccine refusal reasons to explore concerns.

### **To Assess the Effect of Socioeconomic, Parental Beliefs and Practices on Consumption of Fruit and Vegetables in Children in Jeddah, 2016.**

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#### **Background**

Fruit and vegetable consumption is beneficial for health. It provides most of the necessary nutrients and contains many vitamins, fibers, minerals and electrolytes which are essential for growth, especially amongst children. In addition, fruit and vegetables are considered as an antioxidant. Many children are not meeting the minimal daily requirement of fruit (F) and vegetables (V). There is no similar study conducted in Saudi Arabia.

#### **Materials and Methods**

A pilot cross-sectional study was conducted in Jeddah in 2016. The population of our study is parents of children aged 3-11 years, asking them about their fruit and vegetable consumption. Our data collection (the questionnaire) was given as a link shared on social media. We received 156 responses in 24 hours. We excluded three of the questionnaires because the data was not representative.

#### **Summary of Results**

The use of indirect method did not result in significant increase in vegetables intake among children (P-Value 0.251).

The use of indirect method results in significant increase in fruit intake among children (P- Values 0.019).

There is no statically significant difference in consumption of unhealthy snacks among families with different socioeconomic status (P-Value 0.503).

There was a strong association between family beliefs of important vegetables and fruit intake among children and promoting healthy family eating habits (P-Value 0.003).

#### **Discussion and Conclusion**

The study findings suggest that a range of factors within the home food environment appear to be associated with young children's fruit and vegetable intake. There are no differences between low and high socioeconomic class with the consumption of fruit and vegetables among children.

Some of the results suggest that indirect parental practices have a positive effect on vegetables and fruits intake of children.

### **Vitamin D in Autoimmune and Neurodegenerative Disorders**

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#### **Background**

Vitamin D, a seco-steroid exhibiting a pleotropic action, plays an important role in both the nervous system and the immune system. Its neuroprotective role is linked with its influence in neurotrophin production, calcium ion homeostasis and in controlling oxidative damage.

#### **Description of Review**

Vitamin D deficiency results in reduced apoptosis of dendritic cells, resulting in allo-reactive T- lymphocytes and pro-inflammatory Th17 cells activation, and up regulation of MHC-II, IL-2 and co-stimulatory molecules. This contributes to the development of a Th- driven autoimmune response. Reduced inhibition of memory- and plasma- cell production and reduced apoptosis of immunoglobulin-producing B-lymphocytes also contribute to the development of autoimmunity. Therefore, vitamin D deficiency results in the development of several autoimmune diseases including multiple sclerosis (MS), inflammatory bowel disease and type I diabetes mellitus.

One of the factors leading to MS is the loss of balance between inflammatory and anti- inflammatory cytokines due to reduced vitamin D levels. Deficiency of this vitamin results in reduced differentiation of antigen specific Tr1Treg cells, allowing proliferation of Th1 cells and synthesis of inflammatory cytokines, such as IL- 23 and interferon-  $\gamma$ . Together with other T- lymphocytes these alter the activity of inflammatory antigen-specific effector T- lymphocytes in the central nervous system, leading to demyelination and neurodegeneration.

#### **Discussion**

Despite clinical and experimental evidence that vitamin D deficiency is an important factor contributing to autoimmune and neurodegenerative diseases, little is known about the effects of vitamin D supplementation in the prevention and treatment of these disorders.

However, it is believed that its supplementation is important in preventing and treating autoimmunity.

#### **Conclusion**

By impairing activation of T- lymphocytes, promoting apoptosis of B-lymphocytes, and through various other genomic and non-genomic mechanisms, vitamin D is crucial in preventing autoimmunity and neurodegeneration.

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