

British Trauma Society

Annual Scientific Meeting

2023

In collaboration
with Trauma Care



The Patient Journey

22nd – 23rd November 2023

Principality Stadium, Cardiff



Limited Dinner Tickets
22nd November available!



Ansar Mahmood
President of British Trauma Society



Professor Sir Keith Porter
Professor of Clinical Traumatology,
University of Birmingham, UK

Our warmest welcome to our combined meeting of Trauma Care and the British Trauma Society at the Principality Stadium in Cardiff on 22nd and 23rd November 2023. The theme will be a “Patient’s Journey”.

The meeting will include oral presentations from all professions and specialities involved in trauma care, whether members of one of the organizations or not. All the presentations will be judged and prizes will be awarded for the best.

The keynote speakers will include international and national experts in their fields and there will be several symposia over the two days, sponsored and led by our trade partners. The poster presentation competition will be in a digital format with a prize for the best submission.

The 21st November 2023 will be an education day led by experienced trauma personnel with hands-on procedures in acute resuscitation, focussing on the latest developments

in the management of severe blood loss. Further details will be available shortly on the websites of both organizations. There will be a course dinner on 22nd November in the Principality Stadium, a great opportunity for interaction with colleagues and faculty.

This meeting will offer an opportunity to combine the expertise and experience of the UK’s two largest trauma organizations with the aim of further developing a comprehensive and streamlined approach to the management of the severely injured from the roadside to the hospital and beyond.

***“This meeting will offer an opportunity to combine the expertise and experience of the UK’s two largest trauma organizations*”**

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AO UK and Ireland

AO UK & Ireland are a part of the AO - the largest global group of dedicated orthopedic and trauma surgeons, researchers, and ORP striving for excellence and volunteering for a common goal.

- AO Trauma: our value statements
- AO Trauma is the world's largest independent trauma and orthopedic community and organization.
- We educate surgeons, researchers, and ORP.
- We conduct and fund clinical and translational research.
- We offer membership to a prestigious global network that provides members with rich opportunities for dialogue, knowledge-sharing, professional development, and collaboration across the AO Trauma community worldwide.
- We aim to strengthen and enrich our contributions to the entire orthopedic trauma community, and further develop our membership by providing great support, so that we can make a significant impact to improve patients' lives



Aguettant will be showcasing our brand-new pain product, Dzuveo. Dzuveo is a sublingual sufentanil 30mcg tablet which is indicated for acute moderate to severe pain in adults. For anyone wanting to find out more, visit www.dzuveo.co.uk. For Dzuveo prescribing information, click here: <https://www.emcpi.com/pi/42044>
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Galen is the proud founding member of the Almac Group of world-class companies in the pharmaceutical and biotech sectors. The Group is wholly owned by the McClay Foundation, a charitable institution, whose overarching aim is to make a meaningful improvement and advancement in human health.



It is our mission to alleviate pain and improve the quality of life for people around the world. With 90+ years of trusted leadership and proven expertise, our legacy continues to come to life today through our progressive culture of evolution and innovation. Stop by the Zimmer Biomet stand to see our latest range of products with Bactiguard Technology which offers the combination of a unique non-antibiotic-eluting, anti-infective coating with a clinically successful intramedullary nailing system. This pairing is designed to provide a promising solution for addressing implant associated infections and improving patient outcomes.



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Established in 2016, the Major Trauma Signposting Partnership (MTSP) is available at ten NHS Major Trauma Centres.

The free service provides bedside advice and support to patients and their families. We are there for them, at their bedside, with impartial advice and support. Our hospital-based advisers deliver practical, social and welfare advice, working alongside colleagues from the NHS.

Around 25% of the patients we support require legal advice around personal injury and compensation. If they do make a claim, we ensure they receive 100% of their compensation award and their lawyers do not take a penny away from the patient.



Since 1980, Orthofix has evolved and grown to become one of the leading medical device companies with a spine and orthopedics focus in the world. Founded in Verona, Italy, and now headquartered in Lewisville, Texas, Orthofix has two strategic business units – Orthofix Spine and Orthofix Orthopedics – with more than 1,000 employees dedicated to developing, manufacturing and distributing our diverse product lines in more than 60 countries worldwide. Orthofix is proud to be recognized as the 8th Largest Orthopedic Device Company in the World by Medical Design & Outsourcing magazine – but above all else, Orthofix is committed to improving patients' lives and delivering innovative, quality-driven solutions that empower physicians and healthcare organizations to meet the needs of their patients every day.



Hugh James is top 100 UK law firm and is continuously ranked by Legal 500 and Chambers and Partners as a leading personal injury firm with offices throughout England and Wales. Our Serious Injury Team comprises of experienced specialist solicitors who really care about providing the best support for patients. We understand the strain that trauma can have on family life, personal relationships, careers and an individual's mental health. Recovery is not simply about healing wounds; it is about helping injured people access rehabilitation and to have support networks around them. Our fully qualified, multi disciplinary, skilled team help injured people throughout the UK and abroad by providing support and accessing compensation to rebuild their lives and independence.



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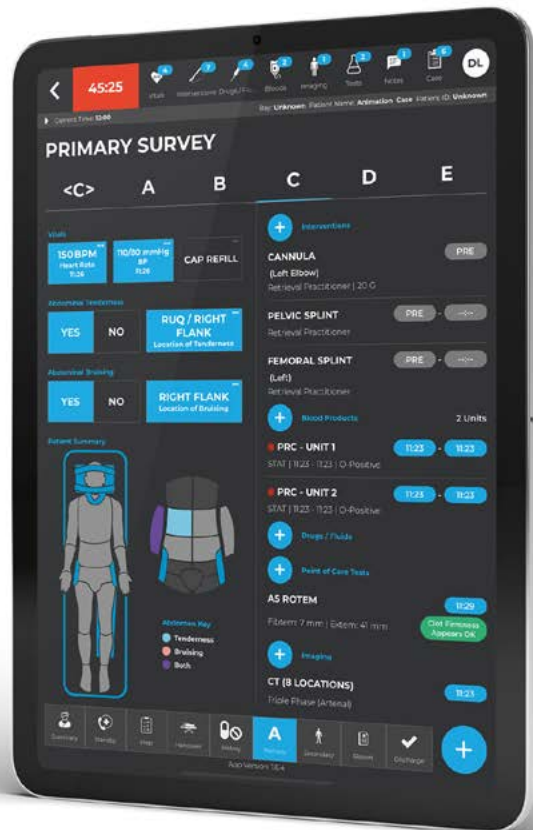


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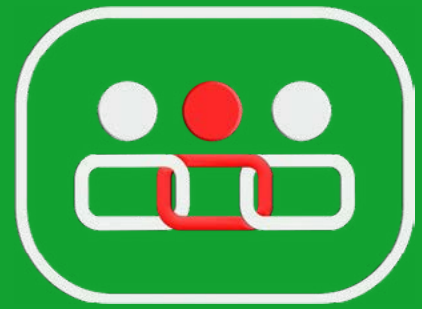


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TRAUMA CARE

FROM ROADSIDE TO REHAB



WHO WE ARE?

Trauma Care Charity was founded in 1996 with one goal in mind: to create a commonly agreed standard of practice for the trauma patient.

Our webinars, publications and research branches help boost professionals knowledge, the world over.

WHAT WE DO?

We aim to improve the outcome of the trauma victim by establishing best practice throughout the whole chain of care. We achieve this through free education, research and publishing.

HOW YOU CAN HELP?

Trauma Care has a range of sponsorship opportunities available. We also have trade stand places available at the British Trauma Society Annual Scientific Meeting. To find out more, email or call on the details below

CALL US FOR MORE INFO



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LIVE WEBINARS

We host weekly webinars, covering a range of trauma-based topics and, they are all free to join.



CONFERENCES

You can attend either our annual conference, one of our regional conferences or study days. We ensure they are always bottom-line prices, but feature a plethora of amazing speakers and topics.



PUBLICATIONS

Our members receive our quarterly journal, "TRAUMA" and we publish a number of trauma manuals, handbooks and manuscripts.



admin@traumacare.org.uk



www.traumacare.org.uk

Executive committee



Mr Ansar Mahmood
President

I am a Consultant in Trauma & Orthopaedic Surgery and the Major Trauma Service at the Queen Elizabeth Hospital Birmingham (QEHB), part of University Hospitals Birmingham, which is the largest trust in the UK. QEHB is the regional Major Trauma Centre for the City of Birmingham and one of the highest volume major trauma receiving units in the UK. We are currently also home to the largest hip fragility fracture unit in Europe. I am the research lead for major trauma at UHB and a Honorary Senior Clinical Lecturer at University of Birmingham. I have been a proud member of the British Trauma Society since 2003 and wish to see it continue to thrive and grow as an inclusive multi-disciplinary society associated with all those interested in Trauma at any level from student through to senior clinician/manager that is looking after injured patients.



Mr Stuart Matthews
Immediate Past President

Highly and widely experienced Trauma Surgeon and Educator used to working in austere as well as in cutting edge environments with French as a Mother Tongue and medicolegal expert for Personal Injury since 1989 and Clinical Negligence since 1994. Stuart's medical interests include the management of multisystem trauma and complex fractures. Consultant Surgeon in Major Orthopaedic Trauma at the Leeds University Teaching Hospitals, recently retired but still actively engaged in the trauma community.



Mr Amratlal D Patel
Trustee

I have had a life-long interest in trauma ever since my first DHS in Sheffield in 1979. My training was on the South-west rotational training scheme based in London and Surrey followed by one year on a trauma fellowship at Sunnybrook Medical Centre, Toronto with Dr Schatzker, learning about multiply injured patients and pelvic and acetabular surgery. I also learnt about the shoulder at Royal National Orthopaedic hospital in Stanmore. I have retired from clinical work. I am now Orthopaedic lead for Norwich Medical school.

I have been a member of British trauma Society (BTS) since its formation in 1988 and served as a president recently. I am now a trustee of BTS and remain involved with the running of the society.

I am very keen to encourage young surgeons to take up trauma, and although demanding it is very rewarding.



Professor Peter Giannoudis
Scientific Officer and President Emeritus

I work as the Professor (School of Medicine, University of Leeds) and Honorary Consultant at Leeds General Infirmary (LGI), a major teaching hospital serving a population in the region of 3.5 million. It is a major trauma unit, accepting complex trauma through its busy Accident and Emergency Department and from other hospitals in the region. I have successfully completed an AO Trauma Fellowship in Hannover, Germany and a Trauma Fellowship at Louisville, Kentucky USA.



Mr Rory Bonner
Treasurer

I am a Plastic Surgery Specialty Trainee in Scotland, having completed Core Surgical Training in West Yorkshire. I completed a Trauma Surgery elective in Australia and enjoyed my time working as a Foundation Doctor at the major trauma centre in Leeds. I value my experiences in Medical Education and strive to encourage students to get involved in trauma care and academia. Since joining the committee I have stepped into the role of treasurer and look forward to this new challenge. As we have a multi-disciplinary focus, we are always keen to collaborate with other specialties and health technology experts. I can be contacted via our committee email: exec@britishtrauma.com.



Mr Paul Andrzejowski
Communications and Web Officer Lead

One of the reasons I became a doctor was to work one day in Trauma. It's what I get up for in the morning and I always look forward to another day at the coal face! I got my first taste of Major Trauma as a student in Nottingham, and completed my Core Surgical Training in Yorkshire, with T&O experience at Bradford and the Major Trauma Centre in Leeds, where I am now an SpR on the Yorkshire and Humber North Rotation, and leading the FIT Study, looking into Functional Outcomes after Major Trauma - which should help to deepen our insight into what's most important for patient recovery following injury. It is an exciting privilege to help expand BTS and bring in people from all clinical backgrounds as part of increasing our reach with the new website... If anyone has any suggestions or would like to get involved I'd be very glad to hear more! Specialist Registrar in T&O



Dr Sarafina Vatharkar
General Secretary

I am an Emergency Medicine Consultant at University Hospitals Birmingham. I have always been passionate about the care of the injured patient, within the trust I also work as a major trauma coordinating consultant. I feel privileged being part of the British Trauma Society.



Professor Ian Pallister
Director of Education

Ian's interest in trauma surgery began as a medical student in Thailand in 1987. This was consolidated working at the Birmingham Accident Hospital. After Trauma Surgery Fellowships in Denver and Oxford, and completion of an MD researching the inflammatory response to major trauma, he started work in Swansea, initially as Senior Lecturer, becoming Professor in 2012. After setting up the MSc Trauma Surgery Programme, Ian developed increasing cooperative links to the UK Defence Medical Services, including development of more complex trauma simulation models. His clinical work focuses on major trauma, pelvic and acetabular fractures, and Ortho-Plastic reconstruction of complex limb injuries. Recovery from these injuries and major trauma remain his main research interests. Ian is also heavily involved in education, helped establish the Damage Control Orthopaedic Trauma Surgery Course and is President of AOUK&I. Professor of Trauma and Orthopaedic Surgery at Swansea University



Ms Justine (JJ) Lee
Deputy Director of Education

Dr Justine Lee (JJ) is a Specialist in Major Trauma at the Queen Elizabeth Hospital, Birmingham (QEHB), with a keen interest in trauma care, mass casualty management, multi-disciplinary training and simulation-based education and course design.

"My aim is to create a hub of knowledge in the management of polytrauma patients, hosted through the BTS website and taught through our workshops and conferences. We have an incredible multidisciplinary team making up the Educational Sub-committee. If you're interested in joining us, please get in touch. I'm looking forward to seeing you all at the Annual Scientific Meeting and at the pre-Conference Workshop! Please say Hello!"



Mr Oliver Dixon
Membership Secretary

My interest in trauma started while working in the Cardiothoracic Unit in Sheffield as a foundation year doctor. Having recently completed core surgical training, I am working as a trust grade registrar in Orthopaedics and plan to apply to ST3 T&O this coming year. My role as member secretary involves managing new members to BTS as well as keeping our member database up to date. Please feel free to get in touch if you have any questions!



Mr Jamie Large
Student Liaison Officer

I am a foundation trainee currently working in South West London. As a medical student, my interest in trauma was sparked through attending trauma conferences and courses. As Student Liaison Officer, my role involves facilitating student-focussed events and increasing participation in trauma amongst healthcare students. I aim to further improve access to academic and clinical trauma teaching for undergraduates. Any students who'd like to hear more about BTS and get involved with trauma please do contact me.

Sub-committee



Uday Mahajan
Junior Specialist Doctor

University Hospital Birmingham NHS Foundation Trust



Beatrice Ho
ST5 T&O

Royal Cornwall hospitals NHS trust



Mycroft Helliwell-Ewen
Clinical Teaching Fellow

Aston University



Semilore Adebayo
FY1

East and North Hertfordshire Foundation Trust



Rahul Bagga
T&O ST3

Worcestershire acute hospitals NHS Trust



Umar Said
CT2

University Hospitals Coventry & Warwickshire .

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AO UK and Ireland

The AO Foundation is a charitable organisation, which is dedicated to the promotion of excellence in surgery of musculoskeletal trauma. AOUK & Ireland is the Anglo-Irish section of the foundation and through its education department delivers non-profit making courses in the UK & Ireland to train young surgeons and operating room personnel in the theory and practice of trauma.

The membership of AOUK & I consists of a group of established surgeons and ORPs who freely give their time to teach on the 30 courses that are run by AOUK annually.

AOUK & I also offer research grants and fellowships.

The AO mission statement is: Promoting excellence in patient care and outcomes in trauma and musculoskeletal disorders

For further information please visit www.aouk.org

Keynote speakers

Prof Sir Keith Porter



Professor of Clinical Traumatology, University of Birmingham, UK

Talk: 'History of Trauma'

Professor Porter was educated at Marlborough College and St Thomas's Hospital, London. He was appointed Consultant Trauma Surgeon at Birmingham Accident Hospital in 1986, a service that is now delivered at Queen Elizabeth Hospital Birmingham, where he was the Clinical Director of the Major Trauma Centre from 2010-2018 and Professor of Clinical Traumatology until February 2023.

He was the clinical lead for injured soldiers returning to the UK for the last decade including both the Iraq and Afghanistan wars.

Professor Porter has been a leader in the development of the new medical subspecialty of Pre-Hospital Emergency Medicine and in recent years has been the Chairman of the Faculty of Pre-Hospital Care and also the Intercollegiate Board for Training in Emergency Medicine. He is the Honorary Secretary of Trauma Care and until recently the co-editor of the journal "Trauma".

Professor Porter has over 200 peer review publications and has co-authored/edited numerous books.

For his services to the military he was knighted in the 2010 Queen's New Year's honours list.

Dr Ami Jones MBE



*Military anaesthetist
CD of Pre-hospital critical care service (EM-RTS)*

Talk: Pre-Hospital Critical Care

Dr. Ami Jones is a consultant in anaesthetics, intensive care medicine, and pre-hospital emergency medicine based in South Wales¹². She has extensive experience providing care in critical and high-risk situations, having worked throughout the emergency services and also in the British Army where she completed two tours in the Medical Corps². Dr. Jones is also known for heading a team that treats about four seriously ill people every day from helicopters based around Wales³. In 2017, she was awarded an MBE for her services to emergency medical retrieval and critical care in Wales.

Dr Rob Moss



*Consultant Anaesthetist, UHB Birmingham
MERIT Doctor, West Midlands Ambulance Service*

Talk: 'Mass Casualty Incidents – A State of the Union Address'

I am a Consultant Anaesthetist in Birmingham specialising in Emergency Anaesthesia and Major Trauma. I also work for West Midlands Ambulance Service as a MERIT Doctor and respond on behalf of MARS BASICS. I have interests in planning for Mass Casualty Incidents and simulation.

Miss Catherine Jane McMahon



*Consultant Neurosurgeon
Manchester Centre for Clinical Neurosciences
(MCCN), Salford Care Organisation, Northern
Care Alliance NHS Foundation Trust*

**Talk: 'Head injuries – the elephant
in the room?'**

Catherine McMahon is a Consultant Neurosurgeon and Clinical Lead for Trauma at the Manchester Clinical Neurosciences Centre. She is a general Neurosurgeon with a particular interest in hydrocephalus, trauma and cranial reconstruction. She graduated from the University of Glasgow MB ChB and completed a BSc in neurosciences at The University of Aberdeen. Upon completion of Basic Surgical training she was appointed as a Neurosurgical Research Fellow at Salford Royal Hospitals NHS Foundation Trust and over the course of 3 years completed a PhD examining mechanisms of inflammatory brain injury after subarachnoid haemorrhage. She undertook her Specialist training in Neurosurgery at Leeds General Infirmary and a Trauma Research Fellowship at Addenbrooke's Hospital, Cambridge. She spent 12 years as clinical lead for trauma and hydrocephalus at The Walton Centre in Liverpool before moving to her current position. Her clinical and research interests relate to implementation of the Liverpool HIT score in TBI, the use of pupillometry for in-patient assessment, QOL after cranioplasty, management of LOVA, and timing of restarting anticoagulation after traumatic ICH (recently awarded an NIHR grant to fund the RESTART tICrH study). She is also a proud mum of 3, in addition to being a keen golfer!

Lt Col Claire Park MBE RAMC



*Consultant in Prehospital Care
London HEMS and in Anaesthesia, Critical
Care and Trauma at Kings College Hospital in
London*

**Talk: 'Care in the warmer zones of
major incidents'**

Lt Col Claire Park has over 20 years of military experience, including numerous operational deployments. International experience of civilian and military prehospital care, trauma systems and tactical emergency medical systems, has given her extensive experience to bring to her work in 'tactical medicine'. This includes a focus on reducing 'The Therapeutic Vacuum' that occurs for casualties in the hot and warm zones of high threat incidents. As the Medical Adviser to the Metropolitan Police Service's Specialist Firearms Units, she also leads on developing interagency support, police officer first aid training and high fidelity simulation training during live police and multi-agency exercises.

Mr Ansar Mahmood



*Consultant Trauma and Orthopaedic
Surgeon, UHB Major Trauma Service*

**Talk: Measuring functional out-
comes - PROMs in Major Trauma:
How to evaluate the 'patient
journey'?**

I am a Consultant in Trauma & Orthopaedic Surgery and the Major Trauma Service at the Queen Elizabeth Hospital Birmingham (QEHB), part of University Hospitals Birmingham, which is the largest trust in the UK. QEHB is the regional Major Trauma Centre for the City of Birmingham and one of the highest volume major trauma receiving units in the UK. We are currently also home to the largest hip fragility fracture unit in Europe. I am the research lead for major trauma at UHB and a Honorary Senior Clinical Lecturer at University of Birmingham. I have been a proud member of the British Trauma Society since 2003 and wish to see it continue to thrive and grow as an inclusive multi-disciplinary society associated with all those interested in Trauma at any level from student through to senior clinician/manager that is looking after injured patients.

Mr Paul Andrzejowski



*Trauma and Orthopaedics Registrar
Yorkshire T&O Rotation,
Academic Unit of Trauma and Orthopaedics,
University of Leeds*

Talk: Measuring functional outcomes - PROMs in Major Trauma: How to evaluate the 'patient journey'?

I am a registrar in trauma and orthopaedics, on the Yorkshire (North) rotation, and have been working with BTS in various roles since 2018.

I have interests across the breadth of T&O, and since 2020 have been undertaking an MD looking into the functional outcomes following major trauma, and set up the FIT (Functional outcomes In Trauma) Study to investigate this at the Leeds Major Trauma Centre, with Prof Peter Giannoudis and an experienced team alongside me. We designed an online PROMs package to achieve this, in a combined prospective and retrospective live cohort study, with a mixed methods approach.

I'm looking forward to sharing some of my experience and results from the study so far, which is exactly in-keeping with this year's theme: the patient journey!

Mr Christopher Bretherton



*Trauma and Orthopaedics Registrar, Re-
search Fellow Oxford University Wolfson
College*

Talk: 'Academic Trauma'

Chris is an NIHR Academic Clinical Lecturer (ST7) in Trauma and Orthopaedic Surgery on the Royal London Hospital Rotation, having recently being awarded a DPhil from the University of Oxford. He has enthusiasm and experience in collaborative research, leading projects including multi-centre audit, randomised controlled trials and priority setting partnerships (PSP). Chris is the past British Orthopaedic Trainees Association (BOTA) Academic Representative and the current chair of the multi-speciality National Research Collaborative (NRC).

When not #Collaborating – you'll find him climbing the walls or throwing down with the University Mixed Martial Arts club!

Dr Jon Hazeldine



*MRC Career Development Fellow
University of Birmingham/University Hospi-
tals Birmingham*

Talk: 'Immune and inflammatory response to major injury'

Trained immunologist with a long-standing interest in how major traumatic and thermal injury modulates the innate immune system. Dr Hazeldine graduated from the University of Birmingham in 2007 with a BSc degree in Human Biology followed by an MSc degree in Human Immunology. Under the guidance of Professor Janet M Lord, Dr Hazeldine completed his PhD in 2013, which investigated how human ageing modulates the immune system and its ability to clear infections. Dr Hazeldine currently holds an MRC career development award fellowship, which is based around investigating the mechanisms that underpin post-trauma immune suppression. Based in the QE Hospital in Birmingham, Dr Hazeldine analyses blood samples acquired from patients enrolled into the "Golden Hour" study, a unique project that acquires research samples in the pre-hospital setting from major trauma patients, all within 1-hour of an emergency 999 call. As the only UK centre able to conduct such work, Dr Hazeldine has published a series of novel findings that have demonstrated evidence of immediate immune activation and suppression within minutes of injury, with such changes linked to subsequent poor clinical outcomes such as the development of multiple organ dysfunction syndrome. Alongside his work on trauma patients, Dr Hazeldine is involved in a prospective cohort study of severely injured burns patients, where he analyses daily blood samples collected over a 2-week timeframe to investigate how burn-induced changes in immune function and inflammation predispose patients to the development of hospital-acquired infections and sepsis.

WEDNESDAY 22nd November 2023

1st day Annual Scientific meeting of British Trauma Society

08:30-09:30	Registration & Refreshments
09:30-09:50	Conference welcome by British Trauma Society President Mr Ansar Mahmood and President of Trauma Care Professor Porter
09:50-10:20	Keynote lecture 1 Professor Porter, University of Birmingham UK <i>`History of Trauma`</i>
	Oral presentations: Session 1 – Transfusion Science
10:20-10:25	140 - The impact of different resuscitation fluids on cellular energy metabolism in traumatic injury and haemorrhagic shock. Laura Cottey - Academic Department of Military Emergency Medicine
10:25-10:30	45 - Predicting blood transfusion following traumatic injury using machine learning models: a systematic review and narrative synthesis William Oakley - Queen Mary, University of London/Dorset County Hospital
10:30-10:35	113 - Hyperkalaemia in Rapid Transfusion - Time-Related Increase In Packed Red Cell Potassium Load Quang Nguyen - Royal Sussex County Hospital, Brighton
10:35-10:40	127 - Plasma as a resuscitative fluid in Traumatic Brain Injury and impact on viscoelastic parameters Arthur Disegna - Radcliffe Department of Medicine, University of Oxford
10:40-10:50	Q&A

10:50-11:20	Refreshment Break-Exhibition area
	Oral presentations: Session 2 – Emergency casualty management
11:20-11:25	134 - A retrospective, single centre, observational study, to compare the performance of different mass casualty triage tools in predicting Priority 1 status Shimri Lim - Royal Medical and Dental Corps, Malaysian Armed Forces
11:25-11:30	41 - Enhancing battlefield care under fire: time for TXA auto-injectors? Mycroft Halliwell-Ewen - University of Birmingham
11:30-11:35	42 - VA-ECMO in Traumatic cardiac tamponade due to diaphragmatic rupture Tae Wook Noh - Korea University Guro Hospital
11:35-11:40	153 - The AAJT-S: A Reproducible and Titratable Zone 1 Occlusive effect with Zone 3 Aortic Occlusion. Thomas Smith - 2 Medical Regiment
11:40-11:50	Q&A
11:50-12:20	Keynote Lecture 2 Dr Ami Jones, EMRTS South Wales ‘Pre-Hospital Critical Care’
	Oral presentations: Session 3 – ED Processes
12:20-12:25	1 - Pentrox® is effective but is it patient approved? Matt Copp - Royal Cornwall Hospital NHS Trust
12:25-12-30	59- Neurovascular Status Assessment of Limb Fractures Presenting to the Emergency Department of the Royal Infirmary of Edinburgh: a closed-loop audit James Harper - University of Edinburgh
12:30-12:35	97 - Closing the Major Trauma Circle: A Quality Improvement Project to ensure completion of Trauma Tertiary Surveys Ilias Marios Oikonomou - Cambridge University Hospitals NHS Foundation Trust
12:35-12:40	7 - Setting up a Medical Assistant Role in the Paediatric Emergency Department: a quality improvement review of a pilot scheme Anshu Sharma, Nathalie Burt (Presenting) - New Cross Hospital
12:40:12:50	Q&A

13:00-14:15	Lunch-Exhibition area <u>Lunchtime Symposium:</u> St David's Lounge 4 Trauma 4 Patients (4T4P) (Platinum Sponsor) "Looking out for your trauma patients' welfare and wellbeing."
14:15-14:45	Keynote Lecture 3 Dr Rob Moss, University Hospitals Birmingham 'Mass Casualty Incidents – A State of the Union Address'
	Oral Presentation Session: 4 – Orthoplastics
14:45-14:50	124 - Enhanced recovery for acute open lower limb fracture 'fix & flap' Guang Hua Yim, Moad Hatamleh (Presenting) et al. - The Welsh Centre for Burns & Plastics
14:50-14:55	5 - Functional Recovery After Local Muscle Flaps in Open Tibial Fractures is Not Impaired Elizabeth Jones - Welsh Centre for Burns and Plastic Surgery
14:55-15:00	98 - Covering the fracture: studying the impact of increased open fracture workload on timely flap coverage procedures. Ilias Marios Oikonomou - Cambridge University Hospitals NHS Foundation Trust
15:00-15:05	161 - The Incidence of neuroma following digital amputation Raveenjot Nagra - University Hospitals Birmingham NHS Trust
15:05-15:15	Q&A
	Oral Presentations Session: 5 – Upper Limb Trauma
15:15-15:20	117 - Fracture dislocation of the elbow: outcomes following operative and non-operative treatment. Richard Doxey - Royal Derby Hospital
15:20-15:25	32 - Acute Management of Simple Elbow Dislocations (Patients Journey at PCH) Neville Jacob - Peterborough City Hospital
15:25-15:30	128 - Does the implementation of national BESS guidance on first time traumatic shoulder instability lead to improved outcomes? Catriona Staunton - The University of Nottingham
15:30-15:35	158 - Is it necessary to perform six week postoperative X-rays for patients treated with distal radius fracture volar locking plates?

	Mr Charles Coombs - University College London, UK
15:35-15:40	Q&A
15:40-16:00	Refreshment Break-Exhibition area
16:00-16:30	Keynote Lecture 4 Catherine McMahon 'Talk: Head injuries – the elephant in the room?'
	Oral Presentations Session: 6 – Varia Trauma
16:30-16:35	30 - Management of Distal Femur Fractures: Distal femur Replacement vs Surgical Fixation vs Conservative Jamie Routledge, Oladimeji Sherif Bashir et al - Huddersfield Royal Infirmary
16:35-16:40	16 - Synthetic grafting for a superficial femoral artery acute perforating injury Miguel Fernando Juárez Moyrón - Hospital Regional 1º de Octubre, Mexico
16:40-16:45	81 - Computed Tomography Angiography and Missed Clinically Significant Injuries in Penetrating Neck Injuries: A Systematic Review Chiedozie Uwakwe - University Hospitals North Midlands NHS Trust
16:45-16:50	106 - Traumatic Central Cord Syndrome(CCS): A retrospective analysis to evaluate neurological& functional outcomes at 1 year interval, a Northern Ireland(NI) experience. Hushil Singh Sandhu - Royal Victoria Hospital, Belfast, UK
16:50-16:55	74 - Anticoagulation as a Predictor of Spinal Cord Injury Following Traumatic Injury Wei Shoa Tung - University of Sheffield
16:55-17:00	Q&A
17:00-17:30	Keynote Lecture 5 : Dr Claire Park, London HEMS and Kings College Hospital 'Care in the warmer zones of major incidents'
18:00-19:00	Annual General Meeting of British Trauma Society Members and non-members all welcome Refreshments
20:00-	Course Dinner-Principality Stadium Dress Code: Smart Casual

THURSDAY 23rd November 2023

2ND day Annual Scientific meeting of British Trauma Society

08:30-09:30	Registration and Refreshments
	Oral Presentations: Session 7 – Chest Trauma
09:30-09:35	6 - Exploring the Incidence, Severity, and Management of Traumatic Rib Fractures: Findings from a One-Year Study in a London Trauma Unit. Christopher Smith - Princess Royal University Hospital, King's College Hospital NHS Trust, London, UK
09:35-09:40	118 - Radiological assessment of Costal Margin Injuries: A single centre approach using Agfa Enterprise Imaging PACS system and 3D rendering of the costal cartilage Jonathan Byers - Sheffield Teaching Hospitals
09:40-09:45	15 - The implementation of a rib fracture pathway in a small district general hospital to improve patient care Justin Collis - East Surrey Hospital
09:45-09:50	96 - Screening for complications of sternal fractures: detecting issues or delaying discharge? Matthew Williams, Ahmed Mostafa et al. - London Northwest University Healthcare NHS Trust
09:50-10:00	Q&A
10:00-10:40	Refreshment Break - St David's Lounge <u>Breakfast Symposium:</u> St David's Lounge Trauma App (Silver Sponsor) "The Trauma App - A Case Study" Introducing innovative digital solutions into the Trauma Care environment With Leah Bradley (Clinical Digital Team at Alder Hey Children's Hospital) and Ben Beaumont (Chief Technical Officer at Daysix Ltd)
	Oral Presentations: Session 8 – Femoral fractures and Coagulopathy
10:40-10:45	26 - Geriatric Assessment Scores and Mortality Prediction in Hip Fracture Patients;A RETROSPECTIVE COHORT STUDY Jehan Zaib - Hull University Teaching Hospitals

10:45-10:50	107 - The Impact of Sociodemographic Factors on Fractured Neck of Femur Mortality Rates Haruka Shimizu, Marie Claire Rebeiz (Presenting) et al. - St. George's, University of London
10:50-10:55	129 - Simplifying final product analysis of post operative images in dynamic hip screw fixation supports shared learning Benjamin Woolner - Great Western Hospital, Swindon
10:55-11:00	65 - Prothrombin Complex Concentrate (PCC) for treatment of Trauma Induced Coagulopathy: a Systematic Review and Meta-Analysis Ioannis Hannadjas - Centre For Trauma Sciences - Barts and the London School of Medicine & Dentistry
11:00-11:10	Q&A
11:10-11:20	Refreshment Break-Exhibition area
11:20-11:40	Keynote Lecture 6 Mr Ansar Mahmood, University Hospitals Birmingham & Mr Paul Andrzejowski, University of Leeds Measuring functional outcomes - PROMs in Major Trauma: How to evaluate the 'patient journey'?
	Oral Presentations: Session 9 – Trauma Systems
11:40-11:45	73 – 999: Feedback Matters Karen Chivers – John Radcliffe Hospital, Oxford
11:45-11:50	157 – National variation in guidance for the management of pregnant women presenting with major trauma. Charis Demetriou, Marie-Claire Rebeiz (Presenting) et. Al. – St George' University London
11:50-11:55	104 – Are Virtual Fracture Clinics really “safe”? An evaluation of the capability of a District General Hospital Virtual Fracture Clinic pathway to detect safeguarding issues. Joseph Heylen – Royal Surrey County Hospital
11:55-12:00	126 – Does digitalisation streamline musculoskeletal injury management and referral pathways? Evidence from a complete audit cycle assessing the novel Virtual Bones software solution. Mohamed Mansour – Cambridge University
12:00-12:10	Q&A
	Oral Presentations: Session 10 – Varia trauma

12:10-12:15	105 - All the gear, no idea? Utilisation and carbon footprint of surgical instruments and disposables Sophie Forster - Bristol Royal Hospital for Children
12:15-12:20	132 - Consent and The Mental Capacity Act 2005: Are We Adhering To Legal Framework When Consenting Patients to Major Orthopaedic Trauma Surgery? A Quality Improvement Report Neesha Jenkins - Leeds Teaching Hospitals
12:20-12:25	36 - E-Scooter attitudes and risk-taking behaviours in the West Midlands: a systematic literature review and survey responses Nathalie Burt - University of Birmingham
12:25-12:30	4 - Use of Virtual reality in the education of orthopaedic procedures as a potential succession of traditional methods. Simran Sehdev – University Hospitals Coventry and Warwickshire, University of Warwick
12:30-12:40	Q&A
12:45-14:00	Lunch-Exhibition area
13:00-13:45	<u>Lunchtime Symposium:</u> St David's Lounge Haemonetics "Viscoelastic Testing in Trauma."
14:00-14:30	Keynote Lecture 7 Mr Christopher Bretherton, Barts and the London NHS Trust 'Academic Trauma'
	Oral Presentations: Session 11 – Varia trauma
14:35-14:40	20 - Tibiototalcaneal nail and primary closure for the management of open ankle fractures in the elderly patient; results from a major trauma centre. Abdel Rahman Saad - University Hospitals Sussex NHS Foundation Trust
14:40-14:45	80 - 'Single plane' osteotomy for long bone deformity correction: a case series of a novel technique. George Richardson - University College Hospital London
14:45-14:50	70 - The Bubble Trouble - A Case of Massive Surgical Emphysema Shahrukh Rizvi - Glangwili General Hospital
14:50-14:55	100 - The Reconstruction of Mandible Defects in War Injuries: Systematic Review and Meta-Analysis Oluwasemilore Adebayo - Lister Hospital, Stevenage
14:55-15:05	Q&A
15:05-15:25	Refreshment Break-Exhibition area

	Oral Presentations: Session 12 - Education
15:25-15:30	2 - Low-Fidelity Orthopaedic Clinical Simulation Training for Medical Students is a Useful Education Tool: Could This Be Adapted for Postgraduate Surgical Training? Alexander Boucher - QMC NUH Trust
15:30-15:35	147 - IMPROVING THE KNOWLEDGE AND SKILLS OF FY2 DOCTORS IN MANAGING TRAUMA CASES, A STRUCTURED EDUCATIONAL PROGRAM Eman Ibrahim - Royal Bolton Hospital
15:35-15:40	121 - CODE RED TRAUMA: This IS a drill! Vasant Mohandas - Wexham Park Hospital
15:40-15:45	66 - A road traffic collision simulation: undergraduate learning from the first stage of the trauma patients' journey. Dr Timothy Paul JOHNSON - Centre for Medical Education, Cardiff University School of Medicine
15:45-15:55	Q&A
16:00-16:30	Keynote Lecture 8 Dr Jon Hazeldine, University of Birmingham 'Immune and inflammatory response to major injury'
16:30-17:00	Discussion of cases, 2 best posters: Oral Presentations to compete for Best Poster Prize
17:00-17:30	Presentation of prizes and closure
17:30	Delegates depart

British Trauma Society

Annual Scientific Meeting

2023

In collaboration
with Trauma Care



Oral presentations



No.	ABSTRACT
1	<p>Pentrox® is effective but is it patient approved?</p> <p>Matt Copp, Ana Dias, Orthopaedic Specialty Trainees Royal Cornwall Hospital NHS Trust</p> <p>Ziad Zeidan - Royal Cornwall Hospital Trust Frances Eslabra - Royal Cornwall Hospital Trust Rawan Hassan - Royal Cornwall Hospital Trust Rory Middleton - Royal Cornwall Hospital Trust</p> <p>Introduction: Pentrox® is a handheld inhaler that administers methoxyflurane¹. Its use is approved for analgesia in moderate-to-severe trauma-related pain for adults in the emergency department (ED)^{1,2}. The literature currently lacks methodologically robust qualitative data on the individual patient experience.</p> <p>Aim: This study aims to address the absence of data reflecting patient opinions of Pentrox®, using a structured qualitative approach alongside qualitative data.</p> <p>Methods: A focus group of five patients was contacted to identify key themes to incorporate into the study questionnaire. All uses of Pentrox® in ED from April to August 2021 were retrospectively identified. Qualitative data was gathered using the Trickett short interview method with responses grouped into positive and negative descriptors. Additionally, quantitative data concerning their experience was gathered using 5-point-Lickert scales.</p> <p>Results: The focus group felt that side effects and overall satisfaction with Pentrox® should be explored. 101 respondents have completed the survey. 90% reported an overall satisfaction '≥ Good', and an NVivo word cloud of patient responses demonstrated an overall positive experience. 97% reported ease-of-use as '≥ Good'. 52% of respondents reported an 'Excellent' analgesic response and 89% reported '≥ Good'. The most reported side effects were drowsiness (13%) and nausea (7%); however, most patients (74%) reported no side effects. Additionally, 94% of respondents reported they would use Pentrox® again if required.</p> <p>Conclusions: This study highlights that Pentrox® is a well-tolerated and user-friendly method of managing acute trauma pain in ED. Furthermore, it highlights the importance of considering the individual patient journey alongside robust evidence-based data for the development of a holistic treatment.</p> <p>References: 1. Coffey F, Wright J, Hartshorn S, Hunt P, Locker T, Mirza K, Dissmann P. STOP!: a randomised, double-blind, placebo-controlled study of the efficacy and safety of methoxyflurane for the treatment of acute pain. <i>Emerg Med J.</i> 2014 Aug;31(8):613-8</p>

2

Low-Fidelity Orthopaedic Clinical Simulation Training for Medical Students is a Useful Education Tool: Could This Be Adapted for Postgraduate Surgical Training?

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Jamie Johnson QMC NUH

Background: Simulation training is becoming more utilised during postgraduate education. HEE recommends simulation-based education within the core medical training curriculum. Orthopaedics' utilises a range of surgical technical skill simulations, but as training becomes more competency based could clinical simulation training be used to help facilitate growth of knowledge and acquiescence of non-technical skills.

Methods: Four simulations; cauda equina, hot swollen joint, compartment syndrome and neck of femur fracture were designed with students completing a pre and post questionnaire about their 'knowledge', 'confidence to deal with orthopaedic condition', 'ability to escalate', 'confidence to handle an acutely unwell patient' (score 1= none to score 10= excellent). It was also looked at whether students thought that these 'enhanced their practice' and 'would recommend sessions' (score 1 = strongly disagree to score = 5 to strongly agree).

Results: There were N=67 students participating across all simulations with 91% strongly agreed that they would 'enhance their clinical practice' and 90% strongly agreed to 'recommending sessions'. We found an increase of 'knowledge' across all stations with an average of 5.6 pre to 7.9 post. A similar increase was observed with regards to 'confidence to deal with orthopaedic condition' 5.2 pre to 7.7 post, along with 'perceived ability to escalate' 6.1 pre to 7.1 post and 'confidence to handle an acutely unwell patient' 6.1 pre to 7.4 post.

Conclusion:

Low-fidelity simulations are an effective teaching method within orthopaedic education. Therefore we believe that these could be adapted for the postgraduate trainee to facilitate clinical growth and competency.

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CT1 Trauma and orthopaedics
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Introduction

Restricted working-hours, increased cancellation of operative-lists and the recent pandemic, have provided challenges to surgical training. Virtual reality (VR) simulation offers a safe environment for trainees to develop their skills in a controlled environment.

The aim of this study was to assess whether VR-simulation was better than traditional learning methods for a trochanteric femoral nail (TFNa, Synthes).

Methods

All participants were recruited from one university teaching hospital from medical students, Foundation Year and Core Surgical Trainees. Participants completed a pre-procedure validated questionnaire assessing their confidence in TFNa using a Likert scale from -3 (Very dissatisfied) to +3 (Very satisfied) as well as the State-Trait Anxiety Inventory (STAI). Participants were then randomised to using VR-simulation or traditional methods (reading operation manual & discussion with consultant). Participants then completed the TFNa on a model, and completed a post-procedure questionnaire.

Results

28 participants were randomised to VR-simulation (13) and traditional (15). The VR group felt steps involved in the simulator were more accurate (1.83 (+/- 1.11) vs 0.92 (+/- 1.43)) they were also more prepared to attempt the procedure after simulation (0.66 (+/- 1.6) vs -0.35 (+/- 1.82)). Simulation training also had a better user experience (2.41 (+/- 0.90) vs 0.21 (+/- 1.67)) and provided a better learning environment (2.33 (+/- 1.07) vs 0.78 (+/- 1.76)).

According to STAI-rating both groups were significantly comparable at base line apart from being content with the overall training experience (VR 3.08 (+/- 0.66) vs traditional 2.64 (+/- 0.92)). Participants agreed the simulator provided a realistic learning environment, enjoyed using the simulator and recognised the need for simulation in formal training.

Conclusion

This study showed that VR-simulation could provide better training than reading the traditional training for inserting a TFNa. Surgeons, trainers and educationalists should invest in simulation to provide a safe learning environment for trainees.

5 Functional Recovery After Local Muscle Flaps in Open Tibial Fractures is Not Impaired

Elizabeth Jones
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Lieutenant Colonel Tim Pearkes - Morriston Hospital, Swansea
Dr Owen Bodger - Swansea University Medical School
Ms Emma Barlow - Morriston Hospital, Swansea
Mr Hywel Dafydd - Welsh Centre for Burns and Plastic Surgery
Professor Ian Pallister - Swansea University Medical School

Introduction:

Open tibial fractures are associated with long-term morbidity in many patients. In wounds unsuitable for primary closure, local flaps or free tissue transfers are often employed. Anecdotal concerns abide regarding the price active patients may pay if hemisoleus or gastrocnemius flaps are used in open fractures of the middle third and proximal tibia.

Aims:

The aim of this study was to determine if there was a clinically important and statistical difference in the objective functional outcome measures and global perceived effect scale between patients who underwent a local pedicled muscle flap and those treated with any other form of soft tissue coverage.

Method:

The functional outcome of 16 patients whose open tibial wounds were treated with local muscle flaps were compared to 27 patients whose wounds were treated in any other manner. All patients were reviewed at fixed intervals post injury and their performance in a range of objective functional outcome measures were recorded. These included comfortable and fast gait speed, Edgren side step test and a global perceived effect scale.

Results:

At six weeks post injury, patients treated with any other wound closure performed slightly better than those treated with local muscle flaps. However, from 12 weeks post injury to 12 months, there was no difference in physical performance nor in self-reported recovery using the global perceived effect scale.

Conclusions:

With careful case selection in open tibial fractures, local muscle flaps have no impairment of function compared to injuries whose wounds are treated by any other means.

6 Exploring the Incidence, Severity, and Management of Traumatic Rib Fractures: Findings from a One-Year Study in a London Trauma Unit.

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Eleanor Gosney, Princess Royal University Hospital, King's College Hospital NHS Trust, London, UK
Mintimer Negametzyanov, Princess Royal University Hospital, King's College Hospital NHS Trust, London, UK
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Introduction:

Rib fractures are the third most common injury in trauma patients and have a broad spectrum of severity. Rib fractures are associated with severe pain, respiratory complications, and prolonged hospital stays. The London Major Trauma System comprises of four 'networks', each containing a 'Major Trauma Centre' and several 'Trauma Units'. There is a scarcity of published evidence reporting on incidence, severity of injury, complications and outcomes for the cohort of patients with traumatic rib fractures admitted to London's 'Trauma Units'.

Aim(s):

We aimed to assess the incidence, severity, complications, management, and outcomes of patients admitted to our hospital, a London 'Trauma Unit', with traumatic rib fractures.

Methods:

We conducted a single-centre, observational study of rib fracture admissions. All adults (≥ 16 years) admitted from 1st May 2022 – 1st May 2023 with rib fractures were included. Data on demographics, injuries, mechanism of injury, management, length of stay (LOS), complications and in-hospital mortality were collected retrospectively. Patients were stratified into low, medium, or high-risk using the STUMBL Score.

Results:

95 patients were included. 49% were male and mean age was 72 years. Commonest mechanisms of injury were falls (80%) and road traffic collisions (13%). Mean LOS was 10.8 days (range 0-96).

3 patients (3%) had bilateral rib fractures. 30 patients (32%) had pneumothorax and/or haemothorax. 35 patients (37%) had other injuries, with ipsilateral upper limb fractures ($n=15$), and spinal fractures ($n=13$) being most common. 29 patients (31%) underwent regional nerve block, an average of 2 days (range 0-5) after presentation. 32 patients (34%) were treated for respiratory tract infection.

63 patients (66%) were high-risk (STUMBL Score ≥ 16); 5% of these required admission to intensive care. In-hospital mortality was 5.3% ($n=5$), 80% were calculated as being 'high-risk' on admission.

Conclusions:

Most patients were elderly, admitted following a fall and had rib fractures in isolation. Our findings support clinicians when discussing prognosis with patients with rib fractures. Stratification through STUMBL scoring enables early specialist input from pain, intensive care, and medical teams.

7

Setting up a Medical Assistant Role in the Paediatric Emergency Department: a quality improvement review of a pilot scheme

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Nathalie Burt (New Cross Hospital, University of Birmingham Medical School)

Introduction: Paediatric Emergency Departments (EDs) continue to face increasing pressures to deliver high quality care to patients. Ensuring units are adequately staffed with the correct skill mix is a constant challenge.

In collaboration with the local medical school, medical students have been appointed as medical assistants (MAs) each year since July 2018 to work in the paediatric ED. Performing a range of clinical, clerical and nursing tasks, they work alongside a senior clinician between 6pm-11pm weekdays, and 3pm-11pm on weekends. Embedded within the ED team for a minimum of 1 year, this position allows for a greater development of skills, preparing medical students for life as a new doctor.

Aims: Although similar positions have been created in other NHS trusts, the extended nature of this position and the role flexibility to adjust to the demands on each shift is invaluable. This study aimed to create a guide to implementing the MA position and assessing the benefits of it.

Methods: A structured guide for departments looking to implement a new position using local medical students has been created. Alongside this, an investigation into paediatric ED attendances and various key department metrics e.g. time in department was conducted. Role specific surveys were distributed to senior clinicians, nursing staff, and the MAs. A comparison between the MAs and their medical student cohort was completed.

Results/Conclusion: Despite a statistically significant increase in attendances, key metrics did not change significantly. Medical students employed as MAs feel more competent in the skills required of Foundation Year doctors, more integrated into the multidisciplinary team and, compared to their peers, feel more prepared for working as a doctor. Consultants believe a better standard of care is achieved and experience a reduction in stress. The combination of quantitative and qualitative data collected has shown the invaluable nature of this new position.

15 The implementation of a rib fracture pathway in a small district general hospital to improve patient care

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Barnaby Farquharson, Richard Dickson-Lowe, Shirley Chan

Introduction

Rib fractures are a common presentation to the emergency department following blunt thoracic trauma. Despite this injury having significant implications for morbidity and mortality no national guideline exists to guide acute management.

This quality improvement project was conducted at a district general hospital (DGH) with the aim of assessing the impact of using a simple rib fracture management pathway.

Methods

A retrospective review of paper notes and electronic databases of patients with a recorded diagnosis of 'rib fractures' were reviewed. Following this a management pathway was designed then implemented, which incorporated BMJ best practice and local hospital needs. The study then assessed the impact of the pathway.

Results

Prior to the pathway a total of 47 individual patients were included in statistical analysis. Of the patients analysed 44% were older than 65 years old. For analgesia 89% received regular paracetamol, 41% received regular non steroidal anti inflammatory drugs (NSAIDs) and 69% received regular opioids. Advanced analgesia such as patient controlled analgesia (PCA) and nerve blocks were poorly used, for instance a PCA was used in only 13% of cases. Only 6% of patient received daily pain team review and 44% of patients were seen by physiotherapist within the first 24hours. Additionally, 93% of patients that were admitted under general surgery had a STUMBL prognostic score >10.

Post pathway a total of 22 individual patients were included in the statistical analysis. In this case 52% were older than 65 years old. The use of simple analgesia was unchanged. However advanced analgesia was better escalated, PCA's in this case were used 43% of the time. Involvement of other healthcare professionals improved, 59% were reviewed by the pain team in the first 24 hours, 45% received daily pain team review and 54% received advanced analgesia.

Conclusion

A simple rib fracture pathway is effective at improving the management of rib fracture patients admitted to a district general hospital.

16 Synthetic grafting for a superficial femoral artery acute perforating injury

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PGY4 General Surgery resident

Hospital Regional 1º de Octubre, Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado (Institute for Social Security and Services for State Workers)

José Luis Serna Soto, MD, General Surgeon, Coloproctologist, General Hospital of Mexico

Introduction: Penetrating vascular injuries (PVI) represent 1-5% of limb trauma cases. The most commonly injured are the femoral and popliteal arteries. The assessment of PVI is based on hard signs (HS) and soft signs (SS). HS comprise expanding hematoma, bruit, pulsatile bleeding, absence of peripheral pulse, pallor and paresthesias. SS comprise a history of bleeding before hospital, neurological deficit, the proximity of injury to a major artery course and non-expanding hematoma. The presence of one or more HS has a specificity and sensibility higher than 90%, indicating urgent surgery. Patients without HS might undergo imaging studies, such as computed scan angiography (CSA), standard arteriography or Doppler ultrasound.

Aims: To describe a case of superficial femoral artery(SFA) injury and its management in a 20-year-old male patient.

Methods: A 20-year-old male arrived at the emergency room, due to a sharp aggression to his left thigh. He was pale, reporting distal paresthesias. His heart rate was 125 beats/minute, his blood pressure was 80/50 mm Hg. The Advanced Trauma Life Support protocol was applied. A single wound of one inch in the left thigh's medial aspect with pulsatile bleeding was seen. The limb was poikilothermic, with weak distal pulses. He was led to surgery. We incised along the medial margin of the sartorius muscle. Important arterial bleeding was seen. An inferior laparotomy with iliac clamping was needed to control blood inflow and to locate a wall-to-wall perforation in the SFA middle portion, which was resected. A standard-wall 6 mm polytetrafluoroethylene graft was placed, both edges were managed with two artery-to-graft 6-0 polypropylene stitches and uninterrupted sutures between them. Hemostasis was corroborated after iliac unclamping, a Penrose drainage was placed, the graft was covered with a muscular flap.

Results: 72 hours after, adequate distal perfusion of the left lower limb was appreciated and confirmed by CSA. The patient was discharged with long-term anticoagulation.

Conclusion/discussion: Concerning vascular trauma, the recognition of HS and SS is crucial to make a prompt decision about management. Imaging studies might be considered for evaluation after vascular repair or grafting.

20 Tibiotalocalcaneal nail and primary closure for the management of open ankle fractures in the elderly patient; results from a major trauma centre.

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University Hospitals Sussex NHS Foundation Trust

Peter Kay, Abdel Rahman Saad, Allister Robertson, Simon Bellringer, Enis Guryel

Introduction

Open ankle fractures in elderly patients are challenging injuries to manage. Use of a tibio-talo-calcaneal nail and primary closure allows full weight bearing while avoiding the morbidity associated with flaps and delayed weight bearing.

Methods:

We identified all open ankle fractures in patients over 65 referred to our major trauma centre managed with a tibiotalocalcaneal nail and primary wound closure over 10 years. We recorded patient demographics, comorbidities, injury mechanism, length of stay, operation, weightbearing status, re-operations, infections and mortality.

Results:

We included 34 patients with an average age of 87 (73-99). We found 56% of patients' mobility status declined post-operatively and 21% of patients were discharged directly home. Four patients required further unplanned surgery including two deep infections requiring amputation. We had a 6% three month mortality rate.

Conclusion:

Use of a tibiotalocalcaneal nail with primary wound closure offers a reasonable treatment option for open fractures of the ankle in the elderly patient.

26 Geriatric Assessment Scores and Mortality Prediction in Hip Fracture Patients;A RETROSPECTIVE COHORT STUDY

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Abdulaziz Madni. Dudley NHS trust
Saad Azhar. Hull University teaching Hospitals
Junaid Zeb. Dudley NHS trust

Introduction

The identification of elderly patients who are at high risk of experiencing unfavorable outcomes following hip fractures is of utmost importance due to the severe consequences associated with such injuries.¹ Given the significant annual incidence of over 60,000 hip fractures in the UK, the efficient allocation of healthcare resources becomes critical in order to avoid providing false hope to patients' relatives. It is crucial for healthcare professionals to prioritize the use of scoring systems to accurately identify high-risk patients and provide customized care, leading to improved outcomes and preventing unrealistic expectations

Aims:

To assess the predictive value of three scoring systems, namely the American Society of Anesthesiologists (ASA) classification, clinical frailty score (CFS), and Nottingham Hip Fracture score (NHFS), in predicting mortality among patients with hip fractures.

Methods

This retrospective cohort study included 628 participants aged 60 years and above who sought treatment at a UK hospital between January 2018 and December 2018. Data on age, gender, mortality, and 3(ASA,CFS,NHFS) assessment scores were collected. The area under the curve was calculated for each ROC. Cross-tabulation was performed to examine the association between various assessment scores and mortality using the chi-square test.

Results

Higher CFS and NHFS scores were significantly associated with mortality, while the ASA score did not show a significant association. The CFS achieved a predictive accuracy of 69.9% in estimating mortality rates. The NHFS score demonstrated the highest predictive capability for mortality, with patients scoring ≥ 5 having a significantly higher risk of mortality compared to those with a score < 5 . There was a statistically significant difference between CFS score and NHFS score ($p=0.031$). The association between NHFS score and mortality was significant ($p<0.001$).

Conclusions:

The study highlights the importance of using scoring systems to identify high-risk patients and provide customized care, potentially leading to improved outcomes and realistic expectations for patients and their relatives

30 Management of Distal Femur Fractures: Distal femur Replacement vs Surgical Fixation vs Conservative

Jamie Routledge
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Huddersfield Royal Infirmary

Oladimeji Sherif Bashir and Ahmed Saber. Huddersfield Royal Infirmary

Introduction: Distal femur fractures are a frequently encountered injury, especially amongst the ageing population. Previous studies have identified that these fractures can be managed with a variety of methods and techniques which has led to an on-going debate and investigation to decipher the optimal approach for managing these fractures.

Aim: The purpose of this study was to compare outcomes of patients managed with either distal femur placements (DFRs), internal fixations or conservative management. Outcomes measured included length of hospital stay, re-admission rates, 30-day mortality and oxford knee score.

Methods: A retrospective review of patients admitted with distal femur fractures was performed between June 2020 and October 2022 at Huddersfield Royal Infirmary Hospital. Patients with both native and peri-prosthetic joints were included. All patient's medical data, including imaging and operative records were reviewed.

Results: 42 patients were identified. 6 males and 36 females with a mean age of 78 years (range 35-102 years). 15 of these fractures were peri-prosthetic, 27 were native joints. 30 patients had an internal fixation, 5 had a DFR and the remaining 7 were conservatively management. Those managed with an internal fixation had an average length of stay of 18 days, oxford score of 24 and 2 patients were re-admitted within 30 days of discharge. For the DFR, the average length of stay was 16 days, oxford score of 22 and no patients were re-admitted within 30 days. For the conservatively managed patients 21 days, oxford score of 25 and 2 patients were re-admitted within 30 days of discharge. There was no 30-day mortality across all groups.

Conclusions: From our study, we can conclude that patients managed with a DFR had the shortest length of stay in hospital and the lowest readmission rates when compared to alternative management techniques. There was minimal difference found between the oxford scores between all 3 groups. This study shows that DFR can be a safe and reliable strategy to manage distal femur fractures. Additional research is required to compare the outcomes of these different methods of repair.

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Daniel Watts (Peterborough City Hospital)
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Zaid Haj Ali (Peterborough City Hospital)
Paul Robinson (Peterborough City Hospital)

Introduction

Elbow dislocation is the most common joint dislocation in children and the second most common in adults. Josefsso et al described simple dislocations as those where there had been no concomitant fracture apart from small periarticular avulsions 1mm or 2mm in diameter. The FuncSIE multi-centre RCT compared early mobilisation vs plaster immobilisation with early mobilisation patients recovering faster, returning to work earlier, and was deemed a safe and effective treatment for elbow dislocations. Studies have also shown that early physiotherapy can result in better outcomes.

Aims

To re-audit management of simple elbow dislocations at Peterborough City Hospital over a 1-year calendar (1st Jan 2022 – 31st December 2022) by assessing the initial management at the Emergency Department, as well as assessing the management in fracture clinic and physiotherapy referrals.

Methods

We undertook a retrospective audit over a 1-year period, allowing sufficient time for follow-up. The terms 'elbow' and 'dislocation' were searched through all radiology reports. 59 patients with included terms were retrieved by radiology and audit department searches. Our inclusion criteria included patients with confirmed elbow dislocations on X-ray and those patients over 14 years-old.

Results

50.0% of patients left the emergency department in plaster immobilisation, of which only 2 required back-slabs due to concomitant fractures. Documentation of handedness (<60%) and NV status, particularly post-reduction (33.3%) were less than what was expected. All patients are currently being seen by physiotherapy more than 2 weeks following injury.

Conclusion

Given most simple elbow dislocations are managed in the emergency department, teaching programmes are required for education purposes on the best form of management for these injuries. Neurovascular documentation is essential for purposes of not only long-term prognosis, but also from a litigious standpoint, and is recommended by NICE and BOAST guidelines. Our audit showed a reduction in patients seen by physiotherapy within 2 weeks following injury compared the original audit carried out in 2018. The implications for this can be due to the COVID-19 pandemic amongst other reasons.

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Introduction: Global research into e-scooter trauma and perceptions has grown rapidly in recent years, with independent UK research focussed on injuries. As the UK government considers e-scooter regulation via trial schemes involving around 20,000 scooters, interested parties are expressing safety concerns about an estimated 750,000 illegally ridden private e-scooters.

Aim: Our study reviewed global research on attitudes to and risk-taking behaviour by e-scooter riders and compared it to the results of two UK based surveys. The aim was to identify common themes and proposals which may ultimately drive down hospital admissions.

Methods: Two independent reviewers conducted a systematic review of global literature in three databases, assessing study quality using the CASP qualitative research checklist. We distributed questionnaires on (1) the public opinion of and (2) road user attitudes to e-scooters via: email, social media, and at locations in Birmingham and Wolverhampton, from March to July 2023.

Results: We retrieved 443 studies of which 13 were subject to systematic analysis. We identified no independent UK study. Common themes were safety concerns, risk-taking behaviours of e-scooter riders and infrastructure deficiencies. The overall quality of the studies was good, but their heterogeneity meant that sample sizes could not be meaningfully aggregated. Under half the studies considered non-rider perceptions. 153 people responded to the public opinion survey and 146 to the road user survey. Opinions varied on e-scooter safety. Risk-taking behaviours frequently cited were tandem riding, alcohol consumption, and pavement riding. A significant majority felt there was insufficient legislation or guidance available around e-scooter safety. Multiple respondents suggested infrastructure improvements to accommodate micromobility vehicles.

Conclusions/discussion: Alongside other UK e-scooter trauma studies, our research points to behaviours driving UK trauma admissions and how some may be prevented. Our research found e-scooters perceived as environmentally friendly but potentially dangerous. Well maintained infrastructure could improve both e-scooter riders and vulnerable pedestrians safety. Rider education and enforcement may also reduce risk-taking behaviours.

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1. Introduction

Battlefield medicine is inherently complex and dangerous, with the tactical situation often dictating the level of care which is able to be given to very seriously injured casualties. The most common cause of death is unsurvivable head-injury but death from exsanguination is second, and it is in these bleeding patients that potential survivors may be found.

This manifested in the drive to provide battlefield first-aid within 10-minutes of wounding and a shift in focus to the control of catastrophic haemorrhage with the use of haemostatic dressings and tourniquets. However, there is a need for solutions to major haemorrhage in more austere environments.

Given the known efficacy of tranexamic acid to reduce mortality from catastrophic haemorrhage in civilian and military patients and the effectiveness of battlefield first aid, the question is whether this life-saving intervention should be delivered at the point of wounding.

2. Aim(s)

This work examines the current case for providing a 1g intramuscular auto-injector device to individual soldiers to administer to themselves or their comrades as part of 'Care Under Fire' Battlefield Casualty Drills.

3. Methods

This work is a feasibility analysis of the case for such devices, covering safety and efficacy of TXA, the pharmacology of the IM route, training issues and logistical considerations.

4. Results

The work found that TXA is safe and effective, the pharmacology of TXA is amenable to IM administration, TXA is cheap and robust in storage and suitable for administration by soldiers.

5. Conclusions/Discussion

As with much of the scientific basis for Pre-Hospital Care, Major Trauma and Military Medicine the context, practicalities, and decision making of clinical interventions is far more complex than many other clinical environments. This work was able to approach the case for TXA auto-injectors in a holistic sense. Robust justification for further development of this technology and its potential implementation was evident across each domain.

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Introduction

Diaphragmatic rupture is a rare disease caused by severe thoracoabdominal trauma. The symptoms of diaphragmatic rupture vary depending on the rupture site and herniated organ. In rare cases of diaphragmatic rupture, cardiac tamponade can occur when the herniation develops around the pericardium.

Aims

We report a case of VA-ECMO applied for cardiac tamponade caused by traumatic diaphragmatic rupture.

Methods

A 25-year-old female was brought to the emergency room unconscious after being hit by a vehicle while crossing the street. Her consciousness level was Glasgow come scale (GCS) 3 and blood pressure (BP) was 60/30 mmHg. After tracheal intubation and fluid resuscitation, BP was 90/45 mmHg. Chest x-ray revealed a left hemothorax with herniated liver. CT imaging revealed discontinuity of the left hemidiaphragm and intrathoracic herniation of the liver with cardiac compression. The patient suffered several other traumatic injuries and emergency operations were planned. However, while waiting for an emergency operation, the patient deteriorated to a BP of 54/47 mmHg and HR of 160 beats per min. The sign of tamponade physiology got worse. The patient was placed on VA-ECMO via the femoral artery and vein cannulation to relieve cardiac tamponade and give hemodynamic stability to the patient during the emergency operation

Results

We performed a median laparotomy, pulled back the liver, which had been herniated into the right pleural cavity and repaired the diaphragm rupture. She was referred to the surgical intensive care unit (SICU) for further resuscitation and treatment. Afterward, the patient stabilized enough to wean the VA-ECMO on a postoperative day (POD) 3. Despite aggressive resuscitation, brain injury deteriorated to an irreversible state. On POD 5, brain death was presumed during conservative treatment in the SICU, and the possibility of organ donation was explained to the family, who agreed. Immediately VA-ECMO attributes hemodynamic stability before an operation like the patient in this report.

Conclusions/Discussion

Traumatic cardiac tamponade due to diaphragmatic rupture is rarely encountered and requires a high degree of clinical suspicion. Therefore, first responders need to recognize that traumatic cardiac tamponade can also result from diaphragmatic rupture.

45	<p>Predicting blood transfusion following traumatic injury using machine learning models: a systematic review and narrative synthesis</p> <p>William Oakley Anaesthetic CT2 Queen Mary, University of London/Dorset County Hospital</p> <p>Dr Sankalp Tandle (Barts Health NHS Trust), Major Max Marsden (Queen Mary, University of London)</p> <p>Background</p> <p>Haemorrhage is the leading cause of early preventable death after injury. Predicting the need for blood transfusion can be challenging. Blood transfusion prediction tools are not in widespread clinical use. Machine learning (ML) techniques have the potential to improve prediction.</p> <p>Aims</p> <p>This systematic review aimed to identify and critically evaluate all ML models that predict blood transfusion in trauma patients.</p> <p>Methods</p> <p>The systematic review was registered on PROSPERO (CRD42022371109). A search of MEDLINE, Embase and CENTRAL databases was completed to identify publications that describe ML models for blood transfusion prediction. Results were screened by two reviewers. Data was extracted from eligible publications using a published prediction modelling checklist. Risk of bias and model applicability was assessed using the Prediction model Risk Of Bias Assessment Tool. Data was synthesised using a narrative approach due to significant heterogeneity.</p> <p>Results</p> <p>The search identified 4,602 results. 22 publications were included, in which 25 ML models were identified. The models varied in ML algorithm used, model predictors and predictive performance. The most frequently reported performance metric was area under the receiver operating characteristic curve (AUROC). Predictive performance was variable (AUROC 0.69 – 0.99) but 17 models predicted blood transfusion-related outcomes with excellent discrimination (AUROC > 0.80) in internal validation. Two models reported calibration metrics. Only four models have been externally validated in prospective cohorts: the Bleeding Risk Index, Compensatory Reserve Index, the Marsden model and the Mina model. These models predict blood transfusion-related outcomes with acceptable to excellent discrimination. All modelling studies were considered at high risk of bias due predominantly to retrospective datasets, small dataset size and lack of external validation.</p> <p>Conclusion</p> <p>High-performing and appropriately validated blood transfusion prediction models using ML have been reported and could lead to personalised, precision blood transfusion in injured patients. Further research is required to externally validate all ML models and integrate models into clinical systems.</p>
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59 **Neurovascular Status Assessment of Limb Fractures Presenting to the Emergency Department of the Royal Infirmary of Edinburgh: a closed-loop audit**

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Introduction:

Neurovascular status assessment (NSA) is a critical aspect of orthopaedic evaluation following limb trauma. However, it's often not performed, leading to potential undetected post-traumatic neurovascular injuries and medico-legal consequences.

Aims:

To increase the rate of NSA within the Emergency Department (ED) of the Royal Infirmary of Edinburgh (RIE) following ankle and wrist trauma. To identify reproducible methods of improving NSA rates in the ED.

Methods:

The clinical notes of 55 consecutive patients presenting with ankle or wrist fractures were reviewed during February and March 2022. Retrospective analysis of NSA at presentation and post-intervention was conducted. Semi-structured interviews with ED staff were carried out to identify obstacles to NSA. Interventions were implemented and the audit repeated in October 2022 for 56 patients.

Results:

Key obstacles to NSA included forgetfulness, lack of awareness of the requirement to document, and inadequate induction training for new ED clinicians. Absence of TRAK commands were also reported as a barrier to formal NSA. To address these issues, a new staff video on NSA was created, a teaching session for current ED staff was scheduled, and TRAK shortcut commands for ankle and wrist NSA documentation were introduced.

For ankle fractures, over the two audit cycles, the rate of NSA pre-manipulation increased from 73% to 96% and post-manipulation increased from 31% to 46%. Likewise for wrist fractures, NSA rates increased from 93% to 96% pre-manipulation and from 14% to 36% post-manipulation. A statistically significant increase of 16.4% ($p < 0.05$) in the NSA of individual named nerves in both wrist and ankle fractures was also observed.

Conclusions:

Staff education and the introduction of technological tools can help implement a measurable and sustained change in clinical practice over 6 months. The rate of NSA following limb trauma may be improved in other EDs by reproducing these methods.

65 Prothrombin Complex Concentrate (PCC) for treatment of Trauma Induced Coagulopathy: a Systematic Review and Meta-Analysis

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Introduction and Aims: Trauma induced coagulopathy (TIC) is common in trauma patients with major haemorrhage. Prothrombin complex concentrate (PCC) is used as a potential treatment for the correction of TIC but the efficacy, timing and evidence to support its use in injured patients with haemorrhage is unclear.

Methods: A systematic search of published studies was performed on MEDLINE and EMBASE databases using standardized search equations. Ongoing studies were identified using clinicaltrials.gov. Studies investigating the use of PCC to treat TIC (on its own or in combination with other treatments) in adult major trauma patients were included. Studies involving pediatric patients, studies of only traumatic brain injury (TBI), and studies involving only anticoagulated patients were excluded. Primary outcomes were in-hospital mortality and Venous Thromboembolism (VTE). Pooled effects of PCC use were reported using random-effects model meta-analyses.

Results: After removing duplicates, 1745 reports were screened and nine observational studies, one randomized controlled trial (RCT) and four ongoing clinical trials were included with a total of 1150 patients receiving PCC. Most studies used 4 Factor-PCC with a dose of 20-30U/Kg. Among observational studies, co-interventions included whole blood (n=1), fibrinogen concentrate (n=2), or Fresh Frozen Plasma (n=4). Outcomes were inconsistently reported across studies with wide variation in both measurement and time points. The eight observational studies included reported mortality with a pooled Odds-Ratio of 0.91 [95% CI, 0.50-1.67], and five reported Deep Venous Thrombosis (DVT) with a pooled OR of 1.20 [95% CI, 0.64-2.26]. When pooling the observational studies and the RCT, the OR for mortality and DVT were 0.89 [95% CI, 0.55-1.45] and 1.00 [95% CI, 0.65-1.55], respectively.

Conclusions: Amongst published studies of TIC, PCCs did not significantly reduce mortality, nor did they increase the risk of VTE. However, the potential thrombotic risk remains a concern that will need to be addressed in future studies. Several RCTs are currently ongoing to further explore the efficacy and safety of PCC.

66 A road traffic collision simulation: undergraduate learning from the first stage of the trauma patients' journey.

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Introduction. The GMC mandate that graduates must be able to diagnose and manage acute medical emergencies, provide immediate life support and work effectively in a multidisciplinary team. These learning outcomes are explicit expectations of post-graduate training in Pre-Hospital Emergency Medicine (PHEM) yet undergraduate opportunities to benefit from exposure to PHEM training are infrequent.

Aims. Outline the planning, implementation and evaluation of an RTC simulation in May 2023 involving over 100 multiagency staff and over 350 medical and adult nursing students at Cardiff University.

Methods. As part of the MBBCh programme at Cardiff university, our multiagency team have developed an RTC simulation modelled around JESIP principles (see <https://youtu.be/24XhjaDcjwo?si=WKBycEt6H3BowXx->). The training consisted of a pre-event seminar using a 75-minute film produced by the team and a full one day, 4-scenario complex multi-vehicle RTC simulation for multiagency staff and students. Each scenario involved live student casualty/bystander volunteers and mannikins. Scenarios were carefully storyboarded to consider each clinical scenario, participants, and venue. The injuries and medical interventions ranged considerably from 'walking wounded' to a resuscitative hysterotomy. Students attended the event in groups of 75, observing each scenario in a 3-sided arena, listening to audio streamed from a MEDSERVE doctor. A full debrief focusing on the learning outcomes was held for each group conducted by emergency service personnel and clinicians experienced in the management of trauma. Students and staff were asked to complete a survey assessing achievement of learning outcomes, sufficiency of training resources and staff knowledge.

Results. All aspects of the training were highly rated by the 75 respondents to the survey and thematic analysis revealed the effectiveness of delivering a realistic and immersive experience.

Conclusion. An RTC simulation provides an innovative approach to delivering key, undergraduate, learning outcomes including the ability to work effectively in a multidisciplinary team. Additionally, students can be taught a safe and appropriate approach for a first-hand witness to an RTC. This approach should be reproducible in other medical schools.

<p>70</p>	<p>The Bubble Trouble - A Case of Massive Surgical Emphysema</p> <p>Shahrukh Rizvi SHO Glangwili General Hospital</p> <p>Title: The Bubble Trouble - A Case of Massive Surgical Emphysema Introduction: Case of a clinically stable patient who presented to the A&E with swelling developing on chest, a week post-VATS for Lung CA. CT TAP revealed extensive surgical emphysema along the neck plains, proximal upper limbs and extending down to mons-pubis and sacral bone. Also, there was a contained pneumothorax on the side of the VATS. Aims/Purpose: To reiterate the importance of thorough bedside examination, early recognition of clinical signs and appropriate clinical intervention to prevent impending critical complications. Moreover, thorough safety netting to ensure early presentation in case of common post procedure complications. Method: Case Study Results: A surgical chest drain and later on Seldinger drain was put in and patient stayed in hospital for weeks to ensure resolution of such an extensive emphysema. Conclusion: A very common complication involving 10% of thoracic surgery patients. Better safety netting could ensure early representation in case of critical complications.</p>
<p>73</p>	<p>999: Feedback Matters</p> <p>Karen Chivers, Consultant Nurse Frimley Health NHS Foundation Trust</p> <p>Victoire Vidart, ED registrar- John Radcliffe Hospital</p> <p>Introduction Ambulance personnel play a valuable role in assessing, managing and conveying patients to Emergency Departments across the country. They accompany patients and relatives during distressing and stressful times, investing themselves on a professional but also emotional level. However, follow up is rare. At Wexham Park Hospital A&E, we have developed a process of providing feedback to ambulance crews and has helped ambulance staff to follow-up on patients. Methodology This process has been gradually implemented over the last 2 years and involves the ambulance personnel completing a paper feedback request form with a numbered code on it. The form allows for request of specific elements relating to the patient's hospital journey. Information is collected from the hospital's electronic patient system and sent back without any patient identifying information. Instead, the form's numbered code is used to identify the patient and feedback is only shared to @nhs.net email addresses to ensure that information governance is implemented. Results Since its start in 2020, this feedback system has been used by over 120 different ambulance personnel and has grown from 5 to an average of 20-30 requests each week. It has been reviewed and updated using direct feedback from ambulance crews in the region. In addition, the educational benefit of the system has been assessed through a questionnaire which has shown that 100% (n=26) of users were satisfied with the feedback given, 84 % were likely to change their clinical practice as a result of the feedback received, and 89% reported a positive impact on their mental wellbeing. Value of the service was perceived to be an equal mix of educational (28%), professional development (24%), reflective (26%), and general interest (21%). Conclusion The ambulance feedback system helps our paramedic colleagues by providing them with the full clinical picture. This allows them to learn from, and reflect on, patient outcomes which contributes to their professional development and ultimately improves patient care. It has a positive impact on mental health by addressing uncertainty and providing closure. We believe that this service should be offered across the region to benefit more ambulance personnel.</p>

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Background:

The Trauma and Audit Research Network (TARN) database has shown predictors such as age, sex, Glasgow Coma Score (GCS) to be linked to spinal cord injury. The aim of this study is to determine whether anticoagulation treatment can predict spinal cord injury or death after trauma.

Methods:

TARN data from 2012 to 2019, was retrieved. Patient records were available in 94,964 cases. Multiple logistic regression models were built accounting for previously identified variables. Dependent variables were incomplete cord injury, complete cord injury, and death with an incomplete or complete injury. Follow-up was a minimum of 1 year. Calculation of the area under the receiver operator characteristic curve (AUC) was used to assess model performance.

Results:

Incomplete or complete cord injury was found in 3,064 of 94,964 (3.23%) patients. 552 (18.02%) of these patients died during follow-up. Increasing age, high energy injuries, injury severity score, and male gender are all significant predictors of poor cord outcomes. A longer CCU LOS is a significant predictor for cord injuries. The use of anticoagulation therapy pre-injury (OR 1.341, 95% CI 1.052-1.685) increases the odds of incomplete spinal injuries by 34.1%, while starting or increasing anticoagulants post-trauma may be associated with complete cord injuries (OR 2.236, 95% CI 1.154-3.940) alone, or together with death (OR 4.303, 95% CI 1.035-11.915). AUC for the four models ranged from 0.712 to 0.949.

Discussion and Conclusions:

Increasing age, male sex, high energy trauma and a high injury severity score remain significant predictors of incomplete or complete spinal cord injury in recent years (2012-19). The prediction of incomplete spinal cord injury from pre-injury anticoagulation use is novel and clinicians must bear in mind that patients with comorbidities requiring anticoagulation are at 34% higher risk of having an incomplete spinal cord injury. We recommend a high index of suspicion for spinal cord injuries if a patient is on pre-injury anticoagulation therapy. Furthermore, utilising these predictive factors, a standardised assessment tool should be considered to aid clinicians in careful management of spinal injury after trauma.

80 'Single plane' osteotomy for long bone deformity correction: a case series of a novel technique.

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Introduction

Long bone deformity commonly occurs through a combination of angulation and rotation. Conventional osteotomies for deformity correction are performed out of the plane of deformity creating either an opening or closing wedge. However, these osteotomies can limit the degree of correction possible, delay union and are inherently less stable requiring longer periods of immobilisation.

Aim

We present and describe the results of a novel osteotomy technique where performing a single plane osteotomy in the oblique plane can resolve angular deformities in the coronal and sagittal plane by allowing rotation of opposing flat surfaces correcting angular and rotational deformity simultaneously whilst maintaining full bone contact.

Methods

This is a single surgeon cases series of consecutive patients who underwent a single plane osteotomy for angular deformity correction of a long bone at our institution between 2018 and 2022 with a minimal follow up of 12 months. Eight patients (mean age at time of surgery = 32) were retrospectively reviewed with a mean follow up of 21.8 months. Two authors independently measured the pre-operative and post-operative angular deformities. In addition, we recorded peri-operative complications, incidence of delayed/non-union and secondary procedures.

Results

Angular correction achieved with a single plane osteotomy is expressed as a percentage of the pre-operative deformity. The mean correction achieved in the coronal plane is 77% (range 55-88) and in the sagittal plane this was 63% (range 46-93). 7 out of 8 patients noted to be clinically and radiologically united at 3 months post-operative. 1 patient developed delayed union and after receiving exogen therapy, achieved union 13 months post-operation. There were no secondary procedures performed in this cohort.

Conclusion

E-Results demonstrate that utilising the single plane osteotomy technique produces significant deformity correction with minimal complications and has the potential to be more effective than conventional osteotomy techniques.

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Background: Penetrating Neck Injuries (PNI) are an important cause of morbidity and mortality in trauma patients which has undoubtedly led to frequent evolution in its management. With the high rate of negative neck exploration associated with a principle of mandatory exploration, the need for a quick and non-invasive imaging modality to assess haemodynamically stable patients with soft signs or asymptomatic was highlighted. Most recent treatment algorithms advocate the use of Computed Tomography Angiography (CTA) for this purpose based on published evidence. This Systematic Review was carried out to answer the research question: Does an approach of imaging with CTA and watchful waiting lead to missed clinically significant injuries in patients with PNI, have soft signs and are haemodynamically stable or asymptomatic?

Methods: An extensive database search of Medline through Ovid, Embase, Pubmed, Cochrane Central Register of Controlled Trials (CENTRAL) and Web of Science was carried out from inception to date to look for eligible papers.

Results: 7 cohort studies were found using the eligibility criteria. There were 799 patients in total who had CTA for PNI looking for Vascular or Aerodigestive Injuries. There were only 9 missed injuries in 9 patients out of 799 patients that underwent CTA. The sensitivity of CTA ranged from 93.9% to 100% and specificity was between 61% and 97.5%

Conclusion: The Systematic Review provides evidence that CTA can be used to rule out clinically significant injuries and thus reduce the rate of neck explorations in PNI patients with soft signs and are haemodynamically stable or asymptomatic.

96 Screening for complications of sternal fractures: detecting issues or delaying discharge?

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Introduction

Sternal fractures can be associated with potentially serious complications such as blunt cardiac injury (BCI). The Eastern Association for the Surgery of Trauma (EAST) guidelines suggest screening suspected traumatic sternal fracture patients with serum troponins and ECGs. Echocardiograms are reserved for those with abnormal results to identify potential complications, but anecdotal experience suggests many undergo unnecessary investigations and prolonged admissions.

Aims

We reviewed our current practice in screening for complications of sternal fractures, auditing it against the EAST guidelines. We also characterised the cohort of patients presenting with sternal fractures, how they were investigated, and their outcomes.

Methods

Using the TARN registry, 154 patients presenting to a London major trauma centre were identified as having a confirmed sternal fracture over a 5-year period (January 2018 to March 2023). Those with suspected or unconfirmed fractures were excluded. Patient electronic records were analysed to establish their mechanism of injury, relevant investigations undertaken and clinical outcomes.

Results

Of 154 patients, none had a significant complication of their sternal fracture identified by echocardiogram that changed management or was not already identified by CT imaging. 76 patients (50.65%) had both an ECG and serum troponin measured during admission and therefore there was no difference in the rate of identifying complications of sternal fracture between those screened as per the EAST guidelines and those that were not.

58% of those with a normal ECG and serum troponin still received an echocardiogram (9% of all patients studied). The median time for an echocardiogram from admission was 43.5 hours and those who underwent an echocardiogram had a significantly longer admission than those who did not (22.4 days vs 11.6 days, $p=0.003$).

Conclusions

We found no examples of an echocardiogram identifying significant complications of sternal fractures that changed patient management. These data suggest current guidelines on screening for complications of sternal fractures may need updating as they may lead to unnecessary investigations and extend admission.

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Introduction

Trauma Tertiary Surveys (TTS) are considered a vital part for the care of trauma patients, as per the Advanced Trauma Life Support guidelines. TTS provides a holistic review for the injured individual, allowing for the identification of missed injuries early in their care. Trauma patients tend to require complicated and multidisciplinary care, with multiple teams involved and several investigations ordered. We identified that reduced awareness, increased workload and unclear trust guidelines on the responsibility to perform a TTS, led to a TTS documentation rate of 11% for patients admitted under Trauma and Orthopaedics in Addenbrooke's Hospital. A Quality Improvement Project (QIP) was designed and run for two cycles, under the coordination of the Major Trauma Service.

Aim(s)

To increase the TTS completion and documentation rate to 60%, for trauma patients admitted to Addenbrooke's Hospital with Trauma and Orthopaedics as their primary team.

Methods

Open-question interviews with clinicians were used to identify the gaps leading to low TTS completion rates. Each QIP cycle lasted three months, consisting of a two-month period of active prompting for intervention, followed by one 1 month of observation, aiming to identify if the results of the intervention were sustained. During the first cycle, a poster to raise awareness on this gap and a prompt in patient notes to complete a TTS were utilised to improve compliance. For the second cycle, the above were repeated, while also developing a new standard of practice for the allocation of TTS completion responsibility.

Results

After the first cycle, the TTS completion rate gradually increased to 38% at a steady rate of 9% per month. After the second cycle, the respective rate increased further to 72%. The second month of that cycle witnessed an increase in completion rates of 20% alone.

Conclusions/Discussion

This QIP has achieved to gradually improve the TTS completion rate to 72%, meeting the target set. It is important to note that the improvement was sustained when active surveillance for compliance was removed; a result that can be related to a positive change in practice. A further cycle is to be performed, aiming to expand this scope of practice to patients admitted under a different primary team.

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Introduction

According to British Orthopaedic Association Standards for Trauma (BOAST), definitive coverage should be achieved in open fractures within 72 hours. The increased clinical workload in NHS Major Trauma Centres has led to a bottleneck effect regarding access to flap coverage operations. This subsequently increases complications and further extends management needs and pressures. A retrospective review of open fracture trauma admissions in Addenbrooke's Hospital was performed, to evaluate the level of adherence of the Cambridge Major Trauma Centre to BOAST guidelines.

Aim

This review aims to identify the average flap coverage waiting time for patients sustaining an open fracture and the percentage of admissions receiving such operation within 72 hours. Furthermore, it aims to study any impact of flap coverage delays on total and postoperative length of stay in hospital.

Methods

The Trauma Audit & Research Network database was used to identify patients admitted to Addenbrooke's Hospital with open fractures from 01/01/2020 to 31/12/2022. Charts were reviewed to identify cases that required flap coverage. Time to flap coverage and total length of stay was calculated. Patients whose flap coverage was delayed, because they were clinically unfit for an operation, were excluded from this study.

Results

The average waiting time for flap coverage was over 72 hours, showing an increasing trend (2020: 104.2h, 2021: 129.4h, 2022: 177.3h). The percentage of patients receiving timely coverage is also reducing (2020: 44%, 2021: 30%, 2022: 14%). The average length of stay was longer for patients with delayed flap coverage (2020: 16.4d v 27.3, $p=0.06$; 2021: 17.1d v 28.0d, $p=0.05$; 2022: 16.7d v 42.3d, $p=0.15$). The post-flap length of stay was greater in delayed flap coverage (2020: 14.3d v 21.2, $p=0.21$; 2021: 15.6d v 20.9d, $p=0.28$; 2022: 15.5d v 34.0d, $p=0.29$).

Discussion

Increased workload has impacted access to flap coverage, causing a clear trend towards extended length of stay. The post-operative hospitalisation, while not statistically significant, is also greater in delayed coverage; the ever-shrinking cohort of timely coverage influences the statistical analysis. An expansion of the current service is required to cope with the current clinical trends and needs.

100 The Reconstruction of Mandible Defects in War Injuries: Systematic Review and Meta-Analysis

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Introduction

There has been an increasing trend in maxillofacial injuries associated with combat trauma. Within the maxillofacial complex, the mandible is the most likely structure to be damaged during combat. The structural deficits as a result can be reconstructed with many options. These include vascularised bone grafts (VBGs), non-vascularised bone grafts (NVBGs), alloplastic implants, reconstruction bars and distraction osteogenesis.

Aims

This study aimed to determine the common modality and efficacy of mandibular reconstruction in combat trauma-related defects.

Methods

A literature search was conducted on Pubmed, Prospero, Dynamed, DARE, EMBASE, COCHRANE and BMJ databases.

Results

A total of six articles met the inclusion criteria identifying 165 patients requiring mandibular reconstruction. Non-vascularised iliac bone graft (n = 137) was the most common method followed by ileac crest bone chips harvest using Dacron urethran os-teomesh tray (n = 24) and frontoparietal grafts (n = 4). Meta-analysis of five out of six trials demonstrated an overall success rate of 85% (95% CI 79–90; I² = 59%). A total of 13% (n = 22) of reconstructions failed either completely or partially and 21% (n = 34) of patients suffered postoperative complications.

Conclusions

NVBGs are a practical, cost-effective and favourable method of war zone management of mandibular defects with success rates comparable to those reported in the civilian literature. However, general trauma principles take precedence to rule out life-threatening injuries. Due consideration of patient factors, surgical factors, and available resources are required in the first-line management of combat-related mandibular defects.

Are Virtual Fracture Clinics really “safe”? An evaluation of the capability of a District General Hospital Virtual Fracture Clinic pathway to detect safeguarding issues.

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Introduction

Virtual Fracture Clinics (VFCs) have been widely reported as “safe” in the literature. This is due to exceptionally low rates of missed or incorrect diagnoses and safe management of conditions. However, there has been minimal discussion regarding the ability of VFCs to identify safeguarding issues.

Aim

To assess the capability of a typical VFC pathway to identify safeguarding issues.

Methods

All referrals to the Unit’s VFC in December 2022 were reviewed. n=397. Each referral was reviewed for:

- Type of healthcare professional making the referral.
- Whether the specific safeguarding “check box” had been completed on the referral.
- The diagnosis.
- The outcome e.g. discharge, review in fracture clinic, physiotherapy etc
- Whether there was a diagnosis or history suspicious of a safeguarding issue.

Allied healthcare professionals (AHPs) involved in the VFC were invited to complete a questionnaire to determine their level of training and confidence in managing safeguarding issues.

Results

Referral forms:

- Most referrals were from advanced nurse practitioners (80%).
- 55% of referrers did not engage with the specific safeguarding section on the referral.
- Of these 13 cases were suspicious for a safeguarding issue. Reasons included: suspicious mechanism of injury, suspicious injury pattern or unclear history.
- Of these 3 were subsequently not seen in a fracture clinic: 2 triaged to physiotherapy, 1 discharged. These could represent missed safeguarding opportunities.

AHP questionnaires:

- 86% of respondents were up to date with mandatory safeguarding training.
- On average respondents felt “confident” managing safeguarding. However, some only felt “some confidence”.
- Majority felt they wanted more teaching on safeguarding.

Conclusion

Whilst VFCs have been deemed “safe” with regards to fracture management, they may not be “safe” with regards to identification of safeguarding issues. This project demonstrates the main issues are:

- Poor quality referrals
- The potential for a patient’s only face to face contacting to be a healthcare professional not confident/ appropriately trained in safeguarding.

105 All the gear, no idea? Utilisation and carbon footprint of surgical instruments and disposables

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Introduction - The NHS has adopted a Sustainable Development Management Plan with environmental sustainability at its core. All staff share responsibility to work towards sustainability, while simultaneously considering the financial and social impact of our work. Operating theatres have a high carbon footprint. Many factors contribute to this including the use of disposables, waste and recycling. As surgeons we have more direct control over the instruments requested for cases.

Aim - measure the carbon footprint of surgical instruments and disposables used in paediatric trauma & orthopaedic surgery.

Methods - A convenience sample of elective and trauma cases performed at the Bristol Royal Hospital for Children in May 2023 were audited. Instruments and disposables were opened as usual. At final count, theatre staff noted which instruments were used against checklists. Carbon footprint per use of common disposables and surgical instruments have been published and were used to calculate emissions.

Results - Data was collected for revision telescopic tibial rod, supracondylar MUA and K-wire, metal work removal and soft tissue procedures. In all cases, a high proportion of instruments were unused. For supracondylar K-wiring the carbon footprint was 6,038.41 kg CO₂ e. The orthopaedic tray was 16.75% of the total procedure but only 9/69 items were used. Disposable items represented 83.75% of the total carbon footprint.

Discussion – Many instruments are routinely opened for cases and not used. The carbon footprint for preparation of unused instruments is not inconsiderable but represents a small proportion compared to use of disposable gowns, gloves and drapes.

Surgeons should consider rationalising their sets, and ensure they are only opened if required. Reducing unnecessary opening, disposal or resterilisation of instruments will improve environmental impact and costs. The carbon cost of sterilising a set is constant unless the set can be reduced in size. Small modifications to sets are unlikely to significantly contribute to the transition to a net-zero health service. For disposable items, cost of production is higher than disposal. A focus on procurement, rather than recycling, is suggested.

Traumatic Central Cord Syndrome(CCS): A retrospective analysis to evaluate neurological & functional outcomes at 1 year interval, a Northern Ireland(NI) experience.

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1. Introduction

Central cord syndrome(CCS) accounts for 70% of all incomplete spinal cord cases. The commonest mechanism of injury is a fall with hyperextension of neck and disproportionate motor impairment of the upper than the lower extremities.

2. Aim(s)

(i) To evaluate neurological and functional recovery in surgical groups up to 1 year.

(ii) To determine whether early surgery(<72hours) or late surgery(>72hours) had a greater neurological recovery at 1 year.

3. Methods

59 patients that were admitted with CCS to the regional spinal unit in NI were identified using the FORD database between 2015-2022.

Inclusion criteria(s): Principle diagnosis of CCS which was confirmed by both neurological examination and imaging results (MRI/CT).

Assessment tools: 3 assessment criteria used:-

1) MRC power grading score at 4 time intervals; Time of injury(TOI), 48hours post-op, 6 months post-op, 1 year post-op,

2) Mobility & functional independence at 1 year.

3) Bowel/bladder dysfunction pre/post-op.

4. Results

63% male patients and 37% female patients were identified in this study with an average age of 68 years. 76% were managed surgically and 24% were managed conservatively. 8 patients died within the 1 year interval and were excluded, leaving 62% for analysis within the surgical group. From this group, 42% underwent early surgery and 58% underwent delayed surgery. The average change in overall motor score from TOI to 1 year post-op in early and delayed surgery was 24.6% and 18.3% respectively. Furthermore, 29.7% of surgical patients returned to their pre-morbid mobility at 1 year; (27% early, 73% delayed). 37.8% of the surgical groups still reported bladder/bowel dysfunction at 1 year.

5. Conclusions

This study confirms the natural history of CCS and is reflective of practice in NI. Patients who received early surgery demonstrated a greater degree of MRC improvement by 6.3%. The average MRC score at TOI was lower in early surgical groups, by 22%. This demonstrates that an early surgical intervention for severe CCS with critical stenosis is beneficial. This study highlights high morbidity and mortality within this patient cohort regardless of surgery or not. This is very valuable when counselling patients, families and carers.

107 The Impact of Sociodemographic Factors on Fractured Neck of Femur Mortality Rates

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Introduction: Fractured neck of femur (FNOF) affects over 70,000 patients annually, with an average age of 84 years in men and 83 years in women and a 9.6% one-month mortality rate. Early mobilization is linked to increased odds of discharge and survival. Earlier work reported 2/3 of patients of black ethnic background to achieve early mobilization compared with 80% of white patients suggesting inequalities in care.

Aim: To examine sociodemographic differences in survival after admission for a FNOF, among a multiethnic cohort from Southwest London.

Methods: Anonymized EMIS data from 2,308 patients between December 2016 and September 2022 from St George's University Hospitals NHS Foundation Trust, included admission and discharge dates, deceased date, mortality days after discharge, age, sex, ethnicity, Index of Multiple Deprivation (IMD), and whether FNOF was the primary reason for admission. Data were analysed using chi-squared tests and multiple variable cox-regression, adjusted for all factors.

Results: Patients aged <75 years had a 1-year survival rate of 91.4%, compared with 67.1% among ≥75 years. Adjusted hazard ratios were 18.32 (95% Confidence Interval (CI) 13.01-25.80) for those aged 85-94 vs. 0-64 years; male sex 1.54 (95% CI 1.30-1.84). Differences in age and sex distributions existed across IMD and ethnicity. 63% of White Europeans were female compared with 48% of Black-African Caribbeans ($p < 0.001$). 61% of Whites were aged ≥75 years compared with 41% of Black patients ($p < 0.001$). Although Black-African Caribbeans were 1.20 times more at risk of death than White Europeans, this was not statistically significant (95% CI 0.70-2.07). The hazard ratio in the least compared to the most deprived quintile was 0.75 (95% CI 0.47-1.20) but was not statistically significant. There was no evidence of difference in the risk of death whether FNOF was primary diagnosis or not (HR=0.89, 95% CI 0.75-1.06).

Conclusion: In fully adjusted models, there was no evidence of any differences in hazard of death by ethnicity or IMD groups. Hence, ethnic and socioeconomic differences in survival after a FNOF appear to be explained by age and sex. Appreciation of these demographic factors will improve clinical understanding of the personalized care for patients with FNOF.

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1. Introduction

In the last year, we have observed cases of severe hyperkalaemia with ECG changes following rapid transfusion of several units of near-expired PRCs (packed red cells) via a Belmont rapid infuser in major haemorrhage scenarios.

In vitro studies have demonstrated a correlation between increasing PRC unit age and PRC potassium concentration, and clinical studies have shown an association between post-transfusion serum potassium and the "age" (or storage time) of transfused PRCs.

Despite this, neither potassium load or age of PRCs are considered in major haemorrhage guidelines. Our current local transfusion practice is to preferentially issue blood products that are closer to expiry to prevent wastage.

2. Aims

We examined the relationship between unit age and potassium concentration of our own packed red cell stocks in order to investigate PRC age as a possible contributing factor to hyperkalaemia in rapid transfusion.

3. Methods

We undertook a cross-sectional analysis of the potassium content of PRCs at our centre. We developed a protocol to sample PRC unit tubing segments, dilute the samples with 0.9% saline, and measure the diluted potassium concentration using a blood gas analyser, to calculate the corrected potassium concentration.

4. Results

In our pilot run, we sampled tubing segments from 38 PRC units. We found a positive correlation between unit age and potassium content, with potassium concentrations of up to 20-25mmol/L in older units.

5. Conclusion

Following local incidences of significant hyperkalaemia in rapidly transfused patients, further investigations demonstrated a dramatic increase in PRC K⁺ concentration with increasing PRC age in our institution.

16 units of packed red cells (Haemorrhage Packs A-D in our centre) that are near expiry, transfused via a rapid infuser, could theoretically deliver a potassium load of up to 120mmol within 10 minutes.

There remains an absence of evidence and guidelines regarding hyperkalaemia following rapid transfusion in trauma and other scenarios associated with rapid blood loss. These preliminary findings should prompt reconsideration of transfusion policy in major haemorrhage protocols, either by limiting the age of issued blood, or use of potassium-reducing measures.

117 Fracture dislocation of the elbow: outcomes following operative and non-operative treatment.

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Introduction

Fracture dislocation of the elbow is a complex injury that poses challenges to both the patient and healthcare professional. Options for management are operative or non-operative. Recent studies suggest treating this injury operatively improves outcomes.

Aim

To review the functional outcome of patients with fracture dislocation of the elbow and to compare the outcome of operative and non-operative groups.

Method

This is a retrospective consecutive case series of adult patients who were referred to the Royal Derby trauma and orthopaedic department having sustained a fracture dislocation of the elbow. The injuries were grouped using the Wrightington classification. The primary outcome was the Oxford Elbow Score (OES) at last follow up. The secondary outcomes were range of movement and pain score, measured using a visual analogue scale (VAS).

Results

90 patients qualified for inclusion (41 male, 49 female) with a mean age of 50 years. Mean follow up 33 months. Using the Wrightington classification there were 19 type A (16 non-op, 3 op), 6 type B (all non-op), 7 type B+ (4 non-op, 3 op), 40 type C (2 non-op, 38 op), 3 type D (all op), 15 type D+ (all op). Mean OES was 17 in the operative group and 14.5 in the non-operative group with no statistical difference between the two ($p=0.25$). Mean flexion arc for the operative group was 1310 and 1370 for the non-operative group with no statistical difference between the two ($p=0.22$). Mean pain score was 1.2 in the operative group and 0.3 in the non-operative group with no statistical difference between the two ($p=0.15$).

Discussion

The results show good outcomes in function, range of movement and pain in this large group of patients presenting with fracture dislocation of the elbow. No statistical difference is seen in these domains when comparing those treated operatively to those treated non-operatively. Most injuries in the operative group were type C, D or D+. The results show that, when these severe injuries are treated appropriately with surgery, the outcome is good and comparable to that of less severe injuries. Other studies from similar size units have suggested treating all fracture dislocations operatively; the results reported here show that a conservative approach does not compromise outcomes.

Radiological assessment of Costal Margin Injuries: A single centre approach using Agfa Enterprise Imaging PACS system and 3D rendering of the costal cartilage

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Introduction

Costal margin rupture (CMR) injuries are under-diagnosed and carry significant symptom burden. Benefit of radiological assessment using CT scans has been reported in small-scale studies and case reports, recently leading to the development of a Sheffield Classification System.

Aims

To present our experience in the radiological assessment of the largest cohort of CMR injuries to date.

Methods

Data were collected prospectively between 2006 and 2023 at a Major Trauma Centre in the United Kingdom. CT scans of patients with CMR were retrospectively analysed using an updated Agfa Enterprise Imaging PACS, and 3D reconstruction of costal cartilages. The Sheffield Classification System was used to categorise injury patterns based on presence/absence of associated Intercostal Hernia (IH). Level of CMR, presence of ipsilateral costal cartilage or rib fractures, and thickness of costal cartilage were also recorded.

Results

54 patients with CMR were included in the study. IH was present in 30 patients. There was a bimodal distribution of the level of the costal margin rupture, with IH Present occurring predominantly at the 9th costal cartilage, and IH Absent at the 7th costal cartilage ($p < 0.001$). Presence of IH was associated with other costal fractures ($p < 0.0001$) and rib fractures ($p = 0.009$). There were correlations between the costal cartilage being 'thin' at the site of the CMR and the presence of intercostal hernia ($p < 0.001$). In 4 instances, disruption of CMR was related to isolated interchondral ligament rupture rather than costal fracture.

Conclusions

Analysis of CT scans and 3d rendering of costal cartilage can aid diagnoses and aetiology of CMR. The Sheffield Classification system is statistically associated with radiological injury patterns: we propose a further study evaluating clinical associations between CMR injury pattern, presentation, and management techniques.

121 CODE RED TRAUMA: This IS a drill!

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Introduction

Managing a critically unwell major haemorrhage patient, particularly in the context of penetrating trauma, is a relatively infrequent occurrence in the Emergency Department (ED) at a DGH. A spate of such cases highlighted the need to consolidate knowledge and skill, and the importance of managing logistics and having a well-aligned multidisciplinary team. This prompted us to create a bespoke, multidisciplinary trauma day emphasising teamwork and human factors- The Code Red Trauma Day.

Aims

We aimed to present a unique opportunity for personnel involved at every stage in the management of major haemorrhage in trauma to work together as a single team. Through simulations, we tried to foster a mutual understanding of the perspectives, priorities, and logistics involved at different points in a patient's journey to definitive treatment. We aimed to provide a safe, informed, and appropriate space to explore team dynamics between colleagues from different services and skill-sets, using a team of human factors experts. Finally, we hoped to define standard practice in the ED for all services and to hone important trauma skills in line with national guidance.

Methods

All the services involved in the management of a trauma patient were invited. The morning session comprised of a series of 20-minute lectures and panel discussions on traumatic cardiac arrest, major haemorrhage, damage control surgery, and resuscitative thoracotomies. Candidates were then split into deliberately multidisciplinary groups of 10 and followed specific schedules ensuring participation in 5 of the 8 high-fidelity simulations designed for the day, and a cadaveric workshop on resuscitative thoracotomy.

Results

Attendance was limited to 80 candidates, with 40 members of faculty, volunteers and actors used. Candidates included doctors and nursing staff from emergency, intensive care, and orthopaedic specialties, along with radiographers, ambulance service personnel, and police officers. Feedback from candidates and faculty was overwhelmingly positive. Most candidates highlighted a better understanding of other services, and an improved confidence in their trauma skills after the day.

Conclusion

Another study day is planned for early 2024, with the aim to make this a biannual event.

124 Enhanced recovery for acute open lower limb fracture 'fix & flap'

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Sophie Pope-Jones; The Welsh Centre for Burns & Plastic Surgery
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Introduction:

Enhanced recovery (ER) aims to achieve earlier recovery, reduced hospital length of stay (LoS) whilst improving outcomes. Our ER protocol for acute lower-limb open fracture (ALLOFs) includes dangling at day 3 and mobilizing fully weight-bearing on day 5.

Aims:

We reviewed our ER protocol by evaluating the LoS following 'fix & flap', the rates of return to theatre rate, successful flap salvage, flap failure and deep infection.

Methods:

An observational study of a prospectively maintained lower limb flap database from September 2020 to January 2023 was undertaken; for patients with a Gustilo IIIB/C injury and free flap reconstruction.

Results:

There were 161 patients, 126 male (78%) and 35 female (22%) with a median age of 40 years (12-79, interquartile range 30.0). 81% of cases were high energy injuries. For all patients, the median time to definitive fixation and soft tissue coverage from injury was 4 days (0-30, interquartile range 2). 18 cases (11.2%) required return to theatre for flap exploration; 13 cases were successfully salvaged (72%). Nine free flaps failed (5.4%). The median total LoS from admission was 10 days (6 to 46, interquartile range 5), with a median LoS following definitive fixation and soft tissue coverage of 7 days (4 to 20, interquartile range 3). The mean follow-up was 10.6 months with a deep infection rate of 4.2%.

Conclusion:

In isolated ALLOFs our ER protocol is safe and effective in shortening the LoS. Our outcomes sit comfortably within the expected rate for return to theatre, flap salvage/failure and deep infection when compared to contemporary literature.

126 Does digitalisation streamline musculoskeletal injury management and referral pathways? Evidence from a complete audit cycle assessing the novel Virtual Bones software solution.

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Introduction

Managing musculoskeletal (MSK) injuries requires effective communication and collaboration between the Emergency Department (ED) and orthopaedic teams. An audit analysing Virtual Fracture Clinic (VFC) referrals, staff challenges and the impact of the novel IT solution, Virtual Bones (VB), was undertaken at the West Suffolk Hospital (WSH).

Aims

To evaluate the MSK injury pathways at WSH.
To assess the impact of Virtual Bones on these pathways.

Methods

Fracture clinic outcome data was collected between 2017 and 2022, with a two-week focussed collection gathering diagnosis, ED wait times, patient leaflet use, and clinical decisions pre and post VB deployment. An ED survey was administered to reveal staff challenges. Virtual Bones was developed and deployed to enable clinicians to comprehensively digitalise local MSK management pathways, specify documentation requirements, facilitate splint and cast application, clarify equipment locations, and offer patient information leaflets.

Results

An average of 504 inappropriate VFC referrals were made annually across 2017-2022. A 12.5% annual increase in VFC referrals was observed. Over 25% of initial VFC appointments resulted in discharge without additional investigations. Improper documentation by ED clinicians was associated with increased follow-up appointments (OR= 2.00, 95%CI [1.16-3.47]). The ED staff survey, with 15 responses, identified challenges in navigating local guidelines, locating equipment, applying immobilization devices, and supplying information leaflets. The Virtual Bones pilot (May-July 2023), peaked at 352 users, 2,400 sessions, and 56,700 page views. The initial 2-week audit involved 260 patients, while the re-audit included 258. Mean ED waiting times decreased from 166 to 122 minutes, with a 90-minute reduction in the foundation doctors' group ($p < 0.0001$). Inappropriately referred dischargeable injuries decreased from 23 to 10. Improper documentation decreased from 58% to 30% ($p < 0.0001$). The VFC discharge rate increased from 39% to 48.8% ($p = 0.021$). Patient information leaflet use increased from 27.9% to 41.7% ($p = 0.032$).

Conclusion

Robust engagement with Virtual Bones, along with improved metrics, imply that it has effectively streamlined MSK injury pathways and eased staff challenges.

127 Plasma as a resuscitative fluid in Traumatic Brain Injury and impact on viscoelastic parameters

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Introduction: Plasma may play a pivotal role in Traumatic Brain Injury (TBI) resuscitation, with the putative advantages of restoring haemostasis, preventing cerebral oedema through osmotic control and more effectively restabilising the cardiac output. TBI was implicated as a subgroup with incremental benefit in clinical trials investigating the ratio of plasma transfusion (COMBAT) and the use of viscoelastic assays (VA) (ITACTIC) in major haemorrhage (MH).

Aims: identify whether the presence of plasma transfusion (PT) rates differ when TBI is present, and the impact of these in subsequent VA parameters, differentiating TBI and extracranial trauma.

Methods: 404 patients with and without TBI were recruited in a Major Trauma Centre and had VAs performed at baseline, 24 and 72 hours. PT was recorded as a proportion of all resuscitative fluids in the first 24h. To adjust for age, injury severity and presence of MH, a linear logistic regression was modelled to demonstrate the relationship between TBI and PT, and a linear mixed-effects model was fitted to find predictors of variation in subsequent VA tests. Outcome analysis were performed with binary (mortality) and ordinal logistic regression (mortality and length of hospital stay).

Results: The presence of TBI and MH were independent predictors of higher and lower PT, respectively ($p < 0.001$); among VA parameters, only the alpha angle showed a crescent trend over time, with the largest value at 72h ($p < 0.001$) and in older patients ($p < 0.05$); but no VA parameter showed a relationship with PT and TBI. Higher PT ($P < 0.05$), older age ($P < 0.001$), total volume infused in 24h ($p < 0.0001$) and the presence of TBI ($p < 0.0001$), but not Injury Severity Scores and MH, were independent predictors of longer hospital stay and death.

Conclusion: TBI patients received more PT. In line with the results of the ITACTIC trial, dynamic VA changes did not reflect clinical management nor distinguished TBI as a subgroup of patients. In this cohort, PT was associated with worse outcomes.

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Introduction: To enhance the management of patients experiencing their initial episode of traumatic shoulder instability, the British Elbow and Shoulder Society (BESS) introduced national guidelines in 2015. However, the impact of this on patient outcomes remains unclear.

Aim: This study aims to assess patient outcomes following the adoption of BESS guidelines at our hospital in 2016.

Methods: We conducted a study involving patients aged over 16 years who presented with their first traumatic shoulder dislocation during two time periods: January 2013 to December 2013 and between January 2016 and August 2016 (pre-guidance) and October 2016 to December 2019 (post-guidance). Patients with associated fractures were excluded from the study. Clinical records and imaging data were analysed to compare the rates of imaging and surgery, as well as the time intervals between these procedures and re-dislocation rates.

Results: The study comprised 144 patients treated for a first-time dislocation before the implementation of BESS guidance and 342 patients after its introduction. The mean age of the cohort was 49.4 years, with a male-to-female ratio of 2:1. Among patients younger than 25 years, the proportion undergoing MRI arthrograms increased from 26.2% to 68.2%, with a reduction in the mean lag time from 158 to 62 days. In patients aged over 40 years, the utilization of ultrasound scans increased from 42.6% to 60.1%, and the mean lag time decreased from 62 to 36 days. While the rate of surgery for instability in those under 25 and cuff tears in those over 40 remained stable, there was an improvement in the lag time, decreasing from a mean of 432 to 249 days. In individuals under 25, the rate of dislocations decreased from 1.83 per person to 1.32 per person, and the percentage of patients under 25 experiencing three or more dislocations decreased from 23.8% to 6.1%. The overall percentage of patients experiencing re-dislocations decreased from 16.0% to 9.36%.

Conclusions: The implementation of national guidance for managing first-time traumatic shoulder instability has resulted in an increased rate of imaging and reduced time intervals between imaging and surgery. The overall rate of dislocation was significantly reduced contributing to improved patient outcomes.

129 Simplifying final product analysis of post operative images in dynamic hip screw fixation supports shared learning

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Introduction

Measurement of technical skill is fraught with methodological challenges. Post operative radiograph review offers a unique learning tool abstract from the operating environment. Dynamic hip screw fixation represents an ideal candidate for final product analysis given the plethora of measures and fracture patterns that require recognition to perform the procedure successfully. This process also offers the opportunity for learning through qualitative feedback to refine techniques to the trainee surgeon in a shared learning environment.

We present a simplified scoring method for reviewing post operative radiographs that is reproducible and prompts shared learning outcomes for a department.

Purpose

To generate a tool to improve feedback to trainee surgeons performing dynamic hip screw fixation

Methods

Post operative radiographs of dynamic hip screw fixations were reviewed in the trauma meeting and rated by the consultant team present.

A simplified scoring system was utilised being: 0 – unsatisfactory, requiring intervention, 1 – satisfactory, with learning points and 2 – excellent. Data was collected initially over a four month period. Results discussed and then a further review over the next four months.

Results

51 DHS procedures were initially reviewed. 15% were scored 1 with potential areas for improvement but with no learning points disseminated. No procedures were felt to be unsatisfactory.

The second cycle reviewed 50 DHS procedures with 28% of these scoring 1 with learning points recorded. No procedures were felt to be unsatisfactory. All procedures scoring 1 had learning points recorded. 40% of all operations received written feedback regardless of score.

Conclusions

Routine final product analysis scoring of post operative radiographs promotes written learning discourse. Unintentional outcomes are increased feedback on procedures felt to be excellent with praise felt necessary for exemplary procedures. This method is simple to promote feedback but also as a surrogate marker to plot learning curves for trainee surgeons.

Consent and The Mental Capacity Act 2005: Are We Adhering To Legal Framework When Consenting Patients to Major Orthopaedic Trauma Surgery? A Quality Improvement Report

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Introduction: Consent for the orthopaedic trauma patient who is deemed to lack mental capacity is a multistep process in accordance with the Mental Capacity Act 2005. There is a paucity of research on adherence to this legal process. Are cognitively impaired orthopaedic patients undergoing major trauma surgery with valid consent?

Aims: To assess the quality of the consent process in orthopaedic trauma patients lacking mental capacity to make an informed decision at our institution.

Methods: Plan-Do-Study-Act (PDSA) methodology was used to structure our quality improvement project. Cognitively impaired patients undergoing major lower limb trauma surgery were identified by retrospective review of inpatient paper records. Consent form four documents were evaluated using the Mental Capacity Act toolkit which included 13 domains. Recommendations were made at a local meeting in the form of a verbal presentation.

Results: N=20, mean age: 87, 55% female. All patients had their mental capacity assessment recorded directly on a Consent Form four. Mean number of assessments of capacity per patient: two. Following two cycles of audit, our institution continued to perform well (100% per cycle) in clear documentation of the decision, clear documentation of a best interests decision and evaluation of all four key elements of capacity assessment (understand, retain, weigh up information and communicate decisions). Family were consulted (80% per cycle). After recommendations, improvements were made in identification and consultation of IMCA/LPA/paid carers (50% and 70% improvement, respectively) and in documentation of evidence to show lack of capacity is caused by an impairment of mind/brain (30% improvement). Further improvements could be made in documentation of job title, named family members, identification of specific impairment(s) causing lack of capacity, evidence of support given to the patient to help make the decision and seeking patient's wishes prior to consent.

Conclusions/discussion: Our project improved the consent process for cognitively impaired patients at our institution. We hope to sustain positive changes and further improve the patient journey by increasing awareness of the legal framework surrounding consent for cognitively impaired patients.

134 A retrospective, single centre, observational study, to compare the performance of different mass casualty triage tools in predicting Priority 1 status

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Introduction:

Mass casualty triage tools play a key role in the management of casualties during a mass casualty incident. The current UK major incident primary triage tool (NARU triage), has proven to have poor performance in identifying patients that require time sensitive life or limb-saving interventions (P1 status). Potential alternatives include existing international tools, a novel AI-derived triage tool known as Quick Triage (QT) and the novel Ten Second Triage (TST). Thus far, there is limited evidence regarding the performance of each tool and no clear consensus of the best triage tool.

Aim:

By using up-to-date data from a UK Major Trauma Centre (MTC), this study aims to evaluate the performance of nine latest triage tools in identifying casualties with P1 status.

Methods:

Adult patients who activated a trauma alert on presentation to a UK MTC and were subsequently admitted in the year 2022 were included in this study. Using computer codes, nine triage tools were applied to the patient's first recorded pre-hospital vitals to generate triage categories. Next, utilising data from hospital records, triage categories were assigned based on the need for time-sensitive life or limb-saving interventions. The tool-derived triage categories were compared to the interventions-based triage categories to determine the performance of each triage tool. Tool performance indicators included sensitivity, specificity, over-triage rate and under-triage rate.

Results:

2042 patients were included in this study. The intervention-based triage categorised 364 patients (17.8%) as P1 and 1622 patients (79.4%) as P2. When compared to the P2 category, P1 group demonstrated significantly higher mortality (9.1% vs 3.9%, $p < 0.0001$), higher ICU admission rate (63.5% vs 5.1%, $p < 0.0001$), and higher median Injury Severity Score (24 vs 9, $p < 0.0001$). QT demonstrated the best performance in predicting P1 status across all age groups with sensitivity of 87% (CI 83.0%-90.2%) and over-triage rate of 64% (CI 60.7%-67.2%).

Conclusion:

QT demonstrated a significant improvement in performance when compared to current utilised triage tools in predicting P1 status. Therefore, this study suggests that the NHS should adopt QT as the primary and secondary mass casualty triage tool.

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Introduction

Trauma is a leading cause of death and despite trauma care improvements, survival rates remain unchanged for critically injured patients, especially in austere settings. Cellular energy stress occurs early following trauma, potentially representing a future therapeutic target for trauma.

Aim

We aimed to determine the degree of cellular energy stress in two porcine trauma and haemorrhagic shock (THS) models resuscitated with saline, fresh whole blood (FWB) and fresh frozen plasma (FFP).

Methods

Two studies were conducted under the Animals (Scientific Procedures) Act 1986. THS1 involved soft tissue, liver injury and 30% total blood volume haemorrhage; THS2 as before with ongoing haemorrhage (4ml/kg/hr). Following a 30 minutes shock phase, prolonged resuscitation took place for 450 minutes or demise (with terminal anaesthesia), with the administration criteria to deliver 3ml/kg of fluid at 200ml/min, being SBP <80mmHg.

Muscle samples for ATP, phosphocreatine (PCr) and lactate content were taken at baseline (neck); and pre-mortem following resuscitation from neck (NIR), non-injured limb (HNS) and injured limb (HS). Descriptive data are reported as mean±standard deviation. A p-value of ≤ 0.05 determined significance.

Results

The studies involved 57 animals (THS1, n=29, weight 50.7±1.0kg; THS2, n=28, weight 53.7±2.3kg). There was increased model severity with reduced survival to 450 minutes in THS2 compared to THS1. In both studies, the saline group had the lowest survival.

THS2 demonstrated increased cellular energy stress compared to THS1 across all treatment groups and sites, with increased lactate and reduced PCr. ATP content was lower in THS2 at the HNS, $p < 0.0001$, and HS, $p = 0.002$ sites only.

In THS2, a statistically significant increase in lactate was observed in the saline group compared to the FWB group, at HNS ($p = 0.0019$) and HS sites ($p = 0.0075$). In THS2, FWB resuscitation only, demonstrated no change in cellular energy from baseline to pre-mortem samples.

Conclusion

High cellular energy stress is observed in a porcine THS model with ongoing bleeding, but FWB administration appears to mitigate that stress. Muscle cellular energy metabolism is a sensitive marker of therapeutics employed to improve survival.

147 IMPROVING THE KNOWLEDGE AND SKILLS OF FY2 DOCTORS IN MANAGING TRAUMA CASES, A STRUCTURED EDUCATIONAL PROGRAM

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Aim: This study aimed to evaluate the effectiveness of a structured educational program in improving the knowledge and skills of FY2 doctors in managing trauma cases. **Objective:** The objective was to use a hybrid teaching method, including e-learning modules and a hands-on simulation course, to enhance the knowledge and confidence of FY2 doctors in managing trauma cases. **Methodology:** This study was a pre-and post-intervention evaluation of the structured educational program for FY2 doctors in a UK hospital. The program comprised e-learning modules sent out a month before the course start date, followed by a hands-on simulation course. The simulation course included several stations, each with its intended learning outcomes. The participants were assessed on their knowledge and skills before and after the program using a structured questionnaire. The simulation course included several stations with intended learning outcomes (ILOs). The stations included C-spine immobilization and logroll, airway management, needle thoracocentesis, IO insertion, LUCAS, an ultrasound simulator and a FAST scan. The course was conducted in a single day, and two doctors facilitated each station. The junior doctors were divided into five groups, and each group rotated through each station. **Results:** A total of 27 participants took part in the study day. Firstly, there was a significant improvement in the mean scores of both knowledge and skills for FY2 doctors in managing trauma cases after participating in the structured educational program. Furthermore, the correlation coefficient between the improvement in knowledge and skills was 0.672, considered a moderate to strong correlation. This positive correlation suggests that the improvement in knowledge gained from the e-learning modules and simulation courses was translated into the practical skills required for managing trauma cases. We also analyzed the feedback provided by the participants. **Conclusion:** The structured educational program was an effective way to enhance the knowledge and skills of FY2 doctors in trauma management. The hybrid teaching method, including e-learning modules and a hands-on simulation course, was a valuable approach for delivering structured education to junior doctors.

153 AAJT-S: Titratable Zone 1 REBOA effect and zone 3 REBOA equivalency. A cadaver study

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Background

'Non-compressible' haemorrhage is the leading cause of preventable battlefield death, often requiring surgical or radiological intervention, which is precluded in the pre-hospital environment. In previous Joint Theatre Trauma Registry analysis, all patients who sustained injuries to named vessels in the abdomen died; only one survived to surgery. Gas insufflation and hyperpressure intraperitoneal fluid studies in animals have shown significant reduction in blood loss from splenic, hepatic and mesenteric injuries. We examine the use of the Abdominal Aortic Junctional Tourniquet - Stabilized (AAJT-S) as a minimally invasive intervention to tamponade bleeding from vessels of the celiac trunk, by generating proximal epigastric compartment pressure.

Methods

4 Fresh self-embalmed cadaveric donors were selected (1 male, 3 female.) A 3-4cm manometric water-filled balloon was placed intraperitoneally in the epigastric space and another in the retropubic space by two Consultant Trauma Surgeons. These were each connected to manometer tubing, a syringe and three-way tap. Skin around the outlets was clipped to form a seal. Baseline pressures of 8cmH₂O were simulated (equating to average central venous pressure.) AAJT-S was then applied and inflated to 250mmHg. Steady pressure readings were then recorded for both compartments.

AAJT-S was then deflated and removed, along with the epigastric manometer. 500ml of water, simulating blood, was then poured into the abdominal cavity via the epigastric aperture and allowed to evenly distribute. The epigastric manometer was replaced and again intraabdominal pressures of 8cmH₂O were simulated. AAJT-s was then applied and inflated to 250mmHg. Steady pressure readings were then recorded for both compartments.

Results

Proximal compartment pressures achieved were a mean of 54.6cmH₂O; distal compartment pressures were a mean of 46cmH₂O.

With 500ml fluid in the abdomen, proximal compartment pressures achieved a mean of 52.25cmH₂O; distal compartment pressures were a mean of 35cmH₂O.

BMI did not have a clinically significant effect on epigastric pressure achieved, but there was some statistical significance observed in the range of this study (16.7-22.9.) It is unclear whether gender has a statistically significant effect on the epigastric or pelvic pressure achieved.

Conclusion

AAJT-S at 250mmHg inflation achieves proximal epigastric compartment pressures c40mmHg, with or without 500ml free blood in abdomen. This likely equates to a highly significant reduction in blood flow to the celiac trunk branches. This effect is titratable. BMI does not have a clinically significant effect on this. AAJT-S may be a point of injury intervention that contributes to clot stabilisation and non-surgical haemorrhage control for zone 1 injuries.

157 National variation in guidance for the management of pregnant women presenting with major trauma.

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Introduction: The initial assessment of pregnant women presenting with major trauma in the Emergency Department is more complicated than non-pregnant women due to the physiological and anatomical changes seen in pregnant women and the presence of the foetus.

Aim: The aim of this study was to determine if management guidelines for pregnant women presenting with major trauma in the Emergency Department exist and if there is national consistency.

Methods: A freedom of information request was submitted to 125 acute NHS trusts in England and six in Wales. The trusts were asked to confirm whether they have a guideline for the management of major trauma in pregnant women presenting to the Emergency Department and what the guidelines were.

Results: 96.2% responded to the freedom of information request. 19% of trusts were found to have a specific guideline for assessing pregnant women with major trauma presenting to the Emergency Department, 7.9% have a generic guideline for assessing pregnant women in the Emergency Department. 19.8% have a protocol that specifies when an obstetric trauma call should be put out by the Emergency Department and when a pregnant woman should be transferred to a major trauma centre for definitive management. 69.8% routinely call Obstetrics/Gynaecology to the trauma call compared to 36.5% calling Paediatrics.

Conclusions: The heterogeneity of guidance available across different trusts in the UK necessitates the agreement of national guidelines for the assessment of pregnant women with major trauma to standardise delivery of care.

158 Is it necessary to perform six week postoperative X-rays for patients treated with distal radius fracture volar locking plates?

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1. Introduction

Standard postoperative management of patients undergoing distal radius fracture fixation with volar locking plates includes a check X-ray at six weeks. It is not clear how much value this adds to the management of these patients. Minimising unnecessary costs and ionising radiation would be advantageous.

2. Aim(S)

Do X-rays performed at six weeks postoperatively in patients undergoing distal radius fracture fixation with volar locking plates have clinical utility?

3. Methods

This study was a retrospective review of patients who underwent open reduction and internal fixation using a volar locking plate between 2018 and 2023 at a large tertiary hospital. Patients were identified using our database for this patient cohort. Clinical information was gathered using the electronic health records system.

4. 286 patients met the inclusion criteria. 167 (58.4%) patients were female and 119 (41.6%) patients were male. The mean age was 49 years. 271 (95%) underwent a six-week radiograph. A change in management on account of the six-week radiograph was seen in only 10 patients (3.5%). Changes in management related to the radiograph were due to the position of metalwork or insufficient callus formation at the fracture site. Further investigations included 5 patients returning for radiographs at a later date to assess union, 3 patients for CT scans to identify whether metalwork was intra-articular and two patients for ultrasound scans. Fractures in the nine patients with delayed healing united within 12 months. There were no non-union in this cohort.

5. Conclusions/Discussion

Our study is the first to question the clinical implications of post-operative radiographs at six weeks for this patient group. The review contributes to the current discussion surrounding rationalising medical care and the post-operative management of patients undergoing volar locking plate fixation for distal radius fractures.

161 The Incidence of neuroma following digital amputation

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Introduction

Around 10,000 upper limb amputations occur in the United Kingdom each year. Following Surgery, these patients can go onto develop debilitating post-amputation nerve pain as a result of neuroma formation. The incidence of painful neuroma occurring after upper limb amputation is 25-25% and 7-8% for digital amputations. The nociceptive pain and discomfort caused by neuroma pain (NP) can have a profound impact on a patient's mental health, function, livelihood and quality of life.

Aim

The aim of this study was to identify the incidence of painful neuroma formation following digital amputation at a major trauma centre.

Methods

A single centre, retrospective review of all digital amputations occurring at the Queen Elizabeth Hospital, Birmingham between January 2015 and December 2018 was conducted. Data points on patient demographics, location of the amputation, indication for amputation and incidence of neuroma was collected from our electronic health records (eHands and PICS). The presence of neuroma was determined from post-operative records and outpatient clinic letters.

Results

A total of 418 digital amputations were performed during the study period, of which 246 (58.9%) were on the left hand. The most common levels of amputation in our study was index finger (n=138), Middle finger (n=101) and small finger (n=69). Amongst these cases, 35 (8.4%) neuromas were identified. The most common aetiology for amputation included trauma (67.2%), infection (19.6%) and Cancer (5.5%). The leading cause of neuroma in our cohort was trauma with 29 (82.9%) cases.

Conclusion

We highlight a significant number of symptomatic neuromas developing as a consequence of digital amputation. The neuropathic symptoms experienced as a result of neuromas is a significant cause of morbidity, decreased quality of life and reduced function. Many surgical techniques exist which attempt to treat these lesions; however, no consensus exists as to which is the best. Our study highlights the importance of detecting these lesions early as well as the need for appropriate awareness of their clinical features amongst surgeons.

British Trauma Society

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2023

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Poster presentations



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Poster Abstracts to be presented at the British Trauma Society Annual Scientific Meeting 22-23 November 2023, Cardiff UK

No.	Primary author	Co-authors, institution(s).	ABSTRACT
10	William Passmore	Anand Pillai- Wythenshawe MFT	<p>The Hive Virtual Fracture Clinic</p> <p>Abstract</p> <p>The HIVE Virtual Fracture Clinic (VFC) is a replacement for face-to-face fracture clinics, to provide a more effective pathway in managing trauma and orthopaedic injuries. The aim of the audit is to conduct a retrospective audit on the effectiveness of the HIVE Virtual Fracture Clinic at Wythenshawe Hospital Manchester Foundation Trust (MFT). The purpose of the audit is to demonstrate how the HIVE VFC can safely replace face-to-face fracture clinics, whilst meeting the guidelines. Data was collected from the HIVE electronic platform in a four-week period by a medical student, on placement at a separate trust site. Stored on HIVE, the data collected was from the first seven months of the HIVE VFC, ranging from 9th September 2022 to 31st March 2023. Therefore, a retrospective study was suitable. The data analysis found that on average 10.6 patients were seen in the HIVE VFC each day, with an overall increase of 50.4% in patients seen per month from September 2022 to March 2023. This shows that the HIVE VFC became more efficient in treating patients over the opening seven months. The HIVE VFC at Wythenshawe Hospital MFT demonstrated an overall successful discharge rate of 94.5%, displaying the effective treatment of patients at the facility. To improve the effectiveness of the HIVE VFC, it is recommended that a template format for the VFC documentation is introduced. Alongside the template, a specialist-based timetable is recommended. In conclusion, the HIVE VFC demonstrates that it is effective in the management of trauma and orthopaedic patients.</p>

11 Miguel Fernando Juárez Moyrón

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ACUTE MANAGEMENT OF ISOLATED CERVICAL AIRWAY INJURY

Introduction: Penetrating neck injuries (PNI) carry significant morbidity and mortality, particularly those involving vascular or aerodigestive hazard. The Advanced Trauma Life Support (ATLS) program must be followed in these cases. Isolated cervical aerodigestive injuries are insidious to discard in stable patients, depending on their presentation alongside "hard signs" (HS) of vascular or aerodigestive injury: pulsatile bleeding, expanding hematoma, voluminous hemoptysis, subcutaneous emphysema, stridor or wound bubbling. Evidence suggests that pursuing HS in PNI furnishes better outcomes than relying on the neck zone where the traumatic injury is located for prompt surgical explorations. Stable patients with PNI and HS may undergo further studies or surgery. Aims: To describe the management of a 25 years-old male, who arrived to the emergency room due to a sharp weapon aggression disrupting skin from the chin to the left anterior neck triangle, with normal vital signs and subcutaneous emphysema, without vascular HS. Methods: Surgery was implemented with a transverse incision to explore the wound course. Minor arterial branches and venous affluents had to be ligated; major vascular structures were unscathed. A 3.5 cm anterior disruption of the larynx and thyrohyoid membrane superior to the thyroid cartilage, exposing mucosa, was detected, visualizing of airway tube; the posterior wall was intact. Repair was made with uninterrupted suture with multifilament-synthetic-absorbable material, subsequent covering with a muscle flap using U-form stitches, then a tracheostomy was placed and soft tissues were repaired with primary closure. Results: Mechanical ventilation was suspended 36 hours passing intervention. No signs of air escape through traumatic injury were seen, tolerating oral intake, with functional tracheostomy, hence the patient was discharged. The tracheostomy cannula was removed after bronchoscopy, one month following the injury. Vocal therapy was needed. Conclusions: The airway management is priority among trauma patients. In steady patients who have HS of aerodigestive injury, the clinicians' expertise and the availability of further studies as computed tomography angiography and endoscopy will define the approach.

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Arjun Chandra

Alex Trompeter

Surgical management of Atypical Femoral Fracture Non-Unions - strategies and outcomes

Introduction Despite their complex pathogenesis, the rate of delayed union or AFF non-union (AFFN) can be as high as 30%. Commonly associated with bisphosphonate use, the resultant bone turnover suppression leads to microfractures within the trabecular bone that propagate without healing. These fractures pose a challenge to manage when compared with other femoral fractures, having higher rates of delayed union and revision surgery. Despite the high risk of non-union, there remains no consensus on treatment strategy for non-union of these complex fractures. Recorded strategies include use of valgus alignment, bone grafting and restricted weight bearing protocols post-operatively. Use of intramedullary nails and 95 degree blade plates has been described in literature. AIM To examine whether similar union rates to those published can be achieved without the use of bone graft and to examine if immediate weight bearing leads to any increase in complication rates or delays in time to fracture union? Methods A retrospective audit of a prospectively collected trauma database at a tertiary centre for non-union was conducted between March 2015 and March 2023. ASBMR revised criteria (2014) was used to define AFF. All revision surgeries were performed by a single surgeon specializing in limb reconstruction. Radiographic union was defined as cortical bridging across the non-union in three of four cortices on radiographs and Non-union was defined as failure to achieve radiographic union within 6 months or no progression of healing on radiographs taken 3 months apart. Results Ten consecutively treated patients met the inclusion criteria of which 8 went on to achieve union after first revision surgery and 9 after second revision surgery. Fixation constructs used were long reconstruction intramedullary nail, 95-degree Blade plate and a reconstruction type nail with adjuvant plate Valgizing osteotomy was used in 5 patients and all patients were allowed to weight bear as tolerated in the immediate post-operative period. Bone grafting was not used in any of the patients. Discussion/Conclusion This case series demonstrates a comparable union rate for AFFN to studies previously reported and achieved without any form of bone grafting was used in the management of AFFN.

14 Justin Collis

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Time to total hip hemiarthroplasty following neck of femur fractures

Hip fractures are associated with significant implications for morbidity and mortality. In the United Kingdom (UK) the Trauma Audit Research Network (TARN) demonstrates over 76,000 hip fractures occur each year. For displaced intracapsular neck of femur fractures the standard of treatment is arthroplasty. In the case of neck of femur fractures arthroplasty is offered as either hemiarthroplasty or total hip replacement (THR). The current guideline from the 'National Institute for Health Care and Excellence' (NICE) is THR should be offered in patients who mobilise with no more than a stick outdoors, are expected to remain independent for up to two years and are suitable medically for the operation. In a small district hospital providing a THR service can be challenging, patients often wait for the appropriate surgeon to become available. Delays are associated with increased morbidity and mortality. The aim of our audit was to assess time to theatre in patients awaiting THR for neck of femur fractures (NOF). Our secondary aim was to review length of hospital stay and associated complications, pneumonia, pressure sores and urine infections. A retrospective review of an electronic database of patient's recorded with neck of femur fracture. Following the identification of hip fracture patients, electronic operative notes were analysed to include patients that underwent THR. Time of admission and operation were recorded, as well as associated complications. A total of 30 patients were included in the statistical analysis. The average age of patients undergoing THR was 78 and the oldest patient was 90 years old. The average time to theatre was 3 days, however there were significant outliers with one patient waiting 10 days. Furthermore 20% (n=6) patients waited longer than 4 days. Patients 16% of patients developed complications (n=5) while waiting for their operation. The most common complication was pneumonia. Consistently the literature demonstrates that delays to the theatre in patients suffering from neck of femur fractures is associated with increased morbidity and mortality. Our project found that providing a THR service in a small district general hospital can be associated with delay to theatre.

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Blunt cardiac injury in sternal fracture patients, when is echocardiography indicated?

Introduction: Echocardiography is used in sternal fracture patients to investigate for blunt cardiac injury. Evidence suggests blunt cardiac injury is a rare occurrence following sternal fractures and simpler tests can be used before echocardiography to rule it out. Currently, in The University Hospital of Wales Major Trauma Centre, echocardiography may be ordered for sternal fracture patients when it is not indicated. Aims: To demonstrate that blunt cardiac injury is rare in sternal fracture patients and we can be more selective with decision making relating to the use of echocardiography by using basic observations, ECGs and serum high sensitivity troponin I tests first. Method: A preliminary survey of emergency medicine clinicians to assess current clinical practice. Followed by a 2-year retrospective review on sternal fracture patients admitted to The University Hospital of Wales Major Trauma Centre. Data was collected from the South Wales Major Trauma Network database. Results: The survey showed clinicians were not always informed on the evidence base and there was significant variation in clinical practice. 94 patients were included for retrospective review. 39 had echocardiography, 6 of these showed abnormalities. All were haemodynamically insignificant pericardial effusions which required no intervention. No patients in the cohort had clinically significant blunt cardiac injury. Many patients did not have electrocardiograms or high sensitivity troponin I tests. Conclusions: Clinically significant blunt cardiac injury is very rare following sternal fracture and current clinical management is variable and inconsistent. Haemodynamically stable patients with no new murmur, no pericardial effusion on CT scan and no acute changes to their ECG or serum high sensitivity troponin I tests do not need echocardiography. A sternal fracture protocol has been created to guide clinicians when echocardiography is indicated.

22 Miguel Fernando Juárez Moyrón

N/A

Clinical concerns about non-fatal firearm Injuries

Introduction: Precepts say that we must dread gunshots whilst the bullet is (speedily) moving and surgeons must not intend to look for the projectile but concentrate on acute injuries, but, is a retained bullet in a cavity or tissue, innocuous? There are reports of abscess formations, lead poisoning, and the onset of illness anxiety severe disorder. Aims: To describe and illustrate four cases of non-fatal gunshot injuries that were documented by imaging studies, as well as the respective outcomes of their management. Methods: 1. A 24-year-old female with normal vital signs. As could be seen, the projectile was apparently, located in the precordium, nevertheless, lateral plain thoracic radiography showed the bullet lodging in the left breast. She underwent vigilance and antibiotic prophylaxis was prescribed. Upon her discharge, she complained about having thoughts of restlessness due to having a bullet inside her body. 2. 31-years-old male. He got shot in the posterior neck. Although he remained steady, the computed scan showed that the projectile could have harmed aerodigestive or vascular structures. He underwent exploration, and the bullet was found adjacent to the esophagus, but not causing any disruptions, so it could be removed. 3. 38-year-old male that was shot in the right forearm three years before the consultation. At that time, he was given antibiotics since no surgery was needed. The extrusion of the bullet allowed its extraction at the consulting room. 4. 29-year-old male. He got hit in the left groin and the bullet reached up to the soft tissues around the right hip. At arrival, he reported hematuria. Vascular exploration was negative, however, an injury to the preperitoneal aspect of the bladder had to be repaired. The projectile was not found during surgery. Results and conclusions: Firearm injuries must be approached individually for every patient. The Advanced Trauma Life Support protocol was followed in every case in the acute scenarios, meanwhile further following for retained projectiles may be necessary since a wide spectrum of health issues are prone to appear, not only concerning soft tissues inflammatory or infectious processes but also psychiatric disorders or their exacerbation.



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Acute care and tomographic following of gastrointestinal smuggling of psychoactive alkaloids

Introduction: The transferral of patients carrying illegal substances, such as cocaine or opiates in the gastrointestinal tract, called "body-packers", is recurrent at hospitals sited nearby international airports. Narcotics are wrapped in plastic bags or condoms and concealed in the body by being swallowed or by dissembling them into the rectum. Most cases are detected after detention by law-enforcement officers and managed expectantly, however, bowel perforation or life-threatening intoxication may occur. Abdominal computed tomography is considered the diagnostic modality of choice for detecting narcotic-containing foreign bodies. Aims: To describe and illustrate the management of a body-packer patient. Methods: A 50-year-old male patient is transferred from the city airport to the emergency room, guarded by Federal Agents, and arrested for suspicion of concealing illicit drug packages in his body. He complained of constipation, reporting the swallowing of 48 packets of cocaine hydrochloride, each one, with a covering made up of two late condoms, and subsequently intaking six milligrams of loperamide. Vital signs were normal, peristalsis sounded normal and abdominal palpation was painless. Rectal examination revealed little non-impacted, non-bloody stool. Signs of acute intoxication were absent. An initial plain abdominal computed tomography with three-dimensional reconstruction (PACT3DR) revealed multiple foreign objects inside the small bowel and colon lumens, that had a density similar to fat. The patient was led to hospitalization; a bedside vital signs monitor was placed. Defecations were witnessed by law enforcement agents and each deposition was followed by a PACT3DR for keeping the evacuation of bundles recorded. Results: The 48 packets were expelled in 36 hours and guarded by police agents. Vital signs and abdominal exploration remained normal, oral intake was tolerated. After the demonstration of the absence of foreign objects inside the intestinal lumen by a PACT3DR, the patient was discharged and stayed in charge of law-enforcement instances. Conclusion/discussion: Expectant treatment for body-packing is suitable as long as signs of mechanical bowel obstruction, bowel perforation, or intoxication due to packet leakage do not emerge.

25 Emma Toman

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Concussion in facial trauma patients; a retrospective analysis of 100 patients from a UK Major Trauma Centre

Introduction: Concussion is a common and potentially debilitating disease. Research has shown that one-third of patients admitted with facial trauma have concurrent concussion. Aim: To investigate the burden and management of concussion within patients acutely presenting with facial trauma and identify potential risk-factors within this population. Methods: A retrospective observational study was conducted at a UK Major Trauma Centre between 01 January 2019 and 01 February 2020. One hundred randomly selected patients who attended the acute clinic responsible for managing facial trauma were identified. No parametric data are included. The Mann-Whitney test used to detect differences for continuous data, the X2 test for categorical data. Clinical significance was defined as $p < 0.05$. Results: 40/100 (40%) of patients had evidence of concussion, of which only 4/40 (10%) had evidence that head injury advice was provided to the patient. There was no statistically significant difference between the non-concussed and concussed groups for age ($p = 0.145$), gender ($p = 0.921$), mechanism of injury ($p = 0.158$) or facial injury location $p = 0.451$. Conclusion: Clinical features of concussion were found in 40% of patients suffering facial injury. Despite this, we found that head injury advice was rarely given. In addition, this study identified no risk factors for concussion within this population, highlighting the need to screen all patients presenting with facial injury. To improve the identification and management of concussion in patients with facial trauma, future work should focus on the development of simple screening tools for use in clinic and signposting patients to existing written and online concussion resources.

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Emma Toman

Valentina Di Pietro,
Antonio Belli**Can we use saliva to diagnose concussion in NHS patients? Preliminary results from phase 1 of the CONTACTS study**

Introduction: In 2021, the SCRUM study [1] identified a panel of 14 salivary micro-RNAs (miRNAs) that accurately identified concussed from control rugby players at several timepoints. Are these findings translatable to a much more heterogeneous NHS population? Aim: To investigate the diagnostic utility of salivary micro-RNA (miRNA) to identify concussed from control individuals in a sample of NHS patients Methods: Prospective cohort study; 9 individuals with concussion and 9 control individuals with isolated limb injuries. Both groups presented to the Emergency Department (ED) within 24 hours of injury, were aged between 16 and 68 years and 28% were female. Patients with concurrent mental health conditions, learning difficulties or alcohol intoxication were still eligible for recruitment. Saliva samples were collected in the EDA predetermined panel of miRNAs were chosen based on the SCRUM study [1]. Using these assays, samples underwent qPCR to provide comparative threshold (CT) values. Data were tested for normality. Fold changes in miRNA expression were calculated using the $2^{-\Delta\Delta CT}$ method. Values were transformed prior to analysis with the t-test and Benjamini-Hochberg procedure for false discovery rate was used to adjust the p-value. GraphPad Prism 9.2.0 software was used for statistical analysis Clinical significance set at $p < 0.05$ Results: One miRNA (hsa-miR-144-3p) was significantly dysregulated, (adj p value= 0.036) with a high predictive value (AUC 0.88, 95% CI 0.71, 1.00). Conclusion: Only one of the miRNAs identified in the SCRUM study was also significantly dysregulated in the CONTACTS study. This is likely because of the heterogeneous nature of our NHS sample. Larger studies are required to confirm these results and further investigation of other small non-coding RNAs are planned. For concussion research to be translatable to clinical practice, future samples should be inclusive and reflect the real-life characteristics of concussed NHS patients. Ref1. Di Pietro V, O'Halloran P, Watson CN, et al. Unique diagnostic signatures of concussion in the saliva of male athletes: the Study of Concussion in Rugby Union through MicroRNAs (SCRUM) British Journal of Sports Medicine 2021;55:1395-1404.

29 Martha Dimech

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To Scan or Not to Scan? A Retrospective Analysis of CT Trauma Scans Requested During A 3-Month Period at A District General Hospital

Introduction & Aim: CT requests across the NHS have been increasing consistently over the last decade as Emergency Departments across the country are being stretched beyond their limits. Following the recognition of an increased radiological workload in our own Emergency Department at Wexham Park Hospital, we looked at CT trauma scans over a 3-month period to establish the proportion of positive versus negative findings and extrapolate data with the aim of better understanding our scanning process. Methods: We conducted a retrospective analysis of all CT Trauma scans ordered by A&E staff at Wexham Park Hospital between July and September 2022. Patient demographics, mode of arrival, GCS and haemodynamic status, presence of trauma team, C-spine immobilisation, Time to CT, CT findings, and ultimate patient disposition data was collated on an anonymised, NHS-protected Microsoft Excel spreadsheet. Results: A total of 287 patients were included in the study. Positive radiological findings were picked up in 38% of patients with the majority being thoracic injuries. Mean 'Time to CT' was 174 minutes, similar to the results from a prior study of 175 minutes. 8.3% of CT positive patients were transferred to a major trauma centre. Conclusion: The majority (62%) of CT trauma scans in the study were negative and almost half (49%) are being done out-of-hours. This is all contributing to imaging delays in the department. Further analysis is required to understand whether all these scans were clinically indicated and if not, measures need to be implemented to reduce this percentage as well as the department's mean 'Time to CT'.

31	Kate Ellis (Barnett Hospital), Pierre William McCaughran	, Mehdi Mohammadi (Lister Hospital), Stuart Roberts (Royal Orthopaedic Hospital), Mike Guest (Lister Hospital), Sadasivam Selvakumar (Lister Hospital)	<p>Henry VIII is one of the most iconic and infamous figures in British History. Once one of the most charismatic rulers to sit on the English throne he underwent significant personality change in the last eleven years of his reign. By the time of his death he was paranoid and tyrannical. The year 1536 was associated with an abnormal temporal density of unpredictable and disinhibited decisions from the king. These included beheading his wife Anne Boleyn, dissolving the Catholic Church, annexing Wales and starting the annexation of Ireland as well as the brutal public execution of the Earl of Kildare. This remarkable density of events began within months of a major injury where Henry was knocked from his horse jousting and remained unconscious for two hours. Due to the large size of the human frontal lobe and relative length of axons between the brainstem and prefrontal cortex closed head injuries are often associated with frontal lobe injury. The pre-frontal cortex regulates behaviour control and mood. Loss of the prefrontal cortex as seen in the case of railway worker Phineas Gage produced no change in intellect or motor function, however produced a profound change in personality and judgement most marked in the immediate aftermath before settling to a new abnormal baseline. Post 1536 the last eleven years of Henry's life were marked by similarly brutal and disinhibited episodes, but the frequency of such events decreased after the first-year post injury. This behaviour is in keeping with the disinhibition and behavioural disturbances seen following traumatic injury to the prefrontal cortex of the frontal lobe. Had Henry VIII not fallen off his horse there may never have been a United Kingdom and the course of European history could have been very different.</p>
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Traumatic Reign Injury - the frontal lobe that changed Europe

Intro: Rotator cuff injuries are one of the most common injuries seen by orthopaedic surgeons. Due to this high prevalence, rotator cuff repairs are one of the most widely performed orthopaedic surgeries. Despite advancement in techniques, re-tears following rotator cuff repair surgery are a common occurrence. Previous studies have identified several factors that have been shown to increase the risk of re-tears, with size of the tear and the patient's age being the greatest predictors of outcomes. Aim: The purpose of this study was to evaluate the rate of re-tear following primary rotator cuff repair and to identify the factors that may contribute to this rate. Methods: A retrospective review of rotator cuff repair surgeries performed between May 2017 and July 2019 was performed. All methods of repair were included. All patient's medical data, including imaging and operation records, were reviewed. Results: 148 patients were identified. 93 males and 55 females with a mean age of 58 years (range 33-79 years). 145 patients had a chronic rotator cuff tear, with the remaining having an acute tear. 34 patients (23%) had post-operative imaging with either magnetic resonance imaging or ultrasound, where it was found that 20 (14%) had a confirmed re-tear. Of these patients, 9 went on to have a further repair surgery whilst the rest were conservatively management. The average age of the re-tear patients was 59 (age range 39-73) and 55% were female. Conclusions: Following this retrospective review, it can be concluded that undergoing an arthroscopic rotator cuff repair results in a positive outcome for the majority of patients. It also identified that re-tears following the procedure are a common occurrence. However, despite this not all patients who sustained a re-tear underwent a second surgery and were instead conservatively managed. Our study differed to other papers in that age was not found to be the largest predictor of re-tear. The results from our study showed that females in their 50's had the highest prevalence of re-tears. Additional research is required to understand to what extent various factors can contribute towards rotator cuff re-rupture rates.

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Delay to hip fracture surgery does not affect mortality or length of hospital stay

Introduction Timely surgery is recommended in hip fracture patients, ideally within 36 hours of admission. In our Major Trauma Centre, often specialist cases take priority over hip fractures due to clinical urgency or surgeon skill mix. **Aim** To assess whether patients delayed due to 'theatre capacity' had different outcomes (length of hospital stay (LOS) and 30-day and 1-year mortality) than those operated on within 36 hours. **Methods** Patients aged >60 presenting with a hip fracture over a 1-year period (1/1/2021-31/12/2021) treated with surgery were included. We compared those who were operated within 36 hours to those who were delayed over 36 hours (for 'theatre capacity' issues only). Patients delayed for other reasons were excluded. **Results** There were 471 hip fractures, of which 372 patients met the inclusion criteria. 183 patients (49%) were operated on within 36 hours. 189 patients were delayed due to 'theatre capacity'. There was no significant difference in LOS between those operated within 36 hours (15.9±8.8 days) versus after 36 hours (16.9±13.0 days); P=0.3765. There was no significant difference in 30-day mortality between those operated within 36 hours (12/183; 6.6%) versus after 36 hours (12/189; 6.3%); P=0.9349. There was no significant difference in 1-year mortality between those operated within 36 hours (49/183; 26.8%) versus after 36 hours (51/189; 27%); P=0.9639. For each successive 24 hours of delay there was no statistically significant increase in LOS, 30-day or 1-year mortality, although the number of patients delayed beyond 96 hours was low (n=12). **Conclusion** There was no significant increase in length of hospital stay, 30-day mortality or 1-year mortality for hip fracture patients whose delay to theatre was due to 'theatre capacity' issues. This suggests that hip fracture patients can safely be delayed if necessary to prioritise other clinically urgent or surgeon specific cases.

43	Jaqueline Howard	Professor Zubair Ahmed, University of Birmingham	<p>Introduction – Trauma is one of the leading causes of disability following injury in the UK and often requires extensive surgery and revisions to counter the injury. Injuries sustained are complex and current orthopaedic implants cannot always account for the fracture injury. Three- dimensional printing is a novel technology that allows for the patients anatomical variance and fracture to be accounted for. Several benefits have been suggested including reduction in total theatre time, reduction in revision surgery, reduction of intraoperative fluoroscopy use, as well as reduction in total blood loss.Aim - This systematic review aims to illustrate the feasibility of three-dimensional printing technologies to produce person specific implants (PSI) following traumatic injury.Methods – Several scientific databases were used in the acquisition of literature relevant to the aims of this systematic review. Initial search criteria including language, research after 2010, and human or cadaveric type were imposed before additional search tags were used along with Boolean operators such as surg*, trauma, three-dimensional, and print*Results – six papers were selected, and data extracted as to the feasibility of the technology’s use in trauma surgery. Secondary data was also extracted where possible pertaining to elements such as production materials, adequacy of implants compared to commercial implants, and manufacturing processConclusion – three-dimensional printing of person specific implants is possible and feasible in the realm of trauma surgery, however, given the small sample sizes and the heterogeneity of data at present, further research must occur on a larger scale to fully cement the technology in the surgical field.</p>
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No other co-authors

What does the pre-hospital physician add to the care of the critically ill patient?

Introduction/background: Pre-hospital emergency medicine (PHEM) is an ever-growing sub-speciality, with more physicians having the desire to deliver care directly to patients in the community. Paramedics have already been providing this vital service, but it was identified there became a need for physicians with further competencies to assist in such situations. This includes, but is not limited to interventions such as endotracheal intubation, ketamine-based analgesia and resuscitative thoracotomy. Aims: The primary aim of this report is to examine the role of pre-hospital physicians and what benefits they add to the care of the critically ill. Other aims are to understand the evolution of pre-hospital medicine and its physicians, and to reflect on aspects learned from PHEM simulations. Method: A literature search was completed using key words listed below, on databases such as PubMed and Ovid. This identified articles/resources related to pre-hospital care, of which around 20 were used in this report due to their pertinence. Specific searches with keywords were also carried out in places such as the British National Formulary as well as relevant journals, where more clarification was needed. Key words/phrases: pre-hospital medicine, pre-hospital interventions, critical care, pre-hospital physician, along with more targeted searches with pre-hospital combined with intubation/ketamine/thoracotomy. Results: The PHEM physician adds to the care of the ill in three areas. Intubation by physicians had a crude success rate of 0.988 compared to 0.917 by a non-physician. Physicians were also able to reduce pain scores by two thirds by administering ketamine. Finally, thoracotomy by physician during traumatic cardiac arrest is associated with increased survival. Conclusion: If a pre-hospital physician is uses interventions such as intubation, analgesia with ketamine and thoracotomy appropriately, they can add benefit to the critically ill. More substantial and detailed research with larger patient populations is needed, to fully evaluate what effect pre-hospital physicians have on patient outcomes.

46 Sarah Easby

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Are patients with three or more rib fractures receiving analgesia in the emergency department?

1. Introduction TARN data suggested that 35% of patients with 3 or more rib fractures received analgesia in the emergency department (ED). 2. Aim(s) The aim of the audit was to define our current practice against ED blunt chest trauma guidelines and assess whether patients who present with isolated chest wall injuries are receiving analgesia. 3. Methods We pulled the most recent fifty one patients from TARN data. We reviewed electronic patient records to identify the number of rib fractures, recorded the time of triage including pain score at this time then determined how long it took to receive analgesia and mode of analgesia through the order history. Patients who were admitted for less than 72 hours or had other significant injuries were excluded. We recorded if a rationale was documented for patients who did not receive analgesia or if it was declined. 4. Results The median and mean number of rib fractures was four and patients had a median and mean pain score of six. Three patients were unable to provide a pain score however they all received analgesia. Forty nine (N=51) (96%) of patients received analgesia in ED. Four (8%) of patients received paracetamol. Forty five (88%) patients received opiates. Of these forty five, 29% received codeine, 51% received oral morphine or oxycodone and 20% received IV morphine. Second doses of analgesia were administered to 71% of patients. The median time to receiving analgesia was sixty minutes with a mean time of 120 minutes. There was no relationship between pain score, time to analgesia and type of analgesia received. There was no documentation of rationale for patients who did not receive analgesia. 5. Conclusions/Discussion There was overall good practice with most patients receiving analgesia including those who were unable to give a verbal answer. Patients with high pain scores did not always receive analgesia quickly and improvements could be made on the speed of time to administration. Exploring the mode of analgesia used for high pain scores and barriers to timing of analgesia were not covered by this audit.

An assessment of current practice for surgical management of non-displaced neck of femur fractures.

Introduction The method of surgical management for non-displaced neck of femur fractures has been the subject of much debate. Our study looked at the results at a district general hospital over a 5 year period. **Aims** To establish which patients groups were being treated by which method , to ascertain if one method had higher risks of complications. To distinguish if one method of treatment was better than the others. **Methods** All non-displaced intracapsular fractures demonstrated on X-ray in patients over the age of 65 between 2018 and 2022 were identified from the National Hip Fracture Database (NHFD). Data stored in the NHFD were reviewed as were electronic and paper notes. Assessed outcomes included presence of avascular necrosis or non-union, reoperation, length of stay, haemoglobin change and transfusion requirements. **Results** 69 patients had a non-displaced hip fracture with a similar number treated with Canulated screws (CS), Dynamic Hip Screws (DHS) and Arthroplasty. CS and THR were on average a decade younger than that of those managed with hemiarthroplasty or DHS. ASA grade followed a similar pattern. Average lengths of stay were similar for DHS, CS and THR but significantly longer for hemiarthroplasty. Haemoglobin drop was lower in those patients fixed, with fewer transfusions. Non union rates were lower in the CS group than DHS group. Mortality was highest in the hemiarthroplasty group. **Conclusion/Findings** DHS patients were an average 7 years older than CS patients. They experienced a higher rate of non-union and had a longer hospital stay. Mortality at 90 days was also comparable despite CS being a younger group. For a frailer patient the hemiarthroplasty group had the lowest chance of reoperation rate but were at higher risk of other complications. This information can help us improve consenting patients who wish to discuss options.

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Introduction of a Major Trauma Newsletter at an MTC

Introduction: Trauma remains the most common cause for loss of life in the under 40s in the UK (1). Early input from the anaesthetic team is imperative to good patient outcomes, furthermore their involvement is seen throughout the entire patient journey from pre-hospital care, to theatre, Interventional radiology, imaging and to the critical care environment. All anaesthetists providing anaesthesia for trauma should ensure that their skills and knowledge of current recommendations are up to date (2). In Major Trauma Centres (MTCs), multidisciplinary mortality and morbidity meetings should take place and follow the guidance of the WHO. Aims: We wanted to develop a Major Trauma Newsletter, that would complement the requirements of clinical governance set out by the WHO and RCoA, reach all anaesthetic subspecialties and trainees We aim to encourage trainees and consultants to develop skills and knowledge in trauma as a speciality. Methods: We designed a Major Trauma Newsletter which was distributed via email amongst the anaesthetic department and the Major Trauma Directorate and posted to the hospital intranet reaching all the allied trauma groups. With each edition we included case reports which followed the patient journey. Within these reports there were first hand patient reflections. There were also clinical reflections, educational updates, opportunities for further learning in clinical skill sessions and updates from MTC quarterly TARN data. Staff were then approached for feedback following each issue.

Results: There has been good uptake of the newsletter with positive feedback and collaboration within the department and amongst the wider allied specialities. It has been a means of opening discussion channels to highlight problems and then bring these discussions to an open forum such as M&M. Since the first issue we have seen a significant increase in attendance at M&M meetings, and topics highlighted in the newsletter have been fed back to the meetings for discussion in person. Conclusions: St George's Hospital is a major trauma centre (MTC) for South West London and the Surrey trauma network. A e-newsletter cannot be a replacement for face-to-face governance meetings; however, it can work as an additional means of encouraging multidisciplinary discussion.

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Ankle Joint Distraction in Ankle Fractures

1) Introduction:Ankle joint distraction is an emergent management option for osteoarthritis. However, no study exists in the literature comparing distraction to non-distraction in the management of ankle fractures in the acute setting with external fixators.2) Aims:To conduct a retrospective cohort study comparing 1) need for further procedures in the fracture healing phase and 2) Patient Related Outcome Measures (PROMs) and joint mobility measurements at 1-2 years follow up.3) Methods:Patient data from 2015 to 2023 was collected from a frame database at a Major Trauma Centre separated into distraction and non-distraction groups. Electronic patient records were then reviewed to investigate complications, need for further procedures, PROMs, and ankle range of movement measurements at follow up.4) Results:90 patients were identified for the study. 40 had received ankle distraction, 50 had not. 13 of the distraction group required further procedures (32.5%), compared to 20 of the non-distraction group (40%). This was not a statistically significant difference. 9 PROMs and ankle dorsiflexion and plantarflexion measurements were analysed for 19 patients, and no statistically significant differences were found between the distraction and non-distraction groups.5) Conclusions:We found ankle joint distraction in the management of acute ankle fractures did not affect outcomes in fracture healing. Future work should investigate long-term follow up of such patients to investigate the development and outcome of post-traumatic osteoarthritis.

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Efficacy and complications associated with acellular dermal substitute use in the treatment of acute burns: a systematic re-view and meta-analysis

Introduction: Over several decades, skin substitutes have become an essential tool in acute burn surgery, particularly in major burns, where scarce donor tissues can limit the availability of autografts. They aim to mimic the innate qualities of human skin, restoring anatomy and physiology, providing protection from infection and accelerating wound healing. With ongoing research into their safety and performance in the clinical setting, we wished to evaluate whether acellular dermal substitutes form a viable alternative to conventional acute burn care. Aims: This systematic review aimed to compare the efficacy, complication rates and long-term outcomes of acellular dermal substitutes to split thickness skin grafting and other conventional acute burn treatments. Methods: This systematic review was prospectively registered with PROSPERO (CRD42023412675). A search was conducted of PubMed, Web of Science and CENTRAL in March 2023 for appropriate randomized controlled trials (RCTs) and observational studies, in which an approved acellular dermal substitute was the primary method of coverage of acute burns. A meta-analysis was conducted if >3 RCTs reported the outcome at comparable timepoints, and a narrative synthesis was conducted of all primary and secondary outcomes. Results: Following screening, ten RCTs and nine observational studies fulfilled our inclusion and exclusion criteria. In our meta-analysis, no significant difference was identified between the substitute and control procedures for our primary outcomes, graft take and incidence of infection ($p=0.37$ and $p=0.25$, respectively). For our secondary outcomes, studies were analyzed via narrative synthesis, which reported variable rates of graft loss and length of acute hospital stay, from which definitive conclusions could not be drawn due to study heterogeneity. Additionally, the evidence reviewed suggests that treatment of an acute burn with a substitute may improve scar quality when compared to conventional grafting. Conclusions: This review therefore suggests that acellular dermal substitutes offer a viable alternative to routine grafting for acute burns patients, and may result in superior scar quality, although more robust RCTs with less heterogeneity are needed to support these conclusions.

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A QUALITY IMPROVEMENT PROJECT TO ASSESS THE EFFECTIVENESS OF THE TRAUMA MULTI-DISCIPLINARY TEAM (MDT) AT A MAJOR TRAUMA CENTRE

Introduction: The Royal College of Radiologists (RCR) standards for trauma radiology in severely injured patients (SIP) states that SIPs should be discussed at regular multi-disciplinary team meetings (MDTs) “to ensure good team communication and holistic management of the SIP”. Not all regional major trauma centres (MTCs) have a regular Trauma MDT. Aintree University Hospital (part of Liverpool University Hospitals NHS Foundation Trust) is a regional major trauma centre which has a daily Trauma MDT. Most SIPs undergo whole body CT (WBCT) scan on arrival to the MTC. After a provisional verbal report is issued to the trauma team, this scan is initially reported by a radiology trainee within 1 hour and then reviewed by a consultant radiologist within 24 hours (usually less). The MDT allows missed findings and clarification of findings to be discussed. Aim: To assess the effectiveness of the major trauma MDT at Aintree University Hospital. Methods: The total number of WBCTs performed and the number that were reviewed in the Trauma MDT in a 6-month period was acquired by the PACS team using appropriate search terms. Relevant data was collected through different hospital databases. Findings by the Trauma MDT were categorised into incidental findings, trauma related misses and advice/guidance. These were further categorised into low, medium, and high significance. Results: In total, 460 WBCTs were performed in the 6-month period between November 2021-May 2022, 160 of which (35%) cases were reviewed in the Trauma MDT. Following MDT review; 11 incidental findings were found; 9 categorised as low significance and 3 categorised as medium significance. A total of 23 trauma related misses were found by the MDT; 19/23 cases (83%) were classified as medium significance and 4/23 (17%) were classified as high significance. High significance findings that require treatment included subarachnoid haemorrhage, mesenteric injury, acromioclavicular joint and posterior shoulder dislocation. Discussion: This QI project provides a 6 month period overview of trauma cases at a MTC. Although limited high significance findings were picked up; Trauma MDT meetings hugely enhance communication between the trauma team and radiologist, which can alter and guide radiological interpretation.

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How safe and effective are paediatric virtual fracture clinics? A systematic review

Introduction: Virtual fracture clinics (VFC) involve a consultant-led multidisciplinary team meeting where cases are reviewed before a telephone consultation with the patient. VFCs have the advantages of reducing waiting times, outpatient appointments and time off school compared to face-to-face (F2F) fracture clinics. There has been a surge in VFC use since the COVID-19 pandemic but there are still concerns over safety in the paediatric population. Fractures make up a large burden of paediatric injuries, therefore research is required on the safety and efficacy of paediatric VFCs. **Aims:** This systematic review will look at the safety and effectiveness of paediatric VFCs, as well as determine the cost-effectiveness and parent preferences. **Methods:** As per the PRISMA guidelines two independent reviewers searched the following databases: Medline, Embase and Web of Science. Studies were included if children under 18 years old presented to A&E with a suspected or confirmed simple un-displaced fracture and were referred to a VFC. The primary outcomes assessed were effectiveness and safety, with the secondary outcomes of cost-effectiveness and parent satisfaction. **Results:** Six studies met the inclusion criteria for this systematic review. There was a high rate of direct discharge from the VFC leading to reduced outpatient appointments. All patients were seen within 72 hours of presentation. There were limited incidences of missed fractures and the rates of re-presentation were similar to that of F2F orthopaedic clinics. There were significant cost savings for the hospitals and high parent satisfaction. **Discussion:** VFCs have shown to be safe and effective at managing most stable, low operative risk paediatric fractures. Safety must be ensured with a telephone helpline and an open return to fracture clinic policy. More research is needed into specific paediatric fracture types to be managed in the VFC.

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Comparing the effectiveness and safety of videolaryngoscopy and direct laryngoscopy for endotracheal intubation in the paediatric emergency department: a systematic review and meta-analysis

1. IntroductionEndotracheal intubation is an uncommon procedure for children in the emergency department but can be technically difficult and cause significant adverse effects. Videolaryngoscopy (VL) offers improved first-pass success rates over direct laryngoscopy (DL) for both adults and children undergoing elective surgery. 2. AimThis systematic review was designed to evaluate current evidence regarding how the effectiveness and safety of VL compares to DL for intubation of children in emergency departments.3. MethodsFour databases were searched on 11th May 2023 for studies comparing first-pass success of VL and DL for children undergoing intubation in the emergency department. Studies including adult patients or where intubation occurred outside of the emergency department were excluded. Quality assessment of included studies was carried out using the Risk Of Bias In Non-randomised Studies of Interventions (ROBINS-I) tool. Meta-analysis was undertaken for first-pass success and adverse event rate. 4. ResultsTen studies met the inclusion criteria representing 5586 intubations. All included studies were observational. Significantly greater first-pass success rate was demonstrated with VL compared to DL (OR 1.64, 95% CI [1.21-2.21], P=0.001). There was no significant difference in risk of adverse events between VL and DL (OR 0.79, 95% CI [0.52-1.20], P=0.27). The overall risk of bias was moderate to serious for all included studies.5. ConclusionVL can offer improved first-pass success rates over DL for children intubated in the emergency department. However, the quality of current evidence is low and further randomised studies are required to clarify which patient groups may benefit most from use of VL.

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Introduction: Hip fractures present a significant global healthcare challenge, with the UK facing 70,000 cases yearly, projected to reach 100,000 by 2033. The UK guideline highlights achieving surgery within 36 hours (TTS) for NOF patients, linked to reduced complications and enhanced recovery. Compliance optimizes patient well-being and healthcare resource utilization. Aim: This study unravels TTS's impact on patient outcomes and LoS in NOF cases at a District General Hospital. We reinforce the 36-hour surgery guideline and assess guideline adherence, revealing care implications. We also explore TTS's influence on LoS, a key marker of effective patient management and resource utilization. Methods: A retrospective study was conducted from July 21, 2021, to July 31, 2022. A total of 290 patients with neck of femur fractures (extracapsular or intracapsular) were included in the study. An analysis of multiple variables affecting the total hospital length of stay (LoS) was performed. Factors examined to ascertain their effects on LoS included causes of operation delay, ASA (American Society of Anesthesiologists) grade, time to operation, MTS (Abbreviated Mental Test Score), and outcomes related to discharge or death. Basic demographics were also analyzed using the chi-square test. RESULTS: 165/290 were intracapsular NOF fractures, while 125/290 were extracapsular NOF fractures. The average length of stay was 21.01 days (± 6.7). An ASA grade of 3 or above, an AMTS of less than 6, and postoperative medical and rehabilitation issues were found to significantly increase the length of hospital stay in our population. Among the patients, 84 out of 290 had died within one year. Among those who stayed over 2 weeks, 73 out of 84 (86.9%) patients had died within a year, while 11 out of 84 (13.1%) patients who stayed less than 2 weeks had died ($p < 0.00$). The main reasons for extended stays were medical issues (91/290, 31.4%) and rehabilitation needs (76/290, 26.2%), followed by the arrangement of a home care package (72/290, 24.8%). Conclusion: Higher ASA grades, lower AMTS scores, and medical/rehabilitation complications were associated with longer stays, underscoring the importance of comprehensive management strategies to improve patient outcomes and resource allocation.

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National CRAFFT study recruitment audit in a teaching hospital

IntroductionThe children's radius acute fracture fixation trial is a multi-centre prospective non-inferiority trial with ongoing national recruitment in the UK since December 2019. The study compares non-surgical casting to surgical reduction in children ages 4 to 10 years. Our audit assessed screening and recruitment for this study locally from March 2023 to May 2023. **Aims**-To identify number of eligible patients and proportion screened-To identify barriers to screening and timely recruitment**Methods**-Retrospective review of all children aged 4-10 with forearm injuries referred to the orthopaedic department during March, April and May 2023 using the hospital's electronic whiteboard-**Comparison** of screening and recruitment success vs ideal of 100%. **Results**-27 patients with forearm injuries were identified, of which 17 were eligible for the CRAFFT study-Most patients (89%) were referred through the on-call team-35%(6) of the eligible patients within the period were screened-Of the screened patients, 66.6%(4) were recruited-All screened patients had recruitment initiated by the surgical team **Discussion/Conclusion**-Overall, recruitment for CRAFFT trial was poor with less than half of the target recruitment achieved-Delays in initiating the conversation can be attributed to inadequate engagement of the Emergency Department with the local research team.-Parents had received conflicting information about the treatment plan between the emergency department and the surgical team-Early discussions and provision of adequate trial information to parents and children about CRAFFT to empower them to make an informed decision-Improve sensitization of the emergency department about all ongoing trials including CRAFFT

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QI project to improve Hand Therapy-led Trauma Clinics (HTTC) - Patient Information Leaflet

Introduction HTTC has streamlined patient pathways and improved delivery of hand trauma services. Closed hand injuries presenting to our emergency departments (ED) are discussed with the on-call trauma team. X-rays are reviewed remotely and those not requiring surgery are referred directly to HTTC via a form completed by our trauma doctor. We found that patients attending HTTC were often unclear about what to expect at their appointment. We developed an HTTC information leaflet (IL) that is given to patients before leaving ED. Aims Audit and Improve compliance with providing ILs in ED Methodology First cycle: Patients attending HTTC with or without ILs were collated to provide a baseline for compliance. The pre-existing HTTC IL was revised to include patient injury-specific details, and posters detailing patient pathways for HTTC referrals were placed in main ED referral sites. The second audit cycle was performed, and results were presented locally. Feedback based on compliance audits was sent to the heads of our emergency departments and a third cycle audit was performed. Results During the first cycle, only 18% of patients attending HTTC were given ILs in ED. After updating the IL and educating ED, compliance went up to 29%. Use of ILs increased to 59.7% following feedback to heads of ED. Conclusion Compliance with giving out ILs may be affected by pressures all EDs are currently facing. Revision of ILs to include patient injury details, coupled with referrer education and feedback has improved compliance. Regular reminders and ED education are needed.

Fibula Rod System in Ankle fractures - Our Experience

1. Introduction Ankle fractures are a common presentation 21.1/1000/year. Unstable fractures often require surgical stabilisation. Use of Plate fixation, Intramedullary device, Ex.Fix, CCC can be complicated by soft tissue problems and poor bone quality. Higher complication rate is seen in patients with comorbidities and poor soft tissue. (1) Intramedullary device is an option. The Acumed fibula rod system uses a minimally invasive technique with a targeting guide.

2. Aim We want to present our experience of the fibula rod system as opposed to conventional fixation methods and compare with literature available.

3. Methods Retrospective . We looked at Ankle fractures treated by the senior author using the fibula rod system from of 2017 to 2021. Data collected using TOMS (operative notes), Clinical notes and Synapse (Radiology). Patient Related Outcome Measures (PROMS) were obtained using the Foot & Ankle Score (FAOS) via telephone and letters . 45 patients. 2 deceased- total of 17 males and 26 females. Average age 60.7 years. Range 20-97 years.

4. Results Fracture pattern - 15 trimalleolar , 12 subluxed TM , 7 Bimalleolar subluxed, 5 BM and 4 pilon fracture. Indications - swelling (19), swelling & blisters (15), poor skin condition (7) and others (4). Comorbidities - Osteopenia (9), Diabetes (3), Vascular Insufficiency (2) and Others (RA, HTn , Psoriasis & B12 deficiency) 18 patients -ex fix stabilisation- for swellings , blisters and fracture dislocations. Average time from frame to fixation was 9.2 days (Range 5-18) Average time to discharge was 12.6 weeks , 25 patients were discharged within 12 weeks (Range 4-52 weeks) Clinical Outcome (clinic letters) -Excellent - 24 - no pain , no stiffness , good ROM Fair - 17 - Stiffness but fracture healed . Manageable pain Poor - 2 - ongoing problems , Pain , stiffness affecting mobility. Radiology - Excellent 18 (union , no shift/shortening/malrotation) . Fair 25 (union , mild shortening /malunion) . Poor 2 (metal failure , non union , malrotation) . FAOS scores - 40 out of 43 responses over 2 years since injury (13-38 months) Average score 73.18% (32-100%)

5. Conclusions Effective , minimal dissection, good clinical , radiological and PROMS. Our experience matches the literature available.

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Latissimus dorsi free flap for a severe degloving injury to the foot: A case report and literature review

IntroductionDegloving soft tissue injuries (DSTI) occur due to avulsion of soft tissue (skin and fat) from the deeper tissues due to shearing forces. This can disrupt the blood supply to the skin leading to necrosis. Typically, if the skin blood supply is compromised the area is debrided and reconstructed with split skin grafts (SSG). However, in some circumstances a SSG may not be possible and local, regional or free flaps may be needed. **Case report & literature review**A large boat slid down a ramp and hit a 57 year old male's foot causing a severe circumferential degloving from the ankle to the toes. The degloved skin was only attached at the toes and was non-viable. The little toe was also crushed and non-viable although the toes themselves were intact. His calcaneum and foot extensor tendons were exposed and so it was not possible to perform a SSG. There were no good local or regional flaps available as it was such an extensive defect. One option was to perform a below knee amputation, but he was keen to try and save his foot. A latissimus dorsi (LD) free flap was harvested from his back and vessels microsurgically anastomosed to recipient vessels near his ankle. A SSG was taken from his thigh and used to cover the remaining defect. The flap and skin graft survived, and the patient is able to walk on his foot and wear shoes.**Ovid Medline** was searched for terms "latissimus dorsi flap foot reconstruction", or "free flap foot degloving". 9 clinical case reports for "degloving Injuries" or "soft tissue injuries" on the lower extremity were found. Only 2 case reports documented using latissimus dorsi flaps on "degloving injuries".**Clinical implications**An alternative option for a reconstruction in this case include an anterolateral thigh flap but his thigh was fairly thick, and this would have needed to be thinned at a later procedure.The free LD was a good option as it covered the majority of the defect including the exposed calcaneum and tendons. As the muscle has atrophied it has shrunk and leaving a good contour to his foot.**Conclusions**This case illustrates a successful foot salvage following a severe degloving injury using a free latissimus dorsi flap and SSG reconstruction. The LD should be considered as an option in these complex cases.

85	Mohamed Fouad Elsaid Elmeligy	Aya Elmeligy- University of East AngliaGanish Prasad- Chesterfield Royal HospitalApurv Sinha-Chesterfield Royal Hospital	<p>Methyl methacrylate allergy- a rising concern, case report and literature review</p> <p>1. Introduction Bone cement is used commonly in orthopaedic surgery, methyl methacrylate is an essential ingredient in bone cement. Allergy to that component can present a challenge to T&O surgeon. 2. Aim The aim is to highlight the rising issue of acrylate allergy and the effect it has on orthopaedic practice. 3. Materials and Methods We present a case report which required Reverse total shoulder replacement for acute proximal humeral fracture in a patient with a documented allergy to the acrylate. It presented a clinical challenge as bone cement cannot be used to stabilise the humeral stem. A literature review on the prevalence of such allergy in dental work and false nail practices with reports of cement related allergy in Hip and knee arthroplasty. 4. Results The review showed an increasing prevalence of early exposure to such allergens due to the wide spread of false nail practices in younger people. There were also multiple reports following cemented arthroplasty in patients with documented allergy to acrylate. 5. Conclusions/Discussion The review highlights the importance of conducting a comprehensive pre-operative patient history in order to identify possible allergy to acrylate prior to undergoing orthopaedic surgical procedures, and the need to find alternative to bone cement in patients with documented allergy.</p>
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Assessing Acute Care for Patients with a Diagnosis of Learning Disability and Hip Fracture: A Retrospective Review

Introduction: Hip fractures are common injuries among elderly individuals, and the provision of appropriate acute care is crucial for optimizing patient outcomes. Patients with learning disabilities (LD) often have complex medical needs resulting in onset of frailty at younger ages. This increases risk of morbidity and mortality in this vulnerable patient cohort. There is little information about how LD affects the quality of care of patients with hips fractures receive as compared to the national hip fracture standards (NHFS). Methods: A retrospective audit reviewed patients with a diagnosis of learning disability and a hip fracture over a 5-year period. The audit examined whether the care of patients with LD complied with the NHFS and best practice tariff guidelines, regardless of age. Additionally, the study sought to explore the potential disparities between LD patients and the general hip fracture population. Results: 46 patients were included; 22% were under 60 years old. Operative management was in line with NICE recommendations for 100% and 74% of patients received surgery within 36 hours of admission (compared with the NHFD 6 year average of 71.9%). 37% were not mobilised within the first 24hrs which correlated with fewer patients remaining freely mobile on discharge (8.7% post-operatively vs 41.3% pre-operatively). Documentation of LD severity and usual behaviours was unreliable, as was documentation of key conversations regarding capacity or resuscitation. The pre and post operative documentation and outcomes for this patient cohort appears to be less than those in the NHFD (National Hip Fracture Database). Conclusion: The study underscores the significance of implementing "best practice tariff hip fracture patient" standards for LD patients, irrespective of age, to ensure they receive optimal care and minimize disparities. We recommend that the LD patient cohort be included in the NHFD data collection as routine practice regardless of age. This would enable healthcare providers to gain valuable insights into the long-term impact of acute care on LD patients and facilitate improvements in their overall management and outcomes.

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Chest Trauma in the very old (80+) and how do they differ to the younger patient? Review of our experience with rib fracture patients over 10 years1. IntroductionThoracic trauma forms a significant part of trauma burden, with these injuries accounting for 25% of deaths related to trauma. With an ageing population more patients suffering traumatic chest injuries are elderly with different patterns of injury, complications and care needs.2. AimTo review outcomes of patients with acute rib fractures at a trauma unit and evaluate if elderly patients are higher risk of requiring surgical interventions, morbidity and mortality.3. MethodsRetrospective review of notes for 373 patients with acute rib fractures from April 2011 to September 2022. Patients with acute rib fracture within 1 month of admission were included while patients without rib fracture on radiological imaging and old rib fractures were excluded. Elderly was defined as 80 years and above with 106 identified. 267 patients were less than 80 years age.4. Results73.4% of younger group suffered high-energy trauma compared to 15.1 % of the elderly. Injury severity score and chest trauma score were 8.1 and 3.8 respectively in the younger group and 5.6 and 4.3 in the elderly. The elderly group were less likely to need a thoracic drain inserted, 16.1% vs 22.7% in the younger group, and less likely to have surgery, 9.4% vs 24.7%. The elderly suffered in hospital complications more frequently 46.2% vs 27.3% in the younger group. Mean length of stay in the elderly, 10.6 days, was significantly longer than in the younger group, 8.3 days ($p<0.001$). 30-day and 1-year mortality in elderly was 11.3% and 31.1% respectively compared to 2.3% and 6.4% in the younger group. There was no significant difference in time from injury to mortality between the 2 groups ($p=0.646$)5. ConclusionElderly are more at risk of morbidity and mortality following acute chest trauma compared to the younger group despite suffering lower energy trauma. With less need for surgery, patient characteristics and developed analgesia pathways, elderly may benefit from care by geriatric teams rather than surgical input.

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Audit of compliance with documentation as per “The Management of Ankle Fractures” BOAST guidelines in a district general hospital (Russells Hall Hospital – Dudley Group NHS Foundation Trust)

1. Introduction Ankle fractures are very common injuries with an annual incidence of 187 cases per 100,000 people. 2. Aims The British Orthopaedic Association Standards for Trauma (BOAST) guidelines for the management of ankle fractures have mandated the documentation of the following for each presentation; Mechanism of Injury, Clinical Findings, Skin Integrity and Assessment of circulation and sensation. This project aims to review and improve the documentation following initial clinical assessment of patients presenting with an ankle fracture. 3. Methods This retrospective & prospective audit involved data collection from ED attendees diagnosed with “Ankle fracture” (n=37) over a 1-month period between 15/04/23 and 15/05/23 using data extracted from a list of all acute trauma & orthopaedic patients referred to the department. For each patient, clinical documentation was reviewed on the local electronic medical records system, SUNRISE, to assess whether it included the documentation of “Mechanism of Injury”, “Clinical Findings”, “Skin Integrity” and “Assessment of circulation and sensation”. Following this, BOAST guidelines for ankle fractures were disseminated amongst orthopaedic on call doctors and emergency department practitioners in person and via email. Following this intervention, the data was prospectively re-audited. 4. Results 37 patients presented to ED with an ankle fracture over a 1 month period (15/04/23 – 15/05/23). 43% (n=16) had “mechanism of injury” documented. 94% (n=35) had “clinical findings” documented. 24% (n=9) had “skin integrity” documented. 45% (n=17) had “assessment of circulation and sensation” documented. Following intervention and subsequent re-audit over the following 1 month (20/05/23 – 20/06/23), there was a significant improvement, 29 patients presented to ED with an ankle fracture. 76% (n=22) had “mechanism of injury” documented. 100% (n=29) had “clinical findings” documented. 66% (n=19) had “skin integrity” documented. 79% (n=23) had “assessment of circulation and sensation” documented. Conclusions/Discussions This intervention has significantly improved compliance with the BOAST guidelines. Further awareness of the guidelines through presentation in MDT/Audit meetings and formalisation of documentation is needed.

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A Review of War and Conflict-Induced Abdominal Trauma in Low- and Middle-Income Countries: Management Outcomes, Challenges, and Strategies

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Abstract: Purpose: The primary objective of this review is to analyse the existing literature, identify knowledge gaps, suggest potential interventions, and contribute to the development of effective strategies to address war-induced abdominal traumas in conflict-affected populations. Methods: A narrative search was conducted in PubMed, EMBASE, Google Scholar, the Cochrane Library, and Scopus databases. The search strategy comprised keywords such as "abdominal trauma", "abdominal injury", and "management", coupled with indicators like "war-inflicted", "war-torn", "conflict" and "war". Additionally, a manual search was performed to include references from recently published disease-specific reviews. Papers published within the last 23 years were considered for inclusion. Results: Surgical interventions, such as exploratory laparotomy and damage control surgery, significantly improve survival rates and functional recovery in penetrating abdominal trauma cases, with procedures like hemicolectomy and colostomy closure showing promise. Surgical interventions, when performed effectively, can prevent complications and postoperative mortality in abdominal trauma cases, such as colon perforation closure

and diaphragmatic injury repair. Expedited recovery and discharge are facilitated by surgical interventions, leading to quicker patient rehabilitation and optimized resource utilization in conflict settings. Diagnostic procedures, including Focused Assessment with Sonography for Trauma (FAST) and CT scans, play a pivotal role in guiding successful surgical interventions for abdominal trauma, improving patient survival.

Conclusion: This narrative review underscores the critical need for comprehensive and optimised abdominal trauma care in conflict zones. It advocates addressing existing barriers and complexities through a combination of surgical and non-surgical approaches and strategic changes. The collective implementation of these strategies is important in order to address the challenges presented and improve outcomes for the management of abdominal trauma in conflict-affected Low- and Middle-Income Countries (LMICs).

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Effect of CT Scanner Location on Time-to-Scanner for Trauma Patients within NHS Trauma Units: A Pre-Post Study

Introduction Computed Tomography (CT) allows for timely and informative cross-sectional imaging to diagnose injuries in a trauma patient. This retrospective study aims to compare time-to-CT in trauma units before and after CT scanners were relocated closer to the Emergency Department (ED). It has been shown distance to CT scanners are inversely proportionate to patient outcome in severely injured patients. The Royal College of Radiologists advise that CT scanners should be located adjacent to, or in the emergency department. Aims To determine if moving CT scanners to within ED improves time-to-scan for trauma patients. Methods Retrospective study of 1119 patients across two NHS hospitals, The Royal Free (RFH) and University College London Hospital (UCLH). The CT scanners at both hospitals were initially over 200m away from the ED and required transit in an elevator to access. In October 2017 the CT at RFH was relocated into resus. In UCLH the CT scanner was relocated in March 2019 to <50m walk and on the same floor as resus. Data was collected from the Trauma Audit and Research Network of trauma patients presenting to ED from July 2016 to August 2021. The time taken between arrival in the ED and first CT was recorded. Time-to-scan was compared before and after the relocation of CT scanners. The data was compared to patients presenting to similar hospitals within London during the same time period. These hospitals had not relocated the CT scanners and acted as a control group to account for any other factors that led to improved time-to-CT. Results At RFH there was an average improvement of 23 minutes following the relocation of the CT scanner and at UCLH there was an average improvement of 26 minutes. At hospitals where the CT scanner had not been moved there was no significant improvement in time-to-scan from 2016 (119mins) to 2021 (120mins). Conclusion Locating the CT scanner within the ED of both hospitals has made significant improvements in time-to-scan. There was no change seen in the control group of hospitals where CT scanners had remained stationary. This study would recommend co-locating CT scanners in EDs receiving trauma patients. This should be considered when designing new departments or modifying existing departments.

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Audit of tertiary surveys performed on major trauma centre patients at Leeds General Infirmary in July 2022 and the consequences for best practice tariff payment

Introduction:A Tertiary Survey (TS) provides a comprehensive review of a patient following their initial injury and assessment within the emergency department. Polytrauma patients who have had a TS have a reduced incidence of missed injuries compared to those who don't. There is no clear guideline regarding when a TS should be performed but the wider literature suggests within the first 24 hours of admission. Leeds has one of the busiest UK Major Trauma Centres (MTC) in accordance with Trauma Audit Research Network (TARN) data. The Trust receives funds via the Best Practice Tariff (BPT), made up of two levels of payment, differentiated by Injury Severity Score (ISS) and completion of a specific set of criteria. Level 1 patients (ISS<8) receive £1,500, and Level 2 patients (ISS>8) receive £3,000.Aim:1. To audit the number of complete tertiary surveys documented at Leeds MTC within the first 24 hours of patient admission.2. To quantify the effect of this practice on BPT payments to the Trust.Methods:All patients aged 16 and over admitted under the care of the Leeds MTC team, from 1 July 2022 to 31 July 2022 inclusive, were included in this audit. Patient records were reviewed for evidence of a completed TS and ISS was retrieved from local TARN database. BPT payments were calculated from this data and compared to the maximum achievable BPT.Results:Out of 144 adult trauma calls, there were 51 MTC admissions in July 2022. 26/51 patients had a TS completed; 25/26 of these were in the first 24 hours of admission. Three patients had additional injuries identified due to performing a TS. 29 patients had a verified ISS but only 17/29 of these patients had a TS carried out appropriately. Assuming all other criteria were met, the trust potentially yielded £37,500. However, 12/29 patients with a verified ISS did not have a TS completed, meaning the Trust lost £27,000.Conclusions/ Discussion:Not completing a TS has consequences for patients in missed or delayed injury recognition and for the Trust/ MTC in missed BPT funds. Introducing a standardised TS proforma can mitigate these negative outcomes and increasing educational awareness to the relevant teams involved in major trauma patients, regarding the importance of a TS would benefit both the Trust and patients.

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The use of emergency resuscitative thoracotomy in paediatric trauma: a systematic review of the literature and meta-analysis

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Introduction: Emergency resuscitative thoracotomies (ERT) are regarded as one of the most aggressive forms of resuscitative efforts in cases of trauma. ERT is described as a procedure intended to temporise wounds and stabilise a patient via direct control of intra-thoracic injuries, decompression of pericardial tamponade, and control of the aorta to prevent exsanguination. Existing guidelines of ERT in adults, that have filtered down to influence decisions in paediatric cases, do differentiate strongly between penetrating and blunt trauma injuries. **Aims:** This study will also focus on outcomes associated with ERT in paediatric penetrative and blunt trauma. **Methodology:** A literature search was conducted on Pubmed, Prospero, Dynamed, DARE, EMBASE, COCHRANE and BMJ databases. (Registry: CRD42023455342). **Results:** 12 studies had fulfilled the inclusion criteria with 198 patients (mean age 11.1) undergoing emergency resuscitative thoracotomy included in this review. Blunt trauma attributed to 59% (N=117), while penetrating trauma attributed to 41% (N=81) of all injuries. In the penetrating trauma group, the overall survival rate was 34.0% (95% CI 7-60, p<0.01; I² = 77%). The overall survival rate in the blunt trauma group was 1.0% (95% CI 0-3, p<0.01; I² = 66%). There was found to be a statistically significant difference in outcomes. **Conclusion:** The greater survival rate seen in ERT in penetrating paediatric trauma highlights the utility of ERT in a select group of paediatric patients. Larger-scale multi-center trials are required to develop a robust evidence base and treatment algorithm that incorporates ERT.

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Should traumatic liver injuries have routine radiological surveillance: A review

Introduction: The liver is the second most frequently injured solid organ in abdominal trauma. Following traumatic liver injury, some patients will develop delayed complications. Routine re-imaging to screen for delayed complications in all patients with traumatic liver injury has been recommended by some centres. However, this remains an area of controversy. **Aim:** The aim of this study was to review the role of surveillance imaging in the management of liver trauma at our Major Trauma Centre. **Methods:** This was a single centre retrospective review of all adult patients with blunt or penetrating liver trauma presenting to the Royal London Hospital over a five-year period, from 1st January 2016 to 1st January 2021. Patients under sixteen years old and those who died within twenty-four hours of presenting to hospital were excluded. All liver injuries were graded by a radiologist according to American Association for the Surgery of Trauma (AAST) score. The primary outcome was rate of complication following liver injury. Secondary outcomes included rate of surveillance imaging, days from admission to re-imaging and rate of reintervention. **Results:** In 378 patients with liver trauma, 290 (77%) were male, the median age was 31 (IQR 22-45), two-thirds had blunt injury (240, 64%) and median ISS was 25 (IQR 14-41). Two-thirds (245, 65%) were managed non-operatively, and 133 patients (35%) underwent operative intervention. In the 137 (36%) patients who were re-imaged, delayed hepatic complications were reported in 38 patients (10%). Rate of delayed complication by AAST grade was 1.5% (n=1) for AAST I, 0.9% (n=1) for AAST II, 14.2% (n=18) for AAST III, 25.5% (n=13) for AAST IV and 26.3% (n=5) for AAST V. Incidence of delayed complication out of the total population was significantly associated with penetrating injury ($p=0.04$), initial operative management ($p=0.0176$) and an AAST grade of III-V ($p<0.0001$). Following identification of delayed complications, 27 patients (71%) required further intervention, of which all had an AAST grade injury of III-V. **Conclusion:** Our findings support routine surveillance imaging in patients with an AAST grade III-V liver injury. Further prospective studies are required to establish the optimum time for re-imaging and appropriate modality.

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Blast induced traumatic brain injury and its impact on reading ability and pursuit dysfunction: a systematic review

Introduction: Traumatic brain injury (TBI) causes visual disturbances and problems with executive functioning, working memory and attention deficits which can ultimately impact on reading comprehension. Military personnel are more susceptible to TBI through a variety of mechanisms including blast. Aims: This systematic review aimed to assess visual dysfunction after blast TBI, and in particular reading difficulties and pursuit dysfunction and how common they were in military patients. Methods: After searches in PubMed, EMBASE and Web of Science, six studies met our inclusion and exclusion criteria and were included in the systematic review. All of the studies originated in the USA, and a total of 1,472 military personnel with blast TBI were included; 77-96% of whom were male. Results: One study reported significantly worse reading difficulties and pursuit dysfunction compared with controls without blast exposure or TBI history. Another reported finding significant reading difficulty and pursuit dysfunction blast mild TBI (mTBI) but did not include a comparator group. Three studies reported results compared against groups with TBI but no blast exposure. Conclusions/Discussion: Overall, the findings were not significant for either reading ability or pursuit dysfunction, including across a range of timescales and severities. Our study demonstrates that blast TBI causes a variety of ocular dysfunction that can have effects of reading ability and pursuit dysfunction. However, there was a high degree of heterogeneity amongst the included studies, making them difficult to compare but also to do a meta-analysis of pooled data. Therefore, better high-quality studies are required to determine the effects of blast TBI on reading performance and pursuit dysfunction.

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Clinical and radiological outcomes in paediatric patients with diaphyseal femoral fractures managed with early hip spica cast application.

Introduction - Diaphyseal femoral fractures are the most common paediatric orthopaedic injury requiring admission. For children aged 1 to 6, the treatment of choice is hip spica cast. This can be applied early (<48 hours) or following a period of traction. There are economic and social implications to consider with the increased length of inpatient stay associated with delayed spica application. At our institution, early spica casting is the management of choice. Aim - Assess clinical and radiological outcomes in paediatric patients with diaphyseal femoral fractures managed with early hip spica cast application. Methods - A retrospective review of notes and imaging of paediatric patients with diaphyseal femoral fractures managed in hip spica cast over a 6-year period in a Paediatric MTC (n = 53). Acceptable position in spica was defined from literature review as <20mm shortening, <20 degrees coronal and sagittal angulation. A telephone questionnaire follow up was used to collect Patient Reported Outcome Measures. Results - Average age at time of injury was 2.6 years (range 0-6). Average time to theatre was 0.8 days (range 0-3) and average length of stay was 2.2 days (range 0-6). All but one fracture was sustained from a low energy mechanism. 15% of our patients did not meet all 3 of our acceptable criteria for fracture position in cast. More fractures of a length unstable configuration had unacceptable position in cast, but this did not reach significance (p=0.09). Fracture shortening on presentation was not associated with unacceptable position (p=0.47). One patient returned to theatre for repeat spica due to loss of position. Average time in spica cast was 42 days and all fractures united. 60% of parents responded to telephone questionnaire. PROMs confirmed excellent clinical outcomes in all. 6% (n=2) reported a leg length discrepancy resolving by an average of 18-months. 3 parents reported it took longer than anticipated to undergo surgery. The time to surgery in these patients averaged 1 day. There was high satisfaction throughout with the service delivered. Conclusion - Excellent clinical and patient reported outcomes were achieved in all patients regardless of fracture configuration, shortening at time of presentation, and position achieved in cast.

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NON-OPERATIVE MANAGEMENT OF UPPER LIMB PATHOLOGICAL FRACTURES IN MULTIPLE MYELOMA-IS IT POSSIBLE? A REPORT OF THREE FRACTURES IN TWO PATIENTS AND LITERATURE REVIEW

Introduction:Multiple myeloma is the second most common haematological malignancy; 80%-90% of these patients develop myeloma bone disease (MBD). Pathological fractures of axial and appendicular skeleton are common and grouped as skeletal-related events (SREs). The pathological fractures of appendicular skeleton generally occur in femur, humerus and radius bones. Intramedullary nailing, plating with or without cement would act like an internal splint and offers pain control, stabilize weakened or broken part of bone which may allow some bone healing and remodelling to take place. Aims:To review the current literature evidence on the effect of newer multiple myeloma treatment regimes on bone healing.Methods:We report two patients with three different fractures of upper limb long bones, presenting as pathological fractures following trivial injuries, when further investigated they turned out to be multiple myeloma as primary pathology. We also conducted a literature review on the newer treatment regimes and their effects on the reduction of bone osteolysis.Results:All three fractures were treated non operatively and full medical treatment for multiple myeloma was given. All three fractures went on to heal and remodel with good functional outcome. Conclusions/Discussion:In summary, whilst operative intervention offers pain relief, fracture stability, early mobilisation and return of functional status, it is associated with some risks related to anaesthesia and surgery, especially when associated with other co-morbid factors. Certainly, non-operative management of pathological fractures in appropriate casts and braces alongside thorough medical management would help healing of these pathological fractures and return to functional status. This strategy was certainly helpful in Covid 19 pandemic where only essential emergency surgery was carried out in hospitals because of fear of contracting Covid 19 virus with general anaesthesia, operation and care that follows. This is particularly true in high-risk groups such as elderly with cancer, smokers, respiratory problems and patients on immunosuppressive therapy. Further research is required to assess the newer treatment and its effect on the management of upper limb pathological fractures.

111	Abdul Muhaymin Khan	Abdus Samee Wasim - Dudley Group NHS FTPrakash Palaparthi - Dudley Group NHS TrustDavid Westacott - Dudley Group NHS Trust	<p>A patient experience of virtual fracture clinic and assessment of compliance with BOAST guidelines on fracture clinic services</p> <p>1. IntroductionVirtual fracture clinics are now frequently used to assess acute trauma patients and triage them appropriately. These virtual appointments still need to comply with local and national standards such as the British Orthopaedic Association Standards for Trauma (BOAST). The NHS values patient centered care and as such it is important to gain insights from a patient’s perspective of the experience they have when accessing these services.2. AimsTo assess to what extent our virtual fracture clinic complied with the BOAST guidance on fracture clinic services (where applicable). To gain an insight from our patients on their experience of having a virtual clinic appointment, guiding us on where we can improve.3. MethodsData was collected over a one week period in which each consultant’s fracture clinic was represented. Standards assessed were the length of time from referral to telephone call, whether a consultant was present in clinic, if the appointment lead to a management plan and if rapid access was explained and documented. This data was collected using the electronic patient record.In order to gain feedback, patients were contacted via telephone and a questionnaire was completed. This occurred within a day of the clinic appointment. 4. ResultsWe found that all virtual fracture clinic appointments occurred within the study period were within the 72 hour time frame outlined by BOAST. A consultant was present in 9 out of 10 clinic sessions. A management plan was made in 58% of cases. Rapid access was documented in the outcome form in 37% of cases, written information was provided in all cases.Patients were generally quite positive about the experience, many felt they had avoided an unnecessary trip to the hospital. Although most were clear about their diagnosis some were unsure about it and had questions about how long they would be in cast for etc. All patients were given worsening advice and how to access the rapid access service.5. ConclusionThis audit will help our department improve the experience that patients have when accessing the virtual fracture clinic. Improving awareness of the guidelines amongst clinicians and nursing staff will make the virtual fracture clinic more in line with national standards.</p>
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Time is Vision: A complex case of globe rupture and retrobulbar haemorrhage

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Trauma is one of the main causes of monocular blindness all over the world. In this regard, globe rupture and retrobulbar hematoma represent two emergent entities that need imminent recognition and proper management to reduce the risk of vision loss and other complications. It is critical to distinguish globe injuries from other ocular injuries and hence early identification with prompt ophthalmology consultation is of utmost importance. The role of the A&E physician is to facilitate and provide the correct emergency care to prevent further damage. The emergency management includes placement of an eye shield, administration of antibiotics, analgesics, tetanus prophylaxis and antiemetics. In this care report, we describe a case of a 78-year-old woman on anticoagulation therapy who presented to the hospital following falling forward and collapsing to the ground, sustaining significant injury to the right eye. The patient presented with right eye pain, vision loss and proptosis. The provisional diagnosis of retrobulbar haemorrhage was made. On examination, there were no acute life-threatening conditions and GCS was 15/15. The patient had a grossly swollen right eye, large and unreactive to light pupil with presence of subconjunctival hemorrhage, hyphema and loss of vision with painful eye movements. There was tenderness around the right lateral supraorbital margins. The patient had an urgent ophthalmology and maxillofacial assessment. CT head and facial bones were performed and some of the findings revealed a globe rupture with a background of retrobulbar hematoma. Thus, lateral canthotomy was not indicated. The patient went for an emergency operation to prevent vision loss. This rare complex case required early recognition of the signs and proper management to prevent vision loss and further damage to the patient.

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The usability of the Fracture Fixation Assessment Tool score (FFATs) in developed and developing countries

Introduction The need for healthcare in developing countries outstrips resources. This issue is further compounded by the lack of training. The fracture fixation assessment tool (FFATs) is an objective post-operative evaluation tool. It aims to provide surgeons in both developed and developing countries with a structured approach to appraise fracture fixations. The tool has been validated for intra and inter-observer reliability and improvement of score with increasing seniority. Aim To assess the usability of FFATs as an educational tool in developed and developing countries. Methods British based trainers were paired with orthopaedic trainees from UK and Ethiopia. Over a 6 month period, each trainer-trainee combination analysed 10 of the trainees' fracture fixations using FFATs. Each trainee undertook a pre- and post-FFATs questionnaire to identify changes in pre-operative planning, confidence executing fracture fixations and the perceived usefulness of FFATs. Results A total of 4 ST7 orthopaedic trainees and 3rd year residencies from UK and Ethiopia were included. In 75% of cases participation changed pre-operative behaviour (written pre-operative plan/drawn plan) and increased trainee confidence. The vast majority (75%) of participants found FFATs to enhance learning. Discussion FFATs provides trainees with structured feedback on fracture fixations and highlights future areas of development. In this pilot study, the utilisation of FFATs increased trainee confidence with fracture fixations and was user-friendly for trainees based in developed and developing countries.

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A retrospective study of diaphyseal femoral fracture management with Titanium Elastic Nails (TENs) or Minimally Invasive Plate Osteosynthesis (MIPO) in a paediatric Major Trauma Centre over a five-year period (2017 - 2022).

Introduction: Femoral fractures in the paediatric population are the most common traumatic injury requiring admission to hospital. For children aged 4 to 12 years, NICE guidelines recommend treatment with Titanium Elastic Nails (TENs).(1) For older children alternative options include rigid intramedullary nails and Minimally Invasive Plate Osteosynthesis (MIPO). There are pros and cons for each method plus limitations depending on age, weight, and future growth potential of the patient.Aim: This study aimed to compare TENs and MIPO treatment options in paediatric femoral fractures.Method: Retrospective data were collected from a paediatric Major Trauma Centre over a 5-year period to compare femoral fracture management using TENs or MIPO. Average age, fracture pattern, length of stay, time to surgery, post-operative deformity, union time (clinical and radiological), plus rates of metalwork removal, average time to removal and any complications were recorded. Results: 40 cases were treated with either TENs (n=24) or MIPO (n=16) over the period reviewed with the outcomes for both treatment options being compared. The average age of patients for both TENs and MIPO were very similar, despite TENs having an upper weight limit. TENs were favoured over MIPO in fractures that were length unstable, however had a higher rate of removal. In our institution, we found that clinical and radiological union time correlated well, and TENs had a slightly longer time to union over MIPO. Overall length of stay was lower for both management options when compared to the national average.(2) Time to surgery was also objectively low, with all TENs treatments being performed within 2 days and MIPO within 4 days, however no national data were found to compare. Complications including wound dehiscence, post-operative deformity and problems with metalwork amounted to 2 patients and 3 patients for MIPO and TENs respectively. Conclusion: To comment on a superior treatment, more comparative studies are needed and observation of patients over a longer time frame would allow for study of complication rate.References(1) Fractures (non-complex): assessment and management. (2016).(2) Talbot, C. et al. Fractures of the Femoral Shaft in Children. Bone Joint J 100, 100–109 (2018).

116 Tom Griffiths

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Open Femur Fractures Presenting in One Calendar Year to the South Wales Trauma Network

IntroductionOpen femur fractures are rare injuries; often associated with “Polytrauma;” commonly the result of high energy traumatic events and pose a significant challenge to manage. British Orthopaedic Association Standards (BOAST) for managing open fractures state a collaborative approach with Orthopaedic and Plastic Surgeons “Orthoplastics”. **Aim**This study aims to assess whether the newly introduced orthoplastic service, within the South Wales Trauma Network (SWTN), manages open femur fractures as per the BOAST guidelines and whether the intervention it provides improves outcomes for patients.**Methods**Patients were retrospectively analysed from a prospective database and TARN. Basic demographics reviewed sex and age as well as variables describing the efficacy of management as per BOAST guidelines. These included timeframes to each of the surgical procedures required, grade and specialty of surgeon at each operation, diagnosed complication of infection, and whether the patient achieved successful limb salvage.**Results**8 patients presented to the SWTN with open femur fractures in one year. The majority of patients (n=7) were involved in a road traffic collision (RTC) either as a pedestrian or as an occupant of a vehicle. Of those who presented from an RTC, all were classified as polytrauma patients. 6 patients had successful limb salvage. A plastic surgeon consultant was present at 55.6% of initial debridements (n=5) and 55.6% of definitive soft tissue closures (n=5). Increased time to definitive fixation of the fracture correlated with an increased risk of deep infection at 6 weeks (p=0.047). If the time to soft tissue coverage was increased, the likelihood of reoperation for orthoplastic complication increased (p=0.024). **Conclusion**Open femur fractures are rare injuries, associated with high energy trauma. With the soft tissue insult, these injuries are more likely to develop complications during their management and require an orthoplastics approach (8). By focusing resources into one location at the MTC, the SWTN has reduced the time between separate operations, reducing the likelihood of further complication. With the continued development of orthoplastic services to a 24/7 service, outcomes should improve and BOAST compliance will increase.

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The Effect of Needle-Free Connectors on the Rate of Infusion of the Belmont Rapid Infusion Device

Introduction Rapid Infusion devices are routinely used in the trauma setting to resuscitate bleeding patients. At the University Hospital of Wales, Cardiff, the Belmont Rapid Infuser is used and can deliver a maximum flow rate of 750ml/minute at a maximum pressure of 300mmHg. Needle-free connectors are used as part of infection control measures and ease of connection of intravenous lines to cannulas, however their effect on the function of the Belmont Rapid Infuser has not been formally assessed in our centre.

Aims Aim of the study was to assess the effect of various needle-free connectors on the speed of delivery of a 500ml fluid bolus from the Belmont Rapid Infuser Device and recommend a connector for use in trauma and major haemorrhage scenarios at our hospital.

Methods Commonly used needle-free connectors were tested in combination with various intravenous cannula and central venous catheters (CVC) to assess the effect of the connector on the speed of delivery of a 500ml crystalloid bolus from a Belmont set at 500ml/minute, into a bucket. The pressure was also recorded. As a control, measurements were taken with the cannula and CVC with no connector attached. Each combination was tested three times and mean calculated. Tested needle-free connectors and cannulas can be seen in figure 1 and tables 1 and 2.

Results Most needle-free connectors reduced the delivery of 500ml crystalloid bolus. Three-way taps when used with CVCs had the quickest delivery of the fluid bolus. Vygon Protect-A-Line had the quickest delivery of the fluid bolus through a peripheral cannula. The Vygon Octopus 2 had the slowest delivery of a fluid bolus. Needle-free adjuncts that generated a pressure of 300mmHg, resulted in the Belmont pausing, and delaying the bolus. The results are summarised in tables 1 and 2.

Conclusion Speed of delivery of a blood during a trauma scenario is important as for every minute of hypotension, morbidity increases. Needle-free connectors reduce the speed of delivery of a 500ml crystalloid bolus to varying degrees. From this study, we recommended the use of three-way taps for CVCs and Vygon Protect-A-Line for peripheral cannulas with the Belmont Rapid Infuser during trauma in our hospital as they reduce the speed of delivery the least.

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Student Trauma Register- Preparing trauma teams of the future

Despite major trauma being the leading cause of death and disability in people aged under 45, with an increasingly reported occurrence in the elderly population, there remains a gap for trauma-based education within the undergraduate curriculum. An overwhelming majority of medical students report that they do not feel their university provides them with enough training in trauma care or major incident management, and would not feel confident to assist in a trauma call. Students and foundation doctors are an invaluable but under-utilised resource in emergency situations, with the greatest potential to shape the delivery of effective trauma care. With this in mind, the Student Trauma Register- STAR-was created; we aim to prepare the trauma teams of the future through high-quality hybrid teaching, face-to-face interactive lectures, and simulation-based training. During regular sessions, participants learn about the organisation of the major trauma service, the structure of the multidisciplinary team, life-saving interventions and the management of a polytrauma patient. By the end of the course, students are prepared to assist in minor but vital roles in the ED, and are registered with STAR to be called upon in the unthinkable event of a major incident. Additionally, students can build their professional network, gain early hands-on experience, and create opportunities to aid their future career.

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Challenges in the surgical management of Ankylosing Spondylitis: Patient Journey, Team Approach and Management Algorithm

Introduction Ankylosing spondylitis (AS) is a chronic inflammatory condition of the axial spine. The hallmarks of the disease are chronic back pain and progressive stiffness. In the setting of trauma, AS predisposes to devastating spinal fracture in low energy trauma. This frail subset of patients present with high risk of associated spinal cord injury as well as increased morbidity and mortality. We present a team approach to the management of low energy spinal fracture in AS. We reflect upon the patient journey of an AS patient with low energy cervical fracture presenting to a Major Trauma Centre. Based on this case we present an algorithm for the management of low energy spinal fracture in AS. We believe this approach can be employed in any centre where there is suspicion of spinal fracture in the stiff spine.

Aim Highlight a case of low energy cervical fracture in an AS patient
Presentation Present a management algorithm for spinal fracture in AS reflective of the patient journey from injury to discharge and follow up.
Reflection on the importance of the multidisciplinary team (MDT)
Method We present a case of low energy cervical fracture in a patient with AS. We highlight the stages in the management of this patient. We present an algorithm emphasising; The correct immobilisation of the spine (Scene to Surgery)
Full and complete spinal assessment and imaging
Considerations in preoperative and perioperative management
Philosophy of fixation reflective of biomechanics
MDT importance
Clinic follow up
Results This case highlights the challenges in the management of low energy spinal trauma in AS with the potential for devastating spinal injury. We detail our considerations in management from presentation through to discharge. We reflect upon our management and why we believe excellent outcomes were achieved. We believe our approach is methodical and repeatable. This can be employed as a management algorithm in similar cases.
Conclusion Patients with spinal fracture in AS are a frail subset of patients. Spinal fracture in this subgroup can be devastating. We present a management algorithm alongside a case study that we feel is an example of the ideal approach to care for this challenging group.

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The journey to definitive care: Secondary transfer of major trauma patients by specialist teams

IntroductionIn Wales, large distances between hospitals and remote population centres uniquely complicate delivery of networked trauma care. Several hour journeys to definitive treatment from scene of incident mean secondary transfer from local hospitals is often required. We describe cooperation between our adult critical care transfer service (ACCTS) and our advanced prehospital team, the Emergency Medical Retrieval and Transfer Service (EMRTS) in overcoming the challenges to delivering timely care to critically injured patients in Wales.

AimsTo conduct a service evaluation of transfer critically ill patients into major trauma centres by Welsh specialist transfer & retrieval teams to assess timeliness of access to specialist care, interventions required and utilisation of transfer platforms.

MethodsA review of electronic patient records from EMRTS Cymru and ACCTS Cymru was conducted for major trauma patients transferred from Welsh hospitals into major trauma centres in Cardiff and Stoke by the ACCTS and EMRTS teams from the launch of ACCTS on August 16 2021 to October 26 2022.

Results76 missions met inclusion criteria. 38 were transferred each by ACCTS and EMRTS. 23 patients were transferred by helicopter and 53 by road ambulance. Median activation time to arrival at referring hospital was 38:30 and 33:30 for EMRTS, 35:00 for helicopter-based teams and 35:30 for road teams. Median activation time to arrival at destination MTC was 2 hours 25 minutes for ACCTS, 1 hour 57 minutes for EMRTS, 1 hour 55 minutes for helicopter-based teams and 2 hours 29 minutes for road-based teams. 78% patients were transferred from ED and 17% from ICU. 8% of teams were led by specialist practitioners, while 92% were physician-led.

ConclusionsTransfer of major trauma patients has historically been conducted by local teams, at least in part due to perception that a local team with a 999 ambulance vehicle represents the fastest and therefore safest option. Our data demonstrates how both critical care transfer and HEMS teams based remotely can deploy and transfer patients in a timely fashion. Furthermore, with their specialist equipment, transfer training and equipment, they are likely to mitigate the inherent risk in transfer of critically injured patients with evolving pat

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EZE

Implementation of an Electronic Smart Phrase to Improve Performance of Tertiary Surveys in a Children's Major Trauma Centre

Introduction: Tertiary survey (TS) is an important stage in the management of trauma patients. Variety exists in the primary caregivers for injured children in our children's major trauma centre (CMTc). TS is commonly missed leaving scope for unidentified injuries. Aims: The primary aim was to determine whether completion of TS could be improved with the introduction of a smart phrase (template) for the electronic patient record. The secondary aim was to identify if variation exists between clinical teams in completion of TS. Methods: A retrospective case note review was performed over two corresponding 12-month periods before (January-December 2018) and after introduction of the smart phrase (January-December 2022). All children aged 0-16 years admitted with moderate and severe injury (ISS>9) were included. Results: 90 patients were identified pre-smartphrase and 54 post. Overall 17 patients were excluded due to death, no trauma identified or age >16 years, leaving 82 pre smartphrase and 45 post for analysis. A 22% increase in completion of TS was found (pre-smartphrase 48% (39/82); post 71% (32/45)). TS was completed using the smartphrase in 81% (26/32) of cases. Completion of TS by primary speciality team pre-smartphrase included 78% (14/18) paediatric surgery 32% (6/19) orthopaedics, 40% (6/15) neurosurgery, 75% (3/4) multiple teams, 25% (1/4) maxillofacial, 0% (0/1) ophthalmology, general paediatrics 43% (9/21). Post-smartphrase included paediatric surgery 90% (9/10); neurosurgery 80% (12/15), orthopaedics 58% (7/12), PICU 100% (1/1), vascular 0% (0/1) general paediatrics 50% (3/6). Overall, 82% (22/27) surgical specialties, PICU 100% (1/1) general paediatrics 100% (3/3) utilised the new smart phrase. Conclusions/Discussion: A gap was identified in the performance of TS for injured children in our CMTc. Introduction of a smartphrase has increased the performance of documented TS by over 1/5th. Variety exists in the specialty teams undertaking the TS and ownership of this task is often unclear. Provision of a standardised template ensures the TS is accessible to all clinical teams and builds confidence in their ability to complete this task safely and promotes excellence in care for injured children.

133 Matthew Williams

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Should prophylactic antibiotics have a role in the management of patients with traumatic rib fractures?

Introduction Patients with traumatic rib fractures are at risk of pulmonary complications including atelectasis and pneumonia. Many strategies exist to reduce this including chest physiotherapy and various regional analgesic techniques, but the role of prophylactic antibiotics remains controversial. **Aims** To establish current antibiotic prescribing practice in patients with chest trauma in a London Major Trauma Centre. **Methods** Patients were identified from the local trauma registry. Inclusion criteria were adults with one or more rib fractures presenting between 01/09/22 – 31/12/22. Electronic records were reviewed to establish demographic information, mechanism of injury, STUMBL score, antibiotic prescriptions and indications, and clinical outcomes at 30 days from presentation. **Results** 126 patients were identified, of whom 42 (33.3%) received antibiotics for a chest source within the first 14 days of admission. 14 (11.1%) patients were prescribed antibiotics for chest indications (most commonly aspiration pneumonia) and 4 (3.2%) were prescribed prophylactic antibiotics based on their perceived risk of developing pneumonia. 24 patients (19%) received antibiotics later within the first 14 days of admission (median of 4 [IQR=5] days from admission), most commonly for a hospital-acquired pneumonia. Compared to the rest of the cohort, patients who received antibiotics later were more commonly female (50% vs 39%), older (median 82 [IQR=12.3] vs 72 [IQR=30] years old), had a higher mean STUMBL score (35 vs 25), a longer length of stay (median 16 [IQR=12] vs 8.5 [IQR=13.5] days), and higher mortality at 30 days (16.7 vs 12.5%). **Conclusions** A significant proportion (33%) of patients presenting with rib fractures receive antibiotics for a chest infection during their admission. A significant subgroup of patients developed chest infections after admission, which suggests that a subgroup of rib fracture patients might benefit from prophylactic antibiotics or a lower threshold for early antibiotics. Future prospective studies could confirm these findings and investigate whether these patients can be identified earlier to reduce the incidence of infective pulmonary complications, length of hospital stay, and potentially mortality.

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A 10 minute journey from ambulation to mechanical ventilation: Life threatening traumatic subcutaneous emphysema with fractured ribs without pneumothorax

A 10-Minute Journey from Ambulation to Mechanical Ventilation: Case Description: This case reports on a 50-year-old male smoker who developed life-threatening subcutaneous emphysema (SCE) after a chest injury. The patient presented with hoarse voice, chest swelling, severe pain, and breathing difficulty. Rapid deterioration required immediate intervention. Examination revealed widespread SCE and pneumomediastinum, without pneumothorax. ABG showed respiratory failure, high lactate, and hypertension. The patient became agitated, leading to intubation. Despite fractured ribs, no pleural air leak was observed. CT scan confirmed rib fractures, lung contusion, surgical emphysema, and small pneumothoraces. A paravertebral block was performed, and the patient spent 7 days in the ICU with chest drains.
Discussion: SCE, characterized by air under the skin, can result from trauma. In this case, it rapidly progressed, causing severe upper airway compromise. Notably, there was no accompanying pneumothorax, despite rib fractures. Management included intercostal drains, subcutaneous drains, and negative pressure wound treatment. This case underscores the need for prompt recognition and intervention in rapidly progressing SCE, emphasizing the importance of a supportive resuscitation team.
Learning Points: SCE can cause life-threatening upper airway issues quickly. Rapidly progressing SCE requires a coordinated response and staff support. In the absence of pneumothorax, focus on managing SCE with techniques like subcutaneous drains.

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Completeness of Operation Notes, and Benefits of a Template

Aims: Royal College of Surgeons outline in their Good Surgical Practice 2013, eighteen points that should be included in an operation note to ensure an accurate and comprehensive document. This is important as a means of communication between healthcare professions and as a legal record. We conducted two cycles of a closed loop audit comparing the quality of operation notes in our department to this national standard. **Methods:** In the first cycle of the audit, we extracted the first forty operation notes from an arbitrary date and recorded how many of RCS' points were recorded. We presented findings at a local clinical governance meeting and worked with consultants to design a new operation note template that was published to the trust's electronic system for ease of use. The second cycle of the audit followed the same methodology to measure whether an improvement in practice was noted. **Results:** The first cycle of our audit found a completion rate of 67.2%. Notable areas for improvement included DVT prophylaxis, antibiotics, whether tissue was removed and sent for analysis, and detailed post operative instructions (especially with regards to physiotherapy instructions including weight bearing status and range of movement restrictions). The second cycle of the audit found an improvement in the completion rate to 73.6%, and an even greater improvement of 79.9% when the new operation note template was used. **Conclusions:** Use of the operation note template helped surgeons to write more complete operation notes. Use of the template should be encouraged to increase uptake in its use.

138

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Open fractures (BOAST): Improvement in compliance demonstrated in a 2 cycle audit

Introduction: Open fractures are those complicated by overlying skin disruption, creating direct communication between the fracture site and the external environment, carrying a heightened risk of complications, notably infection. The British Orthopaedic Association for Trauma and Orthopaedics (BOAST) has developed comprehensive guidelines to optimise open fracture management and reduce complication rates. Aim: This retrospective two-cycle audit at Peterborough City Hospital (PCH) aimed to assess BOAST guideline compliance, identify performance deficiencies, and implement recommendations in an attempt to improve adherence and therefore patient care. Methods: The audit focused on five BOAST points: 1. Timely intravenous antibiotics (IV Abx), ideally within an hour. 2. Comprehensive neurovascular status documentation. 3. Appropriate limb realignment and splinting. 4. Clinical photography at wound exposure. 5. Definitive skin closure within 72 hours. Patients included were those managed at PCH A+E between May 2021 to April 2022 and June 2022 to July 2023, excluding hand, wrist, forefoot, and digit fractures. Electronic records provided the necessary patient data. Following the first audit, implemented interventions included: education of ED and Orthopaedic clinicians, infographic distribution, and addition of BOAST guideline in trust protocol documentation. Results: The study included 29 patients in the first cycle and 23 in the second. Outcomes 2-5 showed high compliance (97-100%). Outcome 1, IV Abx within an hour, had poor compliance in 2021-2022 (10% within an hour of injury, 55% within an hour of review). In 2022-2023, 22% received IV Abx within an hour of injury, and 57% within an hour of review. Average time to antibiotic administration improved from 170 to 128 minutes. Conclusion: BOAST guideline compliance improved; IV Abx administration by 12%. However, antibiotic administration compliance remained a challenge, as the most time critical guideline, likely due to extended ED wait times and limited pre-hospital access. Further highlighting that targeted interventions are needed to address this critical aspect of open fracture management.

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The Clinical Presentation and Survival Outcomes of Major Trauma in Older People: A Retrospective Cohort Study of a UK Trauma Network

Introduction: Major trauma (MT) in people aged ≥ 65 , also referred to as “Silver Trauma”, represents a considerable proportion of UK Trauma Unit (TU) burden. Unfortunately, the drive to design targeted pathways to help clinicians identify and manage severe injury in the older patient, is a relatively late phenomenon. Regional trauma networks (RTNs) now play a crucial role in reducing variation in the quality of trauma care. Aim: The primary aim of this retrospective cohort study was to assess the presentation and survival outcomes of older adult MT within a specific UK network. Secondary aims included a review of Emergency Department performance and the employment of local pre-hospital silver trauma triage tools. Methods: The Trauma Audit and Research Network (TARN) database was used to identify all patients aged ≥ 65 with MT (injury severity score >15), who presented to TUs within the North West Midlands and North Wales (NWM & NW) RTN between 2019 and 2022. Age; mechanism and type of injury; clinical observations and survival, limited to outcome at 30 days and Glasgow Outcome Scale (GOS) score were recorded. Chi-squared and Fisher’s exact tests were used to determine statistical differences ($p < .05$) in survival. Results: 1588 patients were identified. A fall of $<2m$ was the most common mechanism of traumatic injury, with most older people presenting with a head injury alongside normal clinical observations. A statistical difference in overall survival at 30 days post-admission and GOS score (an assessment of disability following traumatic brain injury) across the network was found. Conclusion: This study demonstrates variation in the delivery and outcomes of older adult MT care within a UK RTN. However, further studies that account for important confounding factors such as co-morbidity and frailty are required to comment on the degree of clinical significance of these results. To address variations within clinical practice, we recommend the implementation of standardised silver trauma care pathways to ensure that targeted, high quality MT care is consistently delivered across RTNs.

141 Tara Edwards

N/A

Does anaemia either pre- or post-operatively contribute to an increased length of ward stay in patients with peri-prosthetic fractures?

Introduction: The prevalence of peri-prosthetic fractures is increasing, and these surgeries are associated significant blood loss. Anaemia in elderly surgical patients has been previously associated with an increased length of ward stay and this observational study will explore pre- and post-operative anaemia in peri-prosthetic fractures of the hip and knee. Objectives: To identify whether patients with peri-prosthetic fractures were anaemic during the peri-operative period and if so, whether this correlated with an increased length of ward stay. Methodology: Eligible patient data from an orthopaedic fracture database compiled by CAVUHB was identified and these records were then accessed using WCP in order to identify whether patients were anaemic during any time over the peri-operative period. Results: 34% of patients were anaemic pre-operatively and 97% were anaemic post-operatively. The overall data trend suggested that there was a correlation between both pre-operative anaemia and post-operative anaemia against increased length of ward stay. Discussion: These observations demonstrate a similar trend in anaemia vs. length of ward stay comparative to other surgical patients. Despite a small data cohort and multiple patient co-morbidities existing as an independent variable during this study, an overall data trend could be determined. Conclusion: There is a correlation between both pre- and post-operative anaemia and an increased length of ward stay but the significance of these results has not yet been determined.

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Does a Preoperative Carbohydrate Drink Reduce Postoperative Inflammation? A Systematic Review and Meta-Analysis

Introduction: It has been known since the late 1990s that preoperative carbohydrate drinks are safe to consume two-to-three hours before an operation. Furthermore, trials have repeatedly demonstrated improved postoperative insulin resistance, hunger and thirst in patients given a two-to-three-hour preoperative carbohydrate drink compared to those who are made to fast more than 6 hours. However, despite this, patients are still made to excessively fast preoperatively. Aims: This systematic review investigated whether a two-to-three-hour preoperative carbohydrate drink reduces postoperative IL-6 and C-reactive peptide levels and lessens the reduction in serum albumin. Patients given a preoperative carbohydrate drink were compared to patients given a placebo drink and to those made to fast more than 6 hours. Methods: Two independent researchers searched three databases (Web of Science, MEDLINE and Embase) and identified 473 studies. After screening, 10 randomised control trials were included in the review and meta-analysis. Furthermore, individual study and overall biases was determined using the Cochrane Risk of Bias Tool 2 (RoB2). Results: The meta-analyses found a significantly lower mean IL-6 level of -21.26 pg/mL ((95% CI -33.37, -9.15); $p = 0.0006$) postoperatively in preoperative carbohydrate drink patients compared to fasting patients and a significantly higher mean serum albumin level of 2.56 g/L ((95% CI 1.41, 3.71); $p < 0.0001$) postoperatively in preoperative CHD patients compared to placebo patients. This is thus the first systematic review to identify significant reductions in postoperative inflammation in patients given a preoperative carbohydrate compared to fasting patients and placebo patients. Conclusion: These results reinforce the guideline recommendations of giving patients a carbohydrate drink two-to-three hours preoperatively and urge clinicians to stop the harmful practice of excessively fasting patients.

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Improving the Quality of Postoperative Assessment of the Trauma and Orthopaedic Patient: A Single-Centre Audit and Quality Improvement Project

Introduction Thorough and high-quality postoperative assessments are essential to ensure good patient care and monitor for early complications. Clear documentation is also imperative for patient safety and effective continuity of care. FY1 doctors in our large department must independently perform reviews for all postoperative inpatients overnight, which has been highlighted as a highly time-consuming task on busy night shifts. Aim(s) The aim of this audit was to enhance quality of documentation for postoperative reviews and reduce time needed to perform and document reviews. Methods Postoperative reviews from a 7-day period were scored out of 32 across 8 categories for inclusion of key components of a postoperative review. FY1 doctors were also surveyed about time taken to perform and document postoperative reviews. A proforma was developed that could be copied into electronic patient notes to serve both as a prompt for doctors during review and for documentation purposes. Postoperative reviews were rescored, and doctors resurveyed following implementation of the proforma over 7 days. Results Quality of documentation improved significantly, with mean total scores increasing from 10.8 to 22.6 ($p < 0.00001$). Mean time to perform reviews significantly reduced from 13.6 to 9 minutes ($p = 0.0016$). Whilst mean time to document reviews slightly improved from 15.5 minutes to 12 minutes, this was not statistically significant ($p = 0.391$). Conclusion Use of an editable electronic proforma improved the quality of documentation and time taken to perform postoperative reviews but did not reduce time needed for documentation. A click-through electronic assessment is currently in development to further improve this.

144 Dr Elizabeth Sarah Murray

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Ethanol and Isolated Traumatic Brain Injury – Neuroprotective or Neurotoxic? A Systematic Review and Meta-analysis

INTRODUCTION: Traumatic brain injury (TBI) is a significant cause of morbidity and mortality worldwide, with considerable economic burden. Intoxication with ethanol increases the risk of sustaining injury, however animal trials have suggested a neuroprotective effect of ethanol and various mechanisms have been described within the literature. Human studies have provided conflicting outcomes when investigating isolated TBI and mortality in patients with positive blood alcohol levels. AIMS: To investigate whether ethanol intoxication has any effect on mortality and ICU length of stay in patients with an isolated moderate to severe TBI. METHOD: A systematic review was performed of the literature and extensive database searches undertaken. Only studies including adults with moderate-severe TBI, ethanol as an exposure variable and mortality as an outcome were included. Research that included polytrauma or paediatric patients was excluded. Studies were reviewed and data extracted in accordance with the PRISMA guidelines, and the Newcastle-Ottawa Scale used to assess quality. The Mantel-Haenszel method was used to pool study data and obtain an overall effect. Heterogeneity was assessed and multiple sensitivity analyses performed to further assess outcomes. RESULTS: 4062 studies were extracted for screening with nine manuscripts identified for review. A total of 78,014 patients were included in analysis with 27,026 having positive and 50,988 negative ethanol levels on testing. Overall mortality was 11.6% with ethanol positive and negative cohorts having 10.1% and 12.5% mortality respectively. The pooled odds ratio for mortality was 0.77 (95% CI 0.64-0.91), however there was significant heterogeneity (I² 86%) and further sensitivity analyses were performed. Results remained similar following removal of studies contributing to significant heterogeneity. ICU LOS outcomes were variable with a significant proportion of studies either not reporting or finding statistically insignificant results. CONCLUSIONS: A positive ethanol level in patients with isolated moderate to severe TBI was shown to significantly reduce mortality. This may be due to residual confounding and bias within studies, including missing data and mixing blunt and penetrating cohorts. Future research sho

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n/a

Identifying the Barriers to Rehabilitation Following Traumatic Injury in Low and Lower-Middle Income Countries: A Narrative Review.

Introduction: The burden of non-fatal traumatic injuries (TIs) disproportionately affects low and lower-middle income countries (LLMIC), resulting in a compromised quality of life for those affected, and indisputable socioeconomic consequences for patients and society. Adequate rehabilitation is imperative following TI, facilitating independence and reintegration into society; nevertheless, it remains grossly insufficient in LLMICs. Aims: This project aims to explore the literature concerning rehabilitation following TI in LLMICs and identify the common barriers to the provision and access of adequate rehabilitation. It aims to achieve this through the lens of five key TIs known to cause significant disability: spinal cord injury (SCI), amputation, traumatic brain injury (TBI), burns and fractures. Recommendations for improving rehabilitation following TI in LLMICs will then be proposed. Methods: A narrative literature review was conducted using a structured search of Medline and Web of Science. Studies available in English, published from 2013 onwards and relevant to the barriers to rehabilitation following SCI, amputation, fractures, burns and TBI in LLMICs were included. Results: The search identified 609 results. After removing duplicates, ineligible studies and the addition of four papers from reference searches, 22 studies remained. Analysis of included studies identified 12 common barriers to rehabilitation in LLMICs and concerned: patients, care teams, organisations and the political environment. Nine barriers were applicable to all five TIs, whilst three were injury-specific. Conclusion: Barriers identified from the literature review were discussed, and potential solutions proposed. Addressing the poor governance and policy for rehabilitation across LLMICs is urgently required before other barriers can be overcome. LLMICs should strive to enhance their rehabilitation workforce and develop national standards for the manufacture and procurement of assistive devices. Future research must explore rehabilitation in underreported regions such as Latin America/Caribbean and examine the TIs that receive limited attention in LLMICs, including burns, fractures and TBI.

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An Evaluation of Low-Titre Group O Whole Blood Use in Civilian and Military Pre-Hospital Environments

Introduction Warfare has acted as a crucible for innovation in numerous fields, including in civilian healthcare where multiple advancements have originated from the battlefield. An example is the use of Whole Blood Transfusions (WBTs) in the field to treat hypovolaemic shock due to haemorrhage, the leading cause of preventable death in trauma. It was brought into civilian healthcare after the Vietnam War and included the use of Low-Titre Group O Whole Blood (LTOWB), which reduced the risk of transfusion reaction. In the 1970s, there was a shift to using Blood Component Therapy (BCT), however, there was no evidence to suggest the replacement of WBTs in traumatic haemorrhage. Aim(s) To evaluate the use of LTOWB in patients experiencing catastrophic haemorrhage in civilian and military pre-hospital environments. Methods A literature search was performed to evaluate the use of LTOWB in pre-hospital civilian and military environments through the ProQuest Database, PubMed Database, Medline on OvidSP Database, and a journal titled 'Military Medicine'. After identification of sources, screening, eligibility determination and duplicate removal, the source population was distilled down to 23 from 1559. The sources were read in full and thematically analysed. Results The themes that emerged were: Need for Pre-Hospital Whole Blood Transfusion; Lack of Robust Data; Superiority to Crystalloid Resuscitation and Other Blood Products; Reduction in Mortality; LTOWB Collection, Storage and Delivery; Rh-D Alloimmunisation and Difference in Titre Level. Conclusions/Discussion LTOWB transfusion is widely accepted as safe and effective, including in pre-hospital environments. Limitations that emerged have been investigated and overcome by military and then civilian programmes in multiple countries. It has proved superior to other resuscitation materials and shown a reduction in mortality. However, there is a lack of robust data, particularly in civilian healthcare. To warrant widespread dissemination of pre-hospital transfusions, more research (for example into cost versus benefit and LTOWB versus Group O Whole Blood) needs to be conducted, especially when considering the number of deaths that could be prevented.

149 Jamie Hunter

N/A

Hypocalcaemia during trauma transfusion: A systematic review

Introduction: Activation of major haemorrhage protocols for patients suffering traumatic injuries has become a regular occurrence following substantial trials highlighting the limitations of crystalloid fluid and importance of adequate blood volume/ratio. The importance of calcium during this trauma transfusion remains in question and calcium administration is yet to be included in most protocols often left to clinician judgement. Aims: Many trials have highlighted the association between blood component therapy administration and hypocalcaemia due to citrate binding, but should clinicians be actively treating and correcting hypocalcaemia during transfusion? Methods: Data was obtained following a systematic search of all available evidence across MEDLINE, EMBASE and grey literature to highlight 86 abstracts of which 3 studies were included in the review featuring associations between transfusion induced hypocalcaemia and mortality. These 3 studies identified trauma patients over 18 years receiving blood component transfusion with measured calcium levels and documented outcomes of mortality. Results: These 3 studies with a total of 387 patients were included in the meta-analysis. Each of the studies included showed a positive correlation between hypocalcaemia and mortality risk with only one study having its lower 95% confidence interval below 1. The overall effect was an increased odds of mortality at 1.94(1.07-3.99, 95% CI) in trauma patients experiencing hypocalcaemia during trauma transfusion. Conclusion: Many previous papers have evidenced the association between transfusion of bloods products and the incidence of hypocalcaemia in the trauma patient. This systematic review builds upon this evidence to show a correlation between hypocalcaemia and an increased risk of mortality. Small sample sizes and 2 trials being retrospective observational studies are limitations of this analysis. This review should lead to more work in this field with a view to comprising large, multi-centre, randomised controlled trials to reduce bias and allow an adequately powered study to further acknowledge this relationship.

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Tertiary Trauma Surveys: educational interventions to reduce missed traumatic injuries

IntroductionA tertiary trauma survey (TTS) is a repeated formal top-to-toe examination following major trauma. It has been shown to reduce the incidence of missed injuries in polytrauma patients, preventing death and disability. TTS require completion within 24 hours of admission at St Mary's Hospital. **Aim**We are still well below the target 100% completion rate, so our aim is to deliver an educational package of interventions to improve this rate. **Methods**We audited the current completion rate prior to any interventions. The first cycle of intervention included delivering a face-to-face teaching session with intensive care trainees after which we subsequently re-audited the completion rate. The second cycle involved distributing a video tutorial on how to complete a TTS which is in the process of re-auditing. **Results**Completing TTS <24 hours of admission improved post-intervention in the first cycle, from 55% to 65%. The main reasons for not completing a TTS within this time frame included patients being clinically unstable, end-of-life, pending further procedures, rolling restrictions, and early intensive care step-downs. **Conclusion**Educating trainees regularly using interactive methods may help improve completion rates of TTS within 24 hours in major trauma centres.

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**Improving Management of Patients Admitted with Chest Trauma Dr M.Azher-Anwer, DrJ.Gregory,
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Background: The Trauma and Orthopaedics department at the Great Western Hospital sees a monthly influx of 10-15 patients suffering from rib fractures. To optimise the management of blunt chest wall trauma, the British Orthopaedic Association (BOAST-15) has issued guidelines, emphasising the importance of providing adequate analgesia, especially through the prompt administration of Patient-Controlled Analgesia (PCA) for patients with a chest injury score of ≥ 11 . However, a noteworthy issue identified in this study is the lack of confidence of clinicians when initiating patients on the appropriate analgesic regimen, potentially increasing the risk of complications. Aim: The principal objective of this project was to enhance the timeliness of analgesia administration by implementing a revised proforma, Chest Proforma, that includes PCA prescribing guidelines. Secondary objectives encompassed evaluating complication rates both before and after proforma implementation and assessing the overall treatment outcomes. Methods: A retrospective audit spanning 10 weeks, from August to October 2020, identified 31 patients meeting the inclusion criteria, with a median age of 73. Among these patients, 12 out of 31 (39%) had severe chest wall injuries. Notably, 21 out of 31 (68%) patients were initially prescribed codeine. Interestingly, 75% of patients with severe chest wall injuries were provided with a PCA, while 40% received antibiotics for the treatment of Hospital-Acquired Pneumonia (HAP). The Plan, Do, Study, Act (PDSA) model was rigorously followed to evaluate the revised Chest Trauma Electronic Prescribing and Medication Administration (EPMA) protocol and guidelines. A re-audit conducted in June 2021 included 29 patients, among whom 10 (34%) had severe chest wall injuries, with a median age of 77. Results: The rate of PCA prescription dramatically improved to 100%, reflecting a remarkable absolute increase of 25%. Furthermore, the prescribing of codeine was significantly reduced, particularly in elderly patients, with an absolute decrease of 44%. Conclusion: The revision of the new proforma has instilled confidence in prescribing and administe

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What's stopping Orthopaedic patients from being discharged? Results from a large trauma unit.

IntroductionDelays in patient discharges significantly affects patient recovery, associated costs and increases the risk of nosocomial infections(1).AimThis study aimed to identify reasons for delayed discharges in orthopaedic patients whilst reviewing key predictors of these delays. Methods A single-centre retrospective study was conducted over six weeks. Patients with traumatic injuries admitted and discharged by the orthopaedic team were added. Baseline characteristics and discharge information were extracted from patient records and analysed. Results 271 orthopaedic patients were identified, with 233 included in the analysis. 29.2% of medically fit patients had a delayed discharge. This equated to 226 excess bed days, costing over £75,000. Awaiting transfer to a rehabilitation unit or initiation of a social care package were frequent reasons for delay (63.7%), unlike administrative delays which were less common (4.1%). Age >60 (OR 8.47, 95% CI:4.2–16.9, p<0.0001) and frailty score >4 (OR 11.5, 95% CI:5.9-22.3, p<0.0001) were strongly associated with needing excess bed days. Conclusion 1 in 3 medically fit orthopaedic patients had a delayed discharge, with many needing additional community support such as rehabilitation placement or new social care. Early identification of such patients by using characteristics such as age and frailty score may allow timely planning to help reduce these delays.

154

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Improving Time to Administration of Tranexamic Acid (TXA): A Quality Improvement Project

IntroductionTXA has been shown to reduce mortality in bleeding trauma patients and that even a short delay in treatment reduces the benefit [1,2]. DAATCL drug administration data collected from April 2019-February 2020 showed considerable variability in the time from at patient to the time of TXA administration with 29% of patients receiving it >30 minutes after DAATCL's arrival on scene.
AimThe aim of this quality improvement project was to reduce both the variability and overall time to administration of TXA by DAATCL.
MethodA focus group session was held within the monthly clinical governance meeting with all operational staff available on the day to discuss introducing a clinical quality indicator, including discussions on inclusion and exclusion criteria and target times for administration. The target agreed by the group for time to TXA was 80% within 20 minutes, 90% within 30 minutes and 98% within 40 minutes, including all patients administered TXA after DAATCL arrival on scene. The CQI performance is continuously monitored and presented at monthly governance meetings as well as being included in the daily briefing dashboard.
ResultsMedian time to TXA has reduced by one minute in each year since the introduction of the CQI, reducing from 16 minutes to 13 minutes. Similarly, performance against the agreed targets has improved year on year since the introduction, reducing the percentage of patients receiving TXA >30minutes after arrival on scene to 8%. Continuous monitoring and reporting of the measure promotes awareness and encourages conversations around improvement.
ConclusionInvolving clinical teams in the introduction of a clinical quality indicator encourages engagement and buy in from clinicians on the frontline. The focus group session helped to steer the parameters of the quality indicator towards practical and meaningful data collection. Continuous monitoring and reporting of the CQI has aided its continued success. Further work is ongoing to identify further ways in which time to TXA can be improved.

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Adding a Prehospital Entry to Intensive Care Unit (ICU) Diaries Improves Emotional and Psychological Recovery for Patients and Families

Introduction Intensive care diaries are widely used throughout ICUs within the UK to assist the patient and their families after discharge from the ICU. Research has shown that patients and relatives find ICU diaries valuable and enable patients to gain a coherent understanding of their ICU experience [1,2]. Hospitals in the South-West peninsula commence the patients ICU diary on admission and no prehospital information is available to the patient or their family, leaving a significant gap in the patient's care. **Aim** The aim of this project was to provide patients with pertinent information relating to the prehospital phase of their treatment in order to aid their emotional and psychological recovery following the incident.

Method DAATCL Patient Liaison Clinicians (PLCs) approached Derriford Hospital with a proposal to add a prehospital entry into the ICU diary for patients treated by DAATCL clinicians. PLCs complete the page with help from the attending clinicians and supply it to the ICU team for inclusion in the patient's diary.

Feedback was gained from patients and families during routine aftercare follow up visits and telephone calls. **Results** Understanding the events that lead to the ICU admission has been reported by patients to the PLCs to have helped both themselves and their families in their psychological and emotional recovery.

Feedback from patients has indicated that there is less interest in the medical aspects of treatment and more interest in personal, social and emotional aspects of the incident, such as who was holding their hand at the scene. **Conclusion** The introduction of prehospital entries to ICU diaries has shown to be extremely beneficial to DAATCL patients and their families. Helping patients to understand who was looking after them and how they were looked after contributes to a coherent understanding of the incident. Prehospital ICU diary entries are now also being provided to Southmead Hospital and the aim is to roll this out to further hospitals in the coming months.

Evidence and Improvisation: A Case of Paediatric Traumatic Tension Pneumothorax

Intro: • I will present a poster presentation of a case of a 2yr old boy who was accidentally run over by a van being moved in a driveway suffering obvious head injuries. • He had a reduced GCS and arrested after intubation and positive pressure ventilation • ROSC achieved after bilateral needle thoracocentesis • Cannula kinked and only catheter available that would fit the rib space was a 4.5F neonatal CVC which was inserted with Seldinger technique and attached to the underwater seal with swinging and bubbling and a subsequent improvement in ventilatory dynamics • CT showed a large left pneumothorax and 2 rib fractures as well as cerebral oedema, SDH and multiple skull fractures. • Chest drain swapped to Seldinger 6Fr obtained from SCBU with further improvement in ventilation • Transferred to regional MTC • Discharged from PICU day 10 and home at day 20 with complete subsequent recovery

Aims: • This poster will present a timeline from the presentation in ED reception through the cardiac arrest and resuscitation then the issues with chest drain insertion and transfer. • The poster will also present a literature search of traumatic tension pneumothoraces in children and discuss a recent case series and the learning provided from that. • The poster will also discuss anatomical challenges of chest decompression and drains in children and review evidence on the challenges of insertion due to the size of intercostal spaces and the appropriate size of needle required to decompress the thorax while avoiding iatrogenic injury.

Methods: • As above

Results: • Literature review found a paucity of evidence for management of paediatric traumatic tension pneumothorax • Best available case series recommends thoracostomy over needle decompression and provides advice on the procedure • Evidence on intercostal space size and optimal needle bore and length for needle decompression

Discussion: • Discussion of learning points from this case including: o Value of needle decompression vs thoracostomy o Different techniques / equipment in paediatrics thoracostomy o Implications of intercostal space width for thoracic decompression o Cannula size and length for needle decompression depending on age in children

We look forward to seeing you next year!



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