# PROGRAMME

British Trauma Society's

## ANNUAL SCIENTIFIC MEETING

**9th & 10th November 2016**

8th November Instructional Course

Council House, Birmingham, UK

BRITISH TRAUMA SOCIETY

FOUNDED IN 1988

Dedicated to caring for the injured

**www.bts-org.co.uk**

# Contents

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ANNUAL SCIENTIFIC MEETING
Council House, Birmingham, UK. 8th, 9th & 10th November 2016

**Message from the BTS President, AD Patel**

Welcome to the Annual General Scientific meeting of the British Trauma Society 2016

Dear members and attendees,

A very warm welcome to each and every-one of you. Your active participation is most welcome as this will make this conference informative, enjoyable and memorable. I look forward to meeting with you all throughout the conference.

This year the main theme of the conference is 'the care of the injured using a multidisciplinary approach' and over the 9th and 10th November you will see a host of paper presentations, keynote talks and poster presentations that reflect this. I would encourage you to join in the discussions following the talks as in my experience this is where the real message often comes out. Unlike other meetings we have a friendly atmosphere which makes it easier to engage in the discussions. All paper presentations and posters are judged and prizes will be awarded.

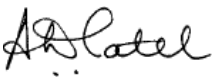
At the end of the first day we hold our annual general meeting which is a must for all the members. You will be enticed to attend by a healthy supply of drinks and nibbles. Important decisions have to be made and they concern you. After this I would encourage you to go to town and enjoy Birmingham.

As in previous years we have received tremendous support from industry. Without their help it would not be possible to run this conference. Apart from financial help they are keen to engage with you to impart knowledge and I would encourage you to spend time with them. There will be a quiz and guess what, there will be a prize!

Finally, my grateful thanks to the whole of the executive board and to Archer Yates Associates for making this conference possible.

I hope that you will learn a lot and enjoy your experience and tell all your colleagues.

Mr A D Patel



President British Trauma Society

## EXHIBITING SPONSORS

**BTS 2016 gratefully acknowledges the contribution that the sponsors below have made to make this event possible.**

| | |
|---|---|
| ZIMMER BIOMET<br>Your progress. Our promise. | Founded in 1927 and headquartered in Warsaw, Indiana, USA, Zimmer Biomet is a global leader in musculoskeletal healthcare. We design, manufacture and market orthopaedic reconstructive products; sports medicine, biologics, extremities and trauma products; spine, bone healing, craniomaxillofacial and thoracic products; dental implants; and related surgical products. |
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| NHS<br>Blood and Transplant | **NHS Blood and Transplant – Tissue and Eye Services**<br>The Tissue Bank in Liverpool is the largest retrieval and storage facility for human tissue in the UK. As part of the NHS we operate as a not-for-profit organisation with patient safety at our core. We are responsible for the entire supply chain, we co-ordinate, recover, process, and bank tissue. Our unique service offers a wide range of tissue for grafting or transplantation in various specialities, we also provide a bespoke service |
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**Keynote Speakers 2016**

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|---|---|---|
|  <br>**Theodoros Tosounidis**<br>*Consultant in Orthopaedic Trauma Surgery.*<br>*Leeds General Infirmary* | | Mr Theodoros Tosounidis is a Consultant in Orthopaedic Trauma Surgery at the Major Trauma Centre of Leeds General Infirmary, Leeds, UK. He completed an Orthopaedic Trauma Fellowship at the Foothills Medical Center at the University of Calgary, Alberta, Canada and a Lower Limb Reconstruction/Orthopaedic Trauma Fellowship at St Michael's Hospital at the University of Toronto, Ontario, Canada. He joined the Leeds Major Trauma Centre in 2012 and specializes in Pelvic and Acetabular Reconstruction and Complex Orthopaedic Trauma (Peri-articular fractures of lower extremity, nonunions, malunions, polytrauma, etc). |
|  <br>**Prof. Peter Giannoudis**<br>*Professor of Trauma and Orthopaedics.*<br>*Leeds General Infirmary.* | | Peter Giannoudis is the Professor of Trauma & Orthopaedic Surgery, School of Medicine, at the University of Leeds. His clinical work at Leeds General Infirmary University Hospital is focused in the management of the polytraumatised patient, reconstruction of pelvic and acetabular fractures, fractures of upper and lower extremity, periprosthetic fractures and the treatment of posttraumatic complications. His research portfolio includes such topics as the immunoinflammatory response to injury, bone regeneration, bone infection, tissue engineering, augmentation of fragility fractures, and functional outcomes after injury amongst others. |
|  <br>**Bergita Ganse**<br>*Resident. Department of Orthopaedic Trauma, RWTH Aachen University Hospital, Germany* | | Dr. Bergita Ganse is a medical specialist in physiology, sport physician, pre-hospital emergency physician, and currently a resident in the Department of Orthopaedic Trauma in RWTH Aachen University Hospital, Germany. She has completed her residency in physiology at the German Space Agency (DLR) in Cologne, where she gained extensive experience in the field of space medicine. Earlier in her career, she conducted dinosaur research at Charité Berlin and completed her basic surgical training in Cologne University Hospital, Germany. Her research topic is the musculoskeletal system in space flight, and in particular its adaptation processes to loading and unloading. She is currently involved in a number of international, space flight-related research projects on bone, muscle and cartilage/IVD tissue including experiments in bedrest-studies and on the International Space Station. These include trials conducted by the European Space Agency (ESA), the German Space Agency (DLR) and the European Union (such as FP7 project PlanHab). In microgravity, humans not only suffer from osteoporosis and losses in muscle volume and strength, but also experience back pain and show different symptoms when injured compared to on earth. |
|  <br>**Prof Sir Keith Porter**<br>*Professor of Clinical Traumatology*<br>*Queen Elizabeth Hospital, Birmingham* | | 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 is both Professor of Clinical Traumatology and the Clinical Director of the Major Trauma Centre.<br>He is the clinical lead for injured soldiers returning to the UK for the last decade including both the Iraq and Afghanistan wars.<br>Professor Porter has been a leader in the development in the new medical subspecialty of pre-hospital emergency medicine and until recently Chairman of the Faculty of Pre-Hospital Care and also the Intercollegiate Board for Training in Emergency Medicine. He is Chair of the Trauma Care Council and co-editor of the journal "Trauma".<br>Professor Porter has over 150 peer review publications and has co-authored/edited numerous books.<br>For his services to the military he was knighted in the 2010 Queen's New Year's honours list. |

BTS 2016 Programme – 9th and 10th November 2016
Council House, Birmingham, UK

| Day 1 - Wednesday 9th November 2016 | |
|---|---|
| 08:30 – 10:00 | Registration & Refreshments |
| 10:00 – 10:15 | Conference Welcome – BTS President AD Patel |
| 10:15 – 10:45 | **Oral Presentations: Session 1**<br>• Banqueting Room<br>• 4 x 5 minute presentations, followed by 10- to 15-minute discussion time<br><br>***"Levels of evidence in pelvic trauma: A bibliometric analysis of the Top 50 cited papers."***<br>*Ailbhe White-Gibson, O'Neill BJ, Cooper D, Quinlan JF, Leonard M, O'Daly BJ*<br><br>***"Missed/misdiagnosed pelvic injuries on CT scan with pelvic binder in-situ"***<br>*Naveen Lokikere, Ulhas Sonar, Amol Chitre, Subhasis Basu, Henry Wynn Jones, Tony Clayson, Nikhil Shah*<br><br>***"Introducing a new PROM for Trauma. The Chertsey Outcome Score for Trauma (COST)"***<br>*Efthymios Iliopoulos, Sugit Agarwal, Arshad Khaleel*<br><br>***"Pelvic binder placement in major trauma – The implications of current NICE guidance."***<br>*Edward Matthews, Alvin Lau, Mark Westwood* |
| 10:45 – 11:20 | **Oral Presentations: Session 2**<br>• Banqueting Room<br>• 5 x 5 minute presentations, followed by 10- to 15-minute discussion time<br><br>**"Can junior doctor lead and driven teaching/training help improve the management of head injuries in a university teaching hospital? Yes it can!"**<br>Vikas Acharya ,Dr Shiv Sapra, Dr Keyur Patel, Dr Qasim Ahmed, Dr Muniswamy Hemavathi<br><br>***"C-spine immobilisation at major trauma centres in London. Is it time for a more pragmatic approach?"***<br>*Hannah Lewis, Sumitra Lahiri, Neal Durge*<br><br>***"Imaging of the cervical spine in trauma: can we simplify the protocol?"***<br>*Mohammed Usmaan Halim, Helen Nicholl, Simon Ostlere*<br><br>***"Complications of pelvic external fixators"***<br>*Michael Mokawem, Gary Hannant, Nik Kanakaris, Peter Giannoudis*<br><br>***"Outcome of Surgical Stabilisation of Complex Chest Wall Injuries in a Major Trauma Centre"***<br>*Hafiz Iqbal, Sohan Shah, Sharon Scott, Simon Scott, David Melling* |
| 11:20 – 11:50 | Refreshments<br>*Trade stands and refreshments situated in the Drawing Room* |
| 11:55 – 12:25 | **Oral Presentations: Session 3**<br>• Banqueting Room<br>• 4 x 5 minute presentations, followed by 10- to 15-minute discussion time |

***"Epidemiology & Outcomes of Concomitant Burns & Major Trauma"***
*Emir Battaloglu, Prof. K. Porter, UHB; Prof. F. Lecky*

***"Anterior Sacroiliac Joint(SIJ) plating for type C pelvic fractures outcome and complications"***
*Mr. Rajkumar Thangaraj, Mr. T. Clayson, Mr. H. Wynn-Jones, Mr. A. Chitre, Mr. N. Shah*

***"Urethral Injury in Major Trauma"***
*Emir Battaloglu, Prof. K. Porter, UHB; Prof. F. Lecky*

***"A review of the management and practice guidelines of paediatric Supracondylar humerus fractures at a district general hospital"***
*Zaid Al-Wattar, Langhit Kurar, Jo Dartnell*

12:25 – 13:05 **Keynote Lecture**

- Banqueting Room

***"Recent Advances in Acetabular Surgery"***
*Theodoros Tosounidis - Consultant in Orthopaedic Trauma Surgery, Leeds General Infirmary*

13:05 – 14:05 Lunch

*Trade stands and refreshments situated in the Drawing Room*

14:10 – 14:45 **Oral Presentations: Session 4**

- Banqueting Room
- 5 x 5 minute presentations, followed by 10- to 15-minute discussion time

***"Pre-operative management of semi-elective trauma patients: are we over-investigating?"***
*Rosemary Wall, Saad Elashry, Sreenadh Gella, Bhuvan Machani*

***"The proliferative and osteogenic potential of fracture haematoma"***
*Gavin Walters, Mr Ippokratis Pountos, Professor Peter V Giannoudis*

***"The outcome of surgical treatment for atypical femoral fractures associated with long term use of bisphosphonates"***
*Vish Kumar, Ibrahim J, Smith R, Clough T*

***"Long Fixed Angle Plates in Management of Proximal Humeral Metadiaphyseal Fractures Patient Reported Outcomes"***
*Zaid Hashim, Y Khalid, A Andres, H Sheikh, H Kapoor H*

***"A practical 'safe zone' technique for lag screw fixation of the fibula"***
*Geraint Williams, William Marlow, Andrew Molloy, Lyndon Mason*

14:45 – 15:20 **Oral Presentations: Session 5**

- Banqueting Room
- 5 x 5 minute presentations, followed by 10- to 15-minute discussion time

***"The Reliability of the National Hip Fracture Database (NHFD)"***
*RafikYassa, R.Wright, Paul Dunkow*

***"THR in neck of femur fractures: Current performance and guidelines .An institutional experience"***
*Sudhir Kannan, Jason Wilson, Nick Johnson, Ash Gulati, Grahame Taylor*

***"Acute Total Hip Replacements Using Burch-Schneider Cages for Acetabular Fractures"***
*Daniel Banks, Pradeep Kankanalu, Bishoy Youssef, Justin Lim*

***"Analysis of early dislocation and revision rates in 174 patients treated with Exeter Trident Total Hip Arthroplasty for trauma over 5.9 years"***
*Daniel Bye, Bola Akinola, Nish Chirodian*

***"A single centre, retrospective analysis of two distal femoral locking plates. Do the synthes plates fail early?"***
*Paul Brewer, Thomas Cash, Edward Mills*

15:20 – 15:50 Refreshments

*Trade stands and refreshments situated in the Drawing Room*

15:55 – 16:40 **Keynote Lecture**
Banqueting Room

***"The changing face of trauma"***
*Prof. Sir Keith Porter – Professor of Clinical Traumatology, Queen Elizabeth Hospital Birmingham*

16:40 – 17:05 **Oral Presentations: Session 6**

- Banqueting Room
- 4 x 5 minute presentations, followed by 10- to 15-minute discussion time

***"The management of post-traumatic osteomyelitis: case series of 12 patients"***
*Mira Pecheva, Bola Akinola, Ben Davis*

***"Post-operative low haemoglobin as a cause of new-onset delirium in patients undergoing surgery for fracture neck of femur"***
*Shahbaz Malik,* Usman Ahmed, Naqvi Huma, Atul Malik

***"Review of atypical femoral fractures in patients on anti-resorptive treatment"***
*Yuvraj Agrawal,* R Akram, N Peel, J McGregror-Riley

***"Management of paediatric femoral shaft fractures using traction in tobruk splint"***
*Seif Sawalha, Peter Skellorn, Rose Davies, Neeraj Garg*

17:30 – 18:30 **BTS AGM**

| Day 2 – Thursday 10th November 2016 | |
|---|---|
| 08:30 – 09:30 | Registration & Refreshments |
| 09:30 – 10:00 | **Oral Presentations: Session 1**<br>• Banqueting Room<br>• 4 x 5 minute presentations, followed by 10- to 15-minute discussion time<br><br>***"The role of CT in assessing the acute elbow dislocation"***<br>*Robert Jordan, P Raval, C Wilding, A Jones, S Malik, A Saithna*<br><br>***"A comparison of total elbow arthroplasty and internal fixation in the management of distal humeral fractures in elderly patients"***<br>*Robert Jordan, A Saithna, P Raval, C Wilding, T Lawrence, S Drew, C Modi*<br><br>***"Total Elbow Arthroplasty versus Internal Fixation in the Management of Acute Distal Humeral Fractures - a systematic review and meta-analysis."***<br>*Robert Jordan, C Wilding, P Raval, A Saithna, S Drew, C Modi*<br><br>***"Elbow fracture dislocation management using hinged external fixator"***<br>*Mahdy M. Yassin, Medhat Khafajy* |
| 10:00 – 10:35 | **Oral Presentations: Session 2**<br>• Banqueting Room<br>• 4 x 5 minute presentations, followed by 10- to 15-minute discussion time<br><br>***"Get smart or get sued: The essential art of The orthopaedic cast"***<br>*Jamie A'Court, Rafik Yassa , CP Charalambous*<br><br>***"Driving Plastered: Who's doing it?"***<br>*Awais Habeebullah, Alexander Bolt, Hartej Sur, Maulik Ghandi, Alastair Marsh*<br><br>***"Management of thoracolumbar fractures in the multiply injured patient - experience of a level 1 Major Trauma Centre"***<br>*Christopher Lodge, Peter Loughenbury, James Tomlinson, Robert Dunsmui*<br><br>***"Biomechanical considerations for strategies to improve outcomes following volar plating of distal radius fractures"***<br>*Robert Jordan, P Raval, C Wilding, Nick Howard, Adnan Saithna* |
| 10:35 – 11:05 | Refreshments |
| | *Trade stands and refreshments situated in the Drawing Room* |
| 11:10 – 11:55 | **Keynote Lecture**<br>• Banqueting Room<br><br>***"Current insights in the pathogenesis and management of long bone non-union"***<br>*Peter Giannoudis – Professor of Trauma and Orthopaedics, Leeds Royal Infirmary.* |

11:55 – 12:25 **Oral Presentations: Session 3**

- Banqueting Room
- 4 x 5 minute presentations, followed by 10- to 15-minute discussion time

***"'Modern' Distal Femoral Locking Plates Allow Safe, Early Weight Bearing with a high rate of union and low rate of failure; 5-year Experience from a UK Major Trauma Centre"***
*William Poole, D Wilson, H Guthrie, S Bellringer, R freeman, E Guryel, S Nicol*

***"Patient survival after surgery for pathological fractures or impending fractures of the femur"***
*Gunasekaran Kumar*

***"Extremity injuries sustained in the Iraq and Afghanistan conflicts: 2003-2014"***
*Jowan Penn-Barwell, Henry Chandler, Kirsty Macleod*

***"The outcome of treating fragility femur fractures using polyaxial locking plating system"***
*Zeiad Alshameeri, A Arora, M Bence, J Owen, V Khanduja*

12:30 – 13:00 **Oral Presentations: Session 4**

- Banqueting Room
- 4 x 5 minute presentations, followed by 10- to 15-minute discussion time

***"Complications of volar locking plate fixation of distal radius fractures: A consecutive series of 165 patients"***
*Amy Firth, George Greenfield, Sami Hassan, Girish Swamy, Amol Tambe, Tim Cresswell, Marius Espag, David Clark*

***"Is post-operative immobilisation with plaster casts following volar locking plating in distal radius fractures beneficial?"***
*Angus Fong, Alistair Eyre-Brook, Stephen Bostock*

***"Semi-extended intramedullary nailing of distal tibial fractures reduces operative time with no difference in outcome"***
*Nisarg Mehta, Veenesh Selvaratnam, Niall Breen, Peter Skellorn, Janse Schermerhorne, Badri Narayan, Nikolaos Giotakis*

***"The Highly Proliferative Mesenchymal Stem Cell Fraction: A Novel Subpopulation"***
*Ippokratis Pountos, Karen Henshaw, Peter V Giannoudis*

13:00 – 14:00 Lunch

*Trade stands and refreshments situated in the Drawing Room*

14:05 – 14:50 **Keynote Lecture**
Banqueting Room

***"Bones and Injuries in Space Flight"***
*Dr Bergita Ganse – Resident. Department of Orthopaedic Trauma, RWTH Aachen University Hospital, Germany*

14:50 – 15:20 **Oral Presentations: Session 5**

- Banqueting Room
- 4 x 5 minute presentations, followed by 10- to 15-minute discussion time

***"The role of intramedullary fixation in ankle fractures – a systematic review"***
*Robert Jordan, Christopher Wilding, Parag Raval, Adnan Saithna, Anna Chapman*

***"Severe acute lower limb trauma in elderly patients treated with circular Ilizarov frame. The Chertsey experience"***
*Efthymios Iliopoulos, Natasha Morrissey, Seok Cho, Arshad Khaleel*

***"Combat hindfoot fractures in UK military 2003-2014: is salvage feasible?"***
*Philippa M. Bennett, Tom Stevenson, Ian D. Sargeant, Alistair Mountain, Jowan G. Penn Barwell*

***"Is routine ankle syndesmosis screw removal required?"***
*Hunter Thomas, Heaver Catriona, Ali Ashique*

15:20 – 15:50 **Oral Presentations: Session 5**

- Banqueting Room
- 3 x 5 minute presentations, followed by 10- to 15-minute discussion time

***"The weekend effect: a retrospective cross sectional study reporting 30-day mortality rates of fracture neck of femur patients, stratified by day of admission to a level one trauma centre"***
*Jack Pullan, Rajpal Nandra, Khalid Baloch, Keith Porter*

***"Hindfoot fractures in uk combat casualties: medium-term patient reported outcomes"***
*Philippa M. Bennett, Tom Stevenson, Ian D. Sargeant, Alistair Mountain, Jowan G. Penn Barwell*

***"Ankle fracture management and NICE (NG38)"***
*Duncan Cundall-Curry, R Cope, C Jackson, F James, E Ribey, A Tsyben, S Imam*

15:20 – 15:50 Closing remarks - BTS President AD Patel

- Banqueting Room

**Conference Close**

| POSTER PRESENTATIONS – WEDNESDAY 9TH AND THURSDAY 10TH NOVEMBER | | |
|---|---|---|
| **POSTER NUMBER** | **POSTER TITLE** | **MAIN AUTHOR AND CO AUTHORS** |
| **1** | **'Traumatic Posterior dislocation of the hip with a pertrochanteric fracture'** | *Manoj Puthiya Veettil, Mr Mazin Fageir Miss Sukhdeep Gill* |
| **2** | **'Plaster cast satisfaction and age groups'** | *Zen Yong, Martyn Lovell* |
| **3** | **'Correlation of pre-operative anaemia with prolonged length of stay for patients with neck of femur fracture'** | *Efthymios Iliopoulos, Hazel Watters, Arshad Khaleel* |
| **4** | **'Change in postoperative serum haemoglobin in neck of femur fracture patients'** | *Usman N Bhatty, L Garwood Martyn Lovell* |
| **5** | **'Operating on hip fracture patients within 12 hours does not affect in hospital mortality or length of stay'** | *Natasha Morrissey, Efthymios Iliopoulos, Ahmad Wais Osmani, Kevin Newman* |
| **6** | **'How do the patients walk after severe fractures of lower limb joints'** | *Efthymios Iliopoulos, Arshad Khaleel* |
| **7** | **'Consent forms for DHS and Hip Hemiarthroplasties'** | *Selina Graham, Alex Taylor, Jemma Rooker* |
| **8** | **'Can ASA score predict the destination of Total Hip Replacement patients discharged from a Trauma unit?'** | *Matthew Arneill, Isman Jidall, David Kealey* |
| **9** | **'Pelvic circumferential compression device positioning – A regional trauma'** | *Sarah Henning, Rory Norris* |
| **10** | **'The impact of fractured neck of femur with an additional fracture on patient outcomes'** | *Edward Jenner, Farhan Syed, Andrew George, Hope Poole, Andrew Proctor* |
| **11** | **'To investigate whether polytrauma patients (ISS>15) with scapula fractures, presenting to a major trauma centre, were at increased morbidity or mortality compared to their counterparts'** | *George Cox, Andrew Cole, Campbell Hand* |
| **12** | **'Antibiotic prophylaxis in the management of open fractures at the Royal Victoria Infirmary'** | *Timothy Morris, Mark Webb* |
| **13** | **'Osteochondrial allograft reconstruction of the humeral head reverse hill sachs lesion'** | *Lynn Murphy, Adam Tucker, Philip Charlwood* |
| **14** | **'Uncommon paediatric elbow fractures needing surgery'** | *Rashid Riaz, Mahesh Pimple* |
| **15** | **'Cable plate osteosynthesis of Vancouver type-B1 peri-prosthetic femoral fractures'** | *Serajdin Ajnin, Y.C.Saidaiah, K Wahab* |
| **16** | **'The cost and impact of attending paediatric orthopaedic fracture clinic'** | *Tobenna Oputa, Rebecca Lefroy, Albert Tang, David Sochart* |
| **17** | **'The socioeconomic impact of attending orthopaedic fracture clinic appointments'** | *Tobenna Oputa, Rebecca Lefroy, Albert Tang, David Sochart* |
| **18** | **'TRAFIC (Trauma Assessment and follow up with incorporation of modern communication devices) results of a pilot study'** | *Tosan Okoro, Anne-Marie Hutchison, Jenny Wong, Victoria Gibbs, Clare Coles, Ian Pallister* |
| **19** | **'TLICS – a useful spinal triage tool'** | *Peter Loughenbury, Chris Lodge, James Tomlinson, Chantelle Mann, Jonathan Lamb, Robert Dunsmuir, Peter Millner, Abhay Rao, Almas Khan, Nigel Gummerson* |
| **20** | **'The economic burden of back pain'** | *Deeraj Loganathan, Mohammed Shaath; David Sochart* |
| **21** | **'Reasons for increased length of admissions with back pain'** | *Mohammed Shaath, Deeraj Loganathan, Professor David Sochart* |
| **22** | **'Effective utilisation of a proforma for patients presenting with a neck of femur (NOF) fracture – analysis of a sample of 93 patients'** | *Linda Watkins, David Sochart* |
| **23** | **'Factors influencing patient satisfaction following surgical management of ankle fractures'** | *Fiona Ashton, Khalid Hamid, Shazali Sulieman, William Eardley, Paul Baker* |
| **24** | **'Does patient experience of care differ between elective and non-elective orthopaedic admissions'** | *Khalid Hamid, Mr Paul Baker, Bev Tytler, Mr Will Eardley, Angela Artley* |
| **25** | **'Tibial plateau fracture and use of calcium sulphate substitute'** | *Sujit Agarwal, Efthymios Iliopoulos, Arshad Khaleel* |
| **26** | **'On table and within 24 hours death in orthopaedic trauma patients'** | *Jehan Shah, Javed Waqas, Toor Muhammad Usman, Javaid MMM, Barlas Khurram, Omonbude Daniel* |
| **27** | **'Clinical Outcomes following proximal humerus locking blade nail fixation (Marquardt)'** | *Andrew George, Edward Jenner, Farhan Syed, Faiz Hashmi* |

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| **28** | **'Assessment of the standard of spinal referral documentation in a regional referral centre'** | *Isman Jidaal, Matthew Arneill, Morgan Jones, Andrew O'Brien, Niall Eames* |
| **29** | **'Outcomes of periprosthetic fractures of total hip replacements'** | *Nisarg Mehta, Thomas Marshall, Veenesh Selvaratnam, Muthukrishnan Ramakrishnan, Adrian Fintan Carroll* |
| **30** | **'The development of a tool for assessing operative fracture fixation'** | *David Huw Hawkes, William James Harrison* |
| **31** | **'Fragment specific fixation of intra-articular distal humerus fractures'** | *Opara Thompson, Mahesh Pimple, Sri-Ram Kesavan* |
| **32** | **'Virtual trauma clinic experience at the Bradford Royal Infirmary'** | *Amanda King, Phil Wright, Lynne Dixon* |
| **33** | **'Factors influencing mortality in high risk patients with hip fractures'** | *Sheweidin Aziz, Nick Johnson, Steffan Hutchings* |
| **34** | **'Complications and radiological outcomes of PHILOS plate fixation or proximal humeral fractures: A university hospital experience'** | *Ayman Gabr, Sam Chan, Annanth Ebinesan, Matthew Smith, Inigo Guisasola, Matthew Kent* |
| **35** | **'Are post operative radiographs a useful clinical tool following volar locking plating in distal radius fractures'** | *Angus Fong, Alistair Eyre-Brook, Stephen Bostock* |
| **36** | **'Broken locking screw in a nail – Site Matters'** | *Gunasekaran Kumar, David Hawkes, Badri Narayan* |
| **37** | **'Is there an overuse of nai fixation in pertrochanteric fractures in the elderly?'** | *Gunasekaran Kumar, David Hawkes* |
| **38** | **'Radiographic Equipoise – Do surgeons differ when assessing pelvic radiographs in hip fracture patients?'** | *Jonathan Herron, Richard Hutchinson, William Eardley* |
| **39** | **'The use of a novel hexapod frame system for acute and chronic tibial and femoral deformity correction'** | *Nicholas Furness, Daniel Marsland, Christopher Jack, Nicholas Hancock, Amir Qureshi* |
| **40** | **'Flexible nailing of femoral fracture in adult with spina bifida -lessons learned'** | *Jack Allport, Njalalle Baraza, Jonathan Sanders, Chetan Modi* |
| **41** | **'An intensive rehabilitation programme for people with complex musculoskeletal injury after major trauma'** | *Lucy Silvester, Leila Razavi, Su Ryan, Sara Smith, Caroline Thomas, Francesca Bianca* |
| **42** | **'Predicting mortality in patients undergoing a hemiarthroplasty for a fractured neck of femur'** | *David Huw Hawkes, Gunasekaran Kumar, Badri Narayan* |
| **43** | **'Outcome of introducing virtual fracture clinic on upper limb fractures'** | *Upasana, Aurelie Hay-David, Manish Divekar,* |
| **44** | **'Is the deltoid tuberosity index a predictive indicator of failure of proximal humerus fracture fixation'** | *Steven Brookes-Fazakerley, Michael Smith, Peter Kenyon Matthew Nixon, Mark Webb* |
| **45** | **'How to prevent a never event in joint arthroplasty: Surgical placement of the wrong implant'** | *Asanka Wijendra, Mitchell Chen, Ravindra Mahajan, Raj Reddy* |
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# ORAL PRESENTATIONS
## Wednesday 9th November 2016

British Trauma Society's

## ANNUAL SCIENTIFIC MEETING

### 9th & 10th November 2016

8th November Instructional Course

Council House, Birmingham, UK

BRITISH TRAUMA SOCIETY

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| | LEVELS OF EVIDENCE IN PELVIC TRAUMA: A BIBLIOMETRIC ANALYSIS OF THE TOP 50 CITED PAPERS |
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| **MAIN AUTHOR** | Ailbhe White-Gibson |
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| **CO AUTHORS** | O'Neill BJ, Cooper D, Quinlan JF, Leonard M, O'Daly BJ. |
| **PRESENTER** | Ailbhe White-Gibson |

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| **OBJECTIVES** | The aim of this study was to identify the top 50 publications relating to the management of pelvic trauma |
| **METHODS** | The database of the Science Citation Index of the Institute for Scientific Information (1945 to 2016) was reviewed to identify the 50 papers most commonly cited |
| **RESULTS** | A total of 1535 papers were included. Of these, 31 papers were cited over 100 times with the top 50 cited 69 times or more. The top 50 were subjected to further analysis to identify the authors and institutions involved. The majority of these publications originated in the United States, followed by Canada. The most cited paper is "pelvic ring fractures – should they be fixed", published by Tile in 1988. |
| **CONCLUSIONS** | We have identified and analysed the publications that have contributed most to the assessment and management of pelvic trauma over the past fifty years. We have also identified the researchers and institutions which have most influenced the evidence based approach currently employed in the management of pelvic trauma. |

| | MISSED/MISDIAGNOSED PELVIC INJURIES ON CT SCAN WITH PELVIC BINDER IN-SITU |
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| | Wrightington Hospital |
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| **PRESENTER** | Ulhas Sonar |

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| **OBJECTIVES** | **Introduction:** Pelvic Binder is effective lifesaving equipment for unstable pelvic injury. Early application of pelvic binder can stop intra-pelvic haemorrhage and close the "open book" pelvis. However CT (Computerised Tomogram) scan with binder in-situ can mask unstable pelvic injury. There is general lack of awareness of this problem amongst Accident and Emergency as well as Orthopaedic teams. Moreover, there is dearth of literature highlighting this problem.<br><br>**Aims/Objectives:** To evaluate concealment of unstable pelvic injuries when CT evaluation is done with pelvic binders in-situ. |
| **METHODS** | All patients referred to "Northwest Pelvic and Acetabular service" during 2014 - 2015 were considered for the study. 33 patients with unstable pelvic injuries were identified. Retrospective review of their clinical and radiological evidence was undertaken. The CT scans, x-ray images, communication between the pelvic team & referring hospitals and outcomes were analysed. |
| **RESULTS** | Mean age at the time of injury was 45 years (16 - 77). Out of 33 patients 25 had CT scans done with binder in-situ, 7 did not have binder on and 1 scan could not be accessed. Out of 25 patients with binders, 9 patients (36%) could potentially have been misdiagnosed as pubic diastases were not evident on their scans. The two-tailed P value = 0.0642. Mean separation of pubic bones on CT scans with binders for these 9 patients was 4.3mm whereas on x-rays without binders it was 30.1mm. 1 patient (4%) with unstable pelvic injury was completely missed only to be identified 1 month later. |
| **CONCLUSIONS** | CT scan in binders poses potential risk of classifying unstable pelvic injuries as low grade injuries, delayed referral and hence inappropriate management. Therefore it is vital to have pelvic x-ray without binder as soon as the patient is stable. |

| | INTRODUCING A NEW PROM FOR TRAUMA.<br>THE CHERTSEY OUTCOME SCORE FOR TRAUMA (COST) |
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| **PRESENTER** | Efthymios Iliopoulos |

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| **OBJECTIVES** | Patient Reported Outcome Measures (PROMs)us are used as outcome of many surgical treatments such as Hip and knee joint replacements, varicose vein and groin hernia surgery.<br>Outcome scores in orthopaedics tend to be site and/or pathology specific. Trauma related pathology uses a surrgotes outcome score. |
| **METHODS** | We have designed a PROM especially for Trauma patients, in order to measure the extent of recovery to pre-injury state. This score uses as baseline the pre-injury status of the patient and has the aim to determine the percentage of rehabilitation after any form of treatment. This PROM is not site specific and can be used for every Trauma condition. It uses simple wording, user friendly and accessed via phone conversation. |
| **RESULTS** | The outcome score consists of eleven questions. The first ten questions use the 5-point Likert scale and the final question a scale from zero to ten. The scoring system ranges from 0 to 100, were the 0 is the worst outcome and the 100 the best (equal to pre-injury level). The questions are divided into three subgroups (Symptoms, Function and Mental status). The final question assesses the extent of return to pre-injury status. |
| **CONCLUSIONS** | There is a need for a specific PROM for Trauma pathology which is not site specific and easy to use and understand. We are developing the COST tool and validating it. |

| | PELVIC BINDER PLACEMENT IN MAJOR TRAUMA – THE IMPLICATIONS OF CURRENT NICE GUIDANCE. |
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| **CO AUTHORS** | Alvin Lau and Mark Westwood, Derriford Hospital |
| **PRESENTER** | Edward Matthews |

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| **OBJECTIVES** | Recent NICE guidance (NG39) states that a pelvic binder should be applied if pelvic fracture is suspected along with haemodynamic compromise. Major trauma involves a majority of young patients with the ability to compensate for haemorrhage. We hypothesised that patients suffering major blunt trauma are not routinely having binders placed. Secondly when applied they are incorrectly placed. |
| **METHODS** | Between April and September 2015 we reviewed 154 consecutive Hospital trauma calls. Primary survey pelvic radiographs where reviewed, binder assessed and mechanism recorded. |
| **RESULTS** | Of the 154 patients, only 52 patients had a binder placed. Of these 52 patients only 33 patients had the binder applied correctly at the level of the greater trochanter. |
| **CONCLUSIONS** | There is evolving guidance for pre-hospital care. With current Nice guidance, published in February 2016, there is likelihood to further reduce the number of pelvic binders applied, limiting it to those patients that have shown haemodynamic compromise already.<br><br>We feel this may lead to under treatment of the occult pelvic injury or bleed. The binder is a safe and easy to use adjunct to the primary survery and has very few complications if used judiciously and released in a timely manner. Rationing it's use may result in the occult pelvic injury cohort of patients receiving sub-optimal pre-hospital care. |

| | CAN JUNIOR DOCTOR LEAD AND DRIVEN TEACHING/TRAINING HELP IMPROVE THE MANAGEMENT OF HEAD INJURIES IN A UNIVERSITY TEACHING HOSPITAL? YES IT CAN! |
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| **PRESENTER** | Vikas Acharya |

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| **OBJECTIVES** | The variety in initial assessment and management of head injuries in this emergency department was identified by junior doctors working within this emergency department. This project was undertaken with the intention of making suggestions for, and attempting to implement change before re-auditing to assess the success of these changes through junior doctor lead service improvement throughout the whole process including teaching and training other doctors of all grades within the department. |
| **METHODS** | Records from 227 patient presentations/consultations in total were used to assess and evaluate the relevant current practice using a uniform proforma, 123 in phase one and 104 in phase two. Following the collection and analysis of phase one results, a two week intervention was trialled in the department. This included teaching sessions by junior doctors to all clinicians and was followed up with an email reminder and the placement of posters and learning resources in the department.<br><br>This audit project was a retrospective analysis of the assessment and management of those presenting to the emergency department with head injuries, it focused at specifically at reviewing the:<br><br>• Assessment and management of adult head injuries.<br>• Assessment and management of adult head injuries.<br>• Cohort who had a CT head undertaken, and whether it was clinically indicated as per the NICE guidelines.<br>• Cohort who did not have a CT head undertaken, but should have according to the NICE guidelines. |
| **RESULTS** | Following the junior doctor led teaching/training, we found that there was an improvement of CT scans being undertaken for head injuries according to the NICE guidelines from 83% to 100%. Additionally, there was a dramatic improvement in the documentation of head injury advice being given to patients in the notes, this increased from 15-88% in adult and 38-98% in paediatric head injuries respectively. |
| **CONCLUSIONS** | Overall, excellent initial assessment and management of adult and paediatric head injury presentations following the intervention/teaching. 100% of patients meeting the criteria for a CT Head now receive it within the advised/required timeframe. Significant improvement in documentation of head injury advice/leaflets being given after our intervention and teaching. |

| | C-SPINE IMMOBILISATION AT MAJOR TRAUMA CENTRES IN LONDON. IS IT TIME FOR A MORE PRAGMATIC APPROACH? |
|---|---|
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| | Barts and the London School of Anaesthesia |
| **CO AUTHORS** | Sumitra Lahiri, Neal Durge, The Royal London Hospital |
| **PRESENTER** | Hannah Lewis |

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| **OBJECTIVES** | Prevention of secondary cord injury following trauma is crucial. Triple immobilisation is the traditional taught method to protect the c-spine in the UK, in accordance with advanced trauma life support teaching. Clinical practice elsewhere is changing. Australia use a combination of soft collars and blocks. Scandinavia advocate against the use of rigid collars in view of risk of harm e.g. airway obstruction and raised intracranial pressure.<br>We designed a survey to establish whether variations in c-spine immobilisation methods exist. |
| **METHODS** | The survey was sent to all trauma team leaders in London at major trauma centres (MTCs) – Kings College London, The Royal London and St George's. Seven realistic clinical scenarios were created to incorporate patients of varying conscious levels, ages and injury severity. For example 'A 25 year old male patient is shot in the right lower abdominal quadrant. He was witnessed to fall backwards following the shooting. He is fully conscious (GCS 15/15) and hypotensive (SBP <80 mmHg). He is moving all four limbs with no focal neurology.' The questions of whether and how to immobilise the c-spine were asked. Certain scenarios were deliberately ambiguous as to the best course of action. |
| **RESULTS** | 38 responses were received, with variation in use of national and local guidelines both within and between trauma centres. Certain MTCs lacked local guidelines. Disparities existed in the decision to immobilise the c-spine and the method used. Ambiguous scenarios generated the most debate; 28% did not immobilise 'an agitated, inebriated patient found collapsed presenting with a fluctuant GCS 11-13' versus 26% electing for triple immobilisation. Straightforward scenarios also failed to reach a consensus; 18% chose to immobilise the c-spine in the scenario with penetrating trauma, where clear contrary guidelines exist. |
| **CONCLUSIONS** | Lack of randomised control trials (RCTs) support the commonly accepted practice in the UK. Harm can be associated with the use of rigid collars, particularly in a population where up to 25% have an associated traumatic brain injury (TBI). Pragmatic and clear local guidelines on selective c-spine immobilisation should be created reflecting changed clinical practice. These should be available at every MTC. |

| | IMAGING OF THE CERVICAL SPINE IN TRAUMA: CAN WE SIMPLIFY THE PROTOCOL? |
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| | University of Oxford |
| **CO AUTHORS** | Helen Nicholl<br>Ahmed Tauseef<br>Simon Ostlere |
| **PRESENTER** | Ahmed Tauseef |

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| **OBJECTIVES** | A cornerstone of dealing with trauma patients is to rapidly obtain appropriate imaging to assess the extent of their injuries. Such imaging typically consists of a computed tomography (CT) head, CT neck, chest, abdomen and pelvis (NCAP) and a CT cervical (C) spine. The C spine is thus imaged twice; the argument for this is that the CT NCAP is performed with intravenous contrast, which can sometimes preclude the visualisation of C spine fractures, hence the need for the CT C spine (performed without contrast). However performing this additional scan takes extra time and exposes the patient to a higher radiation dose, leading some to argue that it is unnecessary. In this preliminary study we aimed to determine whether the C spine can be adequately visualised with CT NCAP alone. |
| **METHODS** | From a list of all the trauma patients presenting to the John Radcliffe Hospital, Oxford, from 26/3/14 to 24/4/14, 15 patients were selected for this study as radiology reports showed that they had sustained C spine fractures. For each patient, a consultant musculoskeletal radiologist who was blinded against the original reports reviewed the CT NCAP and CT C spine images of the 15 selected patients, assessing their overall image quality and severity of artefacts, as well as identifying any fractures. |
| **RESULTS** | Using a 1-4 scale, with 1 being inadequate image quality and 4 being optimal, it was found that the CT C spine images were of significantly higher quality (3.13 vs 2.73, P = 0.0086). No significant difference in artefact severity was found between the CT C spine and CT NCAP images (1.47 vs 1.6, P = 0.3343). Of key clinical importance, fractures were missed on the CT NCAP images in 3 patients, being seen only on the CT C spine. |
| **CONCLUSIONS** | These preliminary findings support the continued use of the CT C spine in trauma scenarios. Were this imaging modality to be excluded, some C spine fractures would be missed, with potentially harmful consequences for injured patients. |

| | COMPLICATIONS OF PELVIC EXTERNAL FIXATORS |
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| **PRESENTER** | Michael Mokawem |

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| **OBJECTIVES** | Identify and quantify the complications of pelvic external fixators in unstable pelvic fractures. |
| **METHODS** | A literature search in May 2016 identified 172 journal articles using the keywords "pelvic external fixation complications". Inclusion criteria were articles detailing a case series, both prospective and retrospective, which specifically mentioned the number of cases studied, the number of complications observed and what those complications were. We further included relevant case reports. Exclusion criteria were mechanical studies, cadaveric studies and studies where it was not possible to isolate the pelvic related complications.<br>31 Articles were identified as being relevant to our study. These were analysed and the results tabulated. |
| **RESULTS** | A total of 1044 patients were included in our review. Pin site infection was the commonest complication and occurred in 161 patients (15.4%). Within the infection group, 4 patients developed abscesses and 1 patient developed osteomyelitis. Only 1 paper separated the infection group into external fixators used for temporary and definitive management. The temporary group had an infection rate of 12.5 % and the definitive group had a rate of 50 %. There were 2 cases (0.2%) of septic arthritis of the hip. Loss of reduction was reported in 81 patients (7.8%) and is the second most common complication. Pin loosening was reported in 25 patients (2.4%). Malunion occurred in 65 cases (6.2%) and is the third most common complication. Malplacement of pins was reported in 12 cases (1.1%) and included 7 transcortical pins and 5 pins in the hip joint. Rarer complications included bladder injury and entrapment due to the closed reduction with the frame, injury to the lateral femoral cutaneous nerve, non-union, failure of the frame and pressure ulcers. |
| **CONCLUSIONS** | We believe that this study informs surgeons and patients and will guide management decisions of pelvic fractures. Pin site infection accounts for a 15.4% complication rate and confirms the need for careful pin placement and meticulous pin site care. Loss of reduction in 7.8% of patients suggests the need for regular checking of the tightness of the construct and regular radiological review. Radiological malunion occurred in 6.2% of cases and these tended to have a poor outcome. Complications caused by incorrect application of an external fixator such as damage to surrounding structures are fortunately rare at 1% and include septic arthritis of the hip (0.2%), bladder injury (0.5%) and lateral femoral cutaneous nerve injury (0.3%). |

| | OUTCOME OF SURGICAL STABILISATION OF COMPLEX CHEST WALL INJURIES IN A MAJOR TRAUMA CENTRE |
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| **CO AUTHORS** | Sohan Shah, Sharon Scott, Simon Scott, David Melling |
| **PRESENTER** | Hafiz Iqbal |

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| **OBJECTIVES** | The aim of this study was to assess the outcome of patients undergoing internal fixation of complex rib fractures in our trauma unit. |
| **METHODS** | This was a retrospective review of prospectively collected data of consecutive patients undergoing operative fixation of rib fractures from March 2014 to May 2016. The primary outcome measures were need for ITU admission and hospital length of stay. The secondary outcomes were; duration of mechanical ventilation, length of ITU stay, respiratory complication and mortality. Patients were divided in to two groups depending upon surgical intervention within or after 48 hours since the injury. |
| **RESULTS** | Overall, 102 patients (66 male, 36 female, mean age 61 years) underwent Rib fractures fixation during the study period. Road traffic accidents were the source of trauma in 39(38.2%), fall from height in 38(37.3%), fall downstairs in 21(27.5%) and other causes in 4(3.9%) patients. The average no of rib fractures per patient were 7 (3-19 ribs) and 55(54%) patients had radiologically reported flail chest. Thirty-eight (37.3%) patients had isolated chest trauma but 64(62.3%) had additional major injuries. 53(52%) patients required ITU admission with mean ITU stay of 4.7 days (1-34) days. The mean length of hospital stay was 13.6 days (3-51 days). Patients with additional major injuries stayed significantly longer than those with isolated chest trauma (10 days versus 15.8 days, p=0.01). Three patients died, two of them due to unrelated causes. All these parameters were better as compared to previously reported patients treated non-operatively.<br><br>Sixty-Five (63.7%) patients underwent their ribs fixation within 48 hours of the injury while 37(36.3%) patients had their surgery after 48 hours. Both groups were comparable with regards to sex (p=0.51) and presence of additional injuries (p=0.50). Second group consisted of relatively younger patients, mean age 55 as compared to first group, mean age 64 (p=0.02). Surgery within 48hrs resulted in significantly less number of ITU admissions (p=0.06), shorter ITU stay (p=0.01), fewer chest infections (p=0.001), reduced duration of mechanical ventilation (p=0.03) and tracheostomies (p=0.02) and; shorter hospital length of stay (11.5 days versus 17.3 days, p=0.008). One patient (1.5%) died in first group and two (5.4%) in the second group (p=0.29). |
| **CONCLUSIONS** | Surgical stabilisation of rib fractures in major trauma patients improves morbidity and mortality. We recommend operative intervention within 48 hours of injury, as it is an independent factor to improve the overall outcome. |

| | EPIDEMIOLOGY & OUTCOMES OF CONCOMITANT BURNS & MAJOR TRAUMA |
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| **CO AUTHORS** | Prof. K. Porter, UHB; Prof. F. Lecky, TARN |
| **PRESENTER** | Emir Battaloglu |

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| **OBJECTIVES** | Great challenges exist in the management of the burned trauma patient, especially in the prioritisation and orchestration of multiple specialities for the multiple injuries. The majority of the literature regarding this topic, based almost exclusively on North American studies, predicts between 5 and 7% of all patients admitted to burns centres will suffer from concomitant (non-thermal) trauma injuries, in addition to their burn injuries. |
| **METHODS** | A retrospective review of patients sustaining concomitant burns and trauma injuries over a 6 year period, between 2010 to 2015. Quantitative analysis was made using the hospital burns database, cross referenced against the hospital records system to form a comprehensive patient cohort. Data collected comprised of patient demographic information, burn injury percentages, details of trauma injuries, details of hospital stay and patient outcome. Comparison of information was made against the total burns cohort to form a base standard for burns injuries. |
| **RESULTS** | Over the period analysed, a total number of 158 patients were found to have concomitant burns and trauma injuries. The patients were stratified according to age and the percentage of total body surface area burned. Hospital length of stay for concomitant burns & trauma patients was found to be higher than that of patients with isolated burns injuries. Mortality rates, although low overall, were found to be higher for patients with concomitant burns & trauma injuries. |
| **CONCLUSIONS** | This study demonstrated the rarity of this combination of injury pattern, in particular the occurrence of severe burns in the presence of major trauma. Improvements in burns care and trauma care hopefully contributes to the higher level of survival in concomitantly injured patients against data from previous literature. However, the synergistic effect of burns and trauma injuries appears to impact on the course of such patients. |

| | ANTERIOR SACROILIAC JOINT(SIJ) PLATING FOR TYPE C PELVIC FRACTURES OUTCOME AND COMPLICATIONS |
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| **PRESENTER** | Mr. Rajkumar Thangaraj |

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| **OBJECTIVES** | Type C pelvic ring fractures which are rotationally and vertically unstable have high rate of mortality and morbidity. Sacroiliac screw fixation has gained popularity but requires a well-reduced fracture which is often difficult after a few days. It is also often associated with malreduction, malunion, limb length discrepancy, nerve root injury, improper screw placement. Sacroiliac screw fixation is difficult in obese patients, irreducible fractures and patients with ileus as bowel shadow obliterates the SI joint. Anterior SIJ plating through the first window of ilioinguinal approach allows for direct vision for reduction of SI joint and direct protection of nerve root. We looked at outcome and complications rate following anterior SIJ plating from a tertiary referral pelvic unit. |
| **METHODS** | Retrospective case series from a single institution (2010 to 2016) reviewing case records and radiographs of patients identified from the prospective pelvic database. Outcome in terms of quality of reduction, nerve injury and other complications such as limb length discrepancy, disability and deformity were noted. |
| **RESULTS** | 19 patients with 20 sacro-iliac joint disruptions (n=20) were identified from the data base. All had type C pelvic injury. 13 are still being followed up and 12 of the group have had at least 1 year follow up. 5 patients had preoperative neurological deficit which improved following procedure. None of the patient had iatrogenic L5 nerve root injury. 1 patient had mild limb length discrepancy (LLD) which was an improvement of his pre-operative discrepancy. None of the patient had infection requiring metal removal. 4 patients are lost to follow up. None of these had any major complications at the last review. 9 patients at 1 year follow up had returned back to work and 2 had been able to do gym activities and running. 2 patients have persistent low back pain. All the patients' radiographs are satisfactory at the latest review. |
| **CONCLUSIONS** | Our incidence of nerve injury of 0% after open sacro-iliac plating compared favourably with the literature reported incidence of 10-22% of iatrogenic L5 nerve root injury. Satisfactory clinical and radiological outcome was noted. We continue to perform this procedure as our standard in SI joint disruptions where open reduction is required reserving percutaneously placed screws in other well-selected cases. Our results indicate it is a safe and reproducible technique. |

| | URETHRAL INJURY IN MAJOR TRAUMA |
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| | University Hospitals Birmingham |
| **CO AUTHORS** | Prof. K. Porter, Prof. F. Lecky |
| **PRESENTER** | Emir Battaloglu |

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| **OBJECTIVES** | Urethral injury in major trauma is an infrequently encountered condition, with complex problems of diagnosis and treatment, especially during the cacophony of polytrauma patient management. The aims of this study are to determine the incidence and epidemiological factors relating to urethral injury in major trauma, as well as determine any additional prognostic factors are evident within this cohort of patients. |
| **METHODS** | A retrospective review of patients sustaining urethral injury in major trauma was made over a 5 year period, from 2010 to 2016. Quantitative analysis was made using the national trauma registry for England and Wales, Trauma Audit and Research Network database, identifying all patients is injury codes of urethral injury. |
| **RESULTS** | 165 patients with urethral injuries were identified, over 90% male patients, most commonly following road traffic accident and an overall mortality of 20%. Urethral injury in association with pelvic fracture occurred in 135 patients, 0.6% of all pelvic fracture major trauma patients. Urethral injury was associated with double the rate of mortality in pelvic fractures, however when evaluated for fracture type, was only significant for unstable patterns (LC2, LC3, APC3,VS,CM). |
| **CONCLUSIONS** | A rare injury encountered following major trauma, yet a herald of poor outcome and requires diligence in diagnosis, as well as timely management to optimise potential outcome. High grade pelvic trauma, with unstable fracture patterns and urethral injuries have significant increase in associated mortality. |

| | A REVIEW OF THE MANAGEMENT AND PRACTICE GUIDELINES OF PAEDIATRIC SUPRACONDYLAR HUMERUS FRACTURES AT A DISTRICT GENERAL HOSPITAL |
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| **CO AUTHORS** | Langhit Kurar,<br>Jo Dartnell, |
| **PRESENTER** | Zaid Al-Wattar |

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| **OBJECTIVES** | To review the practice of paediatric humerus Supracondylar fracture management at a district general hospital |
| **METHODS** | We retrospectively reviewed 33 consecutive Supracondylar fractures managed with MUA+K-wire fixation between 2014 and 2015. The data was obtained from clinical notes, operative notes and PACS system. Radiological assessment of the reduction and Bauman's angle was performed by two independent members of the orthopaedic team. The practice was reviewed with respect to BOAST 11 guidelines and we identified potential areas for improvement. |
| **RESULTS** | 33 paediatric Supracondylar fractures underwent MUA+K-Wire fixation were identified. Mean age was 6.6ys (Range 2-15ys). 45% of these fractures were classified as Gartland 3 and 42% were Gartland 2.<br>22% of the cases were operated on the same day, 55% operated the following day and 25% operated >2 days following diagnosis. The operation was performed by a registrar in 45% of the cases and by a consultant in 55%. The mean time of postoperative radiographs was 4.6 days (Range 0-11 days). The mean postoperative Bauman's angle was 20 degrees (Range 12-31 degrees). 45% had bicortical 2mm k-wire fixation whilst 48% had 1.6mm k-wire fixation. 47.2% of the cases had appropriate preoperative neurovascular examination documentation while only 35% of the cases had appropriate postoperative documentation of neurovascular examination. With regards to complications, there was 6 transeint neuropraxia and 4 failed fixation. No vascular complications were encountered. |
| **CONCLUSIONS** | The study has highlighted the need for improvements in the management of paediatric humerus Supracondylar fractures at the Trust in order to be more compliant with the BOAST 11 guidelines. |

| | PRE-OPERATIVE MANAGEMENT OF SEMI-ELECTIVE TRAUMA PATIENTS: ARE WE OVER-INVESTIGATING? |
|---|---|
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| **PRESENTER** | Rosemary Wall |

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| **OBJECTIVES** | To explore whether the pre-operative management of semi-elective minor and intermediate trauma patients is in accordance with NICE guidelines. |
| **METHODS** | The 'patch and plan' list constitutes a rolling, semi-elective trauma list for minor and intermediate upper limb traumas in an urban based trauma unit. We undertook retrospective analysis of 50 consecutive young (under 40 years) 'patch and plan' patients' notes to explore whether investigations undertaken prior to surgery were in keeping with NICE guidance and whether the investigations instigated any changes in their management. |
| **RESULTS** | 124 of 140 (89%) individual pre-operative blood tests, undertaken across the 50 patients prior to re-admission to surgery, were not indicated according to guidelines. These were most commonly full blood count, renal or liver function tests (n = 27, 27 and 22 respectively). These excess bloods alone had a total cost of greater than £456. 11 of the additional investigations came back mildly deranged (n=10, elevated WCC; n=1, elevated glucose). No changes to surgical or anaesthetic plans were documented. Pre-op imaging (aside from that relating to the primary injury) was indicated in just one patient (chest radiograph) and this had been undertaken. One pre-operative sickle cell blood screen was not undertaken although indicated (1 of 16 indicated bloods, 6%) but surgery went ahead as planned. No patient had undergone ECG for the purposes of their surgery although this was indicated for 2 patients due to significant hypertension. |
| **CONCLUSIONS** | Very few investigations were indicated pre-operatively in this group of patients according to guidelines. However, we found a gross tendency for over-investigation, in particular with regards to pre-op blood tests, with a resulting high projected cost to the department across a 12 month period. Additional investigations were less commonly undertaken inappropriately and, in fact, some of those indicated were missed. Despite this variation from guidelines, no obvious changes to operative management were documented, emphasising the potential misuse of financial resources. Within our department we have highlighted these guidelines (which have recently been updated and simplified) to the trauma and orthopaedic trainees conducting the primary pre-operative assessment of our semi-elective trauma patients. We plan to re-evaluate our adherence to the guidance in due course. |

| | THE PROLIFERATIVE AND OSTEOGENIC POTENTIAL OF FRACTURE HAEMATOMA |
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| **PRESENTER** | Gavin Walters |

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| **OBJECTIVES** | Fracture haematoma forms immediately after fracture and is a crucial stage for the bone healing process. It has been proposed that fracture haematoma is chemoattractant for a number of inflammatory cells and abundant in inflammatory cytokines. However, the effects of fracture haematoma on osteoprogenitor cell differentiation and proliferation has not been previously investigated. This study aims to determine the mitogenic and osteogenic potential of fracture haematoma on bone osteoprogenitor cells. |
| **METHODS** | 15 patients were recruited following informed consent. Peripheral blood, fracture haematoma and bone were collected. Bone derived mesenchymal stem cells (MSCs) were isolated following collagenase digestion. Proliferation assays to determine fracture haematoma effect upon MSC growth were performed. Alkaline phosphatase (ALP) activity and calcium production assays to determine the osteogenic potential of fracture haematoma were also undertaken. |
| **RESULTS** | No notable difference was observed in the proliferation of MSCs between different culture media. ALP activity in osteogenically differentiated MSCs cultured in fracture haematoma was 250% higher than those cultured in commercially available osteogenic media ($p<0.0001$), 216% higher than those cultured in FBS ($p<0.0001$) and 123% higher than those cultured in autologous peripheral serum. Similarly, calcium deposition in osteogenically differentiated MSCs cultured in fracture haematoma was 55% higher than those cultured in commercially available osteogenic media ($p<0.0001$) and 39% higher than those cultured in FBS ($p=0.0011$), There was a numerical increase of 17% when comparing fracture haematoma cultured cell calcium deposition and autologous peripheral serum, however the difference failed to reach statistical significance. |
| **CONCLUSIONS** | Fracture haematoma is a rich osteogenic medium. The osteogenic effect of fracture haematoma is great, with a marked increase in ALP activity and calcium deposition of osteogenically differentiated MSCs. |

| | THE OUTCOME OF SURGICAL TREATMENT FOR ATYPICAL FEMORAL FRACTURES ASSOCIATED WITH LONG TERM USE OF BISPHOSPHONATES |
|---|---|
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| **PRESENTER** | Vish Kumar |

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| **OBJECTIVES** | Bisphosphonates (BP) are increasingly used in the prevention and treatment of osteoporosis. However with their long term use, we have noticed increasing presentation of atypical femoral fracture patterns, which are associated with increased complications and delayed or non-union. |
| **METHODS** | The aim of this study is to describe the outcome of surgical treatment of these atypical fractures associated with BP use. We identified eleven patients between January - July 2011, previously treated with BP, who presented with atypical fractures of the femur and were treated surgically. There were 13 fractures in 11 patients (all female). The median age was 76.6 years (range, 53 - 88 years).The mean BP use was 3.8 years (range, 2.5 - 8 years). Alendronate was the most commonly used BP followed by Risedronate. The mean Z score was –0.7 SD and mean T-score was -1.8 SD for lumbar spine. All the patients were followed up clinically and radiologically at 6 weeks, 3 months, 6 months and 1 year. |
| **RESULTS** | 11 fractures were treated with intramedullary nailing. One fracture was treated by open reduction and internal fixation (LCP) and one by dynamic hip screw (DHS). Two patients developed non-union. One was revised to dynamic condylar screw (DCS) and the other was found unfit for revision surgery. There was one death in our series due to cardiopulmonary cause. |
| **CONCLUSIONS** | In conclusion, we think patients with hip or thigh pain on long term bisphosphonates should be investigated thoroughly and preventive surgery should be considered early to avoid emergency operation and post-operative complications |

| | LONG FIXED ANGLE PLATES IN MANAGEMENT OF PROXIMAL HUMERAL METADIAPHYSEAL FRACTURES PATIENT REPORTED OUTCOMES |
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| **CO AUTHORS** | Y Khalid, A Andres, H Sheikh, H Kapoor |
| **PRESENTER** | Zaid Hashim |

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| **OBJECTIVES** | Primary: Report a case series of 20 patients with metadiaphyseal fractures that needed long fixed angle plate fixation in terms of PROM, complication rates and radiological union<br>Secondary: Compare patients within the case series with fracture extension proximal to humeral surgical neck to ones distal to it using Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire. |
| **METHODS** | Retrospective study, Jun.2011-Aug.2014 involving 20 patients(16 falls 4 road traffic accidents), age median 63(30-96), male to female 9:11 involving Metadiaphyseal fractures fixation using long fixed angle humeral plates in one polytrauma center identified from the theatres logbook. ASA median 2(1-4), all patients were independent pre-injury, 5non-unions and 15acute fractures, all needed fixed angle long bridging plate using extended deltopectoral approach.10 fractures extended proximal to surgical humeral neck. Median days between date of injury(DOI) and operation is 6(0-57). Rehabilitation median 3(2-4weeks) if greater tuberosity was involved patients had longer days of immobilisation.<br><br>Demographics, risk factors, co-morbidities, cause & injury mechanism, surgery indications and extension proximal or distal to surgical humeral neck was constructed in relation to DASH score at a time point greater than 2 years postoperatively using the Mann-Whitney U test, the independent t-test and the Chi-square test as appropriate. |
| **RESULTS** | Median follow up 14.25(12-24), 2(10%) patients had partial radial nerve palsy that recovered completely, 1(5%) had periprosthetic fracture due to recurrent falls and needed revision, 1(5%) had deep infection and needed metal removal, 1(5%) had leaky wound that needed washout and closure. All patients progressed eventually to complete radiological union. Median<br><br>DASH score at least 2 years post-operatively 27.375(0-90), median in fractures extending proximal to humeral surgical neck was 40.3 compared to 20.7 in fractures that did not($P<0.05^*$) |
| **CONCLUSIONS** | Our results are comparable to those published in literature which is scarce about the outcomes of these injuries, to our knowledge this is the first study in UK. This study indicates that patients with matadiaphyseal humerus fractures can be successfully surgically managed with long fixed angle bridging plate, however, surgeons should be cognizant of the increased post-operative complication risks.<br>After comparing the two groups 1st: Extension proximal to humeral surgical neck, 2nd: Distal to humeral surgical neck, groups are comparable in age, DOI to surgery, number of cases, infection rate; higher neurovascular deficit found in 1st group but not statistically significant, DASH score however is higher in the 1st group compared to the 2nd($P<0.05^*$), this is also clinically significant (>12.4point difference).<br>Further large sample studies are recommended. |

| | A PRACTICAL 'SAFE ZONE' TECHNIQUE FOR LAG SCREW FIXATION OF THE FIBULA |
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| **CO AUTHORS** | William Marlow, Andrew Molloy, Lyndon Mason |
| **PRESENTER** | Geraint Williams |

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| **OBJECTIVES** | During ankle fracture fixation, iatrogenic trauma to retro fibula structures such as the peroneal tendons, sural nerve, flexor hallucis longus and syndesmotic ligaments due to overlong or misplaced screws can result in reoperation and unnecessary litigation after Weber B fibula fracture osteosynthesis. Our main objective was to describe a safe zone technique for lag screw insertion as no previous studies have covered this area. |
| **METHODS** | Our trauma database (2016) identified 45 ankle fractures (AO B1.1 - Weber B) type injuries treated with lag screw fixation followed by neutralisation plating. Images were analysed using CARESTREAM Vue PACS Client software. Posterior lag screw exit levels were measured and used to define the 'area of interest' for the second part of our study. 62 musculoskeletal protocol MRI scans from foot and ankle clinic patients, performed on a 1.5T Siemens scanner generating T1 and T2 weighted 4mm axial slice thickness images were used to identify a safe screw trajectory from the anterior surface of the fibula to avoid 'at risk' retro fibula structures. |
| **RESULTS** | The initial lag screw pilot study found typical lag screw lengths between 20-24mm 95% CI (confidence interval) with screw exit points between 4-17mm 95% CI above the ankle joint. MRI image analysis from 4-16mm above the ankle found that using the medial edge of the Achilles tendon as a palpable landmark to guide screw trajectory the surgeon can safely implant a 3.5mm diameter screw avoiding flexor hallucis longus, peroneal tendons, sural nerve and the syndesmosis without direct vision of these structures. |
| **CONCLUSIONS** | Image analysis was performed by the main author; intra observer measurement repeatability was 0.6mm (95% CI 0.5-0.7mm). All MRI scans analysed were reported 'normal' for our structures of interest, radiology reports and reasons for scan were consulted for sources of bias and age gender mix were appropriate to represent normal anatomy for a typical ankle fracture population (mean age 47.4 years, range 17-86).<br><br>This simple method of directing the fibula lag screw towards the palpable medial edge of the Achilles tendon is practical, easy to teach and directs the screw on a safe trajectory away from the most commonly injured structures around the back of the fibula. |

| | THE RELIABILITY OF THE NATIONAL HIP FRACTURE DATABASE (NHFD) |
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| **CO AUTHORS** | R.Wright, Paul Dunkow |
| **PRESENTER** | Rafik Yassa |

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| **OBJECTIVES** | The National Hip Fracture Database is a national clinical audit project, commissioned by the Healthcare Quality Improvement Partnership and Royal College of Physicians as part of the Falls and Fragility Fracture Audit Programme. It is designed to enable improvements in the quality of hip fracture care and the cost effectiveness. The data is recorded locally and inputted into a larger database. It is essential for 100 % compliance and accuracy of information inputted as part of the reliability of the audit, and as a potential resource for research purposes. Additionally, Hospital Trusts may apply the best practise tariff based on the NHFD. We studied the reliability and the degree of accuracy between the details included in the National Hip Fracture Database and the actual details extracted from the hospital records. |
| **METHODS** | We have included a random samples of patients from two non-consecutive months: January 2014 and July 2014 resulting in 60 patients' worth of data from the NHFDB. We compared the NHFDB data with that of our local hospital systems (PACS and ORMIS), including the demographics, admission and operation times, and type of fracture and management recorded. The standard was set at 100% accuracy. |
| **RESULTS** | The results showed that the demographics were correct in 97% of patients. The admission time and date were100% correct. The operation date was93.5% and time was13.5% on the average. ASA grade ranged from 84%-97% with an average 90.5%. Fracture site ranged from 20-60% with an average of 40%. Fracture side and operation type were accurate in 97% and 74%. Respectively. |
| **CONCLUSIONS** | There are many discrepancies in the NHFD, so it is currently not a reliable source to draw research or financial conclusions.<br>We believe that human error and lack of training accounted for majority of inputting errors as untrained non-medical staff submit into the database. We have highlighted the importance of filling in the relevant NHF database forms by the operating surgeon. The need for a dedicated Hip fracture nurse practitioner is of a paramount importance for any trauma and orthopaedic department at any level (teaching hospital versus district general hospital). |

| | THR IN NECK OF FEMUR FRACTURES: CURRENT PERFORMANCE AND GUIDELINES .AN INSTITUTIONAL EXPERIENCE |
|---|---|
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| **CO AUTHORS** | Jason Wilson, Nick Johnson, Ash Gulati, Grahame Taylor |
| **PRESENTER** | Sudhir Kannan |

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| **OBJECTIVES** | National Hip Fracture Database report in 2015 has mentioned that only 26.1% of patients eligible for a total hip replacement are getting this treatment. Further emphasizing a need for improvement this has been included in the key recommendations (NIHFD 2015)<br><br>Our aim was to identify the number of patients with fracture neck of femur who met the NICE criteria, but did not have THR and to make recommendations to ensure most patients who satisfy the NICE criteria, are offered a total joint replacement. |
| **METHODS** | Retrospective data was collected from December 2014 – December 2015. 236 patients were treated with hemi-arthroplasty or THR, out of which 62 patients who were mobile with one or less than one aid, AMT>7 and ASA 1&2 were included in our study. |
| **RESULTS** | Most of patients were females, 9/62 patients who met inclusion criteria had THR. But 52% of THR were performed in patients who had severe systemic illness. Only 7% of eligible patients admitted over weekend get THR. 36% of patients receiving hemiarthroplasty are operated beyond 36 hours.95% of patients having THR are operated beyond 36 hours. |
| **CONCLUSIONS** | **Conclusions:**<br><br>There is lack of clarity in NICE guidelines leading to confusion in patient selection. Further, this lack of clarity does not allow a meaningful audit<br>**Recommendations:**<br><br>We recommend that offering THR to patients with neck of femur fractures who are ASA grade 1 or 2 allows best utilization of available resources and also improve the performance. |

| | ACUTE TOTAL HIP REPLACEMENTS USING BURCH-SCHNEIDER CAGES FOR ACETABULAR FRACTURES |
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| | University Hospital of North Midlands |
| **CO AUTHORS** | Pradeep Kankanalu, Bishoy Youssef, Justin Lim |
| **PRESENTER** | Daniel Banks |

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| **OBJECTIVES** | Osteoporotic acetabular fractures are common and pose a difficult technical challenge for the trauma surgeon. Acute total hip replacement (THR) using a Burch-Schneider (BS) antiprotrusio cage and immediate post -operative weight bearing is one method to approach these injuries. This case series reports our outcomes of acute THR using BS cages from a UK major trauma centre based on length of stay, radiological outcome, complications and outcome scores. |
| **METHODS** | Twenty-six patients were identified that underwent acute THR with a BS cage between June 2006 and August 2015. Mean age was 71 and 5 of these patients were women. The senior author was the lead surgeon in all cases and a consistent technique was used. Patients were followed up clinically and radiologically and outcome scores collected |
| **RESULTS** | All patients were independent walkers at follow up and all achieved radiological union. There were no dislocations, subsidence, revision or deep infections in this group. There was one perioperative death as a result of pre-existing pulmonary fibrosis and one deep vein thrombosis. Mean length of stay was 10 days. Mean Oxford Hip Scores were 33 and EQ5-D VAS score was 68. |
| **CONCLUSIONS** | In conclusion this case series further validates the use of Burch Schneider cages, which can be used in all fracture types in the acute setting. |

| | ANALYSIS OF EARLY DISLOCATION AND REVISION RATES IN 174 PATIENTS TREATED WITH EXETER TRIDENT TOTAL HIP ARTHROPLASTY FOR TRAUMA OVER 5.9 YEARS |
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| **MAIN AUTHOR** | Daniel Bye |
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| **CO AUTHORS** | Bola Akinola, Nish Chirodian |
| **PRESENTER** | Daniel Bye |

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| **OBJECTIVES** | The major complication in Total Hip Arthroplasty (THA) undertaken for trauma is the incidence of early instability and dislocation with rates of up to 22%. Some studies advocate the use of dual mobility cups (DMCs) to reduce this incidence and the associated morbidity and cost of revision surgery. We review the outcomes of THA for trauma at our institution to evaluate whether the argument for DMCs is warranted and to assess factors associated with dislocations. |
| **METHODS** | All THA's for trauma were reviewed over a 5.9 year period. Complications were evaluated from admission, operative and outpatient notes. Patients followed up elsewhere were excluded. Cost calculations were undertaken to evaluate the financial impact of dislocations. |
| **RESULTS** | 174 patients underwent THA for trauma between 2010-2015, average admission lasted 7 days. A posterior approach was undertaken in 156 cases (90%) and a modified Hardinge in 18 cases (10%). 8 patients (4.7%) had early dislocations, 6 (66.7%) within 20 days of primary THA; 16 dislocation episodes occurred in total. 4 patients (2.3%) were offered revision arthroplasty, 3 (1.7%) revisions were undertaken, all within 2.5 months of the original THA. All dislocations were from a posterior approach, 7 dislocations were from size 28 heads, 2 from size 32 heads. The additional cost of managing these dislocations is estimated at £87,000. 9 (5.17%) other complications occurred. |
| **CONCLUSIONS** | Our findings suggest that the incidence of early dislocation is much lower than the literature suggests, and smaller sized heads may be influential, but not the sole factor, in dislocations. Using DMCs would be cost neutral providing no dislocations occurred. Our study demonstrates that by paying attention to particular aspects of the procedure, low dislocation rates can be achieved with conventional arthroplasty implants. The use of DMCs in trauma, while reducing dislocation risks, raises concerns regarding wear rate. |

| | A SINGLE CENTRE, RETROSPECTIVE ANALYSIS OF TWO DISTAL FEMORAL LOCKING PLATES. DO THE SYNTHES PLATES FAIL EARLY? |
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| **PRESENTER** | Paul Brewer |

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| **OBJECTIVES** | Chastened by a recent American publication which reported an extraordinary early failure rate of the Synthes variable angle (VA) locking plate (22.2%), we aimed to retrospectively review the use of all distal femoral locking plates implanted over a two year period in a single British major trauma centre. The primary outcome was radiographic failure of the implant, with secondary outcomes of infection and 30 day mortality. |
| **METHODS** | All patients between March 2014 and 2016 in which distal femoral locking plates were implanted were identified using theatre log books, electronic records and case note review. Statistical analysis was performed using SPSS version 21. |
| **RESULTS** | We identified 68 patients with distal femoral locking plates; 62 were implanted for distal femoral fractures and 6 for limb deformity correction. The age range was 21 to 98, with a mean age of 71.8 years (± 21.8). The majority of fractures were sustained following low energy falls (82%). Fractures were characterised according to AO classification; 33-A 44%, 33-B 8%, 33-C 13% and peri-prosthetic fractures 35%.<br><br>The overall plate failure rate in distal femoral locking plates implanted for femoral fractures in our series was 13%. The failure rate of the Synthes VA locking plate was 16% compared to the Stryker AxSOS plate which was 8%. There was no statistically significant difference between failure rates in both groups (p=0.344). We reported no plate failures when used for deformity correction. Furthermore, there was no statistically significant difference in both early failure rate (<30 days) and overall time to failure between the two groups.<br><br>There were no superficial or deep infections in the series and the 30-day mortality was 5% (n= 3). |
| **CONCLUSIONS** | When used for fractures of the distal femur, our results show an increase in the failure of the Synthes VA system compared to the Stryker AxSOS system. However, this did not reach statistical significance.<br><br>Our unit has discontinued the use of the Synthes VA distal femoral locking plate for trauma but continued its use for elective deformity correction. This is a precautionary measure until further large scale studies are performed. |

| | THE MANAGEMENT OF POST-TRAUMATIC OSTEOMYELITIS: CASE SERIES OF 12 PATIENTS |
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| **CO AUTHORS** | Bola Akinola, Ben Davis |
| **PRESENTER** | Mira Pecheva |

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| **OBJECTIVES** | **Objectives:** To evaluate the treatment of intramedullary osteomyelitis using the method previously described and published by our institution. |
| **METHODS** | **Methods:** Retrospective case series of 12 consecutive patients (10 male, average age 42.1 years) treated for implant or trauma related intramedullary osteomyelitis at our institution over the past 5 years with clinical and / or radiological evidence of infection. Patients with infected metalwork in situ underwent implant removal (11/12 patients) and all 12 patients underwent insertion of a cement antibiotic-coated titanium elastic nail. The manually moulded cement nail was impregnated with a number of different antibiotics in to achieve a broad range of antibiotic coverage. |
| **RESULTS** | **Results:** There was no evidence of recurrence of infection in any patient and no patient required additional surgical procedures following the removal of the antibiotic cement spacer. Of those removed, cement spacers were removed after a median of 67.5 days (7-82 days), with two patients' treatment currently on-going.<br>Eleven patients demonstrated positive tissue cultures. The median duration of intravenous antibiotic treatment was 12 days (7-68 days) and the median course of oral antibiotics was 21 days (2-42 days). |
| **CONCLUSIONS** | **Conclusion:** In house custom made cement intra-medullary antibiotic spacers are an effective and inexpensive adjuncts in the management of medullary osteomyelitis. |

| | POST-OPERATIVE LOW HAEMOGLOBIN AS A CAUSE OF NEW-ONSET DELIRIUM IN PATIENTS UNDERGOING SURGERY FOR FRACTURE NECK OF FEMUR. |
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| **PRESENTER** | Shahbaz Malik |

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| **OBJECTIVES** | To assess if low haemoglobin in post-operatively period leads to new-onset delirium in patients who had undergone surgery for fracture neck of femur. |
| **METHODS** | We retrospectively identified all those patients who had undergone surgery for fracture neck of femur from December 2014 to December 2015. Pre-op cognitive status was recorded along with pre-op Hb. These were then compared to post-op cognitive status and post-op Hb. |
| **RESULTS** | No of patients = 390<br><br>157 (40%) patients had pre-op pre-*existing* delirium,<br><br>Hb ≤100 g/L= 14/157 (9%)<br><br>Hb 100 - 120 g/L = 73/157 (47%)<br><br>Hb > 120 g/L = 70/157 (45%)<br><br>60 (16%) of 382 patients had post-op 'New-onset' on i) pre-existing cognitive impairment, or ii) previously where they had none.<br><br>Hb ≤100 g/L = 47/60 (78%)<br><br>Hb >100 g/L = 13/60 (22%)<br><br>230 of 390 patients, (59%) did not have pre-op cognitive impairment and of these 13% (29) developed New-onset delirium. Further analysis of these shows:<br><br>Hb ≤100 g/L = 22/29 (76%)<br><br>Hb 100 - 120 g/L = 6/29 (21%)<br>Hb >120 g/L = 1/29 (3%)<br><br>Of the 22 patients, 5 had chest infection and 2 had UTI post-operatively.<br><br>9 (41%) of the 22 patients needed 1-2 units of transfusion post-operatively and 2 patients also had 2 units pre-operatively. |
| **CONCLUSIONS** | If Hb is less than 10 g/L, there is increased risk of delirium whether it is a 'new-onset on pre-existing' or new-onset in the absence of any pre-op delirium or confusion. |

| | REVIEW OF ATYPICAL FEMORAL FRACTURES IN PATIENTS ON ANTI-RESORPTIVE TREATMENT |
|---|---|
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| **CO AUTHORS** | R Akram, N Peel, J McGregror-Riley, |
| **PRESENTER** | Yuvraj Agrawal |

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| **OBJECTIVES** | Bisphosphonates have been shown to prevent fractures in osteoporosis in efficacy trials. An association between bisphosphonate and atypical femoral fractures is plausible but treatment prevents many more fractures than it causes. The optimal duration of continued bisphosphonate use is however not established. The aim of this project was to review clinical and radiological outcomes of patients identified with atypical femoral fractures (AFF) in patients on bisphosphonates. |
| **METHODS** | A retrospective review of patients who had presented with atypical femoral fractures (AFF) between 2008-2015. Patients were identified from our Regional Metabolic Bone Centre database. Clinical records were reviewed for underlying diagnosis, history of trauma, operative details and details of medical treatment including the duration of treatment and treatment holidays. Radiographs were reviewed for cortical thickening, pattern and location of fractures and time to union. AFF were confirmed as per the American Society for Bone and Mineral Research definition. |
| **RESULTS** | We identified 34 patients (50 femora) from the database of which 91% were females. 89% patients had an underlying diagnosis of osteoporosis and remainder had metastatic bone disease, osteomalacia or steroid related osteopenia. Alendronic acid was the most commonly used bisphosphonate. Radiological review revealed cortical thickening in 79% of cases. A time lag was identified between first radiological evidence of cortical thickening and the fracture but with improved understanding, cortical thickening was monitored and the femur prophylactically treated with intramedullary nail in 25%. We report our union of fractures at a median period of 6.5 months. |
| **CONCLUSIONS** | The quest for better understanding of the risk factors, aetiology and pathophysiology of AFF continues. A balance of risks and benefit should be reviewed in all patients periodically during treatment. Identifying patients with prodromal symptoms and early radiographic signs could enable early diagnosis and potentially non-operative management. |

| | MANAGEMENT OF PAEDIATRIC FEMORAL SHAFT FRACTURES USING TRACTION IN TOBRUK SPLINT |
|---|---|
| **MAIN AUTHOR** | Seif Sawalha |
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| **CO AUTHORS** | Peter Skellorn, Rose Davies, Neeraj Garg. |
| **PRESENTER** | Peter Skellorn |

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| **OBJECTIVES** | There are several options for management of femoral shaft fractures in preschool age group (2-6 years old); hip spica, traction or operative treatment. We report results of managing femoral shaft fractures in traction. |
| **METHODS** | 175 femoral shaft fractures were treated between 2007 and 2015. Seventy (70) children were treated in traction. Data was collected retrospectively from clinical notes and radiographs. The Tobruk splint is a plaster of Paris augmentation of Thomas splint. The plaster is applied after callus is visible and then the child is discharged home. |
| **RESULTS** | Mean age was 4.5 years (range 1.5 – 9 years) and the majority were boys (n=53). 15 children were > 6 years (2 were non-ambulatory with Cerebral Palsy and spina bifida). The majority (n=50) were simple spiral fractures. Most were isolated (n=69) and resulted from low energy trauma (n=63). Six fractures were pathological. Mean clinical follow-up was 8 months. Mean radiological follow-up 6 months. Mean hospital stay was 14 days (7-26 days). The mean time to fracture union (i.e time in traction) was 47 days (43 days in patients < 6 years old, 63 days in >6 years). The mean angulation in coronal plane was 3.6° (95% CI 2.5°-4.6°) at time of union and 2.3° (1.3°-3.4°) at last radiographic follow-up. Mean angulation in sagittal plane was 6.9° (5°-8.4°) at union and 6.8° (4.7°-8.9°) at last follow-up. Four fractures healed with malunion (angulation more than 15 degrees in coronal plane or more than 20 degrees in sagittal plane); none required operative intervention. Four fractures healed with radiological overlap of >2cm; two were in non-ambulatory children, one had LLD of 1cm at 6 years follow-up and one was lost to follow-up at 4 months.<br>Ten patients had minor skin blisters during early management in Thomas splint. Three patients developed pressure sores; two required change of splint on the ward and in 3rd case, management was changed to hip spica because of social circumstances. None of skin complications required operative treatment. One patient, who was transferred from another hospital, required GA for change of Thomas splint. |
| **CONCLUSIONS** | The results of treatment in traction are satisfactory and the complications are minor. It´s most suitable for preschool age children. The disadvantage is long hospital stay but using Tobruk splint allows earlier discharge and nursing children in home environment. |

# ORAL PRESENTATIONS
## Thursday 10th November 2016

British Trauma Society's

## ANNUAL SCIENTIFIC MEETING

**9th & 10th November 2016**

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| | THE ROLE OF CT IN ASSESSING THE ACUTE ELBOW DISLOCATION |
|---|---|
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| | University Hospitals Coventry & Warwickshire |
| **CO AUTHORS** | P Raval, C Wilding, A Jones, S Malik, A Saithna, |
| **PRESENTER** | Christopher Wilding |

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| **OBJECTIVES** | This study aimed to assess the ability of orthopaedic registrars to accurately identify associated bony injuries on initial plain radiographs using CT as the gold standard for comparison. |
| **METHODS** | Patients over the age of 16 years undergoing an elbow CT scan within one week of a documented elbow dislocation between 1st June 2010 and 1st June 2014 were included in the study. Three orthopaedic registrars independently reviewed both the initial dislocation and immediate post reduction plain radiographs to identify any associated bony injuries. This radiograph review was repeated by each registrar after two weeks. The incidence of associated injuries as well as the inter- and intra-observer variability was calculated. |
| **RESULTS** | 28 patients were included in the study. 54% of the patients were female and the mean age was 45 years (range 16 to 90 years). The incidence of a radial head fracture was 54%, coronoid fracture 43% and epicondyle avulsion 18% on CT. The inter-observer reliability was only shown to be fair amongst registrars and the intra-observer variability moderate. |
| **CONCLUSIONS** | Computerised tomography is a useful adjunct in the assessment of associated osseous injuries following an elbow dislocation due to the presence of a high number of injuries. Plain radiographs alone have been shown to have only a fair and moderate inter and intra-observer variability respectively, therefore a low threshold to obtain further 3D imaging should be practised. |

| | A COMPARISON OF TOTAL ELBOW ARTHROPLASTY AND INTERNAL FIXATION IN THE MANAGEMENT OF DISTAL HUMERAL FRACTURES IN ELDERLY PATIENTS |
|---|---|
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| | University Hospitals Coventry & Warwickshire |
| **CO AUTHORS** | A Saithna, P Raval, C Wilding, T Lawrence, S Drew, C Modi, |
| **PRESENTER** | Christopher Wilding |

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| **OBJECTIVES** | To evaluate patients over 60 years with a distal humeral fractures managed with either Total Elbow Arthoplasty (TEA) or Internal Fixation (IF) in order to assess the number of complications associated with each procedure. |
| **METHODS** | Patients undergoing surgical intervention for distal humeral fractures between April 2010 and 2015 were identified at the author's centre. Inclusion criteria; over 60 years of age, acute distal humeral fracture, over 12 months follow up and either double plate fixation or TEA. Exclusion criteria; previous elbow fractures and grade II/III open fractures. |
| **RESULTS** | During the study period 16 patients underwent IF and 13 TEA. The mean ages were 74.9 and 76.2 years, the proportion of females was 81.3% and 76.2% and the majority were Type C fractures 75% and 92% respectively. The mean follow up was 35 months (range 14 to 70) for the IF group and 22 months (range 12 to 56) for the TEA group. Complications were present in 56.3% of the IF group and 38.4% of the TEA group, relative risk 1.46 (CI 0.64 to 3.3). Further surgery was required in 31.3% in the IF group and 15.4% in the TEA group, relative risk 2.03 (CI 0.47 to 8.8). |
| **CONCLUSIONS** | The rate of complications and revision surgery is higher after IF than TEA in our local practice. The figures are comparable to those previously reported in the literature. |

| | TOTAL ELBOW ARTHROPLASTY VERSUS INTERNAL FIXATION IN THE MANAGEMENT OF ACUTE DISTAL HUMERAL FRACTURES - A SYSTEMATIC REVIEW AND META-ANALYSIS. |
|---|---|
| **MAIN AUTHOR** | Robert Jordan |
| | University Hospitals Coventry & Warwickshire |
| **CO AUTHORS** | C Wilding, P Raval, A Saithna, T Lawrence, S Drew, C Modi |
| **PRESENTER** | Christopher Wilding |

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| **OBJECTIVES** | To search the current available literature to aid clinical decision making on whether Total Elbow Arthroplasty (TEA) or Internal Fixation (IF) is the management of choice in elderly patients with an acute distal humeral fracture in terms of functional outcome and complications. |
| **METHODS** | The Medline and EMBASE databases were searched. Eligibility criteria were applied that identified studies reporting either functional outcomes or complications following plate fixation or TEA for acute distal humeral fractures in patients over the age of 60 years. Included studies were appraised using the STROBE statement and CONSORT checklist. |
| **RESULTS** | The search revealed 219 results, after application of the eligibility criteria and removal of duplicates 26 studies were included for review; 5 comparative studies, eight TEA case series and 14 IF case series. The studies varied in their quality and had significant limitations. Only one randomised controlled study was reviewed and reported that TEA had improved functional outcomes. Overall the functional outcomes were improved after TEA but the complication rate appeared to be comparable. |
| **CONCLUSIONS** | The evidence reviewed suggests that an improved functional outcome can be achieved after TEA but further data regarding complications and the long term consequences of TEA are required before definitive recommendations can be made. |

| | ELBOW FRACTURE DISLOCATION MANAGEMENT USING HINGED EXTERNAL FIXATOR |
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| | Al Rahba Hospital, Abu Dhabi, UAE |
| **CO AUTHORS** | Dr. Medhat Khafajy MD |
| **PRESENTER** | Dr. Mahdy M. Yassin FRCS |

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| **OBJECTIVES** | Posterior dislocation of the elbow with associated fractures of the radial head and the coronoid process of the ulna has been referred to as the "terrible triad of the elbow" because of the difficulties encountered in its management. However, there are few published reports on this injury. |
| **METHODS** | 7 patients with this pattern of injury were evaluated after average period of 40 weeks. All of them were treated with hinged monolateral external fixator after the appropriate reconstruction. All 7 patients returned for clinical examination, functional evaluation, and radiographs. |
| **RESULTS** | The average maximal arc of movement while in the frame was 100 degrees [range, 70-130] .No deep infections. |
| **CONCLUSIONS** | Fracture-dislocations of the elbow remain a complex problem in orthopaedics. The myriad of treatment protocols and methodologies focuses on precise articular alignment and restoration of the skeletal architecture. The goal is to re-establish function as quickly as possible so as to allow rehabilitation involving the full range of motion. Surgical management, primarily reconstruction of the secondary stabilizers of the elbow joint as well as preserving soft tissue structures, subsequently provides the possibility of a speedier recovery. If proper skeletal alignment does not confer enough stability, hinged external fixation becomes an integral part of the treatment strategy for the reconstructive and trauma surgeon.<br>outcome of treating complex injuries of the elbow with the “Orthofix” hinged elbow external fixator in patients where the condition of the soft tissues did not permit extensile surgical approach or where the internal fixation would not be stable enough to permit safe early joint mobilization postoperatively.7 patients were treated, with fracture–dislocation of the elbow and excessive soft tissue impairment. Despite the technical difficulties, external fixation of the elbow could be a salvage procedure in difficult cases of elbow trauma, where open procedures are not indicated |

| | GET SMART OR GET SUED: THE ESSENTIAL ART OF THE ORTHOPAEDIC CAST |
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| **MAIN AUTHOR** | Jamie A'Court |
| | Stockport NHS Foundation Trust |
| **CO AUTHORS** | Rafik Yassa; Blackpool Teaching Hospital |
| **PRESENTER** | Rafik Yassa, CPCharalambous |

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| **OBJECTIVES** | The rise in negligence claims is on rise and this cannot be underestimated. This study aims to evaluate the litigation cost of plaster complications in the UK and provide lessons to be learnt to avoid this happening in the future. |
| **METHODS** | A retrospective review of the NHS Litigation Authority (NHSLA) database, retrieving all successful/settled claims relating to plaster/cast between 1995-2009. More than 9800 claims were made during the period from 1995 to 2000. Claims were identified that were related to casts. We excluded any claims that were left open. |
| **RESULTS** | 58 cases were identified. The total defence and compensation costs were over 2.7 million. The total compensation per claim ranged from £500 to over £370,000.<br><br>48% of the claims were from incorrect plaster application, poor technique or failure to identify issues before they developed. 25.9% of these claims resulted from burns or scar from removal of the cast. 22.4% of the claims resulted from other causes related to fractures treated with casts. |
| **CONCLUSIONS** | The rate of orthopaedic litigation is increasing. However, the overall of litigation relating to cast use is still small. Mastering cast art is a fundamental skill for any individual involved in providing cast service. This involves orthopaedic trainees and plaster technicians. This will decrease the rate of plaster complications, better patient's care and saving a significant amount of NHS budget. About 69% of cases seem to be preventable and consequently there is a considerable saving potential. |

| | DRIVING PLASTERED: WHO'S DOING IT? |
|---|---|
| **MAIN AUTHOR** | Awais Habeebullah |
| | Russells Hall Hospital, Dudley |
| **CO AUTHORS** | Alexander Bolt, Hartej Sur, Maulik Ghandi, Alastair Marsh |
| **PRESENTER** | Awais Habeebullah |

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| **OBJECTIVES** | The DVLA states that It is the driver's responsibility to ensure that they are in full control of their vehicle at all times. The driver will be held responsible for any convictions or accidents that may result from an impaired ability to drive because of the plaster cast. We aim to determine if patients are aware of this, where they acquired the information, and if informed, did they drive in plaster. |
| **METHODS** | A standardised questionnaire was given to patients that attended fracture clinic at our regional trauma unit between December 2015 and January 2016**.** Data was collected on driving habits, car transmission, type of plaster immobilisation and information received regarding driving whilst in plaster. Patients were aware their responses were anonymous. Patients who did not drive prior to their injury were excluded from the series. |
| **RESULTS** | Twenty-nine patients completed questionnaires; two were excluded from analysis because they did not drive prior to their injury. Thirteen of the 27 patients drove whilst in plaster cast**.** Nine of the 13 patients drove a manual car and patients would drive an average of 30 minutes 4-5 times a week. The most common type of plaster was a right below elbow cast but 3 patients drove whilst immobilised in a below knee plaster. The majority of driving was done for personal reasons rather than occupation. Only 2 patients that drove whilst in plaster cast did not receive advice from a healthcare professional, their insurance company or the DVLA. No patient was involved in a road traffic accident or stopped by the police. |
| **CONCLUSIONS** | The majority of patients are receiving advice regarding driving whilst in plaster cast that attend our trauma unit. However almost half are driving regardless which is concerning as there is good evidence that plasters impair the ability to drive. An exception can be made for patients in left below knee plasters who drive automatic cars but as doctors we should actively discourage driving in plaster. Patient's need to be made aware that if we state they should not drive in plaster cast it may invalidate their car insurance and lead to criminal proceedings. |

| | MANAGEMENT OF THORACOLUMBAR FRACTURES IN THE MULTIPLY INJURED PATIENT - EXPERIENCE OF A LEVEL 1 MAJOR TRAUMA CENTRE |
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| **MAIN AUTHOR** | Christopher Lodge |
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| **CO AUTHORS** | Peter Loughenbury, James Tomlinson, Robert Dunsmuir |
| **PRESENTER** | Christopher Lodge |

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| **OBJECTIVES** | Leeds Major Trauma Centre (MTC) opened on 2nd April 2013. This increased the spine departments' involvement in the multi-specialty management of complex trauma patients from admission through to rehabilitation. We aim to assess the epidemiology of spinal injuries in multiply injured patients since opening as an MTC, to review management decisions in concordance with current spinal fracture scoring systems and review clinical and radiological outcomes. |
| **METHODS** | Trauma Audit and Research Network (TARN) data was collated including all multiply injured trauma patients with spinal fracture, this database was cross-referenced with hospital documentation, radiological imaging and outpatient follow up clinic letters. |
| **RESULTS** | 101 patients were identified and 93 had complete data for inclusion. 48.5% of patients were from outside the hospital catchment area. 72% were male and mean age was 47 (range 8-96). Mechanism of injury included fall >2m (47%), road traffic collision (40%), fall <2m (9%), crush/blow (4%).<br><br>38% of patients had single level of spinal injury, 45% had multi-level vertebral injuries with 17% having spinal fractures limited affecting only spinous or transverse processes. 83% were vertebral body fractures - AO types A1/2 (54%) A3/4 (33%), B (8%) and C (5%).<br><br>Mean thoracolumbar injury and classification severity score (TLICS) was 2. 22 patients underwent operative stabilization (mean TLICS 3.8) - of which 3 had a neurological deficit as a result of injury. At 1 year, 2 patients had a persistent neurological deficit and 2 were experiencing on-going low back pain. There was one complication (screw pull-out). 2 patients had a second procedure to remove metalwork. No conservatively managed patient required subsequent surgical intervention. |
| **CONCLUSIONS** | Spinal fractures are common in the multiply injured patient. In our series most (77%) were successfully treated without surgery. However, when operative intervention is required the clinical outcomes are good. |

| | BIOMECHANICAL CONSIDERATIONS FOR STRATEGIES TO IMPROVE OUTCOMES FOLLOWING VOLAR PLATING OF DISTAL RADIUS FRACTURES |
|---|---|
| **MAIN AUTHOR** | Robert Jordan |
| | Southport and Ormskirk Hospital NHS Trust |
| **CO AUTHORS** | P Raval, C Wilding, Nick Howard, Adnan Saithna, |
| **PRESENTER** | Christopher Wilding |

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| **OBJECTIVES** | To perform a systematic review of the literature to determine the biomechanical evidence to guide optimum surgical techniques and strategies for achieving the best clinical outcomes of volar plating for distal radius fractures. |
| **METHODS** | A systematic review of the literature using the Medline and EMBASE databases was conducted on the 16th January 2016. Search terms included 'volar plate fixation,' volar plating,' 'distal radius fracture' and 'wrist fracture'. All biomechanical papers reporting the use of volar locking plate fixation of distal radius fractures were included. Studies were appraised with respect to the validated quality assessment GRADE tool. |
| **RESULTS** | The search strategy revealed 137 studies but after application of the inclusion criteria 21 papers were eligible for inclusion. Of three studies comparing the use of screws and pegs, two reported a significant reduction in torsion and compression strength using pegs. Two studies compared the length of distal row screws and reported that screws traversing 75% of radius had equal strength to those that completely traversed the distal radius. Of three studies comparing the number of distal screws, two reported that the stability of the construct was increased when using an increased number but showed that there was no significant difference in load to failure when using either 4 or 7 screws. Three studies compared variable and fixed angle plates and all demonstrated improvement in the stability when using variable angle plates due to the increased ability for fragment specific fixation |
| **CONCLUSIONS** | The use of variable angle plates and screws rather than pegs has been shown to increase construct stability in biomechanical studies. However, the use of slightly shorter screws does not seem to have a detrimental effect on construct biomechanics whilst potentially reducing the risk of extensor tendon complications. In addition, using fewer distal locking screws is not associated with decreased load to failure in the fracture patterns evaluated and provides an important cost saving. |

| | **'MODERN' DISTAL FEMORAL LOCKING PLATES ALLOW SAFE, EARLY WEIGHT BEARING WITH A HIGH RATE OF UNION AND LOW RATE OF FAILURE; 5 YEAR EXPERIENCE FROM A UK MAJOR TRAUMA CENTRE** |
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| **MAIN AUTHOR** | William Poole |
| | Royal Sussex County Hospital, Brighton, Sussex, UK |
| **CO AUTHORS** | D Wilson, H Guthrie, S Bellringer, R freeman, E Guryel, S Nicol |
| **PRESENTER** | William Poole |

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| **OBJECTIVES** | *Introduction* - Distal femoral fractures can be challenging to manage and are increasingly being seen in the elderly osteoporotic population. Management with casting or bracing can unacceptably limit a patients ability to weight bear but historically, operative fixation has been associated with a high rate of re-operation. |
| **METHODS** | *Methods* - All patients who had distal femoral fractures treated with lateral distal femoral locking plates (LDFLPs) between 2009 and 2014 were identified at a UK major trauma centre. Fracture classification, operative data including post operative weight bearing status, union rates, re-operation, implant failure and mortality rate was collected. |
| **RESULTS** | *Results* - 127 fractures were identified in 122 patients. The mean age was 73 years and 80% were female. A consultant performed the operation in 67% of cases with the remainder performed under direct consultant supervision. 84% of patients were allowed to mobilise fully weight-bearing immediately. The rate of clinical and radiological union was 95% and only 3% required re-operation. The 30-day, 3-month and 12-month mortalities were 7%, 15% and 22% respectively |
| **CONCLUSIONS** | *Discussion and Conclusion* - Our study is the first to demonstrate an exponential increase in distal femoral fractures with age which is analogous with the proximal femoral fracture population. Our study demonstrates that it is safe to allow patients to mobilise fully weight bearing immediately and with a high rate of union and low rate of re-operation when using modern LDFLPs to treat distal femoral fractures. |

| | PATIENT SURVIVAL AFTER SURGERY FOR PATHOLOGICAL FRACTURES OR IMPENDING FRACTURES OF THE FEMUR. |
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| **MAIN AUTHOR** | Gunasekaran Kumar |
| | Royal Liverpool University Hospital |
| **PRESENTER** | Gunasekaran Kumar |

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| **OBJECTIVES** | Improvements in medical management of cancer has resulted in longer life expectancy in patients with bony metastases. More than half of bony metastases requiring surgery involves the femur. Femoral nailing is the commonest procedure undertaken for femoral metastases.<br>The purpose of this study was to assess the patient survival following femoral nail fixation either for pathological fracture or impending fractures. |
| **METHODS** | All patients who underwent femoral stabilisation during the period January 2010 to July 2015 were identified from a prospective database. Data collected included age, primary neoplasm, comorbidities, site of femoral metastasis, pathological or impending fractures, Mirel score, early complications, patient survival. Kaplan-Meier analysis was performed to identify patient survival. |
| **RESULTS** | There were 68 patients with 73 femoral nail fixations during the study period. Average age was 69 years (34 to 90 years). There were 26 males and 42 females. Forty-one patients had no major comorbidities. Of the 73 femora nail fixations, 57 were undertaken for metastases in the trochanteric or subtrochanteric region. The rest were in the femoral shaft. Sources of primary are shown in Table 1. All the patients had a Mirel score of 8 or more. Prophylactic femoral nail fixation was done for 24 of the 73 procedures. Majority of the patients reported at least 50% pain relief. There was no incidence of infections. Two incidences of deep vein thrombosis (DVT), 5 had urinary retention, 5 had blood transfusion, Survival analysis is shown in graph 1. |
| **CONCLUSIONS** | Femoral stabilisation for pathological or impending fractures is a good option for pain relief which helps improve function. However, early mortality rates high as shown in graph 1. |

Graph 1

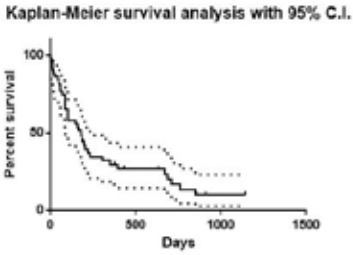


Table 1

| Primary | Number of patients |
|---|---|
| Lung | 17 |
| Breast | 15 |
| Myeloma | 11 |
| Gastrointestinal | 5 |
| Renal | 3 |
| Prostate | 3 |
| Miscellaneous | 11 |

| | EXTREMITY INJURIES SUSTAINED IN THE IRAQ AND AFGHANISTAN CONFLICTS: 2003-2014 |
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| **MAIN AUTHOR** | Surg Lt Cdr Jowan Penn-Barwell |
| | Institute of Naval Medicine, UK |
| **CO AUTHORS** | Capt Henry Chandler, Capt Kirsty Macleod |
| **PRESENTER** | Capt Henry Chandler RAMC |

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| **OBJECTIVES** | Extremity injuries predominate in warfare, however their nature, the associated burden in terms of hospital stay and surgical treatment has not been characterised in light of recent conflicts. Wounds resulting from high-energy military weapons are typically complex and heavily contaminated. These require multiple surgical procedures and prolonged hospital treatment. The aim of this study was to characterise the range of traumatic injuries to the extremities sustained over the 12 years of conflict in Iraq and Afghanistan. Furthermore this study aims to define the treatment burden associated with extremity injuries sustained on the modern battlefield. |
| **METHODS** | All cases entered into the UK Military Trauma Registry between the invasion of Iraq (19/03/03) and the cessation of combat operations in Afghanistan (27/10/14) were examined. Injuries are coded according to the 2005 military version of the Abbreviated Injury Scale (AIS) survivors with AIS codes for injuries to their limbs were included in the analysis. |
| **RESULTS** | From a total of 2,429 UK military survivors injured in Iraq and Afghanistan, 1,856 (76%) had extremity injuries; of these 146 had at least one amputation. Aside from amputations, there were 1,613 fractures, of which 529 (33%) were in the upper limb and 1,084 (67%) were in the lower limb and pelvis. Of the lower extremity fractures, 632 (58%) were open and of the upper extremity fractures, 307 (70%) were open.<br><br>Patients with a amputation had a median length of stay of 51 days (IQR 30-65) and underwent a median of 7 surgical procedures on their limbs (IQR 5-9). For casualties with long bone fractures, without amputation, the median length of stay was 13 days (IQR 6-25) and underwent a median of 2 surgical procedures on their limbs (IQR 1-4).<br><br>If their long bone fractures were closed, a patient's median LoS was 11 (IQR 6-32) whereas patients with an open long bone fractures had a significantly longer initial hospital stay of 24 days (IQR 13-46) [p<0.0001]<br><br>For closed long bone fracture the median number of surgical episodes was 1 (IQR 0-3) whereas for open fractures it was 3 (IQR 2-5). This difference was statistically different (p<0.001, Mann-Whitney). |
| **CONCLUSIONS** | This is the first study to define the overwhelming orthoplastic nature of combat injuries and their associated surgical workload. The effect of whether a fracture is open or closed is also quantified. Adequate provision of surgical resources to care for casualties from future conflict must be orthoplastic in nature. |

| | THE OUTCOME OF TREATING FRAGILITY FEMUR FRACTURES USING A POLYAXIAL LOCKING PLATING SYSTEM |
|---|---|
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| | Addenbrookes Hospital, Cambridge |
| **CO AUTHORS** | A Arora, M Bence, J Owen, V Khanduja, |
| **PRESENTER** | Zeiad Alshameeri |

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| **OBJECTIVES** | The incidence of fragility fractures of the femur is increasing and their treatment can be challenging because of low bone quality and frailty of patients. Polyaxial plating systems are increasingly used in the managements of these fractures however there is very little in the literature about the outcome of using these plates in this setting. These systems offer wide screw trajectories whilst at the same time retain the advantageous properties of locking plates. The aim of this study is to report on our experience of using the polyaxial locking plating system for the treatment of different femur fragility fractures. |
| **METHODS** | Retrospective review of a prospectively collected data on all femur fractures treated with polyaxial plating system at our unit. We only included fragility fractures in the elderly that were sustained by a fall from a standing height. |
| **RESULTS** | 50 cases fulfilled our criteria with a mean age of 78 years. One case of non-union occurred in a fracture that had previously been treated with intramedullary nail but failed to unite. The time to union was shorter in the distal femur periarticulr fragility fractures ($p<0.001$) with a mean delay of 14.5 weeks compared to 20 and 31 weeks in TKR (total knee replacement) and THR (total hip replacement) periprosthetic fragility fractures respectively. Half of those patients who were mobilising independently returned to their previous level; of mobility. One case of deep wound infection required surgical debridement and another case treated with antibiotics. The one-year mortality rate was 16% (n=8) including one patient who passed away as an in-patient. There was no a plate failure or screws pull outs at the end of follow up. |
| **CONCLUSIONS** | High union rate was achieved with the Polyaxial plating system in our cohort of femur fragility fractures with no plate failure which compares well with uniaxial plates and other fixation modalities for theses difficult fractures. |

| | COMPLICATIONS OF VOLAR LOCKING PLATE FIXATION OF DISTAL RADIUS FRACTURES: A CONSECUTIVE SERIES OF 165 PATIENTS |
|---|---|
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| **CO AUTHORS** | George Greenfield, Sami Hassan, Girish Swamy, Amol Tambe, Tim Cresswell, Marius Espag, David Clark |
| **PRESENTER** | Amy Firth |

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| **OBJECTIVES** | The incidence of distal radius fractures is increasing and open reduction internal fixation using a volar locking plate is now a common procedure. Currently there are few large series examining the complications from locking plate fixation of distal radius fractures. Published complication rates vary greatly from 9.8% to 36%, with a need for larger studies. We therefore undertook a review of all patients treated with a volar locking plate in our unit, with complications as a specific outcome. |
| **METHODS** | We identified 1852 adult patients who were treated for wrist fractures over a 2 year period. 165 required treatment with a volar locking plate. Clinical and radiological review was undertaken. All patients were reviewed until satisfactory outcome, with follow up ranging from 3 months to 3 years. |
| **RESULTS** | 165 patients were identified (mean age 57.3, 1:4 M:F ratio). The overall complication rate was 11.5%. The commonest complication was removal of metalwork (6.1%); indications included patient factors, tendon irritation and malposition of distal pegs. There were 2 tendon ruptures (1.2%), 2 infections (1.2%), 2 cases of carpal tunnel syndrome (1.2%) and 1 case underwent revision for further stabilisation (0.6%). We found our complication rates to be comparable to the rates reported in the literature. Locking plates provided stable fracture fixation. The main avoidable complication was malposition of metalwork at the time of fixation. |
| **CONCLUSIONS** | This series provides assurance that our complication rates from locking plate fixation are in line with the lowest complication rates reported. This study aids surgeons to effectively and accurately counsel patients when treating distal radial fractures. |

| | IS POST-OPERATIVE IMMOBILISATION WITH PLASTER CASTS FOLLOWING VOLAR LOCKING PLATING IN DISTAL RADIUS FRACTURES BENEFICIAL? |
|---|---|
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| **CO AUTHORS** | Alistair Eyre-Brook<br>Stephen Bostock |
| **PRESENTER** | Alistair Eyre-Brook |

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| **OBJECTIVES** | The use of volar locking plates in distal radial fractures is becoming more common. The opinion of the surgeons at our unit is that post-operative immobilisation is not beneficial. In fact this will normally lead to increased stiffness in the early rehabilitation period. We aim to investigate the clinical outcome of our patients who were treated with this regime. |
| **METHODS** | All distal radius fractures that were fixed with volar locking plates were identified over a 6 month period at a major trauma centre. These were obtained retrospectively through the operating theatre management system. Basic demographics were recorded and cross-referenced using digital clinical records regarding post-operative regimes, follow-ups and complications. |
| **RESULTS** | A total of 106 distal radius volar locking plate operations were identified. Of which 4 were excluded (re-patriated out of area, 3x associated carpal fractures). Of the 102 patients, 22 (22%) patients had plaster cast immobilisation. Of the 80 patients, 15 (19%) reported complications (5x nerve symptoms, 3x CRPS, 2x delayed union, 2x fracture collapse, 2x inadequate fixation, 1x protruding screw). 5 patients (6%) required further surgery (3x removal of metalwork, 1x revision, 1x carpal tunnel decompression). In contrast the 22 patients that had cast immobilisation 4 (18%) had complications (3x nerve symptoms, 1x ulna mal-union affecting movement). 1 patient (5%) is awaiting further surgery. Of those in plaster cast 12 were removed at 2 weeks and the remainder within 6 weeks. There are 37 (46%) intra-articular fractures in the non-cast group, compared with 13 (60%) in the cast group. |
| **CONCLUSIONS** | There was a significant number of patients that were immobilised in a cast post-operatively. Complication rates were comparable within both groups, with similar re-operation rates. Although there were equal complication rates within both groups, anecdotally we know that patients without immobilisation reach functional range of movement quicker. Interestingly, there were a higher proportion of intra-articular fractures managed with cast immobilisation post-operatively. This suggests that our surgeons deviate from the usual regime for more complicated fractures, which may require a longer period of immobilisation. We are therefore of the opinion that in general, early rehabilitation without cast immobilisation is the recommended management, and plaster cast should only be reserved for patients with complex or unstable fracture patterns. |

| | SEMI-EXTENDED INTRAMEDULLARY NAILING OF DISTAL TIBIAL FRACTURES REDUCES OPERATIVE TIME WITH NO DIFFERENCE IN OUTCOME |
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| **PRESENTER** | Mehta Nisarg |

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| **OBJECTIVES** | Semi-extended intramedullary nailing of distal tibial fractures via a supra-patellar approach is a relatively new technique. Proponents cite ease of the procedure and potential to reduce mal-alignment. Methods to obtain intraoperative reduction prior to nailing metaphyseal fractures include modified external fixators, femoral distractors and commercial reduction tools. The Staffordshire Orthopaedic Reduction Machine (STORM) (Intelligent Orthopaedics, Staffordshire) is an intra-operative device that helps reduce and maintain reduction prior to definitive fixation. The aim of this study was to assess whether STORM assisted reduction reduces mal-alignment in patients undergoing semi-extended nailing for distal tibial fractures. |
| **METHODS** | A case-control study was conducted in 20 patients who had STORM assisted reduction of distal tibial fractures prior to intramedullary nailing and 20 controls without STORM. The control group was matched for age, sex, fracture type (AO/OTA), ASA and gender. All patients had an Intramedullary nail using the semi-extended system. Primary outcome measures were coronal and sagittal mal-alignment. Five degrees of mal-alignment in the coronal and sagittal plane were considered significant. Secondary outcome measure was unplanned return to theatre for complications. Statistical analysis was performed using GraphPad Prism Version 6 (GraphPad Software Inc. California, USA). Fisher's exact test was used for independent categorical data and Mann–U Whitney for continuous nonparametric data. |
| **RESULTS** | There was no clinically significant mal-alignment in both groups in the coronal & sagittal planes. Mal-alignment in the coronal plane was 0.35 degrees (0.6-1.6) in the STORM group and 2.6 degrees (1.6-3.3) in the control group. Mal-alignment in the sagittal plane was 0.94 degrees (0.41-1.5) in the STORM group and 1.7 degrees (0.22-3.2) in the control. There was no significant difference in time to union in both groups [175 Days (113-228) STORM; 192 days (165-269) Control, p=0.311). Both groups had equal number of patients requiring unplanned return to theatre (p=1.0). There were 3 cases of non-union in the control group all of whom had exchange nailing however, this was not statistically significant (p=0.23). The STORM group was associated with a significantly increased operative time (p=0.02, 120mins vs 90mins). |
| **CONCLUSIONS** | Intraoperative use of STORM significantly increases operative time with no difference in outcome. The superior orthogonal views and manual control obtained during semi-extended nailing via a supra-patellar approach obviate the need for additional methods of intraoperative reduction for this fracture group. |

| | THE HIGHLY PROLIFERATIVE MESENCHYMAL STEM CELL FRACTION: A NOVEL SUBPOPULATION |
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| **CO AUTHORS** | Karen Henshaw, Peter V Giannoudis |
| **PRESENTER** | Ippokratis Pountos |

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| **OBJECTIVES** | MSCs cultures are characterized by morphological and functional heterogeneity with cells of variable self-renewal and differentiation capacities. The aim of this study was to analyse whether MSC subpopulations exist and if so to assess the potential of the cells to proliferate and differentiate. |
| **METHODS** | 10 consecutive fit and healthy adult patients suffering from lower extremity long bone fracture were recruited following ethics committee approval. There were 6 males and 4 females with mean age of 39 (range 19 to 64). Mesenchymal Stem Cells (MSCs) were isolated with enzymatic digestion or gradient centrifugation. The resulted MSC population was divided in 4 subpopulations using FACS cell sorting and a fluorescent dye. Whole un-sorted MSC populations were used as controls. Functional assays were performed in the ensued populations; MSCs proliferation was studied with the CFU-F and XTT assay and osteogenesis was assessed using the alkaline phosphatase activity and calcium production. Levels of osteoprotegerin within the growing osteoblasts and cellular production of PGE-2, VEGF and IGF in culture supernatant were also quantified utilising commercially available ELISA's. Gene expression on 84 different molecules was also performed. |
| **RESULTS** | Subpopulations within MSC yields exist. The MSCs low on the fluorescent dye exhibited a 2.7-fold increase in the proliferation rates when compared to the controls ($p<0.001$). The alkaline phosphatase activity during the 7th day of osteogenic differentiation was statistically significantly increased by 60% ($p<0.05$) in the MSCs low on the dye and the total calcium production at day 21 was increased by 92%, ($p<0.05$). We failed to identify any statistically significant difference in the levels of OPG, PGE-2 and IGF between the groups. However, VEGF production was statistically significantly increased in the MSC subpopulation low on the fluorescent dye, ($p<0.05$). Genetic expression highlighted significant differences between the groups. |
| **CONCLUSIONS** | MSC cultures are heterogenous and subpopulations with different mitogenic and osteogenic potential exist. The presented technique can be utilized to isolate a distinct MSCs subpopulation with high mitogenic and osteogenic potential. This could be the outcome of an inherent up-regulated endogenous production of key growth factors. |

| | THE ROLE OF INTRAMEDULLARY FIXATION IN ANKLE FRACTURES – A SYSTEMATIC REVIEW |
|---|---|
| **MAIN AUTHOR** | Robert Jordan |
| | University Hospitals Coventry & Warwickshire |
| **CO AUTHORS** | Christopher Wilding, Parag Raval, Adnan Saithna, Anna Chapman |
| **PRESENTER** | Christopher Wilding |

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| **OBJECTIVES** | To perform a systematic review of the literature to analyse the use of both fibula nails and talo-tibial-calcaneal (TTC) implants in the management of fragility ankle fractures. |
| **METHODS** | We conducted a systematic review of the literature using the online databases Medline and EMBASE on 26th December 2015. Only studies assessing ankle fractures that were treated with either an intramedullary fibula nail or TTC implant were included. Studies must have reported complications, patient mobility status or a functional outcome measure. Studies were excluded if the intramedullary device utilised was an adjunct to plate fixation or where a variety of surgical treatments were included in the study. The included studies were appraised with respect to a validated quality assessment scale. |
| **RESULTS** | Our search strategy produced 350 studies although only 17 studies met inclusion criteria; ten assessed a fibula nail and seven assessed a standard hindfoot nail, a TTC implant. 15 studies were case series, the overall quality of the studies was low and only one randomised controlled trial was reviewed. The mean Olerud and Molander Ankle Score for fibula nail studies ranged from 58 to 97 and the complication rate from 0 to 22%. Two comparative studies reported a statistically significant increase in complication rate with plate fixation but similar functional outcomes. Studies assessing TTC implants reported a mean Olerud and Molander Ankle Score of 50 to 62 and complication rate from 18 to 22.6%. |
| **CONCLUSIONS** | The studies reviewed suggest that fibula nails may be capable of producing similar functional outcomes with lower rates of complications to plate fixation. TTC implants produce lower functional outcomes but this may be acceptable in a subgroup of patients at high risk or with reduced pre-injury mobility. However, the low quality of evidence reviewed, the variation in patients included, implant used and outcome scores measured restricts the ability to draw definitive conclusions. Further comparative studies are required to explore the role of these implants further. |

| | SEVERE ACUTE LOWER LIMB TRAUMA IN ELDERLY PATIENTS TREATED WITH CIRCULAR ILIZAROV FRAME. THE CHERTSEY EXPERIENCE |
|---|---|
| **MAIN AUTHOR** | Efthymios Iliopoulos |
| | Rowley Bristow Unit, Ashford and St Peter's Hospitals NHS Foundation Trust |
| **CO AUTHORS** | Natasha Morrissey, Seok Cho, Arshad Khaleel |
| **PRESENTER** | Efthymios Iliopoulos |

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| **OBJECTIVES** | Severe acute lower limb trauma remains a challenge for the orthopaedic surgeons. The use of circular Ilizarov frame in such conditions could be a reasonable option, but is still not well established in the literature for elderly patients. The purpose of this study was to demonstrate the outcome after severe acute lower limb trauma in elderly patients, who were treated with circular Ilizarov frame. |
| **METHODS** | Data from all elderly patients (aged over 65 years), treated with an Ilizarov circular frame for severe acute lower limb trauma, between January 2002 and December 2014, was collected. Clinical, radiological and quality of life questionnaire (SF-12) data, mortality, complication and revision data were also collected. |
| **RESULTS** | During this period we treated 37 elderly patients with Ilizarov circular frame at a mean of age 70.8 years. Indications were tibia plateau fractures (Schatzker IV-V-VI) (49%), pilon fractures (24.3%) and miscellaneous complex lower limb fractures (27%). Mean time in the frame was 163.6 ±71.9 days. Mortality and complication rates were low (2.7-5.4%) at a mean follow-up 4.1 years. There was no case of new induced septic arthritis or deep infection. Physical and Mental components of SF-12 questionnaire returned to normal for that age group (42.9 and 50.9 respectively). There was no difference between the subgroups concerning the physical and mental subjective (PCS and MCS SF-12 component) outcomes ($p>0.05$). There was no significant correlation between age and subjective outcomes, neither between time of follow-up and subjective outcomes. |
| **CONCLUSIONS** | Severe acute lower limb trauma in elderly patients can be treated safely and reliably with Ilizarov circular frame with good quality of life results. |

| | COMBAT HINDFOOT FRACTURES IN UK MILITARY 2003-2014: IS SALVAGE FEASIBLE? |
|---|---|
| **MAIN AUTHOR** | Philippa M. Bennett |
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| **CO AUTHORS** | Tom Stevenson, Ian D. Sargeant, Alistair Mountain, Jowan G. Penn Barwell |
| **PRESENTER** | Philippa M. Bennett |


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| **OBJECTIVES** | This retrospective study aims to characterise the pattern of hindfoot injuries sustained by UK military casualties in the recent conflicts of Iraq and Afghanistan. By determining the early amputation and infection rates, the work aims to identify factors associated with poor early outcome, and examine the technical feasibility of salvaging these severe injuries. |
| **METHODS** | The UK Joint Theatre Trauma Registry (JTTR) is an electronic database that prospectively gathers data on all military casualties sustained overseas. The database was searched for British casualties sustaining a hindfoot fracture from Iraq and Afghanistan between 2003-2014. Patients managed with a primary amputation within the first three surgical episodes were excluded. Only fractures of the calcaneus and talus in UK survivors were included for analysis.<br>Statistical analysis was performed with the Chi-squared test and the creation of a binomial logistic regression analysis. The threshold for significance was set at 0.05. |
| **RESULTS** | During the study period 114 patients sustained 134 hindfoot injuries. The calcaneus was fractured in 116 cases (87%): 54 (47%) were managed conservatively, 32 (28%) with k-wire fixation and 30 (26%) underwent internal fixation. Eighteen-month follow-up was available for 92 patients (81%) and 114 hindfeet (85%). Nineteen patients (17%) required trans-tibial amputation in this time, with a further 17 (15%) requiring non-amputation revision surgery. Deep infection requiring surgical treatment occurred in 13 cases: *Staphylococcus aureus* was the commonest infective organism (46%). Deep infection was strongly associated with operative fracture management (p=0.0022). When controlling for multiple variables, the presence of deep infection was significantly associated with a requirement for amputation at 18 months (p=0.001). There was no association between open fractures and requirement for amputation at 18 months (p=0.926), nor was k-wire fixation (p=0.814) or open reduction, internal fixation (p=0.228) associated with amputation requirement in the study period. |
| **CONCLUSIONS** | Deep infection was the sole variable significantly associated with requirement for amputation at 18 months. Thirty-six fractures (32%) required unplanned revision surgery within the first 18 months following salvage of which 19 (53%) involved amputation. These results suggest that attempts at salvaging these injuries are at the limits of orthopaedic technical feasibility. |

| | IS ROUTINE ANKLE SYNDESMOSIS SCREW REMOVAL REQUIRED? |
|---|---|
| **MAIN AUTHOR** | Thomas Hunter |
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| **CO AUTHORS** | Catriona Heaver, Ashique Ali |
| **PRESENTER** | Thomas Hunter |

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| **OBJECTIVES** | There is much debate surrounding the topic of whether ankle syndesmosis screws should be removed of left in situ. There is a large amount of published evidence to suggest that no routine removal is required. The purpose of this study was to assess how our hospital manages syndesmosis fixation and whether any complications occur from removal or non-removal. |
| **METHODS** | We retrospectively identified all ankle fractures that underwent surgical fixation over a two-year period. Radiographs were then reviewed to further identify which patients underwent syndesmotic fixation. Patient case notes were then accessed to ascertain how these were managed and if any complications occurred. |
| **RESULTS** | 56 patients were identified as having a syndesmotic fixation over a two-year period with a minimum follow up time of six months. Two patients were lost to follow up. 31 patients had routine removal of the syndesmosis screws and the remainder had the screws left in situ. Screw breakage was found in seven patients and there were no documented complications in any patient where the fixation was left in situ. Six (19%) patients who underwent screw removal suffered wound infections that required antibiotics and all went on to heal fully. |
| **CONCLUSIONS** | There is much debate on whether or not syndesmosis screws should be routinely removed. There is good evidence in the literature to suggest that they can be safely left in situ. They may often go on to eventually break but this rarely causes any problems. On the other hand, surgical removal of the screws does have an associated morbidity and this was echoed by a relatively large infection rate seen in our patient series. We did not see any complications arise from leaving the syndesmosis screws in situ. Our study has shown that syndesmosis screws can be safely left in situ and do not require routine removal. |

| | THE WEEKEND EFFECT: A RETROSPECTIVE CROSS SECTIONAL STUDY REPORTING 30-DAY MORTALITY RATES OF FRACTURE NECK OF FEMUR PATIENTS, STRATIFIED BY DAY OF ADMISSION TO A LEVEL ONE TRAUMA CENTRE |
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| **MAIN AUTHOR** | Jack Pullan |
| | University of Birmingham |
| **CO AUTHORS** | Rajpal Nandra, Khalid Baloch, Keith Porter |
| **PRESENTER** | Jack Pullan |

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| **OBJECTIVES** | The delivery of emergency care in the U.K. is under intense scrutiny, following recent evidence suggesting poorer patient outcomes and higher rates of mortality if admitted at the weekend. Fracture neck of femur (NOF) patients are a high risk patient group, requiring multidisciplinary input and complex care pathways. Despite financially incentivised multi-disciplinary standards for care delivery, 30-day mortality rate in fracture NOF patients is 7.5%. Fracture NOF patients therefore provide a fitting population to evaluate short-term survival as proxy for comparing weekday vs weekend service provision. We investigated weekday and weekend admission 30-day mortality rates. |
| **METHODS** | A retrospective cross-sectional study using a prospectively maintained database, included 2061 consecutive patients admitted between April 2010 and April 2015 with fracture NOF (mean age 82.5 years, 1462 (70.9%) female and 999 (48.7%) intracapsular fractures). Data extracted included patient factors, fracture configuration and interventional variables. Univariate correlation to 30-day mortality was estimated to identify credible variables to include in multivariate analysis. Multivariate analysis was performed using a binomial logistic regression model, allowing investigation of the relationship between each variable and 30-day mortality. Statistical analysis was performed using SPSS. |
| **RESULTS** | Overall 30-day mortality was 10.1%. There was no significant difference in 30-day mortality of patients admitted on a weekday compared to patients admitted at the weekend (10.2 vs 9.7%; OR 0.94; 95% CI 0.67 to 1.32; p=0.74). Multivariate analysis suggests that increased mortality risk associated with female gender, increasing age, pre-existing comorbidities, cognitive impairment and increased time to surgery. |
| **CONCLUSIONS** | We did not observe a 'weekend effect' in fracture NOF patients. There was no independent difference in weekday and weekend admission 30-day mortality, when admitted to a level one trauma centre providing on call junior doctor cover and consultant led service. This reflects appropriate service provision and robust care pathways, providing effective seven day care. |

| | HINDFOOT FRACTURES IN UK COMBAT CASUALTIES: MEDIUM-TERM PATIENT REPORTED OUTCOMES |
|---|---|
| **MAIN AUTHOR** | Philippa M. Bennett |
| | Institute of Naval Medicine |
| **CO AUTHORS** | Tom Stevenson, Ian D. Sargeant, Alistair Mountain, Jowan G. Penn Barwell |
| **PRESENTER** | Tom Stevenson |

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| **OBJECTIVES** | It is unclear whether military casualties with hindfoot fractures have an improved outcome with salvage or trans-tibial amputation. This study aims to measure the functional scores associated with each outcome before determining which injury features are predictive of eventual recovery following a battlefield hindfoot fracture. |
| **METHODS** | The UK Joint Theatre Trauma Registry (JTTR) was searched for British casualties sustaining a hindfoot fracture from Iraq and Afghanistan between 2003-2014. Patients were interviewed by telephone and questioned about their recovery and whether they had undergone amputation. All respondents underwent SF-12 quality of life outcome scoring: in addition, those who had retained their limb completed American Association of Orthopaedic Surgeons Foot and Ankle (AAOS F&A) scoring out of 100. Multiple regression analysis was developed to examine the association between features identifiable at time of injury and AAOS F&A of those retaining their limbs. |
| **RESULTS** | In 12 years of conflict in Iraq/Afghanistan there were 134 fractures in 114 patients. Telephone follow-up was available for 90 (90/134, 67%) fractures, with median follow-up of 5-years. Twenty-eight limbs (28/90, 31%) had undergone trans-tibial amputation. In limb retaining patients, three variables were identified from the analysis as strongly associated with a negative effect on recovery as measured by AAOS F&A score: coexisting plafond fracture (minus 10.5 points; p=0.03), concurrent talus and calcaneal fracture (minus 12.9 points; p=0.026) and negative Bohler's Angle on initial radiograph (minus 16.1 points; p=0.008). The presence of 2 of these 3 variables at time of injury was associated with a significantly lower AAOS F&A score (p=0.0021). The physical component scores of SF-12 in casualties whose injuries had 2 of the 3 identified variables significantly lower than the amputee cohort (medians: 35 vs. 51, p=0.0001). |
| **CONCLUSIONS** | These findings raise the possibility that severe hindfoot injuries which will go on to an outcome worse than that likely to be achieved with a trans-tibial amputation can be identified at time of initial management. This provides surgeons making those decisions with medium term follow up data to counsel patients and can help determine which patients may benefit from the treatment route of attempted limb salvage versus those with a predicted poor outcome that may benefit from early amputation rather than be exposed to the long term morbidity of multiple surgical procedures and a poor functional outcome. |

| | ANKLE FRACTURE MANAGEMENT AND NICE (NG38) |
|---|---|
| **MAIN AUTHOR** | Duncan Cundall-Curry |
| | Ipswich Hospital |
| **CO AUTHORS** | R Cope, C Jackson, F James, E Ribey, A Tsyben, S Imam |
| **PRESENTER** | Duncan Cundall-Curry / Anastasia Tsyben |

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| **OBJECTIVES** | A review of practice in a busy District General Hospital against the new NICE guidelines for trauma (NG38) and a review of the evidence base |
| **METHODS** | A retrospective review of over 300 ankle fractures managed operatively. Data from hospital administrative databases, electronic patient records, the Picture Archiving & Communication System and medical databases cross referenced. |
| **RESULTS** | 307 Patients, 54 Exclusions. Population 253. Mean day to surgery 2 (range 0-15), mean post-operative bed days 4 (range 0-60), mean total bed days 5. Mode classification AO B2. Classification was not statistically significant in delay to surgery, total number of bed days or complication rate. Delay to surgery greater than 48hrs showed a significant increase in total bed days (p=0.05). Complication (n=18) for infection, DVT and wound breakdown 8.5% for surgery within 48hrs and 5.7% for surgery after 48hrs. |
| **CONCLUSIONS** | The majority of patients would meet the new guidelines. Our data supports the conclusion in NG38 that surgery within 48hrs reduces bed days however does not support the reduction in post operative complications in this cohort |

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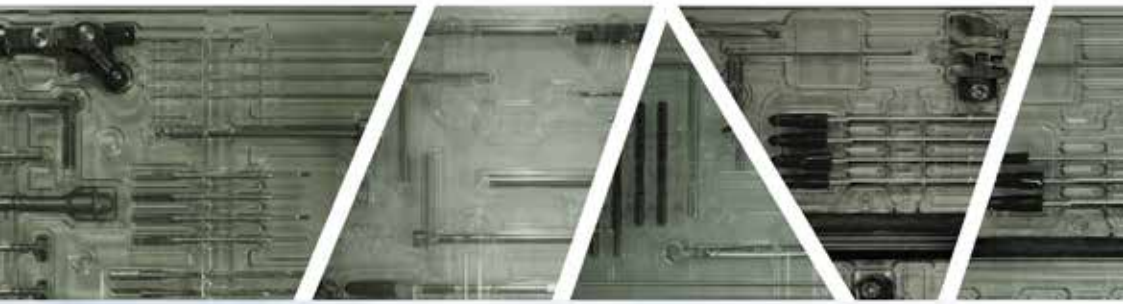

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| | TRAUMATIC POSTERIOR DISLOCATION OF THE HIP WITH A PERTROCHANTERIC FRACTURE. |
|---|---|
| **MAIN AUTHOR** | Manoj Puthiya Veettil |
| | University Hospital Southampton NHS Trust |
| **CO AUTHORS** | Mr Mazin Fageir<br>Miss Sukhdeep Gill |
| **PRESENTER** | Manoj Puthiya Veettil |

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| **OBJECTIVES** | Hip dislocations are generally caused by high energy injuries. There may be an associated ipsilateral knee ligamentous injuries or dislocation may be part of a major trauma. They are very rarely associated with femoral neck fractures. Only very few cases have been reported in the literature where a per trochanteric fracture is associated with a posterior hip dislocation. Closed reduction of the dislocation is virtually impossible in most situations. |
| **METHODS** | We present the case of a 31 years old man involved in a road traffic accident sustaining a multi fragmentary per trochanteric fracture with an ipsilateral posterior hip dislocation. At the time of presentation he was haemodynamically stable and was neurovascularly intact. He was taken to operating theatre urgently. An attempt of closed reduction was failed. There fore open relocation of the femoral head was performed with the patient in supine position. A standard incision for a cephalomedulary nailing was used. A corkscrew was used to assist the relocation with one hand palpating the femoral head, which was lying under the gluteus maximus muscle. Hip joint found to be stable after relocation. |
| **RESULTS** | We found this as a good technique in reducing the dislocation with no further risk to sciatic nerve. Repeated attempts of failed closed relocation may injure the sciatic nerve as the femoral head may have button holed through the capsule as in this case. We stabilized the per trochanteric fracture with a cephalomedullary nail. |
| **CONCLUSIONS** | There are extremely few reported cases describing this type of fracture dislocation and their management. It can be a surgical challenge with possibility of iatrogenic injury to the major neurovascular structures. Attempted open reduction may further damage the blood supply to the femoral head. There fore we recommend a good surgical planning before taking the patient to operating theatre. |

| | PLASTER CAST SATISFACTION AND AGE GROUPS |
|---|---|
| **MAIN AUTHOR** | Zen Yong |
| | Wythenshawe Hospital |
| **CO AUTHORS** | Martyn Lovell |
| **PRESENTER** | Zen Yong |

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| **OBJECTIVES** | This study aimed to evaluate the satisfaction of patients having worn and experienced cast treatment after the cast removal. The proposed idea was that patients with ages 51 and above will have a higher satisfaction rate compared to the ages of 50 and below, that is they are perhaps less demanding and the presence of a cast would interfere less with their activities. |
| **METHODS** | Patients were selectively chosen as long as they were above the age of 18, a questionnaire was filled in, 42 patients were recruited. Questions involving comfort of cast in the past week, feeling of cast when first applied, tightness and weight of cast, whether there was any itching, smell, hot and sweaty feeling were asked and analysed. |
| **RESULTS** | There was a generally high satisfaction rate. There is a higher satisfaction level of patients who are using synthetic (fibreglass) compared to patients who are using Plaster of Paris(POP) as their cast. There was no difference between the age groups as to the satisfaction level. |
| **CONCLUSIONS** | This audit shows that patients regardless of age are actually satisfied with the cast treatment they are receiving in the fracture clinic though it also shows that using synthetic casts shows a higher level of satisfaction in comparison with POP. |

| | CORRELATION OF PRE-OPERATIVE ANAEMIA WITH PROLONGED LENGTH OF STAY FOR PATIENTS WITH NECK OF FEMUR FRACTURE |
|---|---|
| **MAIN AUTHOR** | Efthymios Iliopoulos |
| | Rowley Bristow Unit, Ashford and St Peter's Hospitals NHS Foundation Trust, Chertsey, United Kingdom |
| **CO AUTHORS** | Hazel Watters, Arshad Khaleel |
| **PRESENTER** | Efthymios Iliopoulos |

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| **OBJECTIVES** | The incidence of neck of femur (NOF) fractures in elderly patients is increasing as the population continues to age. The aim of this study was to evaluate the impact of pre-operative anaemia on mortality and length of stay of these patients. |
| **METHODS** | All patients who were admitted to our hospital between January and October 2015 following a neck of femur fracture were included. We recorded demographic and hospitalisation data from patients' files. Haemoglobin levels at admission and transfusion data were also collected. |
| **RESULTS** | 336 patients were included, 72.3% were female. Patients who needed transfusion during their hospitalisation had significantly lower Hb at admission ($p=0.044$). More specifically patients who had Hb<110 at admission were more likely to need transfusion ($p<0.001$). Length of hospital stay of patients who needed transfusion was significantly longer ($p<0.05$). |
| **CONCLUSIONS** | In our effort to deliver best care to our patients, we should consider transfusing patients with NOF who have low Hb at admission (Hb<110) pre- or peri- operatively. This may help reduce length of hospital admission. |

| | CHANGE IN POSTOPERATIVE SERUM HAEMOGLOBIN IN NECK OF FEMUR FRACTURE PATIENTS |
|---|---|
| **MAIN AUTHOR** | Usman N Bhatty |
| | University Hospital South Manchester NHS FT<br>Manchester, England |
| **CO AUTHORS** | L Garwood<br>Martyn Lovell |
| **PRESENTER** | Usman N Bhatty |

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| **OBJECTIVES** | To determine whether there is a difference in drop of HB (serum haemoglobin) between patients undergoing total hip arthroplasty and hemiarthroplasty in displaced neck of femur fracture patients. |
| **METHODS** | Retrospective study of 92 patients admitted between 2011 and 2015 to a single major trauma centre with displaced neck of femur fracture patients. HB within 48 hours of surgery and post operative HB within 72 hours of surgery were recorded. Patients matched for THR (total hip replacement) guidelines as per NICE (National Institute of Clinical Excellence). |
| **RESULTS** | 46 THR and 46 HA (hemiarthroplasty) patients were captured. Pre-op mean HB in HA group was 130.2 g/L (grams/Litre) and in THR group 130.4 g/L. Post-op mean HB in HA group was 107.8 g/L and in THR group 102.3 g/L. Mean change in HA group was 22.4 g/L and in THR group 28.1 g/L. This difference was statistically significant ($p<0.05$). |
| **CONCLUSIONS** | Current NICE guidelines determining which patients with intracapsular displaced neck of femur fractures should undergo THR are deficient in detail. HB is not taken into account and may add a greater morbidity burden on already frail patients. Post-operative anaemia is associated with delays in rehabilitation and reduced mobility. Thus further detail must be added to NICE guidelines for determining which patients should undergo THR, or each patient assessed on a case to case basis. Furthermore current literature would suggest better functional outcomes following THR as compared to HA. However this study shows a greater drop in HB in THR patients and therefore one would expect reduced mobility in this group. This is in contravention to current literature. Further research is necessary to fully clarify the association between HB and rehabilitation. |

| | OPERATING ON HIP FRACTURE PATIENTS WITHIN 12 HOURS DOES NOT AFFECT IN HOSPITAL MORTALITY OR LENGTH OF STAY |
|---|---|
| **MAIN AUTHOR** | Natasha Morrissey |
| | Rowley Bristow Unit, Ashford and St Peter's Hospitals NHS Foundation Trust, Chertsey, United Kingdom |
| **CO AUTHORS** | Efthymios Iliopoulos, Ahmad Wais Osmani, Kevin Newman |
| **PRESENTER** | Natasha Morrissey |

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| **OBJECTIVES** | We sought to determine if there was a relationship between early surgery and mortality and length of stay |
| **METHODS** | This was a retrospective population based study of patients with hip fractures aged over 60 years of age that were admitted to St Peters Hospital between 2011 and 2015. We collected information including demographics, ASA grade, type of fracture, type of operation, time to surgery, in hospital mortality and length of stay. |
| **RESULTS** | Total 1913 patients were admitted during this period. Mean age was 83.9 years ±8.3 (range 60-105 years) with 73.7% being women. 30-day mortality was 6.1% and the mean length of stay was 13 ±11.3 days for the acute hospital and 20.2 ±17.2 days for the trust. Operations were performed at a mean of 23.83 ±14.8 hours after admission to A&E.<br>In our monovariant and multivariant analysis timing of surgery before 12 hours did not have a significant impact on mortality or length of stay. Age, gender, ASA grade and type of fracture were independent predictors of either mortality or length of stay. Timing of surgery had a significant effect on mortality but this only reached significance at 24 hours. |
| **CONCLUSIONS** | Our study did not find any significant relationship between early surgery and in hospital mortality and length of stay. This outcome contributes to the on-going debate between those advocating ultra early surgery or merely timely surgery within 36 hours. |

| | HOW DO THE PATIENTS WALK AFTER SEVERE FRACTURES OF LOWER LIMB JOINTS |
|---|---|
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| | Rowley Bristow Unit, Ashford and St Peter's Hospitals NHS Foundation Trust, Chertsey, United Kingdom |
| **CO AUTHORS** | Arshad Khaleel |
| **PRESENTER** | Efthymios Iliopoulos |

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| **OBJECTIVES** | Severe lower limb trauma has a great impact on the patients' lives, but in what extend is not clear yet in the literature. The purpose of this study was to investigate the gait alternations after treatment of patients who had severe lower limb injuries. |
| **METHODS** | We have evaluated the gait of patients who were treated with circular Ilizarov frame after severe lower limb trauma in our department. The gait was tested by using a force plate in a walking platform. Ground Reaction Forces (GRF) data were collected during level walking at self-selected speeds. The patients performed two walking tasks for each limb and the collected data were averaged for each limb. Demographic, clinical, radiological and quality of life questionnaire (SF-12) data were also collected. |
| **RESULTS** | We have analysed the gait through the GRF of twelve patients (aged 54.5 ±19.7 years), who had undergone treatment with circular Ilizarov frame following severe lower limb trauma (seven for pilon fractures and five for tibia plateau fractures -Schatzker IV-VI). Six were male and six were female. The tests were performed at an average of 9.3 months after the initial treatment. SF-12 Mental scores have returned to normal (mean 55.2 ±13.3) but physical scores remained impaired (mean 42.3 ±9.8).<br>Although the patients reached higher ground reaction forces with their normal limb during walking and the maximum force was noted earlier in the gait circle in the affected limb, these differences do not reach significance. In the contrary terminal stance phase was significantly prolonged on the affected limb. There was a tendency of forefoot striking in the normal limb comparing the affected one but this difference did not reach significance. |
| **CONCLUSIONS** | Nine months after severe lower limb trauma treated with circular Ilizarov frame the patients manage to return to almost normal gait pattern. Although minimum impairments may be explained from ankle or knee stiffness which is still present at that time point. |

| | CONSENT FORMS FOR DHS AND HIP HEMIARTHROPLASTIES |
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| **CO AUTHORS** | Alex Taylor, Jemma Rooker |
| **PRESENTER** | Selina Graham |

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| **OBJECTIVES** | The Royal United Hospital Bath is a busy district general hospital admitting on average 535 patients with neck of femur fractures per year. The admitting and operating teams are often different therefore accuracy and consistency of the consenting process are important. The British Orthopaedic Association provides consent guidelines for both hip hemiarthroplasty and dynamic hip screw (DHS).<br><br>This is a completed cycle audit comparing current consenting practise for hip fractures to these guidelines. |
| **METHODS** | We audited 20 consecutive consent forms for both hip hemiarthroplasty and DHS. |
| **RESULTS** | The average compliance for hip hemiarthroplasty was 76% and for DHS it was 57.5%. Following an education process and first cycle re-audit there was no significant improvement. We therefore introduced a standardised complications sticker to be used on all hip fracture consent forms. Further audit demonstrated compliance with the BOA guidelines improved to 100%. |
| **CONCLUSIONS** | In this audit education alone was not sufficient to improve practise. This may be due to changes in junior staff and cross-cover by general surgical trainees. Complication stickers are a robust and reliable way to ensure clear and consistent consenting for hip fracture patients which complies with the guidelines. There is a large amount of information on the complication stickers therefore we have also introduced a patient information leaflet. |

| | CAN ASA SCORE PREDICT THE DESTINATION OF TOTAL HIP REPLACEMENT PATIENTS DISCHARGED FROM A TRAUMA UNIT? |
|---|---|
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| **OBJECTIVES** | To determine if the pre-operative ASA (American Society of Anesthesiologists) score can predict the destination of patients discharged from a regional trauma unit following THR (Total Hip Replacement) surgery for hip fracture. In a busy trauma unit, patient flow must be maintained to ensure adequate bed space for new admissions. Early identification of patients requiring a prolonged period of inpatient rehabilitation permits early referral and discharge to alternative units. |
| **METHODS** | Patients undergoing THR for hip fracture over a 2-year period in a regional trauma unit (March 14–Feb 16) were identified retrospectively and destination from hospital recorded. Destination was matched to pre-operative ASA score. The number of days from operation to discharge was calculated. |
| **RESULTS** | A total of 113 patients were identified. 112 of these patients were living at home prior to admission with 1 admitted from a residential home. There were 20 males and 93 females. The majority of these patients were ASA-2 (68) and ASA-3 (39). Only 6 patients were ASA-1 and of these, 4(67%) were discharged home and 2(33%) to a rehabilitation unit. Of ASA-2 patients, 48 were discharged home (71%) and 20 to a rehabilitation unit (29%). Of ASA-3 patients, 18 were discharged home (46%) and 21 to a rehabilitation unit (54%). The average number of days from operation to discharge home in the ASA-2 group was 6.5 and in the ASA-3 group, 9.4. Time to discharge for rehabilitation was similar in both groups (5.7 Vs 6.6 days). |
| **CONCLUSIONS** | The greatest proportion of patients undergoing THR for hip fracture were ASA-2 and these patients were more likely to be discharged to home compared to ASA-3 patients (71% Vs 46%) ($p<0.05$). ASA-2 patients had a shorter time to discharge home (6.5 days) compared to their ASA-3 counterparts (9.4 days). Both groups had a similar time to discharge for inpatient rehabilitation. A high ASA score appears to be a predictor of requirement for inpatient rehabilitation. This finding will help to facilitate early transfer from our Trauma Unit. Patients with a high ASA score will be prioritised for early assessment by the multi-disciplinary team post-operatively, and referred for rehabilitation if appropriate. At present, our region has no agreed tariff for post-operative rehabilitation following hip replacement. Implementation by the Department of Health of a tariff payment system may encourage early patient transfer to rehabilitation units. |

| | PELVIC CIRCUMFERENTIAL COMPRESSION DEVICE POSITIONING – A REGIONAL TRAUMA |
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| **OBJECTIVES** | To assess position of PCCD in trauma patients attending University Hospitals Coventry & Warwickshire. |
| **METHODS** | Retrospective study of patients presenting as trauma calls during 6 months between 2014-2016. Scout images from trauma scans were used to determine placement, independently reviewed by two registrars with disagreement ratification. The centre of visible buckle/ buttons was used to determine centre of PCCD. |
| **RESULTS** | Of 626 patients identified, 89 had a PCCD. Of these, there were 21 females and 68 males (F:M, 1:3.24) with a mean age of 39.33 yrs (range: 11-83 yrs). 37 patients had a SAM Pelvic Sling II™ (SAM Medical Products), 37 had a TPOD® (Pyng Medical Corporation) and the remaining 15 had a Prometheus Pelvic Splint (Prometheus Medical Ltd). Overall 53 (60%) were centred, 28 (31%) were too high and 8 (9%) were too low. Of the incorrectly placed binders, 50% were SAM slings, 36% were TPODs and the remaining 14% were Prometheus. |
| **CONCLUSIONS** | 40% of the PCCDs were incorrectly placed, mostly these were too high (78%). Further education and device-specific training is needed in order to improve correct placement of these devices. |

| | THE IMPACT OF FRACTURED NECK OF FEMUR WITH AN ADDITIONAL FRACTURE ON PATIENT OUTCOMES. |
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| **PRESENTER** | Edward Jenner |

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| **OBJECTIVES** | Hip fractures in the elderly are associated with significant morbidity and mortality. Previous studies have indicated that approximately 5% of patients who sustain a fractured neck of femur also have an additional fracture. We examine the impact of having an additional fracture on morbidity and mortality. |
| **METHODS** | We retrospectively reviewed 1600 patient with neck of femur fractures from 2010-2014 and identified 70 patients with an additional fracture. We performed a case-control study to compare the outcomes of patients with a fractured neck of femur and an additional fracture to patients with an isolated neck of femur fracture. |
| **RESULTS** | The incidence of additional fracture was 4.4%. There was a higher proportion of females than males (Case 7:1 vs. Control 3:1) however the difference between groups was not significant (p=0.0518). There was no difference in mean age of the groups. There was no significant difference in mortality at discharge and one year between the two groups (discharge p=0.775, one year p=0.284). The length of stay was significantly longer in the additional fracture group (p=0.005). 72% of additional fractures were of the upper limb, with distal radius fractures being the most common. The remaining fractures included pubic rami, spine and lower limb. |
| **CONCLUSIONS** | Patients sustaining fractured neck of femur and an additional fracture have a significantly increased length of stay but no increase in mortality. We show that the majority of additional fractures are upper limb however a range of fractures are noted. Additional fractures represent a significant additional burden to healthcare services. |

| | TO INVESTIGATE WHETHER POLYTRAUMA PATIENTS (ISS>15) WITH SCAPULA FRACTURES, PRESENTING TO A MAJOR TRAUMA CENTRE, WERE AT INCREASED MORBIDITY OR MORTALITY COMPARED TO THEIR COUNTERPARTS. |
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| **PRESENTER** | Dr Aran Sivakumar |

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| **METHODS** | Polytrauma patients were identified from the local TARN database (01/04/12-31/12/14). Outcome measures included; age, ISS, AIS, predicted survivorship, mortality, admission rate to ICU and length of hospital stay. Patients with scapula fractures were compared with their counterparts without. |
| **RESULTS** | Sixty-three patients (5.6%) with scapula fractures were identified from 1124 polytrauma patients. Scapula fracture patients were of similar mean age (50, SD 22) compared to their counterparts (52, SD 24), although there was a preponderance of males (82% vs. 68%). Injury severity score was significantly higher in the scapular fracture patients (32.7, SD 12.5 vs. 25.3, SD 8.6, $p < 0.05$). Abbreviated injury scores showed increased severity of chest (3.2, SD 1.3 vs. 1.1 SD 1.64, $p<0.05$) and limb injuries (2.3, SD 0.4 vs. 0.7, SD 1.1, $p<0.05$) in patients with scapula fractures. No other significant differences were noted in the other AIS fields. Admission rates and mean length of at stay to ICU were higher and longer in scapula fracture patients (81% 9.2 days, SD10.6 vs. 54% 4 days, SD8.0, $p<0.05$) as was overall length of stay (25.1 days, SD 39.3 vs. 14 days, SD 17.4). Predicted survivorship was lower in patients with scapular fractures, although not significantly so (79.3 SD 26.6 vs. 82.1, SD 21.9, $p>0.05$) actual mortality rates were similar at 11 and 10 % respectively ($p>0.05$). |
| **CONCLUSIONS** | Polytrauma patients with scapula fractures have more severe chest, limb and total injuries than those without. Higher levels of supportive care and length of admission were observed in this group although mortality rates were unaffected. |

| | ANTIBIOTIC PROPHYLAXIS IN THE MANAGEMENT OF OPEN FRACTURES AT THE ROYAL VICTORIA INFIRMARY. |
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| **MAIN AUTHOR** | Timothy Morris |
| | Newcastle University |
| **CO AUTHORS** | Mark Webb |
| **PRESENTER** | Timothy Morris |

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| **OBJECTIVES** | To determine compliance with the BOAST4, BAPRAS and Trust guidelines with regards to the antibiotic prophylaxis in the management of open fractures. |
| **METHODS** | Data was obtained retrospectively at a Major Trauma Centre in the North East of England by reviewing written and electronic medical records. A proforma was designed and the data was analysed using Microsoft Excel. The audit was registered locally according to trust guidelines. |
| **RESULTS** | Thirty-five patients were admitted between 30 January 2014 to 24 December 2015. There were 24 males and 11 females with a mean age of 41 (range 3 to 81). All age groups were represented evenly. Ninety-seven percent (n = 34) received appropriate antibiotics initially; mainly administered within the Emergency Department (n = 23) or pre-hospital setting (n = 7). Eighty-six percent received antibiotics within the recommended 3 hours. At surgical debridement, 63% (n = 22) received appropriate antibiotics according to the BOAST4 and BAPRAS guidelines. All debridements were performed within 24 hours (mean = 8 hours 48 minutes, range = 2 – 19) At the time of definitive metalwork, 3 patients (9%) received appropriate antibiotics. Fifty-six percent received antibiotics appropriate for debridement but not fixation. Twenty-eight (80%) cases were performed with the Plastic Surgeons. Fourteen patients required soft tissue flaps, but only 7 (50%) received simultaneous orthopaedic fixation and soft tissue reconstruction. Sixty-three percent (n = 23) of patients underwent definitive fixation within 24 hours. Ten (29%) required external fixation which were applied within the recommended 24 hours. The mean time to definitive fixation was 2.42 days (range = 2 hours – 11.85 days). The mean time to soft tissue reconstruction was 4.5 days (range = 3 hours – 11.75 days). Six were performed within the recommended three days and four exceeded seven-days. One case required soft tissue reconstruction following late wound breakdown and not due to a late index procedure. Twelve patients (34%) developed a surgical complication. Four (33%) were infection and 2 of these were deep infections. Four patients required further operations: 2 developed mal/non-union and 2 developed necrotic flaps. |
| **CONCLUSIONS** | There is good compliance with guidelines for initial management. However, compliance becomes poorer at subsequent stages. The 2.5 – day discrepancy between the mean times to fixation and soft tissue reconstruction observed may contribute to the high complication rate. However, consistency between guidelines may lead to increased compliance. |

| | OSTEOCHONDRAL ALLOGRAFT RECONSTRUCTION OF THE HUMERAL HEAD REVERSE HILL SACHS LESION |
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| **PRESENTER** | Lynn Murphy |

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| **OBJECTIVES** | Posterior gleno-humeral dislocations are rare accounting for approximately 2% of all shoulder dislocations and are often associated with an anterior impression fracture of the humeral head, the “reverse Hill Sachs lesion”. Reconstruction of the humeral head using fresh frozen femoral allograft is a recognized treatment option although little is known regarding patient outcomes. Our objective was to evaluate radiological and functional outcomes in patients who underwent this procedure. |
| **METHODS** | Between 2010 and 2015 we used this method to treat 5 patients (3 males, 2 females), average age 53.4 years. All had unstable posterior shoulder dislocations with a humeral head defect of between 30% and 60%. All proceeded to a timed open reduction and femoral head allograft reconstruction via a deltopectoral approach. Fresh frozen femoral heads from the regional bone bank were used as structural osteochondral allograft to restore the articular anatomy and secured with headless compression screws. At the most recent follow up (mean 34 months) radiological and CT evaluations were performed to assess articular anatomy and graft incorporation. The Constant-Murley shoulder score was utilized to assess functional outcomes. |
| **RESULTS** | Mean time from injury to diagnosis was four days. Closed reduction under GA was attempted in all cases, one was irreducible and four were recurrently unstable. All patients showed graft incorporation on CT scan. Three patients showed full preservation of the joint, one showed graft incorporation with partial flattening of the articular graft surface and one although fully incorporated developed articular retraction of the graft. Four patients had no restriction of ADLs and three had no pain. No patient displayed instability. The patient with articular retraction has developed secondary osteoarthritis and is awaiting shoulder resurfacing as the graft is fully incorporated. Mean Constant-Murley score at latest review was 83 (45-96). |
| **CONCLUSIONS** | Reconstruction of the humeral head with fresh frozen femoral head allograft provides shoulder stability and good functional outcome scores. The allografts incorporate well, however graft retraction is a potential complication. Due to excellent graft incorporation bone preserving revision arthroplasty surgery is possible. There are only a few studies in literature that describe this procedure, due to the rarity of this injury and the local availability of quality structural allografts. Our results would support its use with good radiological and functional outcomes. Further refinement of this technique is possible with the use of templating via medical imaging software. |

| | UNCOMMON PAEDIATRIC ELBOW FRACTURES NEEDING SURGERY |
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| **PRESENTER** | Rashid Riaz |

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| **OBJECTIVES** | Supracondylar humeral fracture is the most common elbow fracture in children. Its pattern, management is well known. Our aim is to study elbow fractures other than supracondylar fractures in children. We studied elbow fractures, which needed surgery in children less than 16 years age. |
| **METHODS** | From our radiology database (PACS), we identified children who needed surgery in our institution over the past 8 years for fractures around elbow. We noted the age at presentation, type/severity of fracture, method of fixation and radiological results. We noted non-union and deformity (carrying angle) at final follow up. |
| **RESULTS** | 98 fractures other than supracondylar fractures were studied (153 Supracondylar fractures formed the largest group needing surgery. All united and were not studied in detail.)<br><br>The distribution was: fractured lateral condyle 36, Radial Neck 24, Medial Epicondyle 10, Olecranon 9, Radial head Fracture 3, inter-condylar 3, Elbow fracture-dislocation 7 and undefined 6.<br><br>Age at presentation for lateral condyle fractures was 4 to 7 years. All needed fixation (2 K-wires in majority; 23 /36).8 went to non-union and 3 had deformity (cubitus valgus needing surgical correction). 2 had been missed and had delayed fixation at 3 and 4 weeks. Both went to unite without deformity.<br><br>Age at presentation was 4 to 14 years for Radial neck fractures. 14 fractures fixed with flexible nails and 10 had MUA.<br><br>Age at presentation was 11 to 15 for Medial epicondyle fractures. All were fixed (K-wires for 6, screw for 4).<br><br>Age at presentation was 7 to 10 for 9 olecranon fractures. All healed uneventfully. 6 fractures were fixed with K-wires and 3 had MUA.<br><br>Age at presentation was 10 to 14 for 3 Radial head fracture. All were fixed with headless screw.<br><br>Age at presentation was 11 to 13 for 3 inter-condylar fractures. All needed fixation with K-wires.<br><br>7 elbow dislocations and 6 rare elbow injury (medial condyle, dislocation with lateral condyle fracture, monteggia variants, capitellum) fractures. |
| **CONCLUSIONS** | We would like to draw attention to relatively uncommon fractures in paediatric elbow. Of these injuries, lateral condyle fractures are prone for complications i.e. Non-union and deformity. A poorly treated lateral condyle fracture is likely to result in significant functional disability. This may not be evident in the early postoperative period. We also noted other uncommon fractures, which had good results. |

| | CABLE PLATE OSTEOSYNTHESIS OF VANCOUVER TYPE-B1 PERI-PROSTHETIC FEMORAL FRACTURES |
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| **PRESENTER** | Serajdin Ajnin |

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| **OBJECTIVES** | To evaluate the outcome of treatment of femoral fractures around a well fixed implant using cable plate. |
| **METHODS** | 20 patients with Vancouver type-B1 fracture treated with osteosynthesis using cable plate between (2006-2014) reviewed retrospectively.<br>12 female, 8 Male with average age of 81yrs (63-88).<br>11 fracture in cemented, 9 in uncemented stems. The average follow-up was 21 months.<br>3 patients died within 4 months. |
| **RESULTS** | 12 out of 17 patients fracture united (71%). (fractures around stem body)<br>Non-union in 4 out of 17 patients due to failure of osteosynthesis, (fractures around stem tip)<br>Implant migration in one patient.<br>All failed osteosynthesis were revised successfully using long stem prosthesis that allows immediate full weight bearing. |
| **CONCLUSIONS** | Vancouver B1 peri-prosthetic fractures should be subcategorized into fractures around body of the stem which could be treated by internal fixation without strut graft using biologic fracture fixation techniques. Meanwhile in fractures around tip of the stem Internal fixation needs augmentation with cortical onlay strut graft to minimize stress concentration.<br>However, in instances when either internal fixation or long stem revision treatment option is feasible, revision arthroplasty should be the preferred option. |

| | THE COST AND IMPACT OF ATTENDING PAEDIATRIC ORTHOPAEDIC FRACTURE CLINIC |
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| **CO AUTHORS** | Rebecca Lefroy, Albert Tang, David Sochart |
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| **OBJECTIVES** | The aim of this study was to determine the socioeconomic and educational impact of attending paediatric fracture clinic appointments by quantifying the cost incurred by parents or guardians and the amount of days of work and school lost to attend clinic. |
| **METHODS** | Patients attending clinic over a one-week period were given an optional questionnaire at the time of attendance. |
| **RESULTS** | Data was collected for 64 patients attending clinic. All patients were accompanied by parents or guardians. The average number of appointments previously attended by patients for this diagnosis was 1.84 Appointments (Standard deviation 0.98 range 1-6). This accounted for 54 days of school lost (13 full days, 40 partial days, 1 not recorded) and 31 days of work lost (5 full days, 26 partial days). 20 people lost pay due to children attending fracture clinic, 19 parents or careers lost an average of £51.68 (standard deviation 47.93, range £7.50 -£200.00). 2 patients arrived by public transport at an average cost £5.50 (standard deviation 0.71 range £5.00 - £6.00), 22 patients arrived by car or van with an average parking cost of £2.73 (standard deviation £2.41 range £0.00 - £12.00), 13 patients arrived by taxi at an average cost £6.72 (standard deviation 3.74 range £1.80 - £15.00), 2 patients reported other costs associated with attending clinic at an average of £10.00 (standard deviation 7.07 range £5.00 – £15.00). In total the average cost of attending clinic was £18.14 (standard deviation £31.26 range 0.00 – 200.00) |
| **CONCLUSIONS** | Our results demonstrate that the average cost of attending a paediatric fracture clinic appointment at our centre £18.14 with 84% of patients missing school and 40% of accompanying adults missing work. Recent studies have demonstrated the financial benefit to the NHS of reducing fracture clinic attendances with various strategies including virtual clinics and emergency department direct discharge protocols. Our results suggest that reduction in the number of paediatric fracture clinic appointments would also not only benefit parents or guardians financially, but would have an impact in reducing absence in the labour market, and educational absences |

| | THE SOCIOECONOMIC IMPACT OF ATTENDING ORTHOPEDIC FRACTURE CLINIC APOINTMENTS |
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| **OBJECTIVES** | The aim of this study was to determine the socioeconomic impact of attending fracture clinic appointments by quantifying the cost incurred by patients and relatives and the amount of work days lost to attend clinic. |
| **METHODS** | Patients attending clinic over a one-week period were given an optional questionnaire at the time of attendance. |
| **RESULTS** | Data was collected for 88 patients attending clinic. 49 patients attended alone and 39 patients were accompanied. The average number of appointments previously attended by patients for this diagnosis was 2.42 Appointments (Standard deviation 1.33 range 1-6).<br>This accounted for 36 days of work lost (16 full days and 20 partial days). Of these, 28 days of work (10 full days, 18 partial days) were missed by patients and 8 days of work (6 full days and 2 partial days) were missed by those accompanying patients to clinic.<br>20 people lost pay due to attending fracture clinic 15 patients, lost an average of £83.18 (standard deviation 85.16, range £9.00 -£350.00), and 5 people accompanying patients to clinic lost an average of £34.68 (standard deviation 19.97, range £7.00-£60.00)<br>10 patients arrived by public transport at an average cost £5.58 (standard deviation 2.13, range £3.10 - £10.00), 24 patients arrived by car or van with an average parking cost of £2.73 (standard deviation £0.90 range £2.00 - £6.00), 17 patients arrived by taxi at an average cost £7.63 (standard deviation 2.86 range £2.20 - £12.50), 3 patients reported other costs associated with attending clinic at an average of £9.67 (standard deviation 9.29 range 20.00 – 2.00). In total the average cost per patient of attending clinic was £18.88 (standard deviation 47.29 range £0.00 – £355.50) |
| **CONCLUSIONS** | Our results demonstrate that the average cost of attending a fracture clinic appointment at our centre is £18.88 with 41% of patients missing work. Recent studies have demonstrated the financial benefit to the NHS of reducing fracture clinic attendances with various strategies including virtual clinics and emergency department direct discharge protocols. Our results suggest that reduction in the number of fracture clinic appointments would also not only benefit patients financially but would have an impact in reducing absence due to sickness in the labour market. |

| | TRAFIC (TRAUMA ASSESSMENT AND FOLLOW UP WITH INCORPORATION OF MODERN COMMUNICATION DEVICES). RESULTS OF A PILOT STUDY |
|---|---|
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| **PRESENTER** | Jenny Frederina Wong |

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| **OBJECTIVES** | 7.5 million people are estimated to attend trauma and orthopaedic clinics in the UK per year. Compared to elective orthopaedics, collection of patient reported outcome measures (PROMs) in trauma clinics is relatively non-existent. This pilot study aimed to assess the feasibility of prospectively collecting PROMs using a web based APP downloaded onto tablet computers (TCs) in the trauma clinic setting. |
| **METHODS** | Following local research ethics approval, a web-based APP (TRAFIC) was developed and downloaded onto TCs. It consisted of a total of 21 questions (demographic information, employment, and rehabilitation status as well as quality of life (EQ5D)). With the aid of a medical professional, eligible patients were invited to use TRAFIC during the 'lag period' from 'booking in' to 'being called' for their appointment. Total time spent using the app (APP-time) was recorded as well as the total time spent in the outpatient department (CLINIC-time). |
| **RESULTS** | Ninety-nine patients were recruited for the study n=49 males, n=50 females. All recruited patients completed all questionnaire items with a median APP-time of 5 min. (range 2-118 min). The median 'lag' period was 16 min. (range 2-166min.), with a median CLINIC-time of 81 min (range 4 – 428min.). Recruited patients were generally receptive to this method of collecting data. |
| **CONCLUSIONS** | PROMs collection in the trauma OPD using a web based APP on TCs is feasible (APP-time falls well within the 'lag period') and well tolerated by patients. |

| | TLICS – A USEFUL SPINAL TRIAGE TOOL |
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| **CO AUTHORS** | Chris Lodge, James Tomlinson, Chantelle Mann, Jonathan Lamb, Robert Dunsmuir, Peter Millner, Abhay Rao, Almas Khan, Nigel Gummerson |
| **PRESENTER** | Chris Lodge |

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| **OBJECTIVES** | To assess the reliability and validity of TLICS in UK practice. |
| **METHODS** | Retrospective review of all spine fractures admitted in a UK major trauma centre from January 2013 to January 2014. All images were reviewed and scored using the TLICS system by three spinal surgeons. Inter-rater reliability was determined using Fleiss-Kappa values. Porposed management suggested by TLICs score was compared to actual clinical management. |
| **RESULTS** | The inter-rater $\kappa$ coefficient was 0.55 (CI 0.47-0.63) for proposed TLICS management category. This represents moderate agreement. TLICS 0-3 (nonoperative management) $\kappa$ = 0.61 (substantial agreement). TLICS 4 (surgeons choice) $\kappa$ = 0.15 (slight agreement). TLICS >4 (operative management) $\kappa$ = 0.68 (substantial agreement). 22 patients had a mean score >4 (operative management) and 17 of these had surgical stabilisation. No patients with a mean score <5 underwent surgery. There were no late procedures for failed conservative treatment. |
| **CONCLUSIONS** | TLICS had substantial agreement for TLICS >4 (operative treatment) and TLICS <4 (conservative treatment). Suggested management (as per TLICS) recommended overtreatment when compared with actual treatment in five cases. TLICS did not recommend undertreatment in any patients. Controversy remains over what constitutes 'PLC' injury, even when MRI scanning is performed. |

| | THE ECONOMIC BURDEN OF BACK PAIN |
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| **CO AUTHORS** | Mohammed Shaath; David Sochart |
| **PRESENTER** | Deeraj Loganathan |

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| **OBJECTIVES** | To identify the number of patients admitted with back pain and suspected cauda equina or other sinister causes with normal MRI scans.<br>To Calculate the total length of stay for the aforementioned patients, therefore reflecting one aspect of the economic burden on hospitals.<br>To record patient outcomes and determine the number of unnecessary admissions. |
| **METHODS** | Retrospective Cohort Study of all patient admitted to North Manchester General Hospital with Back pain between August 2015 to October 2015. Patients with confirmed cauda equina were excluded from the study. All patients were discussed with the local Spinal cord injury centre prior to admission. Data was collected from the hospital trauma tracker and inpatient hospital records. Data was collated and analysed using Microsoft excel. |
| **RESULTS** | 97% of patients with MRI scan showed no cauda equina on MRI Scan. Of these patients the mean length of stay was 3.9 days with a range of 0 to 19 days stay. The total length of stay was 125 days. 100% of patients required no urgent surgical or medical intervention. Routine follow up at a neuro spinal clinic was arranged for 34% of the patients. 12.5% of patients were transferred to spinal cord injury centre for urgent assessment. The remaining 53.5% of patient were discharged with no follow up required. |
| **CONCLUSIONS** | Back pain presents a significant economic burden to healthcare. It is essential to investigate those presenting with red flags symptoms of cauda equina syndrome, however there is no clear guidance regarding inpatient admission criteria. This results in unnecessary hospital admissions as reflected by the significant proportion of patients discharged with non-urgent intervention or follow up. An inpatient admission criteria is therefore necessary, in order to guide health care professionals and help alleviate this burden on hospital resources. |

| | REASONS FOR INCREASED LENGTH OF ADMISSIONS WITH BACK PAIN |
|---|---|
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| **OBJECTIVES** | To identify the number of patients admitted with back pain and suspected cauda equina or other sinister causes with normal MRI scans.<br>To Calculate the total length of stay for the aforementioned patients, therefore reflecting one aspect of the economic burden on hospitals.<br>To identify the number of patients with delayed discharges and factors affecting them. |
| **METHODS** | Retrospective Cohort Study of all patient admitted to North Manchester General Hospital with Back pain between August 2015 to October 2015. Patients with confirmed cauda equina were excluded from the study. All patients were discussed with the local Spinal cord injury centre prior to admission. Data was collected from the hospital trauma tracker and inpatient hospital records. Data was collated and analysed using Microsoft excel. |
| **RESULTS** | 97% of patients with MRI scan showed no cauda equina on MRI Scan. Of these patients the mean length of stay was 3.9 days with a range of 0 to 19 days stay. The total length of stay was 125 days. Only 31.3% of patients had no delays in discharge. Factors identified increasing length of stay included:<br>1) delays in MRI scan (28.1%)<br>2) pain management (18.7%)<br>3) rehabilitation (9.4%)<br>4) medical comorbidities (9.4%)<br>5) awaiting transfer to spinal center (3.1%)<br>6) |
| **CONCLUSIONS** | There are numerous factors affecting inpatient length of stay due to back pain. The most significant of these factors include delay in MRI scan and pain control. There is a need for prompt investigations and early pain management in order to reduce length of stay and provide a more efficient health care service. |

| | EFFECTIVE UTILISATION OF A PROFORMA FOR PATIENTS PRESENTING WITH A NECK OF FEMUR (NOF) FRACTURE – ANALYSIS OF A SAMPLE OF 93 PATIENTS |
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| **CO AUTHORS** | David Sochart |
| **PRESENTER** | Linda Watkins |

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| **OBJECTIVES** | Initial assessment through thorough history taking is essential to inform diagnosis and management plan. In those with a NOF fracture, a proforma is used at admission. This was revised in July 2015, consists of 17pages and is printed on-site. It prompts the admitting doctor in clerking with space for results, senior review and operation notes. Our aim was to assess the utilisation of this proforma. |
| **METHODS** | Patients admitted between 1/8/15 and 31/12/15 to North Manchester General Hospital who were >16 with a newly diagnosed NOF fracture were identified from a randomised list of admissions coded S.72 provided by the audit department. Most data was collected using electronic notes, 12 as paper notes. Data collected: demographics, mechanism of injury, co-morbidities, pre-morbid state, abbreviated mental test (AMT) score, diagnosis and management. |
| **RESULTS** | 369 admissions were coded S.72 in the 5 month period examined. 125 records were sampled. Of those excluded: 2 post-operative repatriations, 3 <16 years old, 8 femoral shaft fractures and 19 sets of notes were unavailable. 93 patients fulfilled the inclusion criteria. 63% female. 52% left-sided fractures. All 93 had the proforma with some description of the mechanism of injury and their comorbidities recorded. 92 detailed type of current residence. 48 had their baseline mobility recorded. There was variation in recording baseline mobility with metres, yards, “unrestricted” and phrases describing distances. 86 had the absence/presence/type of walking-aid documented. AMT was calculated in 91 patients. In 74 cases, the operation note of the proforma was blank. This was every case where the operation note proforma was identified, i.e. if it was present it was not completed. 3 patients had no specific operation note although other case evidence indicated they had undergone one. |
| **CONCLUSIONS** | The sample represented a third of relevant cases. The proforma is well-utilised at admission for documenting history. Perhaps changing to standardised responses from open questions would eliminate variation and increase completion of baseline mobility, evidenced by high completion of sections with tick-box responses – current residence and mobility aids. Printing 4pages extra for an unused operation note is counter-productive. The proforma can be shortened to 13pages – less paper, less ink, less scrolling when transition to electronic notes. We have demonstrated that a proforma is a well-utilised aid to ensure appropriate details are recorded for patients with a NOF fracture and reiterated the importance of re-evaluating to ensure that any proforma or pathway is useful and fit for purpose. |

| | FACTORS INFLUENCING PATIENT SATISFACTION FOLLOWING SURGICAL MANAGEMENT OF ANKLE FRACTURES |
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| **CO AUTHORS** | Khalid Hamid, Shazali Sulieman, William Eardley, Paul Baker |
| **PRESENTER** | Khalid Hamid |

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| **OBJECTIVES** | To evaluate patient experience and satisfaction following hospital admission for operative fixation of ankle fractures by:<br>1) Comparing levels of patient experience and satisfaction with non-trauma patients (elective hip and knee arthroplasty)<br>2) Identifying correctable factors associated with lower levels of patient experience and satisfaction within this group of patients |
| **METHODS** | We prospectively identified adult patients presenting to a single centre with closed ankle fractures requiring operative stabilisation. Prior to discharge all patients completed the Picker Patient Experience Questionnaire (PPE-15), satisfaction visual analogue scale (VAS: 0-10) and a demographic questionnaire determining details of presentation and management. Control PPE-15 and VAS data was collected concurrently from elective arthroplasty patients. |
| **RESULTS** | We identified 52 patients over ten months: 29 females and 23 males, with an average age of 47 years (range 17 to 86). Median pre-operative length of stay was 3 days (IQR 1 to 6).<br><br>Ankle fracture patients had significantly worse experiences than elective hip and knee arthroplasty patients ($p < 0.05$ across all 15 PPE domains). Once pre-operative length of stay exceeded 3 days, patients report more areas of concerns (6) than those waiting 3 days or less (4) ($p=0.02$). Those cancelled despite fasting reported significantly worse experiences, with VAS of 7 (versus 9 in those not cancelled [$p= 0.005$]), and median of 6 PPE-15 domains of concern (versus 3.5 [$p=0.03$]). |
| **CONCLUSIONS** | Ankle trauma patients have a poorer experience of inpatient care than elective patients, worsened by surgical cancellations or significant delays to theatre. Minimising cancellations and theatre delays, alongside timely and consistent communication throughout admission and at time of discharge are vital to optimising patient experience. |

| | DOES PATIENT EXPERIENCE OF CARE DIFFER BETWEEN ELECTIVE AND NON-ELECTIVE ORTHOPAEDIC ADMISSIONS? |
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| **PRESENTER** | Khalid Hamid |

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| **OBJECTIVES** | 1- To establish whether patient experience differs between elective and emergency orthopaedics admissions<br>2- To compare patient experience between a range of different orthopaedic subspecialties. |
| **METHODS** | This is a prospective observational study using data from an established patient experience programme. We recorded information of the experience of care from 878 adult patients admitted to the orthopaedic department of a large university hospital. For each patient the subspeciality under whose care they were admitted was recorded as either trauma (Trauma – Hip fracture; Trauma –Other) or elective( Hip and knee arthroplasty; Foot and ankle: upper limb; Spine; Other). Data were collected for a one year period using the Picker Patient Experience-15 Questionnaire (PPE-15) distributed to patients by staff nurses on the day of discharge. |
| **RESULTS** | Between March 2015 and March 2016 data was collected from a total of 878 inpatients. Speciality data was available for 505 of them. Overall, Patient's reported positive experiences of care across all subspecialities. Patient experience in the elective and non-elective groups showed great similarity in most domains, interestingly, non-elective patients had better experiences in discharge-related aspects (Q14 and Q15 of the questionnaire) than their elective counterparts ($p<0.05$). The number of problems, overall satisfaction, friends and family rating, and return to department rating were similar for elective and non-elective patients. |
| **CONCLUSIONS** | Levels of patient experience are generally high irrespective of the admitting orthopaedic speciality. While there is some minor variation between subspecialties no one speciality performed better than another. Non-elective patients experience is better in some aspects; this is probably related to the routine use of pathways of care for hip fracture patients. |

| | TIBIAL PLATEAU FRACTURE AND USE OF CALCIUM SULPHATE SUBSTITUTE |
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| **PRESENTER** | Sujit Agarwal |

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| **OBJECTIVES** | Anatomical reduction of articular fragments in tibial plateau fractures often leads to bone void and need is felt for a filler and support while the bone is regenerating. MIIG X3 is marketed as high strength injectable graft, which resorbs and remodels fast. Efficacy and complications related to the use of this bone graft substitute were evaluated in this study. |
| **METHODS** | Between January 2012- December 2015 we injected calcium sulphate (MIIGX3) in 35 out of 90 consecutive complete articular (AO type C3) tibial plateau fractures referred to our unit that were stabilised with Ilizarov ring fixator. Postoperative CT scans after a period of bearing were evaluated along with sequential radiographs, for union, graft resorption and subsidence. IOWA functional outcome score and complications were recorded. |
| **RESULTS** | The median age was 52 (Range 17-87) years. Post operative CT scans showed leak of the graft in the joint in seven patients and around the proximal tibiofibular joint in 2 patients but this disappeared spontaneously in all patients. Average time for graft resorption was 3.1 months. Union occurred in all patients. Minor subsidence was noted in almost half of these patients but IOWA knee score at final follow up was similar to the other group (n= 55) where substitute was not used. (p value > 0.05) |
| **CONCLUSIONS** | Bone graft substitutes provide effective filler for void created by intraoperative restoration of articular surface in high-energy complex complete-articular type fractures. Leak in the joint or soft tissue resorbed spontaneously in all cases without complications or need for surgical removal. Its use may also be associated with lack of significant late subsidence seen in our series. |

| | ON TABLE AND WITHIN 24 HOURS DEATH IN ORTHOPAEDIC TRAUMA PATIENTS |
|---|---|
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| **CO AUTHORS** | Javed Waqas, Toor Muhammad Usman, Javaid MMM, Barlas Khurram, Omonbude Daniel |
| **PRESENTER** | Jehan Shah |

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| **OBJECTIVES** | The purpose of this study was to identify high-risk patient groups, and high-risk procedure types for death during surgery or within 24 hours of surgery. We also looked for any surgeon or anaesthetist related factors. |
| **METHODS** | It was a retrospective study. The sample was identified from theatre records. We reviewed patient records using Operating Room Management Information System (ORMIS) and mortality data from 2009 to 2014 in a district general hospital. We identified 20 cases over five years. We collected information for demographic data, pre-operative accommodation, comorbidities, indication for surgery, procedure type, grade of operating surgeon and anaesthetist, resuscitation status and cause of death. Age range was 76- 98 years with average age was 86 years. There were 5 males and 15 females patients. |
| **RESULTS** | Patients were admitted from their own homes (50%), nursing or residential homes (45%) and from other hospitals (5%). On average, each patient had 4 comorbidities with a range from 1 to 12 comorbidities. The most common comorbidity was ischaemic heart disease followed by hypertension, heart failure, dementia and cancer. Indications for surgery included: intracapsular neck of femur fracture (11), extracapsular neck of femur fracture (5), sub-trochanteric fracture (1), shaft of femur fracture (1), infected hemiarthroplasty (1) and infected total hip replacement (1). The procedures types were: cemented hemiarthroplasty (11), dynamic hip screw (5) intramedullary nail (2) and wound washout (2). Middle grade doctors operated on 13 patients, consultants on 6 patients and associate specialist on one patient. General anaesthesia was given to 65% of patients and spinal anaesthesia was given to the rest. The grade of anaesthetist was middle grade in 13 cases and consultant in 7 cases. Four patients died during surgery while 16 of them died within 24 hours of surgery. Only two patients had Do Not Attempt Resuscitation (DNAR) forms in case notes pre-operatively. Resuscitation was attempted in 14 patients. In majority of patients (11) the cause of death was cardiac failure. Other causes were chest infection (4), myocardial infarction (3), fat embolism (1), and in 1 patient the cause was unknown. |
| **CONCLUSIONS** | We conclude that there is a combination of factors that increase the risk of death during surgery or within 24 hours of surgery in orthopaedic trauma patients. These factors may be patient related i.e. history of poor cardiac function or procedure related i.e. cemented hemiarthroplasty and IM nails. |

| | CLINICAL OUTCOMES FOLLOWING PROXIMAL HUMERUS LOCKING BLADE NAIL FIXATION (MARQUARDT) |
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| **PRESENTER** | Andrew George |

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| **OBJECTIVES** | To determine functional outcomes following proximal humerus fracture fixation using Marquardt intramedullary device as compared to traditional prosthesis |
| **METHODS** | A retrospective study was carried out including clinical and radiological assessment for patients having undergone intramedullary nail fixation for proximal humerus fracture over a 2-year period. The Oxford Shoulder Score (OSS) and SF-12 health survey questionnaire were used to determine outcome measures. Results were analysed using two-tailed Mann-Whitney U test at a significance level of 0.05. |
| **RESULTS** | A total of 80 eligible patients were identified (36 Marquardt nail fixation and 44 other device). Complete data were available for a total of 22 patients. 12 patients underwent Marquardt nail fixation with 10 patients having undergone intramedullary nail fixation other than Marquardt. The median OSS for Marquardt nail fixation was 43 (IQR 28-45) whilst median OSS for any other nail fixation was 48 (IQR 44-48). Mann-Whitney U = 31 (p=0.06). |
| **CONCLUSIONS** | Our preliminary results suggest that there is no significant difference in functional outcomes between Marquardt nail fixation compared to traditional intramedullary nail fixation devices. A larger data sample, however, will be required to determine this further. |

| | ASSESSMENT OF THE STANDARD OF SPINAL REFERRAL DOCUMENTATION IN A REGIONAL REFERRAL CENTRE. |
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| **PRESENTER** | Isman Jidaal/ Matthew Arneil |

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| **OBJECTIVES** | To evaluate the completeness of documentation of spinal referrals using the current proforma.<br>In a busy regional referral centre for spinal trauma, documentation of referral information by core surgical trainees facilitates discussion with senior members of the spinal team, the formation of a management plan and documentation of both the management plan and advice given to the referring team. The proforma is a written record of information exchanged and accuracy is essential for clinical decision making. |
| **METHODS** | A retrospective audit was performed of 50 completed spinal audit proformas, beginning in February 2016. 18 key data entry points in our current proforma were identified and each was assessed for adequacy of documentation. These include date of referral, time of injury and clinical examination findings. Each form was evaluated by two independent observers using the same criteria. |
| **RESULTS** | 49 (95%) proformas were not complete. The average proforma score was 15, with a range of 11-18. The most frequently missing data were date and time (25) and mechanism of injury (32)<br>The most frequently completed data entry was management plan (50) |
| **CONCLUSIONS** | The current spinal proforma is not completed well by medical staff. This, at worst, may lead to inappropriate spinal advice. The current proforma is generic for all orthopaedic referrals and not appropriate for spinal referrals. Given the volume of spinal referrals made to our unit, a new, dedicated spinal referral proforma will be introduced. Advice will be sought from other regional referral spinal centres to streamline this proforma. Training will be provided to our core surgical trainees and trust doctors by the spinal team to both aid and enforce the accurate and complete recording of referral information. |

| | OUTCOMES OF PERIPROSTHETIC FRACTURES OF TOTAL HIP REPLACEMENTS |
|---|---|
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| **PRESENTER** | Nisarg Mehta |

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| **OBJECTIVES** | Periprosthetic fractures of total hip arthroplasty (THA) represent a difficult treatment challenge. The aim of this study was to look at the outcomes of periprosthetic fractures of THA over a two-year period in a University Teaching Hospital |
| **METHODS** | A retrospective case notes analysis was performed. Fourty-patients sustained a periprosthetic fracture between June 2013-June 2015. Fractures were classified according to the Vancouver classification. Our primary outcome measure was complications up-to 90 days post op. |
| **RESULTS** | There were 26 females and 14 males with an average age of 80.3 (41-102) years. Thirty-six were cemented prosthesis while four were uncemented. The average time since the primary surgery was 3.24 years (95 days-14 years). There were seven B1, seventeen B2, three B3, and thirteen type C fractures. B1 and Type C fractures had surgical fixation while B2 and B3 fractures were revised. Patients had to wait an average of 5.5 days prior to obtaining surgical intervention and were discharged 21.7 days on average post operatively. Complications within 90 days was a single post-operative dislocation and two fixation failures; one traumatic, one secondary to inadequate proximal fixation. Inpatient mortality was 8.1%. |
| **CONCLUSIONS** | The Vancouver classification is a reliable guide to management of these fractures. Access to theatre for fixations was significantly quicker than in those requiring revision surgery. This however had no significant effect on post-operative LOS or patient morbidity and mortality. |

| | THE DEVELOPMENT OF A TOOL FOR ASSESSING OPERATIVE FRACTURE FIXATION |
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| **CO AUTHORS** | William James Harrison |
| **PRESENTER** | David Huw Hawkes |

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| **OBJECTIVES** | Continual assessment is a fundamental component of training. Currently however, there are no means of assessing operative fracture fixation. A tool has been developed, which is based firmly on the AO principles. The objective of this work was to test its reliability and validity. |
| **METHODS** | The assessment comprised 4 domains focusing on the different factors pertinent to operative fracture fixation. Reliability and validity was evaluated by asking 10 surgeons to score 20 test cases on different occasions at least 6 weeks apart. Internal consistency was assessed by Cronbach's alpha. Inter-rater and test-retest reliability was assessed by the inter-class correlation coefficient (ICC) and content validity by the content validity ratio (CVR). |
| **RESULTS** | Cronbach's alpha was 0.976. Total score inter-rater reliability, for a single assessor, as given by the ICC, was 0.708. Overall test-retest reliability was 0.961. The CVR was 0.65 (above the critical value for establishing validity). |
| **CONCLUSIONS** | The assessment tool demonstrates excellent internal consistency in addition to substantial single assessor and excellent test-retest reliability. The CVR illustrates the assessment is also valid. There are a number of potential applications for the assessment tool for both training and service evaluation. |

| | FRAGMENT SPECIFIC FIXATION OF INTRA-ARTICULAR DISTAL HUMERUS FRACTURES |
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| **PRESENTER** | Opara Thompson |

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| **OBJECTIVES** | To review different methods of fixation of distal humerus fractures and their effect on possible outcome |
| **METHODS** | We studied preoperative CT scans and methods of fixation of distal humerus fractures in 27 cases that had open reduction and internal fixation with bi-condylar plating.<br><br>14 cases were fixed with arch plating and 13 had perpendicular plating. Medial column was always fixed with a medial plate and lateral column was fixed with either a postero-lateral (perpendicular plating) or lateral plate (arch plating).<br><br>We identified 3 major fracture patterns of the lateral column. These are coronal plane fracture of the capitellum, saggital and axial plane fractures.<br><br>We recreated the fracture patterns in saw bones and fixed it with either technique to study the orientation of screws with respect to the fracture plane.<br><br>We discovered that, when lateral arch plating is used for coronal plane type fractures of the lateral column; this resulted in the screws being parallel to the fracture plane or within the fracture. This is potentially a sub-optimal construct and could lead to failure of fixation or loss of reduction. The use of a postero-lateral plate in this situation led to screws orthogonal to fracture plane in concordance with the basic principle of fracture fixation.<br><br>We developed an algorithm to facilitate and guide the choice of appropriate fixation technique depending on the personality of the fracture. |
| **RESULTS** | In our series 14 patients required arch plating and 13 required perpendicular plating. The average follow up is 10months with no failures to date. We observed one delayed-union but this did not affect patients overall outcome. |
| **CONCLUSIONS** | We propose fragment specific fracture fixation for distal humerus fracture. We suggest the use of preoperative CT to assess fracture type. Then apply the algorithm to facilitate choice of technique/method of fixation. We recommend postero-lateral plate for coronal plane fractures of the lateral column and the Lateral arch plating for saggital and axial fractures of the lateral column. |

| | VIRTUAL TRAUMA CLINIC EXPERIENCE AT THE BRADFORD ROYAL INFIRMARY |
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| **CO AUTHORS** | Phil Wright, Lynne Dixon |
| **PRESENTER** | Amanda King |

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| **OBJECTIVES** | The BOA is aware of the virtual trauma clinics (VTCs) introduced in Scotland and NICE have evaluated the evidence finding it insufficient to make recommendations to change BOAST 7 guidelines. Patients should be reviewed by a consultant within 72hrs directly, or by review of case notes and imaging. Our VTC was set up on 1st March and we review the first 2 months to investigate if we are meeting the 72hr target, the outcome following review and if patients are being appropriately triaged. |
| **METHODS** | Exclusion criteria include cognitive impairment, dementia or learning disabilities, inability to speak English, an injury sustained elsewhere and scaphoid fractures who should be reviewed in A&E clinic. Following A&E triage, patients are given an information leaflet about VTC and contacted by telephone to discuss the injury and outcome following review by a consultant. |
| **RESULTS** | The 72hr target was met in 74% of the 538 patients reviewed in VTC. There was 1 patient with no consultant review documented. Face to face trauma clinic review was arranged for 46%, 42% were discharged to their GP, 5% were referred to a sub-specialist, 3% had no outcome documented, 1% were for discussion at the trauma meeting and 1% were added to the trauma board for surgery. VTC follow-up was inappropriate for 2% of patients who should have been excluded and 9% should have followed the A&E scaphoid protocol. |
| **CONCLUSIONS** | Further audit following introduction of established protocols, feedback and education will determine whether the VTC service can be improved. |

| | FACTORS INFLUENCING MORTALITY IN HIGH RISK PATIENTS WITH HIP FRACTURES |
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| **PRESENTER** | Sheweidin Aziz |

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| **OBJECTIVES** | Our objective in this study was to identify factors influencing mortality at 30 days and 1 year in our unit over a 2 year period in high risk patients (ASA - American Society of Anaesthesiologists grade 3 and 4). |
| **METHODS** | Retrospective analysis of high risk patients admitted with hip fractures to our unit in the period from June 2012 to June 2014 inclusive. All patients identified were included in the data analysis. ASA grades 3 and 4 comprised a total of 1,181 patients. Data including ASA grade, gender, age, fracture type, management option, anaesthetic choice, surgical technique, survival and mortality at 30 days & 1 year were summarized, calculated and compared. Data was analysed using Microsoft Excel and GraphPad Prism Version 7.00. |
| **RESULTS** | A total of 1,181 patients were identified; 70% were women. Eighty percent of patients were above the age of 75 years with a median age of 83 years (range 18-102 years). The overall mortality rates at 30 days were 8.2% and 10.6% for ASA 3 and 4 respectively; whereas at 1 year were 28.8% and 33.5% for ASA 3 and 4 respectively ($p$=0.08 Hazard Ratio {HR} 1.195, Confidence Interval {CI} 0.97 – 1.48). Thirty-day and 1 year mortality rates for women were 5.3% and 25.8% while men had 16.7% and 39.1% for the same periods ($p$=<0.0001, HR 1.51 and CI 1.25 – 1.82). Mortality rates at 1 year for women in ASA 3 and 4 were similar at 25.8% and 25.9% respectively; men in ASA 3 group had a mortality of 36.3% and those in ASA 4 of 48.8% ($p$=<0.0001). Only 1.5% of ASA 3 patients were treated conservatively compared to 7% of ASA 4 patients. The mortality rates at 1 year for ASA 4 patients treated operatively versus those treated conservatively was 32.1% versus 75% respectively ($p$=0.0015). Type of fracture, anaesthetic choice and mode of operative management had no significant impact on mortality in our patient groups. |
| **CONCLUSIONS** | Our study revealed that there is a significant difference between high risk patients treated operatively versus those treated conservatively. Surgically managed high risk patients have higher survival rates at 1 year. Although women have a higher incidence of hip fractures it is men and those over the age of 75 years that are less likely to survive. There is no difference between ASA 3 and ASA 4 patients. |

| | COMPLICATIONS AND RADIOLOGICAL OUTCOMES OF PHILOS PLATE FIXATION FOR PROXIMAL HUMERAL FRACTURES: A UNIVERSITY HOSPITAL EXPERIENCE |
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| **CO AUTHORS** | Sam Chan, Annanth Ebinesan, Matthew Smith, Inigo Guisasola, Matthew Kent |
| **PRESENTER** | Ayman Gabr |

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| **OBJECTIVES** | The aim was to assess complication rates associated with the use of Proximal Humeral Internal Locking System (PHILOS®) plate in the management of proximal humeral fractures. Radiographic assessment of all fracture fixations was also performed to identify predictive criteria for failure of internal fixation. |
| **METHODS** | We performed a retrospective review for all patients who underwent open reduction and internal fixation with PHILOS plate for proximal humeral fractures at our institution between October 2009 and December 2015. A total of 164 patients (51 male and 113 female) were included in this study with an average age of 58 (range 16 - 85). Electronic patients hospital records were reviewed along with their shoulder radiographs. Radiographic assessment for plain x-rays include measuring neck shaft angle at time of fixation and at final follow up, quality of reduction, greater tuberosity (GT) displacement and distance from the top of the plate to the GT. |
| **RESULTS** | According to Neer's classification, 28 patients had two-part, 91 three-part and 45 four-part fractures. Average time from injury to surgery was 12 days. Mean follow up time was 326 days. Twenty-three patients (14%) had complications during the follow-up period. Twelve patients (7%) required removal of the plate due to pain related to the metal work. Loosening or perforation of screws was reported in five patients (3%). Three patients developed AVN, of whom two required reverse polarity shoulder replacement. Two patients had arthrscopic subacromial decompression for impingement. Adhesive capsulitis, nonunion, infection and peri-implant fracture were distinctively reported in one patient each. On radiographic assessment, the average neck shaft angle was 131 degrees while it was 126 on final follow up. The commonest risk factor for reduced neck shaft angle at final follow up was varus malalignment of the fracture. About 30% of varus malaigned proximal humeral fractures have shown loss of 25 degrees in the neck shaft angle at final follow up compared to immediate postoperative x-rays. |
| **CONCLUSIONS** | Open reduction and internal fixation of proximal humeral fractures with the PHILOS plate was associated with good clinical outcomes. The complication rates were similar to what have been reported previously in the literature. Proximal humeral fractures with varus malalignment have a higher risk for loss of reduction and failure of plate osteosynthesis. Patient selection is the key for optimizing outcomes in surgical management of proximal humeral fractures. |

| | ARE POST-OPERATIVE RADIOGRAPHS A USEFUL CLINICAL TOOL FOLLOWING VOLAR LOCKING PLATING IN DISTAL RADIUS FRACTURES? |
|---|---|
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| **CO AUTHORS** | Alistair Eyre-Brook, Stephen Bostock |
| **PRESENTER** | Alistair Eyre-Brook |

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| **OBJECTIVES** | The use of volar locking plates in distal radial fractures is becoming more common. However, there are no agreed follow-up regime recommended and practice of obtaining post-operative radiographs at follow-up varies. We aim to investigate the relevance of post-operative radiographs at first clinic follow-up at 4-6 weeks as this is our current follow-up policy. |
| **METHODS** | All distal radius fractures that were fixed with volar locking plates were identified over a 3months period at a major trauma centre. These were obtained retrospectively through the operating theatre management system. Basic demographics are recorded and cross-referenced with radiographic images in pre-/ intra-/ and post-operative settings. Further data was compiled through digital clinic records regarding follow-ups and complications. |
| **RESULTS** | A total of 60 distal radius volar locking plate operations were identified. Of which 2 were excluded (revision surgery, periprosthetic fracture). Of the 58 patients, 43 patients had post-operative radiographs. Of the 15 patients that did not have post-op x-rays, 6 were because of lost to follow-up and 9 did not adhere to follow-up protocol. 14 out of 43 (33%) of the x-rays performed were not of a satisfactory standard. This is mainly because of a poor lateral joint line view which prevent identification of protruding screws. 4 out of 43 (9%) of the x-rays were deemed to have sub-optimal fixation. This only contributed to 2 out of 9 complications post-fixation (4 nerve symptoms, 2 delayed union, 1 CRPS, 1 fracture collapse, 1 failed fixation). Only 1 patient (1.7%) required further operative intervention (carpal tunnel release). |
| **CONCLUSIONS** | Although there were significant number of complications (15.5%), only 1 patient required operative treatment. However, only 4 (7%) of these complications can be recognised by an x–ray and none of these required further surgery. To that point, it has been recognised that there are poor correlation between radiographic appearance and patient symptoms or function in hand surgery. It is therefore difficult to objectively prove the benefits of performing check radiographs at 4-6weeks follow-up purely based on clinical outcomes. However, in this study we have found that only 22 patients (38%) have their intra-operative films readily available on PACS, it is therefore our opinion that performing a check radiograph is a sensible option. Ideally, intraoperative x-rays should be available on PACS and check radiographs are reserved for those experiencing clinical symptoms at follow-up. This will not only protect patients from receiving unnecessary radiation, but also improve efficiency in logistics during clinic. |

| | BROKEN LOCKING SCREW IN A NAIL – SITE MATTERS. |
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| **OBJECTIVES** | Interlocking nail fixation of long bones provides improved fracture stability. However, locking screws are liable to break in delayed or non-union. Removal of broken screws can be challenging. We describe the rationale and techniques of broken locking screws removal from a nail. |
| **METHODS** | We analysed the case records and radiographs of all femoral and tibial intramedullary locked nail removal procedures during the period 2003-2012. Of these, cases with broken locking screw identified either pre operatively or per operatively were analysed for any associations with the following factors and to create an algorithm for removal of broken screws in a nail.<br>Factors analysed: Proximal or distal locking screws, location of break in the screw (between near cortex and nail or between nail and far cortex), single or segmental screw break, association between site of screw break and the nail position or fracture alignment, early versus delayed weight bearing, techniques used to remove these screws, iatrogenic fracture or other injuries. |
| **RESULTS** | Of the 38 femoral and 59 tibial nail removals, there were in total 8 broken screws - between nail and far cortex, 13 between near cortex and nail and 3 segmental screw breakages. There were no associations between the site of screw break and any of the factors that were analysed. However, almost all the complications and difficulties occurred in screws that were broken between the nail and the near cortex and in segmental broken screws. Based on these results we designed an algorithm to decide on the technique of extracting the broken locking screw (Figure 1). |
| **CONCLUSIONS** | Implant removal is fraught with risks. Site where an interlocking screw is broken in an intramedullary nail decides optimum techniques of removal. The algorithm provided will be a valuable addition to Orthopaedic surgeons' armamentarium. |

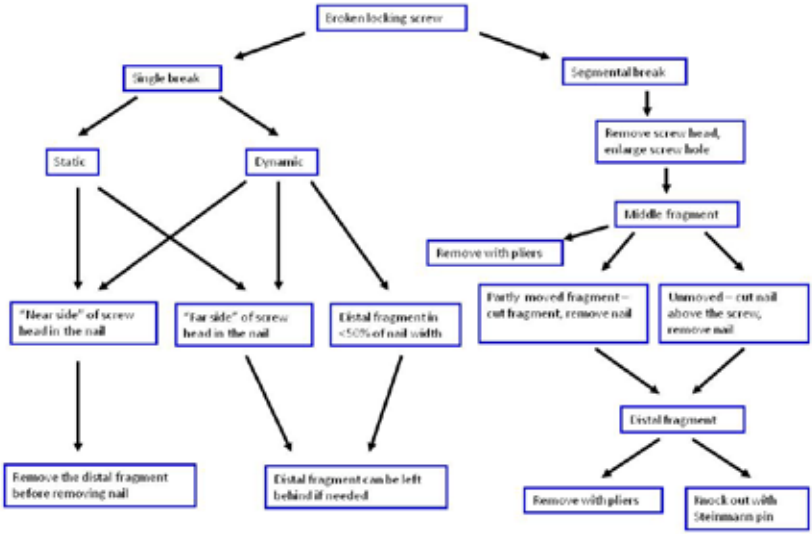


Figure 1

| | IS THERE AN OVERUSE OF NAIL FIXATION IN PERTROCHANTERIC FRATURES IN THE ELDERLY? |
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| **OBJECTIVES** | Aim of the study was to identify whether nail fixation of pertrochanteric fractures in the elderly was appropriate. National Institute for Health and Clinical Excellence (NICE) guidance (CG124) supports the use of sliding hip screw fixation (SHS). Since, there is evidence about lateral wall thickness and size of lesser trochanter playing a part in fixation stability, we further subdivided 31A2 fractures as described in the methods section. |
| **METHODS** | From January 2012 to Dec 2015, pertrochanteric fracture fixations in the elderly were identified. Exclusion criteria were multiple injuries, delayed presentation, pathological fractures, subtrochanteric fractures, previous ipsilateral femoral fractures or surgery performed as part of a surgical trial.<br>Fractures that were OTA 31A11 to 31A21 (Group A) were considered to be suitable for SHS and fractures that were OTA 31A22 to 31A33 (Group B) were considered suitable for nail.<br>Data collected included demographics, anaesthetic used, American Society of Anesthesiologists (ASA) grade, OTA classification, thin or non-thin lateral wall, lag screw entry point close to fracture line or not, implant used, iatrogenic lateral wall fracture after insertion of lag screw. Thin or non-thin lateral wall versus fracture propagation was analysed using Fischer exact test. Demographic data and ASA grade were analysed using Mann-Whitney test. |
| **RESULTS** | Of the 429 femoral nail fixations, we had 307 nails after exclusion criteria were applied. All patients had general anaesthesia. There were no significant differences in demographics or ASA grade. Using OTA classification, there were 93 fractures in Group A and 214 fractures in Group B. There were 26 fractures in Group A that were considered to have thin lateral wall or lag screw entry point close to fracture line but only in 8 integrity of lateral wall was lost through propagation of fracture. Of the fractures that did not have thin lateral wall, none had fracture propagation into lag screw hole. Fischer exact test did not show a significant difference in fracture propagation in thin lateral wall fractures($p>0.1$). All 31A21 fractures (61/93) in Group A had long nail fixation while the rest in Group A had short nail fixations. |
| **CONCLUSIONS** | Majority of Group A fractures (67/93) without thin lateral wall could have been potentially treated with a sliding hip screw system. The presence of a thin lateral wall was not a significant predictor of loss of lateral wall integrity. Hence, there seems to be an over use of nails in treating pertrochanteric low energy fractures in the elderly. |

| | RADIOGRAPHIC EQUIPOISE – DO SURGEONS DIFFER WHEN ASSESSING PELVIC RADIOGRAPHS IN HIP FRACTURE PATIENTS? |
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| **OBJECTIVES** | Recent guidance suggests that a total hip replacement (THR) should be offered to appropriate patients although none of the considerations are radiographic. However; surgeons examine radiographs prior to meeting patients and this study aims to investigate surgeon behaviour when radiographs are examined. |
| **METHODS** | Nine clinicians (three each of Consultant, registrar and core trainees (CT)) were sent a web-based questionnaire showing a range of intracapsular hip fracture radiographs. Each was asked whether a hemiarthroplasty or a total hip replacement (THR) was indicated based solely on an anonymised plain injury radiograph of 30 patients. Agreement over >75% was deemed a majority. The outcomes of presented cases were14 hemiarthroplasty's and 16 THR's. |
| **RESULTS** | In terms of agreement, no group reached majority agreement for THR. In contrast hemiarthroplasty achieved majority (80% agreement). CT's voted to perform THR in 30% of cases compared to 10% for Consultants and 0% for Registrar's. In terms of matching prediction with ultimate implant, CT's were 60% accurate with their predictions, Consultants 57% and Registrar's 46%. |
| **CONCLUSIONS** | There is a tendency for lack of agreement for considering THR in hip fracture care based on radiographic assessment. There is a default position of a hemiarthroplasty for this population. |

| | THE USE OF A NOVEL HEXAPOD FRAME SYSTEM FOR ACUTE AND CHRONIC TIBIAL AND FEMORAL DEFORMITY CORRECTION |
|---|---|
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| **OBJECTIVES** | The TrueLok-Hex (TL-Hex) is a relatively new hexapod frame system that has been in use at our institution since August 2013 to treat acute fractures and correct tibial and femoral deformity. We report our initial experience of 48 completed treatments with this novel system in 46 patients and discuss illustrative cases. |
| **METHODS** | For acute fracture, 30 patients (23 male, 7 female) required framing with a mean age of 43 years (range 19-80). One patient underwent bilateral framing. The tibia was involved in all cases. In two cases, the femur also required framing. Open fractures occurred in 13 cases (43.3%).<br>For elective limb reconstruction, 16 patients (14 male, two female) required framing with a mean age of 35 years (range 16-67). One patient underwent bilateral framing. The tibia was involved in all but one case, which affected the femur. Surgical indications included congenital deformity in four cases, malunion in eight cases, non-union in three cases and chronic infection in two cases. |
| **RESULTS** | For acute fractures, the mean frame time was 164 days (range 63-560) and all but one fracture achieved union. Complications included pin, wire or strut failure requiring adjustment (three patients) and pin site infection (six patients). Three patients are being considered for residual deformity correction or treatment of non-union.<br>In the elective limb reconstruction group, mean frame time was 220 days (range 140-462). All treatments successfully achieved deformity correction and bone union. Complications included two pin site infections. There was no evidence of recurrence of infection in the two osteomyelitis cases. |
| **CONCLUSIONS** | In conclusion, the TL Hex frame system appears to be a safe and reliable tool for limb reconstruction. We have observed acceptable frame times, low complication rates and almost 100% bony union. |

| | FLEXIBLE NAILING OF FEMORAL FRACTURE IN ADULT WITH SPINA BIFIDA – LESSONS LEARNED |
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| **OBJECTIVES** | Educate trauma surgeons on lessons learned from our experience using a novel approach to managing a challenging fracture. |
| **METHODS** | Case study on an adult patient with Spina Bifida who presented with a femoral fracture treated with Flexible Nails, good initial results but ultimately required revision surgery. |
| **RESULTS** | Pre-operative considerations discussed. Imaging from initial and revision surgery. Lessons learned presented including technical experience from theatre and patient outcome. |
| **CONCLUSIONS** | Flexible nails show potential as an alternative to plating or standard intramedullary nailing of femoral fractures in this technically challenging and high risk group of patients. Although this case was not successful valuable lessons were learned. |

| | AN INTENSIVE REHABILITATION PROGRAMME FOR PEOPLE WITH COMPLEX MUSCULOSKELETAL INJURY AFTER MAJOR TRAUMA |
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| **OBJECTIVES** | The aim of the project was to provide an intensive rehabilitation programme for people over 16 years old who sustained complex musculoskeletal injuries (CMSK) following major trauma.<br>Objectives:<br>1) To research existing rehabilitation services within the South West London & Surrey Trauma Network (SWLSTN)<br>2) To establish an intensive multidisciplinary rehabilitation programme<br>3) To enable people with CMSK injuries to reach their maximum potential in terms of mobility, activities of daily living, and participation in work, education, and leisure.<br>4) To complete a service evaluation to report patient satisfaction and outcomes.<br>5) |
| **METHODS** | The evidence shows that an intensive multidisciplinary rehabilitation programme is recommended to facilitate return to work, improve outcomes and reduce complications. Such service models existed within the SWLSTN but were exclusive to amputee and neurorehabilitation. In particular, there is the well-established rehabilitation service for amputee and prosthetic rehabilitation at Queen Mary's Hospital, Roehampton (QMH).<br>QMH service was approached to participate in this pilot project. The clinical team felt they had the right skills and experience to trial CMSK patients alongside their inpatient and outpatient amputee and prosthetic rehabilitation programmes. A referral pathway and service specification was drawn up and commissioner (CCG) approval sort. Potential patients came from a wide geographical area (London, Surrey and Kent) so it was agreed CCG funding would be approved on case by case basis.<br>Patients were identified by the treating therapists on the major trauma and orthopaedics wards. The patients were referred but did not commence the programme until cleared for full weight bearing at their consultant orthopaedic clinic appointment. The intensive rehabilitation programme lasted 2-4 weeks dependent on the individual's needs and goals. The first patient attended the programme in October 2014. A telephone survey was completed 18-months after this date to assess patient experience and outcomes. |
| **RESULTS** | QMH pathway has proven to be successful. Good patient feedback has been received. Approximately 15 patients have used the service since October 2014. The survey is nearly complete with information on patient experience and outcomes, including return to work and leisure activities. Once analysed these results will be added to the poster. |
| **CONCLUSIONS** | The QMH pathway has improved the experience and outcomes of people who sustained CMSK injury following major trauma. During the pilot period, the service has only been available to one patient per month. The SWLSTN is exploring options to increase access to CMSK rehabilitation in consultation with commissioners. |

| | PREDICTING MORTALITY IN PATIENTS UNDERGOING A HEMIARTHROPLASTY FOR A FRACTURED NECK OF FEMUR |
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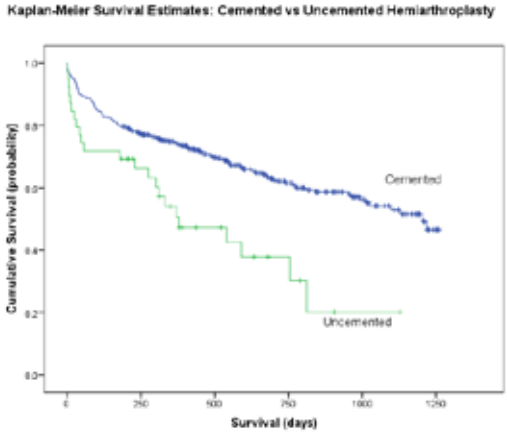
| **OBJECTIVES** | Hip fractures are a major challenge to trauma services. Bone cement implantation syndrome is widely accepted to present a risk to this elderly population. Consequently uncemented prostheses are often used if the patient is medially unwell. However, a proportion of patients have been noted to survive for a significant period following an uncemented hemiarthroplasty. This leads to the question was it this the right approach in this cohort? The aim of this work was to study the factors that influence survival following hemiarthroplasty and use logistic regression to identify any predictive variables for survival in those patients undergoing an uncemented procedure. |
| **METHODS** | A retrospective analysis of all hemiarthroplasties undertaken at a University Hospital during a 2 year period between 10/01/13 and 31/12/15 was performed. Hospital records were reviewed to gather data on the following variables: age, gender, residence prior to admission, pre-operative mobility, admission Hb, type of surgery, time to first mobilisation, presence of a pressure sore or indwelling catheter, abbreviated mini-mental score and mortality. Statistical analysis was undertaken in SPSS and included Kaplan-Meier survival estimates and logistic regression. |
| **RESULTS** | The review included 457 cases. 91% of patient underwent a cemented hemiarthroplasty and 9% an uncemented. Survival was significantly greater in those undergoing a cemented as compared to an uncemented procedure with a mean survival time 500 days vs 843 days respectively (p=<0.001) (see figure). Survival was significantly better in those admitted from their own home as compared to an institution (p=<0.001), those patients who mobilised on the first post-operative day (p<0.001) and those that did not have an indwelling catheter (p=0.001). Considering survival at 300 days post-uncemented hemiarthroplasty a logistic regression model identified a predictive effect for pre-admission residence, ASA grade, pre-operative AMT and the presence of a pressure sore and urinary catheter (82.1% of cases correctly identified). |
| **CONCLUSIONS** | Fractured neck of femur surgery presents a challenge and carries a high complication rate, particularly in medically unwell patients. Uncemented procedures are often undertaken if there is concern due to cardiopulmonary comorbidities. However, there is a cohort of patients with an uncemented stem surviving for a prolonged period. This study has identified a number of variables that can predict survival past 300 days post an uncemented procedure. It is advocated that this could act as a useful guide to surgeons and anaesthetist alike when faced with these difficult management dilemmas. |



| | OUTCOME OF INTRODUCING VIRTUAL FRACTURE CLINIC ON UPPER LIMB FRACTURES |
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| **OBJECTIVES** | Our hospital has implemented a virtual fracture clinic enabling orthopaedic consultants to assess new patients within 24 hours as per the NICE guidance. Our aim was to evaluate the impact of this service on upper limb surgical workload in terms of time of primary surgical procedure from injury prior to and following the introduction of the virtual clinic in our trust. |
| **METHODS** | Design – A retrospective study was conducted comparing patients referred to fracture clinic with upper limb fractures, prior to and following the introduction of the virtual fracture clinic in our trust. Data was collected comprising four months (April, May 2015 and September, October 2015) around the introduction of the virtual fracture clinic.<br>Participants- There was 139 patients (including 70 patients in the pre virtual clinic and 69 patients following introduction of the virtual clinic). Our inclusion criteria were adult and paediatric patients sustaining upper limb injuries. Exclusions included old fractures requiring further surgical management, planned metalwork removal cases and holiday period to justify local static population case influx only.<br>Outcome measure- three parameters were compared including time from injury to review in clinic, time from clinic to surgery, and lastly time from injury to first surgical procedure. |
| **RESULTS** | Result – When the two periods were compared there was reduction in time to surgery (median time 10 days in pre-virtual clinic group as 8 days in post virtual clinic group), which was statistically not significant (asymptomatic significance 0.327). The time from injury to clinic had decreased following the introduction of the virtual clinic (median time 8 days in pre-virtual clinic group as compared to median time 1 day in post virtual clinic group). This was found to be statistically significant (asymptomatic significance 0.000). An increased time for clinic to surgery was observed in second group (median time 2 days in pre-virtual clinic group as compared to median time 6 days in post virtual clinic group, asymptomatic significance 0.123) thus statistically insignificant. The most common reason was unavailability of subspecialty surgeon to undertake the procedure. |
| **CONCLUSIONS** | Conclusion-We can conclude that from our experience, the virtual clinic has had a positive impact on the treatment of patients. We were able to identify fractures requiring operative intervention early and plan appropriate surgery. |

| | IS THE DELTOID TUBEROSITY INDEX A PREDICTIVE INDICATOR OF FAILURE OF PROXIMAL HUMERUS FRACTURE FIXATION? |
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| **CO AUTHORS** | Michael Smith, Peter Kenyon, Matthew Nixon, Mark Webb |
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| **OBJECTIVES** | Predicting failure of proximal humerus fracture fixation is a complex, multifactorial process. The Deltoid Tuberosity Index (DTI) has been proposed as a radiographic tool to assess local bone quality in proximal humerus fractures. We have calculated the DTI in patients who underwent proximal humerus fracture fixation and determined its role as an adjunct to predict outcome of screw cut-out and non-union. |
| **METHODS** | We retrospectively reviewed the radiographs of 76 patients who underwent fixation of proximal humerus fractures over a 5-year period. Exclusion criteria included fractures involving the deltoid tuberosity, open fractures and ORIF with screw fixation alone. DTI was measured by the two leading authors on two separate occasions using the AP radiograph taken pre-operative to diagnose the fracture. DTI was measured immediately proximal to the deltoid tuberosity where the cortices become parallel and calculated by dividing outer cortical diameter by inner cortical diameter. A recommended DTI threshold of $\leq$1.44 was used to indicate low BMD. All patients were followed-up to union and fixation failure was classified as screw cut-out in AP and lateral radiographs. |
| **RESULTS** | Fifty-two (68%) patients were female with a median age of 63.6 years (range 25-88 years). Sixteen (21%) patients had Neer 2 part fractures, thirty-five (46%) had 3 part fractures and twenty-five (32%) four part fractures. Thirty-six (47%) patients had an established diagnosis of bone mineral density deficiency and osteoporosis confirmed by Dual-energy X-ray Absorptiometry (DEXA) scan. All patients underwent ORIF with pre-contoured, anatomical locking plate fixation with sixty-two (82%) patients having the operation performed by a consultant grade surgeon and the remainder by a supervised registrar. The average duration of follow-up was 375 days (range 83-1779), 7 patients (8%) died during the follow-up period. Nine (12%) patients failed to unite and six (9%) patients had metalwork failure. Three (4%) patients had both non-union and metalwork failure. The median DTI of all patients was 1.43 (range 1.18-1.90), non-union patients 1.47 (range 1.29-1.59) and 1.40 in the screw cut-out group (range 1.22-1.75). All patients that suffered screw cut-out had osteoporosis, compared to two thirds of the non-union group. |
| **CONCLUSIONS** | We can further substantiate that a low DTI is associated with proximal humerus fractures. Our data also correlates a low DTI with screw cut-out but not failure to unite. We therefore concur with current evidence that DTI is an easily reproducible measurement that correlates with increased risk of fixation failure when low. |

| | HOW TO PREVENT A NEVER EVENT IN JOINT ARTHROPLASTY: SURGICAL PLACEMENT OF THE WRONG IMPLANT |
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| **OBJECTIVES** | Implant related errors are a commonly encountered problem in trauma & orthopaedic surgery. Such errors can result in serious patient harm as well as the need to discard implants that were opened in error. As such they have been categorised as 'never events' and included in the 2015/16 'Never event list' produced by NHS England.<br><br>A recent report from an Orthopaedic Department in a busy UK center described that in a 3-month period 3 wrongly sized metallic femoral heads were implanted into patients and that these errors where only noticed when patient data was being inputted into the national joint registry (NJR).<br><br>The objective of our project was to reduce chance of errors in the communication chain from when the surgeon decides which type and size prosthesis should be used during arthroplasty to when that prosthesis is selected from the hospital stores and implanted. |
| **METHODS** | We developed a proforma for use during elective and trauma arthroplasty to record the type, size and side of implant as requested by the lead surgeon intraoperatively as well as to document that it had been independently checked by the runner, scrub nurse and lead surgeon in turn. |
| **RESULTS** | During a 3-month period the proforma was used in 30 hip and knee arthroplasties at the unit. There were no cases of an incorrect prosthesis being opened during a procedure and no cases of a wrong prosthesis being implanted and subsequently found to be incorrect during data entry into the NJR, as has been noted to be a method for identifying errors from the literature. |
| **CONCLUSIONS** | This was a simple intervention which required no additional resources and as such no additional expenditure. It was simple to implement with little to no addition to the operative time whilst providing a potential way to help prevent a never event which could prove to be extremely expensive if it were to ever occur. |

| | OUTCOME OF EXTENSILE APPROACH TO FIXATION OF TIBIAL PLAFOND FRACTURES. |
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| **OBJECTIVES** | A variety of anterolateral, medial and posterior approaches have been described based on the ease of fracture reduction and internal fixation. Some of the incisions are fracture specific, i.e., planned for a limited approach to the pilon. But in more complex cases, a wider exposure is indicated to expose both coronal and sagittal columns, can be valuable. The extensile approach is indicated for the group of fractures that result in a complete separation of the 2 columns of the tibia from the metaphysis or diaphysis. We evaluated this approach in 5 consecutive patients that had at least 2-column injury |
| **METHODS** | We describe the outcome of 5 cases of pilon fractures that were treated with ORIF by using the extensile approach. All patients had two column (sagittal and anterior coronal) fractures. All patients underwent 2 procedures with first being application of external fixator followed by a CT scan. A second procedure was then carried out using the external fixator as a distractor and completing the ORIF.<br><br>The approach starts 10mm lateral to the anterior border of tibia proceeding vertically down to the ankle and then angling at 110 deg medially to finish about 10mm distal to the medial malleolus. These patients were evaluated for wound complications, bony union as on radiographs and range of movement. |
| **RESULTS** | All 5 patients the wound healed without any issues. All patients had functional range of movement. There were no cases of non-union or mal-union. |
| **CONCLUSIONS** | Up until recently, there was no single incision described that permitted simultaneous exposure of the sagittal and coronal column fractures.<br><br>We have found the extensile approach provides complete access to both medial and lateral columns through a single incision. It offers the advantage of plate placement medial, anterolateral without the concerns of wound closure for two/ three incisions. This incision should be used judicially in selected pilon fractures. |

| | AUDIT OF THE TIME TAKEN FOR A NEW PATIENT WITH A NECK OF FEMUR FRACTURE TO BE FIRST SEEN BY A DOCTOR IN THE HIP FRACTURE WARD IN A MAJOR TRAUMA CENTRE |
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| **OBJECTIVES** | To evaluate the efficiency of the hip fracture integrated pathway through measuring patients' waiting times and compare against hospital standards |
| **METHODS** | This was a prospective observation which was conducted in the hip fracture ward in a large university hospital. As per hospital policy, hip fracture patients must be fast tracked to the hip fracture ward within 2 hours from A&E arrival time and seen within 2 hours from ward admission by a junior orthopaedic doctor. A&E admission time, ward admission time and the time the first patient contact with a junior orthopaedics doctor were recorded from hospital records and compared against hospital standards. Patients were grouped into 3 categories according to the time of A&E admission: weekdays (WD), weeknights (WN) and weekends (WE). |
| **RESULTS** | Over a period of 4 months data was collected from 73 patients. Out of the 3 patients' groups, WE patients showed the longest waiting time from hip fracture ward arrival until being assessed by a junior orthopaedic doctor (median waiting time is 203 minutes, IQR: 121.5-299.5 compared to 83 and 81 minutes in WD and WN respectively, p-value is: 0.002); the results also shows a statistically significant difference in patients' groups who are waiting for more than two hours (p-value 0.004). No statistically significant difference between groups in A&E to ward time. |
| **CONCLUSIONS** | newly admitted patients wait to hip fracture wards over the weekend wait longer before being first seen by an orthopaedic doctor in the ward; while no difference in waiting time between groups in A&E. |

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