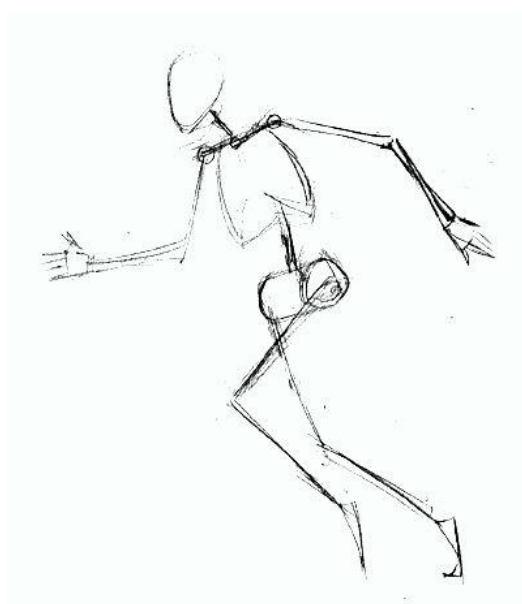


# Trauma & Orthopaedics

## Evidence Update



## February 2018 (Quarterly)

Respecting everyone  
Embracing change  
Recognising success  
Working together  
**Our hospitals.**



## Training Calendar 2018

### February (12.00-13.00)

1st (Thu)	Literature Searching
9th (Fri)	Critical Appraisal
12th (Mon)	Statistics
20th (Tue)	Literature Searching
28th (Wed)	Critical Appraisal

### March (13.00-14.00)

8th (Thu)	Statistics
12th (Mon)	Literature Searching
20th (Tue)	Critical Appraisal
28th (wed)	Statistics

### April (12.00-13.00)

5th (Thu)	Literature Searching
9th (Mon)	Critical Appraisal
17th (Tue)	Statistics
25th (Wed)	Literature Searching

## Your Outreach Librarian: Jo Hooper

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# Updates

**UpToDate**<sup>®</sup>

OpenAthens login required. Register here: <https://openathens.nice.org.uk/>

[Postoperative fever](#)

**Literature review current through:** Jan 2018. | **This topic last updated:** Jan 11, 2018.

[Patient positioning for surgery and anesthesia in adults](#)

**Literature review current through:** Jan 2018. | **This topic last updated:** Jan 31, 2018.

[Antimicrobial prophylaxis for prevention of surgical site infection in adults](#)

**Literature review current through:** Jan 2018. | **This topic last updated:** Feb 01, 2018.

[Medical consultation for patients with hip fracture](#)

**Literature review current through:** Jan 2018. | **This topic last updated:** Dec 12, 2017.

**NICE** National Institute for  
Health and Care Excellence

## MEDICAL DEVICE ALERT

**[Plum 360 infusion pumps – user actions required to prevent risk of interrupted infusion or delay to treatment](#)**

Source: [Medicines and Healthcare products Regulatory Agency - MHRA](#) – 15 February 2018 -  
Publisher: Medicines and Healthcare products Regulatory Agency

[British Orthopaedic Association Standards for Trauma: the management of patients with pelvic fractures](#) [PDF] Source: [British Orthopaedic Association - BOA](#) - 01 January 2018 - Publisher: British Orthopaedic Association (BOA) [Read Summary](#)

[Zimmer Biomet, specific hip and trauma instruments: risk of infection](#)

Source: [GOV UK](#) - Source: [Medicines and Healthcare products Regulatory Agency - MHRA](#) - 15 February 2018 - Publisher: Medicines and Healthcare products Regulatory Agency [Read Summary](#)

[Potential Sex Bias Exists in Orthopaedic Basic Science and Translational Research](#) Source: [PubMed](#) - 17 January 2018 - Publisher: The Journal Of Bone And Joint Surgery. American Volume [Read Summary](#)

[Cost-utility analysis in orthopaedic trauma; what pays? A systematic review](#) Source: [PubMed](#) - 31 January 2018 - Publisher: Injury [Read Summary](#)

[Getting it right first time programme \(GIRFT\)](#) [PDF] 08 February 2018 - Publisher: NHS Providers

[Revised SPC: Pradaxa \(dabigatran\) hard capsules](#) Source: [electronic Medicines Compendium - eMC](#) - 01 February 2018 - Publisher: electronic Medicines compendium [Read Summary](#)



[Graft type for femoro-popliteal bypass surgery](#) Online Publication Date: February 2018

[One-incision versus two-incision techniques for arthroscopically assisted anterior cruciate ligament reconstruction in adults](#) Online Publication Date: December 2017

[One-incision versus two-incision techniques for arthroscopically assisted anterior cruciate ligament reconstruction in adults](#) Online Publication Date: December 2017

[Intramedullary nailing for femoral shaft fractures in adults](#) Online Publication Date: February 2018



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## Guidance & Good Practice



**BOA Policy & Position Statements**



**Consultant Advisory Book**



**Guidance Documents**



**Scaling Up**



**Private Practice**

## Support to Surgeons

- [Royal College of Surgeons of England](#)
- [NHS Confederation](#)
- [British Medical Association](#)
- [Federation of Surgical Specialty Associations](#)



**BOA Regional Adviser Map**



**Clinical Champions**



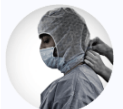
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## Journal Tables of Contents

Click on the hyperlinked journal title or image (+Ctrl) for the most recent tables of contents. If you would like any of these papers in full text then get in touch: [library@uhbristol.nhs.uk](mailto:library@uhbristol.nhs.uk)

### [Journal of Bone and Joint Surgery](#)

February 7 2018, Volume 100, Issue 3

### [Journal of Orthopaedic Trauma](#)

February 2018, Volume 32, Issue 2

### [Injury](#)

February 2018, Volume 49, Issue 1

### [Strategies in Trauma and Limb Construction](#)

November 2017, Volume 12, Issue 3 (triannual)

### [Clinical Orthopaedics and Related Research](#)

December 2017, Volume 475, Issue 12



## Recent Database Articles related to Orthopaedics

Below is a selection of articles related to orthopaedics recently added to the healthcare databases.

### **Ankle fracture controversies: Do the foot and ankle specialists have a different vision?**

**Author(s):** González-Lucena, G; Pérez-Prieto, D; López-Alcover, A; Ginés-Cespedosa, A

**Source:** Revista española de cirugía ortopédica y traumatología; 2018; vol. 62 (no. 1); p. 27-34

**Publication Type(s):** Journal Article

**Abstract:**OBJECTIVE To analyse the differences in the management of ankle fractures between orthopaedic/trauma surgeons and foot and ankle specialists. MATERIAL AND METHOD An e-mail survey was performed asking some of the country's orthopaedic surgeons controversial questions regarding the analysis of 5 clinical cases of different ankle fractures. RESULTS Seventy-two surgeons responded to the questionnaire (response rate of 24.2%): 37 foot and ankle specialists and 35 non-specialist orthopaedic surgeons. For trimalleolar fracture, 40.5% of the specialists would request a computed tomography scan compared to 14% of the non-specialists ( $P=.01$ ). Ninety-four percent of all the respondents would synthesise the posterior malleolus; 91% of the non-specialists would use an antero-posterior approach, either with a plate or with screws ( $P=.006$ ). No differences were found between groups in the treatment of syndesmotic injuries ( $P>.05$ ). For trans-syndesmotic fracture (Weber B) with signs of medial instability, 54% of the non-specialists would revise the internal lateral ligament compared to only 32% of the specialists ( $P=.06$ ). CONCLUSION The foot and ankle specialists ask for more complementary tests to diagnose ankle fractures. In turn, they use a greater diversity of surgical techniques in synthesis of the posterior malleolus (posterior plate) and the medial malleolus (cerclage wires). Finally, they indicated a lower revision rate of the internal lateral ligament.

### **Initial peri- and postoperative antibiotic treatment of infected nonunions: results from 212 consecutive patients after mean follow-up of 34 months.**

**Author(s):** Helbig, Lars; Bechberger, Maren; Aldeeri, Riyadh; Ivanova, Adriana; Haubruck, Patrick

**Source:** Therapeutics and clinical risk management; 2018; vol. 14 ; p. 59-67

**Publication Type(s):** Journal Article

Available at [Therapeutics and clinical risk management](#) - from nih.gov

**Abstract:**Purpose Infected nonunions of the long bones belong to the most feared complications in the field of orthopedic and trauma surgery. Optimal antibiotic therapy should start early with the first revision surgery. Therefore, the aim of this study was to evaluate our peri- and postoperative antibiotic regime in context with the microbial spectrum and antibiotic resistances of patients with infected nonunions and to assess the possible impact on healing rates. Methods We included all patients with first revision surgery during 2010-2015 due to nonunion of long bones with a clinical history of infection treated with radical debridement, local application of a gentamicin-impregnated bone cement, and systemic cefuroxime. Mean follow-up was 34.2 months. Data collection was performed retrospectively using a computerized databank with information about microbial species

from intraoperatively acquired tissue samples and respective antibiograms. Bone fusion rates were evaluated based on findings of the latest X-rays and computed tomography scans. Results Two hundred and twelve patients with nonunion and history of infection were selected; 171 patients had positive intraoperative microbial evidence of infection. Bacterial testing was mostly positive in fractures of the tibia (47.4%) and the femur (27.5%). Coagulase-negative Staphylococcus spp. were the most frequently detected (44.4%) followed by mixed infections (18.7%) and Staphylococcus aureus (10.5%). Antibiograms revealed that 62.6% of our cases were cefuroxime sensitive; 87.7% were gentamicin sensitive. Only 10.5% showed resistance to both cefuroxime and gentamicin. There was no statistically significant difference of fusion rates between patients with different microbial species or different antibiograms. Conclusion Our data suggest that besides the high variety of different detected species, initial antibiotic treatment with a combination of systemic cefuroxime and local gentamicin-loaded bone cement is effective and in almost 90% the later determined microbial infection was sensitive to this treatment. Therefore, we recommend initial treatment according to this algorithm until specific antibiograms are available from intraoperatively acquired tissue samples.

### **Ankle fractures: Getting it right first time**

**Author(s):** Walsh A.S.; Sinclair V.; Watmough P.; Henderson A.A.

**Source:** Foot; Mar 2018; vol. 34 ; p. 48-52

**Publication Type(s):** Article

**Abstract:** Introduction Ankle fractures are common injuries presenting to trauma departments and ankle open reduction and internal fixation (ORIF<sup>2</sup>) is one of the first procedures targeted in early orthopaedic training. Failure to address the fracture pattern with the appropriate surgical technique and hardware may lead to early failure, resulting in revision procedures or premature degenerative change. Patients undergoing revision ORIF are known to be at much greater risk of complications and many of these secondary procedures may be preventable. Method A retrospective analysis of all patients attending our unit for ankle ORIF over a two year period was undertaken. Patients were identified from our Bluespier database and a review of x-rays was undertaken. All patients undergoing re-operation within eight weeks of the primary procedure were studied. The cause of primary failure was established and potential contributing patient and surgical factors were recorded. Results 236 patients undergoing ankle ORIF were identified. 13 patients (5.5%) returned to theatre for a secondary procedure within eight weeks. Within this group, seven (54%) patients returned for treatment of a neglected or under treated syndesmotic injury, three (23%) for complete failure of fixation, two (15%) with wound problems and one (8%) for medial malleolus mal-reduction. Of the patient group, five (39%) were known type 2 diabetics. Consultants performed two (15%) procedures, supervised registrars five (39%) and unsupervised registrars six (46%) operations. Conclusion Errors are being made at all levels of training in applying basic principles such as restoring fibula length and screening the syndesmosis intra-operatively. Appropriate placement and selection of hardware is not always being deployed in osteopenic bone resulting in premature failure of fixation and fracture patterns are not being fully appreciated. Patients are undergoing preventable secondary procedures in the operative treatment of ankle fractures. Copyright © 2017 Elsevier Ltd

### **Use of a Defined Surgical Approach for the Debridement of Open Tibia Fractures.**

**Author(s):** Marecek, Geoffrey S.; Nicholson, Luke T.; Auran, Richard T.; Lee, Jackson

**Source:** Journal of Orthopaedic Trauma; Jan 2018; vol. 32 (no. 1)

**Publication Type(s):** Academic Journal

**Abstract:** Objectives: To determine whether a defined approach for debridement of open tibia fractures would result in no change in reoperation rate, but reduce the need for flap

coverage.Design: Prospective cohort study.Setting: Academic Level 1 trauma center.Patients: A total of 66 patients with 68 open diaphyseal tibia fractures were included. Patients under the age of 18 and with orthopaedic trauma association open fracture classification (OTA-OFC) skin score of 3 were excluded.Intervention: Debridement of the open fracture through direct extension of the traumatic wound or through a defined surgical interval.Main Outcome Measurements: Number of operations. Need for soft-tissue transfer.Results: A total of 47 patients had direct extension of the traumatic wound and 21 patients had a defined surgical approach. The groups had similar proportions of Gustilo-Anderson and OTA-OFC subtypes. The average number of surgeries, including index procedure, per patient was 1.96 in the direct extension group and 1.29 in the defined approach group ( $P = 0.026$ ). Flap coverage was needed in 9 patients in the direct extension group and no patients in the defined approach group ( $P = 0.048$ ).Conclusions: A defined surgical approach to the debridement of open tibia fractures is safe and may reduce the need for flap coverage in select patients.Level Of Evidence: Therapeutic Level III. See Instructions for Authors for a complete description of levels of evidence.

**A Prospective Randomized Study on Operative Treatment for Simple Distal Tibial Fractures- Minimally Invasive Plate Osteosynthesis Versus Minimal Open Reduction and Internal Fixation.**

**Author(s):** Ji Wan Kim; Hyun Uk Kim; Chang-Wug Oh; Joon-Woo Kim; Ki Chul Park; Kim, Ji Wan;

**Source:** Journal of Orthopaedic Trauma; Jan 2018; vol. 32 (no. 1)

**Publication Type(s):** Academic Journal

**Abstract:**Objectives: To compare the radiologic and clinical results of minimally invasive plate osteosynthesis (MIPO) and minimal open reduction and internal fixation (ORIF) for simple distal tibial fractures.Design: Randomized prospective study.Setting: Three level 1 trauma centers.Patients: Fifty-eight patients with simple and distal tibial fractures were randomized into a MIPO group (treatment with MIPO;  $n = 29$ ) or a minimal group (treatment with minimal ORIF;  $n = 29$ ). These numbers were designed to define the rate of soft tissue complication; therefore, validation of superiority in union time or determination of differences in rates of delayed union was limited in this study.Intervention: Simple distal tibial fractures treated with MIPO or minimal ORIF.Main Outcome Measurements: The clinical outcome measurements included operative time, radiation exposure time, and soft tissue complications. To evaluate a patient's function, the American Orthopedic Foot and Ankle Society ankle score (AOFAS) was used. Radiologic measurements included fracture alignment, delayed union, and union time.Results: All patients acquired bone union without any secondary intervention. The mean union time was 17.4 weeks and 16.3 weeks in the MIPO and minimal groups, respectively. There was 1 case of delayed union and 1 case of superficial infection in each group. The radiation exposure time was shorter in the minimal group than in the MIPO group. Coronal angulation showed a difference between both groups. The American Orthopedic Foot and Ankle Society ankle scores were 86.0 and 86.7 in the MIPO and minimal groups, respectively. Minimal ORIF resulted in similar outcomes, with no increased rate of soft tissue problems compared to MIPO.Conclusions: Both MIPO and minimal ORIF have high union rates and good functional outcomes for simple distal tibial fractures. Minimal ORIF did not result in increased rates of infection and wound dehiscence.Level Of Evidence: Therapeutic Level II. See Instructions for Authors for a complete description of levels of evidence.

**Primary Intra-Medullary Nailing of Open Tibia Fractures Caused by Low-Velocity Gunshots: Does Operative Debridement Increase Infection Rates?**

**Author(s):** Donnally, Chester J; Lawrie, Charles M; Sheu, Jonathan I; Gunder, Meredith A

**Source:** Surgical infections; Jan 2018

**Publication Type(s):** Journal Article

**Abstract:**BACKGROUND Although gunshot-induced extremity fractures are typically not considered open fractures, there is controversy regarding wound management in the setting of operative fixation to limit infection complications. Previous studies have evaluated the need for a formal irrigation and debridement (I&D) prior to intra-medullary nailing (IMN) of gunshot-induced femur fractures but none have specifically evaluated tibias. By comparing primary IMN for tibial shaft fractures caused by low-velocity firearms additionally treated with a formal operative I&D (group 1) with those without an I&D (group 2), we sought to identify whether there are: differences in treatment group infection rates; particular fracture patterns more prone to infection; and patient characteristics more prone to infections. PATIENTS AND METHODS Retrospective cohort study at a single level I trauma center of gunshot-induced tibial shaft fractures managed primarily with IMN in 39 patients from October 1, 2008 to October 30, 2016. The following were studied: demographics, follow-up, fracture characteristics, injury management, and patient outcome. Fractures were categorized based on the Orthopaedic Trauma Association (OTA) classification system for diaphyseal tibia/fibula fractures. All patients had intravenous antibiotic agents at presentation and received three days of post-operative intravenous antibiotic agents per institutional protocol. RESULTS In group 1, 6 of 23 patients (26.1%) developed superficial infections and 4 of 23 patients (17.4%) developed deep infections. In group 2, none of 16 patients (0%) developed superficial infections and 1 patient (6.25%) developed a deep infection, making the total cohort infection rate 28.2% (11/39). Superficial infections were associated with a formal I&D whereas deep infections were not. Tobacco smokers and type 42-A fractures had higher infection rates when treated with a formal I&D. CONCLUSION A formal debridement, followed by primary IMN in tibia fractures caused by low-velocity firearms is associated with an increased risk of superficial infection that is well managed with antibiotic agents, but the incorporation of a debridement does not affect rate of deep infection. A formal I&D during IMN fixation should be avoided in patients that are smokers and have type 42-A tibia fractures as these are factors associated with increased infection rates.

### **Trends in Orthopedic Fracture and Injury Severity: A Level I Trauma Center Experience.**

**Author(s):** Tarabdkar, Neil; Alton, Timothy; Gorbaty, Jacob; Nork, Sean; Taitman, Lisa;

**Source:** Orthopedics; Jan 2018 ; p. 1-6

**Publication Type(s):** Journal Article

**Abstract:** The purpose of this study was to define the trends in fracture complexity and overall injury severity of orthopedic trauma patients at a level I trauma center. A retrospective review of a prospectively collected trauma database was performed to determine the Injury Severity Score (ISS) and AO/OTA classification of the most common fractures among all patients presenting from 1995 to 1999 and from 2008 to 2012. Inclusion criteria were lower extremity fractures of the femur and tibia and pelvic fractures within the years of interest. Exclusion criteria were age younger than 18 years, pathologic fractures, and insufficient medical records to determine ISS or AO/OTA classification. The total number of fractures increased from 4869 between 1995 and 1999 to 5902 between 2008 and 2012. There was an increase in the percentage of lower extremity periarticular fractures (20.7% to 23.4%,  $P < .001$ ) and the percentage of pelvic and acetabular fractures (32.7% to 39.9%,  $P < .001$ ) and a decrease in the percentage of lower extremity extra-articular fractures (46.6% to 36.7%,  $P < .001$ ). The ratios of tibial pilon and plateau fractures relative to extra-articular tibial fractures increased from 0.29 to 0.60 ( $P < .001$ ) and from 0.49 to 0.81 ( $P < .001$ ), respectively. The average ISS had increased from 2008 to 2012 compared with from 1995 to 1999 (19.2 vs 15.1,  $P < .001$ ). The complexity of certain lower extremity fractures and the severity of injury of patients treated at this referral institution are high and continue to increase. As US health care economics continue to change, with provider and hospital reimbursements shifting toward a patient outcomes basis with potential penalties for complications and readmissions, hospitals and providers must recognize these trends. Trauma centers must continue to measure the complexity of fracture care provided to properly risk-stratify their patient population. [Orthopedics. 201x; xx(x):xx-xx.].

### **Risk of Subsequent Fragility Fractures Observed After Low-Trauma Ankle Fractures.**

**Author(s):** Roux, S; Cabana, F; Carrier, N; Beaulieu, M C; Boire, G

**Source:** Calcified tissue international; Jan 2018

**Publication Type(s):** Journal Article

**Abstract:** While fragility fractures (FFs) are one of the strongest predictors of subsequent osteoporotic fractures, it remains unclear whether low-trauma ankle fractures have this ability. The aim of the study was to identify the characteristics of patients with low-trauma ankle FFs who develop subsequent FFs. The OPTIMUS initiative is a strategy to improve osteoporosis treatment post-FF in orthopedic clinics. FRAX scores without BMD (FRAX-BMI) were calculated at time of inclusion. Recurrent FFs were recorded over a 48-month follow-up. All FFs were X-ray-confirmed. A total of 265 patients with initial ankle FF were included (190 women; mean age  $62.8 \pm 9.6$  years), of whom 15 developed new FFs. Patients with ankle FFs had longer time until recurrence and lower 2-year incidence of recurrent FFs (3.2%) compared with those having wrist FFs (9.0%) or other initial FFs (9.6%), and 4-year incidence rates of 6.2, 13.4, and 15.3%, respectively (log-rank test,  $p = 0.001$ ). With an ankle FF at inclusion, recurrent FFs were more frequent in patients with previous FF (6.2 per 100 patient-years;  $p < 0.01$ ) or high-risk FRAX-BMI scores pre- or post-FF (2.4 or 2.0 per 100 patient-years, respectively; ns), compared to patients without any of these conditions (0.7 per 100 patient-years). Ankle FFs represent a clinical opportunity for identifying at-risk patients who should be targeted for treatment (previous FFs and/or high-risk FRAX). Because of mechanical factors and other contributors involved, ankle FFs themselves do not predict subsequent FFs overall, and their inclusion in FRAX-BMI risk calculation may thus not be warranted.

### **Medial Unloader Braces and Lateral Heel Wedges Do Not Alter Gait Biomechanics in Healthy Young Adults.**

**Author(s):** Goodwin, Jonathan S; Creighton, Robert A; Pietrosimone, Brian G; Spang, Jeffery T

**Source:** Journal of sport rehabilitation; Jan 2018 ; p. 1-22

**Publication Type(s):** Journal Article

**Abstract:** CONTEXT Orthotic devices such as medial unloader knee braces and lateral heel wedges may limit cartilage loading following trauma or surgical repair. However, little is known regarding their effects on gait biomechanics in young, healthy individuals who are at risk of cartilage injury during physical activity due to greater athletic exposure compared to older adults. OBJECTIVE Determine the effect of medial unloader braces and lateral heel wedges on lower extremity kinematics and kinetics in healthy, young adults. DESIGN Cross-sectional cross-over design. SETTING Laboratory setting. PATIENTS Healthy, young adults who were recreationally active (30 min/day for 3 days/week) between 18-35 years old who were free from orthopedic injury for at least 6 months and no history of lower extremity orthopedic surgery. INTERVENTIONS All subjects completed normal over ground walking with a medial unloader brace at two different tension settings and a lateral heel wedge for a total of four separate walking conditions. MAIN OUTCOME MEASURES Frontal plane knee angle at heelstrike, peak varus angle, peak internal knee valgus moment, and frontal plane angular impulse were compared across conditions. RESULTS The medial unloader brace at 50% ( $-2.04 \pm 3.53^\circ$ ) and 100% ( $-1.80 \pm 3.63^\circ$ ) maximum load placed the knee in a significantly more valgus orientation at heelstrike compared to the lateral heel wedge condition ( $-0.05 \pm 2.85^\circ$ ). However this difference has minimal clinical relevance. Neither of the orthotic devices altered knee kinematics or kinetics relative to the control condition. CONCLUSIONS Though effective in older adults and individuals with varus knee alignment, medial unloader braces and lateral heel wedges do not influence gait biomechanics in young, healthy individuals.

### **Acute and overuse elbow trauma: radio-orthopaedics overview.**

**Author(s):** Nocerino, Elisabetta Antonia; Cucchi, Davide; Arrigoni, Paolo; Brioschi, Marco;

**Source:** Acta bio-medica : Atenei Parmensis; Jan 2018; vol. 89 (no. 1-S); p. 124-137

**Publication Date:** Jan 2018

**Publication Type(s):** Journal Article

**Abstract:**The correct management of acute, subacute and overuse-related elbow pathologies represents a challenging diagnostic and therapeutic problem. While major trauma frequently requires a rapid surgical intervention, subluxation and minor trauma allow taking more time for diagnostics and planning the correct elective treatment after careful clinical and radiological investigation. In these conditions, communication between orthopaedic surgeon and radiologist allow to create a detailed radiology report, tailored to the patient's and surgeon's needs and optimal to plan proper management. Imaging technique as X-Ray, CT, US, MRI, CTA and MRA all belong to the radiologist's portfolio in elbow diagnostics. Detailed knowledge of elbow pathology and its classification and of the possibilities and limits of each imaging technique is of crucial importance to reach the correct diagnosis efficiently. The aim of this review is to present the most frequent elbow pathologies and suggest a suitable diagnostic approach for each of them.

#### **Diagnosis and management of long-bone nonunions: a nationwide survey.**

**Author(s):** Özkan, Sezai; Nolte, Peter A; van den Bekerom, Michel P J; Bloemers, Frank W

**Source:** European journal of trauma and emergency surgery : official publication of the European Trauma Society; Jan 2018

**Publication Type(s):** Journal Article

**Abstract:****PURPOSE**There is variability among surgeons on definitions regarding the degree of bone healing of long-bone fractures. A lack of consensus may negatively affect communication between surgeons, and lead to unintended and unwanted variability in treatment of patients suffering from abnormal healing of long-bone fractures. We aimed to identify differences between surgeons regarding their views on the degree of union of long-bone fractures.**METHODS**We performed a survey among 114 surgeons who worked at 11 level I trauma centers and 68 level II/III hospitals in the Netherlands. We asked them to represent their institutional colleagues and answer questions regarding their views on the definition, factors influencing bone healing, clinical practice, views on scientific evidence, and the use or need of guidelines for non-union of long-bone fractures. A total of 26 trauma surgeons and 37 orthopedic surgeons responded (59%).**RESULTS**Compared to trauma surgeons, more orthopedic surgeons maintain 6 months as the timeframe for classifying a fracture without healing tendencies as a non-union fracture (50 vs 70%;  $P = 0.019$ ). Compared to orthopedic surgeons, trauma surgeons use the bone scan (46 vs 19%;  $P = 0.027$ ) and the PET scan (50 vs 5.4%;  $P < 0.001$ ) more often, and consider medication use to be a factor influencing bone healing more often (92 vs 69%;  $P = 0.040$ ). Furthermore, they utilize bone marrow aspiration (35 vs 11%;  $P = 0.029$ ), reaming of long bones (96 vs 70%;  $P = 0.010$ ), synthetic bone substitutes (31 vs 5.4%;  $P = 0.012$ ), bone morphogenetic proteins (58 vs 16%;  $P = 0.001$ ), and the Diamond concept (92 vs 8.1%) more often as treatment modalities for non-union of long-bone fractures. Surgeons agreed on that intramedullary nail osteosynthesis was the treatment option supported by the highest level of evidence. 80% of the respondents feel a need for a clinical guideline on the management of long-bone non-union.**CONCLUSION**There is no consensus among surgeons on the definition, factors influencing healing, clinical practice, and scientific evidence regarding non-union of long-bone fractures. The vast majority of surgeons believe that their practice would benefit from (inter)national guidelines on this topic, and efforts should be made to reduce surgeon-to-surgeon variability in treatment recommendations and facilitate more homogenous scientific research on non-union of long-bone fractures.**LEVEL OF EVIDENCE**Level V.

### **Muscle versus Fasciocutaneous Free Flaps in Lower Extremity Traumatic Reconstruction: A Multicenter Outcomes Analysis.**

**Author(s):** Cho, Eugenia H; Shammas, Ronnie L; Carney, Martin J; Weissler, Jason M;

**Source:** Plastic and reconstructive surgery; Jan 2018; vol. 141 (no. 1); p. 191-199

**Publication Type(s):** Comparative Study Multicenter Study Journal Article

**Abstract:**BACKGROUND Clinical indications are expanding for the use of fasciocutaneous free flaps in lower extremity traumatic reconstruction. The authors assessed the impact of muscle versus fasciocutaneous free flap coverage on reconstructive and functional outcomes. METHODS A multicenter retrospective review was conducted on all lower extremity traumatic free flaps performed at Duke University (1997 to 2013) and the University of Pennsylvania (2002 to 2013). Muscle and fasciocutaneous flaps were compared in two subgroups (acute trauma and chronic traumatic sequelae), according to limb salvage, ambulation time, and flap outcomes. RESULTS A total of 518 lower extremity free flaps were performed for acute traumatic injuries (n = 238) or chronic traumatic sequelae (n = 280). Muscle (n = 307) and fasciocutaneous (n = 211) flaps achieved similar cumulative limb salvage rates in acute trauma (90 percent versus 94 percent; p = 0.56) and chronic trauma subgroups (90 percent versus 88 percent; p = 0.51). Additionally, flap choice did not impact functional recovery (p = 0.83 for acute trauma; p = 0.49 for chronic trauma). Flap groups did not differ in the rates of flap thrombosis, flap salvage, flap loss, or tibial nonunion requiring bone grafting. Fasciocutaneous flaps were more commonly reelevated for subsequent orthopedic procedures (p < 0.01) and required fewer secondary skin-grafting procedures (p = 0.01). Reconstructive and functional outcomes remained heavily influenced by injury severity. CONCLUSIONS Muscle and fasciocutaneous free flaps achieved comparable rates of limb salvage and functional recovery. Flap selection should be guided by defect characteristics and reconstructive needs. CLINICAL QUESTION/LEVEL OF EVIDENCE Therapeutic, III.

### **Does a daily consultant ward round affect the outcomes of orthopaedic patients?**

**Author(s):** Baryeh, Kwaku W; Elliott, David; Harb, Ziad; Lisk, Radcliffe

**Source:** British journal of hospital medicine (London, England : 2005); Jan 2018; vol. 79 (no. 1); p. 41-43

**Publication Type(s):** Journal Article

**Abstract:**INTRODUCTION In the UK, more than 60 000 patients present with a fractured neck of femur each year. These patients represent a huge financial cost. This study looks at the 30-day readmissions and total length of hospital stay of patients presenting with a fractured neck of femur, as well as length of stay in non-hip fracture trauma patients, following the change to a daily consultant-led ward round. METHODS A total of 200 records of patients with fractured neck of femur were reviewed with data collected retrospectively and prospectively following the introduction of the daily consultant-led ward round. Readmissions were classed as patients who spent a period of time admitted to hospital. Those who only attended an emergency unit were not included. Reasons for readmission and length of readmission were reviewed as were the initial and total length of stay. The authors also evaluated the length of stay in trauma patients (non-hip fracture emergency admissions) for a period of 6 months before and 4 months after the new working model was introduced. RESULTS With the new working pattern, there was a reduction in the length of stay in those readmitted (13 vs 8 days), and the total length of stay of readmitted patients was also considerably lower (23 vs 13 days). In non-hip fracture trauma patients, there was a reduction in length of stay (8 vs 6 days). CONCLUSIONS This study demonstrates that by adopting a daily orthopaedic consultant-led ward round, it is possible to reduce the length of stay for patients with a fractured neck of femur, both on initial and subsequent hospital admissions, as well reducing the length of stay for non-hip fracture trauma patients.

**Motorcyclists and pillion passengers with open lower-limb fractures: a study using TARN data 2007-2014.**

**Author(s):** Hay-David, Agc; Stacey, T; Pallister, I; Trauma Audit and Research Network Research Committee, University of Manchester

**Source:** Annals of the Royal College of Surgeons of England; Jan 2018 ; p. 1-6

**Publication Type(s):** Journal Article

Available at [Annals of the Royal College of Surgeons of England](#) - from EBSCO (MEDLINE Complete)

**Abstract:**Introduction We aimed to identify population demographics of motorcyclists and pillion passengers with isolated open lower-limb fractures, to ascertain the impact of the revised 2009 British Orthopaedic Association/British Association of Plastic Reconstructive and Aesthetic Surgeons joint standards for the management of open fractures of the lower limb (BOAST 4), in terms of time to skeletal stabilisation and soft-tissue coverage, and to observe any impact on patient movement. Methods Retrospective cohort data was collected by the Trauma Audit and Research Network (TARN). A longitudinal analysis was performed between two timeframes in England (pre-and post-BOAST 4 revision): 2007-2009 and 2010-2014. Results A total of 1564 motorcyclists and 64 pillion passengers were identified. Of these, 93% (1521/1628) were male. The median age for males was 30.5 years and 36.7 years for females. There was a statistically significant difference in the number of patients who underwent skeletal stabilisation (49% vs 65%,  $P < 0.0001$ ), the time from injury to skeletal stabilisation (7.33 hours vs 14.3 hours,  $P < 0.0001$ ) and the proportion receiving soft-tissue coverage (26% vs 43%,  $P < 0.0001$ ). There was no difference in the time from injury to soft-tissue coverage (62.3 hours vs 63.7 hours,  $P = 0.726$ ). The number of patients taken directly to a major trauma centre (or its equivalent) increased between the two timeframes (12.5% vs, 41%,  $P < 0.001$ ). Conclusions Since the 2009 BOAST 4 revision, there has been no difference in the time taken from injury to soft-tissue coverage but the time from injury to skeletal stabilisation is longer. There has also been an increase in patient movement to centres offering joint orthopaedic and plastic care.

**Radiological classification of retroperitoneal hematoma resulting from lumbar vertebral fracture.**

**Author(s):** Nakao, Shota; Ishikawa, Kazuo; Ono, Hidefumi; Kusakabe, Kenji; Fujimura, Ichiro

**Source:** European journal of trauma and emergency surgery : official publication of the European Trauma Society; Jan 2018

**Publication Type(s):** Journal Article

**Abstract:**PURPOSELumbar vertebral fracture (LVF) infrequently produces massive retroperitoneal hematoma (RPH). This study aimed to systematically review the clinical and radiographic characteristics of RPH resulting from LVF.METHODSFor 193 consecutive patients having LVF who underwent computed tomography (CT), demographic data, physiological conditions, and outcomes were reviewed from their medical records. Presence or absence of RPH, other bone fractures, or organ/vessel injury was evaluated in their CT images, and LVF or RPH, if present, was classified according to either the Orthopaedic Trauma Association classification or the concept of interfascial planes.RESULTSRPH resulting only or dominantly from LVF was found in 66 (34.2%) patients, whereas among the others, 64 (33.2%) had no RPH, 38 (19.7%) had RPH from other injuries, and 25 (13.0%) had RPH partly attributable to LVF. The 66 RPHs resulting only or dominantly from LVF were radiologically classified into mild subtype of minor median ( $n = 35$ ), moderate subtype of lateral ( $n = 11$ ), and severe subtypes of central pushing-up ( $n = 13$ ) and combined ( $n = 7$ ). Of the 20 patients with severe subtypes, 18 (90.0%) were in hemorrhagic shock on admission, and 6 (30.0%) were clinically diagnosed as dying due to uncontrollable RPH resulting from vertebral body fractures despite no anticoagulant medication.CONCLUSIONSLVF can directly produce massive RPH leading to hemorrhagic death. A major survey of such pathology should be conducted to establish appropriate diagnosis and treatment.



**Isolated avulsion fracture of the first metatarsal base at the peroneus longus tendon attachment: a case report.**

**Author(s):** Weinberg, Maxwell W; Krähenbühl, Nicola; Davidson, Nathan P; Hanrahan, Christopher J

**Source:** Skeletal radiology; Jan 2018

**Publication Type(s):** Journal Article

**Abstract:**Avulsion fractures of the first metatarsal (MT1) base at the peroneus longus (PL) tendon attachment are rare and may be undiagnosed during an emergency visit. If the injury is not treated properly, chronic pain or persistent impairment for inversion and plantar-flexion of the first ray may occur. This case report presents a 30-year-old woman who presented 10 weeks post trauma to a foot and ankle surgeon due to a swollen right midfoot with diffuse tenderness over the medial Lisfranc joint. Further evaluation showed an isolated avulsion fracture of the first metatarsal, which was undiagnosed during the emergent visit following the accident. In this case, the patient was successfully treated conservatively. The goal of this article is to raise awareness of this rare injury for radiologists and orthopedic surgeons.

**Outcome after Surgical Management of Acetabular Fractures: A 7-Year Experience.**

**Author(s):** Mesbahi, Seyed Amir Reza; Ghaemmaghmi, Ali; Ghaemmaghmi, Sara; Farhadi, Pouya

**Source:** Bulletin of emergency and trauma; Jan 2018; vol. 6 (no. 1); p. 37-44

**Publication Type(s):** Journal Article

Available at [Bulletin of emergency and trauma](#) - from nih.gov

**Abstract:**ObjectiveTo determine the functional and radiologic results of surgical treatment in patients with acetabular fractures.MethodsThis was a retrospective cross-sectional study. We retrospectively reviewed medical records of patients operatively treated acute acetabular fractures at a level I trauma center (Shahid Rajaei) and an orthopedic center (Shahid Chamran) both in southern Iran (Shiraz) with minimally 1 year follow up over a period of 7 years from April 2009 to March 2016. Functional and radiographic outcomes, and complication were considered as main outcomes.ResultsA total number of 79 patients completed the study. Fifty-five patients were operated through Kocher-Langenbeck approach, and 18 were operated through the standard ilioinguinal approach, and 6 patients were operated through the standard ilioinguinal approach combined with Kocher-Langenbeck approach. The mean follow-up of patients was 45.6 months. The average operative time was 162.4±78.5 min, and the median blood loss was 500 ml. Functional results were excellent in 41 patients (51.9%), good in 12 (15.2%), fair in 13 (16.5%), and poor in 13 patients (16.5%). Radiologic results were excellent in 27 cases (34.2%), good in 17 cases (21.5%), fair in 18 cases (22.8%), and poor in 16 (16.5%). Osteoarthritis of hip (60.8%) and AVN of head of femur (22.8%) were two most common complications. In addition, there wasn't any significant difference between surgical approaches regarding clinical and radiographic outcomes.ConclusionThe operative treatment for acetabular fractures gives universally satisfactory results. Thereafter, this study provides evidence that ilioinguinal approach is a good choice for anterior fractures, Kocher-Langenbeck is a good choice for posteriors fractures, and combined approach may be a good choice in the management of acetabular fractures involving two columns.

**Osteoinduction and -conduction through absorbable bone substitute materials based on calcium sulfate: in vivo biological behavior in a rabbit model.**

**Author(s):** Pförringer, D; Harrasser, N; Mühlhofer, H; Kiokekli, M; Stemberger, A; van Griensven, M

**Source:** Journal of materials science. Materials in medicine; Jan 2018; vol. 29 (no. 2); p. 17

**Publication Type(s):** Journal Article

**Abstract:** Calcium sulfate (CS) can be used as an antibioticly impregnated bone substitute in a variety of clinical constellations. Antibioticly loaded bone substitutes find specific application in orthopedic and trauma surgery to prevent or treat bone infections especially in relation to open bone defects. However, its use as a structural bone graft reveals some concerns due to its fast biodegradation. The addition of calcium carbonate and tripalmitin makes CS formulations more resistant to resorption leaving bone time to form during a prolonged degradation process. The aim of the present study was the evaluation of biocompatibility and degradation properties of newly formulated antibioticly impregnated CS preparations. Three different types of CS bone substitute beads were implanted into the tibial metaphysis of rabbits (CS dihydrate with tripalmitin, containing gentamicin (Group A) or vancomycin (Group B); Group C: tobramycin-loaded CS hemihydrate). Examinations were performed by means of x-ray, micro-computed tomography (micro-CT) and histology after 4, 6, 8 and 12 weeks. Regarding biocompatibility of the formulations, no adverse reactions were observed. Histology showed formation of vital bone cells attached directly to the implanted materials, while no cytotoxic effect in the surrounding of the beads was detected. All CS preparations showed osteogenesis associated to implanted material. Osteoblasts attached directly to the implant surface and revealed osteoid production, osteocytes were found in newly mineralized bone. Group C implants (Osteoset®) were subject to quick degradation within 4 weeks, after 6-8 weeks there were only minor remnants with little osteogenesis demonstrated by histological investigations. Group A implants (Herafill®-G) revealed similar degradation within at least 12 weeks. In contrast, group B implants (CaSO<sub>4</sub>-V) were still detectable after 12 weeks with the presence of implant-associated osteogenesis at latest follow-up. In all of these preparations, giant cells were found during implant degradation on surface and inside of resorption lacunae. None of the analyzed CS preparations triggered contact activation. All implants demonstrated excellent biocompatibility, with implants of Group A and B showing excellent features as osteoconductive and -inductive scaffolds able to improve mechanical stability.

### **A service evaluation for tranexamic acid in surgery for proximal femoral fractures**

**Author(s):** Poots C.; Eggleton A.; Hamilton J.; Ogonda L.; Corry R.

**Source:** Anaesthesia; Jan 2018; vol. 73 ; p. 38

**Publication Type(s):** Conference Abstract

**Abstract:** Recent NICE guidance advises that tranexamic acid (TxA) should be considered in any surgery where blood loss exceeds 500 ml [1]. It is well known that peri-operative blood loss in surgery for hip and femur fractures frequently exceeds 500 ml [2]. We commenced a project in July 2015 to promote consideration and use of TxA at the time of surgical repair of proximal femur fractures. As part of the project governance we conducted a service evaluation of the years surrounding the project start. Methods Joint approval for the project was granted by the Trust's anaesthetic and orthopaedic departments in July 2015. Following a literature review, a consensus guideline was then devised to assist staff with decisions around TxA use. In trauma theatres, cognitive aids were displayed and a TxA stem was added to the Surgical Safety Checklist. Approval for the service evaluation was granted by the Trust's IRD Office. The year prior to the project start was termed the Baseline Year (BY, 1 Aug 2014-31 July 2015) and the year following as the Treatment Year (TY, 1 Aug 2015-31 July 2016). Case lists for each year were generated from a Trauma Database. Data were then gathered for process (TxA administration), balancing (30 and 90-day mortality, cardiac arrest and events of early venous and pulmonary thromboembolism, stroke unit admission and myocardial infarction) and outcome measures (peri-operative transfusion rates and packed red cell usage). Results There were 375 and 376 cases of surgery for proximal femur fracture in the BY and TY respectively - mean age, ASA grading and operation types were comparable across both years. The rate of TxA administration increased from less than 10% in the BY to an overall mean of 54% in the TY. There was little difference in balancing measures between the two years - observed 30 (6.1% vs. 5.9%) and 90-day mortality (15.2% vs. 13.3%) were both lower in the TY. There was a fall

in transfusion rate from 37.3% in the BY to 23.7% in the TY with 142 fewer packed red cell units transfused in the TY (278 in BY vs. 136). Discussion The fall in transfusion between BY and TY equated to a transfusion cost-saving of approximately 23,000 for an additional TxA expenditure of less than 500. The findings of our service evaluation would suggest that TxA is a safe and cost-effective agent for reducing peri-operative transfusion in patients undergoing surgical repair of proximal femur fractures.

### **A descriptive study of the burden of animal-related trauma at cork university hospital**

**Author(s):** Sheehan M.; Deasy C.

**Source:** Irish Medical Journal; Jan 2018; vol. 111 (no. 1); p. 673

**Publication Type(s):** Article

**Abstract:** Farming is the most dangerous occupation in Ireland<sup>1</sup> and the incidence of farm accidents is rising. This study examines major farm animal-related trauma treated at Cork University Hospital over a 5 year period. There were 54 patients admitted to Cork University Hospital (C.U.H.) with major farm animal-related trauma. The median age was 56 years, 85% were male and the median hospital length of stay was four days. Older patients had longer lengths of stay; 5.5 vs 4 days ( $p=0.026$ ). Tibia/fibula fractures were the most common injuries ( $N=13$ , 24%); head injury occurred in six patients (11%). There were 32 (59%) patients who required surgery, the majority for orthopaedic injuries. There were nine patients (16.7%) admitted to the intensive care unit; their median ICU stay was four days. Injury prevention and treatment strategies require that the age profile, mechanism of injury and injury patterns of farmers sustaining animal-related trauma is recognised. Copyright © 2018, Irish Medical Association. All rights reserved.

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