BESS COVENTRY 2017

PROGRAMME FOR THE ANNUAL SCIENTIFIC MEETING OF BESS 21 – 23 JUNE 2017

Wednesday, 21 June – Registration from 08:00	
09:00 - 12.00	**AHP symposium**
INFORMING AND ENHANCING OUR APPROACH TO UPPER LIMB REHABILITATION	
Chair: Clare Connor	
09:00 - 09:10	Welcome address
09:10 – 09:40	The origins of shoulder apprehension Gregory Cunningham
09:40 - 10:10	Exercise for rotator cuff tendinopathy: does it work as we think it should and can we do it better? Chris Littlewood
10:10 - 10:35	Break
10:35 - 11:05	Functional recovery - learning to move again Robert Letchford
11:05 - 11:35	Consultation based reassurance - from primary care and throughout the journey Tamar Pincus
11:35 - 12:00	Panel questions and answers/discussion
10:15 - 12:00	**BESS Research symposium**
MANAGEMENT OF THE YOUNG ARTHRITIC SHOULDER (<50)	
Chair: Steve Drew	
10:15 - 10:45	Evidence for shoulder replacement in the young arthritic shoulder Jonathan Rees
10:45 - 11:15	Anatomic total shoulder arthroplasty in the young patient Joaquin Sanchez-Sotelo
11:15 - 11:45	Reverse shoulder arthroplasty in the young patient John Sperling
11:45 - 12:00	Panel questions and answers/discussion
12:00 - 13:20	**Lunch and trade exhibition**
13:20 - 13:35	**Welcome address**
13:35 - 14:50	**SESSION 1: Basic science and miscellaneous**
Chairs: Jonathan Rees and Steve Drew	
13:35 - 13:43	APPLICATION OF DEMINERALISED CORTICAL BONE MATRIX AND BONE-MARROW DERIVED MESENCHYMAL STEM CELLS IN A CHRONIC ROTATOR CUFF TEAR MODEL. T Thangarajah; A Sanghani-Kerai; F Henshaw; CJ Pendegrass; SM Lambert; GW Blunn University College London/Royal National Orthopaedic Hospital, London/Stanmore Purpose: The purpose of this study was to determine if demineralised bone matrix (DBM) enhanced with mesenchymal stem cells (MSCs) could improve healing when applied to a degenerative rotator cuff tear model.

	Methods: Eighteen female Wistar rats underwent unilateral detachment of the supraspinatus tendon. Three weeks later, tendon repair was carried out in animals randomized into three groups: Group 1 received augmentation of the repair with cortical allogenic DBM (n = 6); Group 2 received augmentation with a commercially-available non-meshed, ultra-thick accellular human dermal matrix (n = 6); and Group 3 underwent tendon-bone repair without a scaffold (n = 6). All animals received one million MSCs. Specimens were retrieved at six weeks postoperatively for histological analysis and evaluation of bone mineral density. Results: All groups demonstrated closure of the tendon-bone gap with a fibrocartilaginous enthesis, but the degenerative process could not be reversed. Although there were no significant differences in the enthesis maturation and Modified Movin scores, repairs augmented with dermal matrix + MSCs exhibited a disorganised enthesis, abnormal collagen fibre arrangement, and greater cellularity compared to other MSC groups. Only repairs augmented with DBM + MSCs reached a bone mineral density not significantly lower than non-operated controls. Conclusions: This study demonstrated that when DBM and MSCs were applied to the healing enthesis in a chronic rotator cuff tear model, a fibrocartilaginous-based structure was produced, which significantly increased bone density compared to other groups.
13:43 - 13:51	GLENOID POLYETHYLENE WEAR FROM ARTICULATION WITH A CERAMIC HUMERAL HEAD: COMPARISON OF CONVENTIONAL AND HIGHLY CROSS LINKED VITAMIN E POLYETHYLENE S Bell; L Reto; F Dallman Melbourne Shoulder and Elbow Centre, Monash University, Melbourne Aim: To compare the wear behaviour, including with edge loading, of a ceramic humeral head on a conventional polyethylene (CPE) glenoid component, and a vitamin E enhanced highly cross linked (VEPE) polyethylene glenoid. Glenoid components with unaged polyethylene and with accelerated polyethylene aging were compared. Background: Polyethylene wear resulting in glenoid loosening is the main reason for long term failure of total shoulder replacements. Methods: Wear tests were performed using a wear simulator set up for roll glide and edge loading wear. The accelerated aging was carried out utilizing pressurized pure oxygen at 370 (ASTM F2003). The wear behaviour was based on the mass loss of polyethylene components. Characterization was made of the size and morphology of the particles. Results: The unaged VEPE glenoid showed a 36% reduction in wear compared with the unaged CPE glenoid (p=0.003). Aging significantly increased the polyethylene wear rate; however, the increased wear rate of the aged VEPE glenoid was halved when compared with the aged CPE glenoid (p=0.0002).

	Analysis of the size and morphology of the wear particles showed no difference between the 4 groups. Particles in all groups had double the length compared with the width. Conclusion: This study demonstrates in vitro superior wear properties of the cross-linked polyethylene glenoid compared with conventional polyethylene when articulating with a ceramic head. The addition of vitamin E to polyethylene was shown to decrease polyethylene degradation related to oxidation, resulting in less wear in the artificially aged VEPE glenoid.
13:51 - 13:59	LOW-GRADE INFECTION IN NON-ARTHROPLASTY SHOULDER SURGERY U Khan; E Torrance; R Townsend; S Davies; T Mackenzie; L Funk The Arm Clinic at the Wilmslow Hospital, Wrightington Upper Limb Unit; University of Manchester, University of Salford Aim: The current study assessed patient-related risk factors, outcomes and clinical presentation of low-grade infection following open and arthroscopic non-arthroplasty shoulder surgery. Background: Recent studies have identified the diagnostic challenge of low-grade infections following shoulder arthroplasty surgery. Infections following non-arthroplasty procedures have not been reported in the literature. Methods: Thirty-five patients presenting with suspected low-grade infection were reviewed. Biopsies taken at revision surgery were cultured in the sterile environment of a class II laminar flow cabinet and incubated for a minimum of 14 days at a specialist orthopaedic microbiology laboratory. Patient-related factors (age, occupation, injection), index surgery and infection characteristics (onset of symptoms, duration to diagnosis, treatment) were analysed. Results: Positive cultures were identified in 21 cases (60.0%), of which 15 were male (71%). Of all patients with low-grade infection, 47.6% were males between 16-35 years of age. Propionibacterium acnes and coagulase negative staphylococcus were the most common organisms isolated (81.1%, n=17 and 33.3%, n=7, respectively). Of fourteen negative culture cases, nine were treated with early empirical antibiotics (64.3%); seven of whom reported symptomatic improvement (77.8%). Of five patients treated with late empirical antibiotics, four improved. Conclusion: Young male patients are at greatest risk for low-grade infections following arthroscopic and open non-arthroplasty shoulder surgery. Propionibacterium acnes was the most prevalent organism. Patients presented with classical post-operative frozen shoulder symptoms, resistant to usual treatments. Interestingly, 78.6% of patients with negative cultures responded positively to empirical treatment

13:59 - 14:07	**A CENTRALISED PROCUREMENT STRATEGY WITH CLINICAL ENGAGEMENT DELIVERS SIGNIFICANT COST SAVINGS** W Tabi; A Chambler; BWT Gooding Circle Nottingham NHS Treatment Centre, Nottingham Purpose: To define the cost savings realised by a systematic hospital group wide centralised procurement strategy for shoulder and elbow surgery. Methods: A group of hospitals centralised their procurement strategy in 2016 to systematically review all procured services and items. This involved moving away from national procurement frameworks and engaging an MDT clinical cabinet of shoulder and elbow surgeons from across the hospitals, supported by an expert procurement team. A direct negotiation occurred with companies and the clinical cabinet agreed on group wide use of evidence based prostheses, implants and consumables. Results: A single supplier for shoulder prosthesis was agreed by the MDT clinical cabinet realising savings of 25% on previous multiple prosthesis use across the hospitals. 32% savings were achieved for shoulder and elbow implants by negotiation with leading suppliers including framework agreement for whole supplier ranges. Operative consumables cost was reduced by 25% and post-operative consumables by 43% using alternate suppliers with clinical agreement. Agency staffing costs in theatres was reduced by 15% both through direct recruitment and using a single agency supplier. Conclusion: A hospital group wide procurement strategy with full clinical engagement and expert commercial procurement support results in significant savings far beyond those offered by national supply chain and procurement frameworks. The lessons learnt from this process could transform procurement strategy and cost-effectiveness across the healthcare system.
14:07 - 14:15	**THE N-BRACE TRIAL - A FEASIBILITY STUDY** T Baring; K Desai Homerton University Hospital, London Aim: Does position of arm immobilisation influence outcome following displaced proximal humeral fractures? Background: Recent evidence has suggested that for 2, 3 and 4 part fractures long term function is significantly compromised whether surgery is performed or not. Traditionally the arm has been placed in a simple sling which effectively internally rotates the shoulder and puts the posterior glenohumeral structures under tension potentially encouraging stiffness and malunion. A neutral-rotation brace (positioning the glenohumeral joint in an anatomical position) may prevent this. Methods: We randomised patients with 2, 3 and 4 part proximal humeral fractures into 4 weeks of immobilisation either in a simple sling (SS) or a neutral rotation brace (NRB). This was independent to operative vs non-operative treatment. A CT was performed at

	time 0 and again 3 months after the injury. Range of movement, DASH score, Oxford Shoulder Score (OSS), Constant score (CS) and were assessed at 6 weeks, 3 months and 1 year. Results: At present 8 patients have been randomised into the SS group and 7 patients into the NRB group. In the simple sling arm group 4 patients underwent surgical fixation and the N-Brace group 1 patient. At 3 months post injury the difference between the DASH score were 77 vs 62, OSS 27 vs 37, CS 45 vs 55 for the simple sling group and N-Brace group respectively. Forward elevation was 77° vs 111° and external rotation was 15° vs 19° in the SS group and NRB group respectively. Two patients in the SS group required further surgery. One patient from each group had hydro distension to treat stiffness. Conclusions: Although this is short term data with small numbers provisional results demonstrate a trend towards the NRB group having better outcomes. This feasibility study supports the need for a larger multi-centre trial with longer follow-up
14:15 - 14:23	MORTALITY FOLLOWING PROXIMAL HUMERUS FRACTURE JR Adam; I Isah; M Jeyam; U Butt Salford Royal NHS Foundation Trust, Greater Manchester Purpose: This study looks at whether there is an increased mortality rate following a proximal humerus fracture Method: This was a retrospective study, reviewing all patients who sustained a proximal humerus fracture between 1st January 2007 and 31st December 2011, at our Trust. Electronic patient record system was used to collect data and radiographs were analysed using PACS system. The annual risk of death per age group, in the general population, was calculated using mortality statistics from the office for national statistics. Results: Overall there were 286 adult patients (193 F: 93 M) who sustained this fracture, with an average age of 70 years (range 19 to 99 years old). Overall mortality in the over 65 years' age group was 5.2% at 1 month, 14.5% at 3 month, 22.8% at 12 months and 50.3% at 5 years. The standardised mortality ratio in patients over 65 years old was 2.78 times that of the age-matched general population. Statistically significant predictors of mortality, 12 months after fracture, include age of 65 years and older, male gender, ASA grade of 4, anaemia and residing in a higher level of care (residential/nursing home). Conclusion: Proximal humerus fractures are associated with an increased risk of death with advancing age. The rates are comparable to neck of femur fractures. The contributing factors for this are likely multi-factorial.
14:23 - 14:31	HYBRID BLADE AND LOCKING PLATE FIXATION FOR PROXIMAL HUMERUS FRACTURES: A COMPARATIVE BIOMECHANICAL ANALYSIS A Jabran; L Ren; C Peach University of Manchester, University of South Manchester, Manchester

	Introduction: Treatment of proximal humerus fracture with locking plates is commonly associated with complications such as varus collapse and glenohumeral screw penetration. The aim of this study was to investigate whether a novel hybrid fixed angle blade plate (Equinoxe Fx plate, Exactech) exhibited superior biomechanical properties compared with a commonly used fixed angle locking plate (PHILOS plate, Synthes). Methods: A previously validated fracture gap model was used in ten synthetic composite humeri. Humeri were treated with both plating systems. The humeral head was affixed in a custom-made holder so that cantilever displacement could be applied to the humeral shaft. Varus/valgus and extension/flexion bending was achieved in the elastic tests by displacing the humeral shaft for up to 5 mm along the frontal and sagittal plane, respectively. In order to determine the constructs' resistance to varus collapse, they were then loaded in the plastic tests for up to 30 mm along the varus direction. Results: For both plates the bending stiffness and peak load determined for extension/flexion was higher than that for varus/valgus. The Equinoxe Fx construct was statistically significantly stiffer than PHILOS constructs in varus/valgus (7.59/6.90 vs. 6.61/6.09 N/mm; p‹0.001 for both) but less in extension/flexion (8.77/9.54 vs. 9.53/10.00 N/mm p ‹0.001 for both). As for the elastic varus stability, Equinoxe Fx constructs were stiffer than PHILOS constructs in the plastic tests (134.391 vs. 115.531 N; p‹0.001). Conclusion: Treatment of two-part proximal humerus fractures with a novel fixed angle blade plate (Equinoxe Fx plate) achieved stiffer construct in varus and valgus loading than with a fixed angle locking plate (PHILOS plate). Further clinical studies will be required to examine whether these findings translate to a reduction in early or late varus collapse after fixation.
14:31 - 14:39	ARE IMAGE-GUIDED INJECTIONS MORE CLINICALLY EFFECTIVE THAN PAPLATION-GUIDED INJECTIONS FOR ACROMIOCLAVICULAR [ACJ] PAIN? R Dowell; E Salt; F Mainwaring. Queens Hospital, Burton Purpose: It is not known whether image-guided AC injections have a preferential clinical outcome to palpation-guided methods to justify additional wait times and cost. Method: MEDLINE, EMBASE, Cochrane Systematic Reviews, Cochrane (CENTRAL), Clinical Evidence, DARE/HTA/NHSEED, CINAHL, and AMED databases were searched using preset search terms using a critically appraised topic methodology. Twenty-one studies were selected based on their titles and the abstracts read. Twelve papers did not meet the inclusion criteria. Nine papers were read in full and a further seven studies were excluded as they were not specific to outcome of pain or upper limb function following guided or palpation-guided injection of the ACJ. The remaining two studies were critiqued using the RCT CASP tool. Results: There is limited evidence that steroid injections to the ACJ, administered under ultrasound guidance (US guided) are no more effective than those using a palpation-

	guidance method in terms of reducing pain and increasing function in the short (3 weeks) and medium term (6 months). There is no evidence for long term outcomes (12 months onwards). Conclusion: Further research is needed to justify the additional cost and wait times of US guided over palpation-guided injections in light of similar clinical outcomes.
14:39 - 14:47	THE COMBINED SHOULDER ASSESSMENT: A CONVENIENT METHOD FOR OBTAINING EQUIVALENT OUTCOME SCORES E Torrance; L Hallam; AC Watts; M Walton; P Monga; L Funk The Arm Clinic at the Wilmslow Hospital, Wrightington Upper Limb Unit; University of Manchester, University of Salford Aim: The aim of this study was to develop a concise shoulder assessment form to derive three equivalent outcome scores in a 12-item patient-reporting questionnaire. Background: Outcome scores are useful tools in quantifying how pain affects the patient's functionality and lifestyle. Three shoulder outcome methods (Oxford, Constant and Quick DASH) are commonly used in practice but collectively consist of 34 questions, taking approximately 7 minutes to complete. Methods: Outcome scores from 1285 outpatients of an upper limb clinic were collected. The patient cohort consisted of 462 females and 823 males with mean age of 47.2 (±16.79; range 13 to 90). Using a correlation matrix, a 12-item questionnaire was drafted. The Combined Shoulder Assessment was validated by 227 patients; consisting of 101 females and 126 males with a mean age of 47.91 (±16.63; range 13 to 88). Results: Agreement was achieved between the two methods, with an equivalent Oxford (eOS) Shoulder Score intraclass correlation (ICC) of 0.930 and mean Oxford 30.32±7.806 versus 29.35±8.316 using the combined shoulder questionnaire. This was consistent across all investigated outcome scores, where the equivalent Constant (eCS) has an ICCvalue of 0.942 and a mean from the original assessment of 43.48±20.54 and 40.01±17.70 from the new scoring system. The equivalent QuickDASH (eQD) presented with ICC values of 0.869 and an original score of 46.79±17.68 compared with 47.43±17.43. Bland-Altman analyses showed no systematic difference between individual questionnaires and the Combined Shoulder Assessment. Conclusion: The new Combined Shoulder Assessment is a more convenient and patient-friendly method to obtain equivalent Oxford, Constant and QuickDASH shoulder outcome scores.
14:47 - 14:55	FINITE ELEMENT ANALYSIS OF A STEMMED HUMERAL COMPONENT OF AN ELBOW PROSTHESIS WITH ANTERIOR FLANGE K Chin; S Lambert; S Taylor; G Blunn Biomechanical Engineering Department UCL

	Purpose: To determine the stress distribution after implantation of a stemmed total elbow humeral component with variation in the length of stem and geometry of the anterior flange. Methods: A simplified model of humeral component of an elbow replacement was created using computer assisted design software. Volumetric mesh of a humerus with material properties based on greyscale value of the CT scan of a middle age patient was created using 3D processing software. The humeral component was virtually implanted with PMMA and exported to a finite element analysis software for investigation of the von Mises stress and micro-displacement with physiological loading based on stationary protocol. The intramedullary stem length was sequentially shortened from 100cm in steps of 20cm and the design of the anterior flange was altered. The study was carried out based on adequate cementation and full contact between the anterior flange, the "shoulder" of the humeral component and the anterior and distal humerus. The displacing force from the common flexors, common extensors and anconeus and medial head triceps were incorporated into the model. Results: Micro-displacement of the humeral component in a rotational mode was observed in the sagittal plane under 10N load with the elbow in 90° flexion. Under this loading condition, the proximal humeral stem tip is displaced by the sagittal torque anteriorly mimicking clinical scenario of periprosthetic fracture. The von Mises stress was concentrated mainly in the distal humeral region while the proximal stem tip was stress-shielded during initial loading and thus increasing stem length did not seem to confer additional stability. Increasing the contact between anterior humeral cortex and anterior flange did not confer any further protection. Increasing the width of the distal humeral stem mimicking an "internal condylar flange" was shown to improve the stress distribution and resist the sagittal torque. Conclusion: This study proposed several design concepts to improve the mechanical stability of the humeral component of an elbow replacement.
14:55 - 15:35	**Local organisers guest lecture**
SHOULDER ARTHROPLASTY: PAST PRESENT AND FUTURE **Luc Favard introduced by Matt Stanislas**	
15:35 - 16:10	**Coffee and trade exhibition**
16:10 - 17:30	**SESSION 2: Rotator cuff**
Chairs: David Clark and Cameron Hatrick	
16:10 – 16:18	**OPTIMISING THE OUTCOME OF EXERCISE AND CORTICOSTEROID INJECTION IN PATIENTS WITH SUBACROMIAL IMPINGEMENT SYNDROME: A FACTORIAL RANDOMISED TRIAL** E Roddy; R Ogollah; I Zwierska; P Datta; A Hall; EM Hay; S Jackson; M Lewis; J Shufflebotham; K Stevenson; D van der Windt; J Young; Primary Care and Health Sciences Institute, Keele University Purpose: Subacromial impingement syndrome (SIS) is the most common cause of shoulder pain. Management commonly involves exercise and corticosteroid injection yet

	how these are best delivered is uncertain. The SUPPORT trial investigated whether better outcomes in pain and function are achieved with (1) physiotherapist-led individualised, supervised and progressed exercise rather than a standardised advice and exercise leaflet, and (2) ultrasound (US)-guided subacromial corticosteroid injection rather than unguided injection. Methods: A 2x2 factorial randomised controlled trial. Adults with SIS were recruited and randomised to one of four treatment groups: (1) US-guided steroid injection and physiotherapist-led exercise, (2) US-guided steroid injection and an exercise leaflet, (3) unguided steroid injection and physiotherapist-led exercise, (4) unguided steroid injection and an exercise leaflet. Outcomes were collected at 6 weeks, 6 and 12 months by postal questionnaire. The primary outcome measure was the Shoulder Pain and Disability Index (SPADI), compared at 6 weeks for the injection interventions and 6 months for the exercise interventions. Results: 256 participants were recruited. Greater mean improvement in total SPADI score was seen with physiotherapist-led exercise than with the exercise leaflet at 6 months but not 6 weeks or 12 months: -1.60 (95%CI -6.99, 3.90) at 6 weeks, -8.23 (95%CI -14.14, -2.32) at 6 months, and -4.25 (95%CI -11.48, 2.99) at 12 months. Similar improvements were seen in the SPADI pain and disability subscales. The physiotherapist-led exercise group showed more positive illness perceptions, less impact on work performance at 6 months and greater reduction in current shoulder pain intensity at 12 months. Conclusion: Physiotherapist-led exercise in patients with SIS leads to greater improvements in pain and function than providing a standardised advice and exercise leaflet. Ultrasound-guidance confers little additional benefit over unguided corticosteroid injection.
16:18 - 16:26	**A RANDOMISED CONTROLLED TRIAL OF ARTHROSCOPIC CAPSULAR RELEASE VERSUS HYDRO-DILATATION IN THE TREATMENT OF PRIMARY FROZEN SHOULDER** S Gallacher; JC Beazley; R Anaspure; D Silver; A Redfern; W Thomas; J Kitson; C Smith Royal Devon and Exeter Hospital, Exeter Aim: To determine if a difference in Oxford Shoulder Score (OSS) exists between patients with severe frozen shoulder randomised to treatment with either an arthroscopic capsular release (ACR) or a hydro-dilatation. Background: Arthroscopic capsular release and hydro-dilatation have both been developed for the management of frozen shoulder refractory to conservative treatment. Both techniques have shown promising results but to date no randomised trial has directly compared the efficacy of both interventions. Methods: Patients presenting with severe primary frozen shoulder deemed suitable for surgical intervention by a consultant shoulder surgeon were randomised to either arthroscopic capsular release or hydro-dilatation. The primary outcome measure was OSS at 6 months with secondary outcomes measures of EQ-5D VAS, external rotation,

	complication and crossover rate also recorded. Results: Between June 2013 and December 2016, 50 patients were randomised to hydro-dilatation or ACR. The average age of the hydro-dilation and ACR cohorts was 54.5 (36-72; SD9.6) and 52.6 (40-74; SD 8) respectively. Twelve patients were available for follow-up at 6 months in the hydro-dilatation cohort and 19 in the ACR cohort. Four patients in the hydro-dilatation group (25%) crossed over to ACR prior to final follow-up and were excluded from analysis. The ACR cohort showed a significantly higher improvement in OSS at six months (our primary outcome) than the hydro-dilatation cohort (26 vs 19, p=0.018). Both ACR and hydro-dilatation cohorts also showed improvements in external rotation (34 vs. 34; p › 0.05) and EQ-5D VAS (10 vs 21, p › 0.05) but the mean difference in improvement between the cohorts was not significant. No complications were noted in either group. Conclusions: Patients randomised to ACR showed a significantly higher improvement in OSS than those randomised to hydro-dilatation. On this basis we recommend ACR as our first line therapy for frozen shoulder.
16:26 - 16:34	**ARTHROSCOPIC SUBACROMIAL SPACER IMPLANTATION PROVIDES RELIABLE PAIN AND FUNCTIONAL IMPROVEMENT IN PATIENTS WITH IRREPARABLE MASSIVE ROTATOR CUFF TEAR AT 20 MONTHS FOLLOW-UP: A UK BASED SINGLE CENTRE PROSPECTIVE STUDY** K Chin; G Bhabra; C Modi; T Lawrence; S Drew University Hospital Coventry & Warwickshire Purpose: Subacromial biodegradable spacer implantation has been reported to be an effective treatment for irreparable rotator cuff tear but the factors predictive of outcome had not been studied. We intend to report U.K. based patient experience and to study significant predictive factors. Method: We reviewed a prospectively collected database of 26 patients (mean age: 68; range: 48-88) who had undergone arthroscopic subacromial spacer implantation (mean follow-up: 20.5 months). Data was collected via telephone interview, questionnaire and clinical examination at 8 weeks, 6, 12 and 24 months post-op. Results: The mean post-operative Oxford Shoulder Score (OSS) is 31 (9-48). Nearly half (48%) of the patients reported ›50% improvement in pain and function while 33% reported no improvement. Nearly two-thirds (64%) of patients reported that the surgery was worthwhile and would undergo the surgery again for the contra lateral shoulder. Eighty-five percent (22/26) of the patients had early grade 1 or 2 glenohumeral joint arthritis; 42% (11/26) had a partial thickness upper border subscapularis tear; 50% had pre-operative abduction of over 90° and 65% had superior humeral head migration pre-operatively. Five patients had improvement in abduction while 3 deteriorated. The pre-operative superior humeral head migration remained unchanged post-operatively. Of those patients

	who had no improvement, 4 required reverse shoulder replacement and 1 had superior capsular reconstruction. There were no complications. Linear regression analysis showed that age, early arthritic changes, history of previous cuff repair, superior humeral head migration, bicep pathology, subscapularis tear, pre-operative abduction did not predict the final outcome (p>0.05) although this may be due to type 1 error. Conclusion: Subacromial spacer implantation provides reliable short term pain and functional improvement. However, larger size prospective study is required to investigate the predictive factors and recommend selection criteria for patients who will benefit from this procedure as one third of patients in our series showed no improvement.
16:34 - 16:42	THE ARTHROSCOPIC SUPERIOR CAPSULAR RECONSTRUCTION FOR MASSIVE IRREPARABLE ROTATOR CUFF TEAR USING DERMAL ALLOGRAFT D Makki; B Morgan; R Sandher; M Ravenscroft Stepping Hill Hospital, Stockport Purpose: In this study, we present our preliminary results of the arthroscopic superior capsular reconstruction (SCR) using dermal allograft for massive irreparable cuff tears Patients and methods: This prospective study with a standardised protocol. Inclusions criteria were as follows: massive irreparable supraspinatus tear, the absence of glenohumeral OA and in the absence of pseudo paralytic shoulder. Procedures were carried arthroscopically using the ArthroFLEX decellularized dermal allograft. The graft was secured medially with 2 anchors, laterally using a double row technique and side to side to infraspinatus tendon. Oxford Shoulder Score (OSS) and range of movements (ROM) were recorded preoperatively and at 3, 6 and 12 months postoperatively. MRI scan was performed at 3 months postoperatively. Results: So far, 22 patients were enrolled in the study (13 males and 9 females). Mean age was 64 years (range: 49 to 72). The mean OSS improved from 17.33 (SD: 6.5) preoperatively to 28.5 (SD: 8.3) at 3 months and to 31.5 (SD: 11.84) at 6 months postoperatively. This improvement was statistically significant at 3 months (p=0.04, paired t-test) and more significant at 6 months (0.006, paired t-test). Active forward flexion improved by 20 degrees in 17 patients and 5 patients, it remained unchanged but became pain free. MRI scans at 3 months showed medial failure of the graft in 3 patients. Since we have improved our technique of medial fixation we have had no further failure of the graft. Conclusion: To our knowledge this is the first reported series on SCR. Our preliminary results showed that this procedure can improve clinical outcomes in patients with massive and irreparable supraspinatus tears. Our results, despite being relatively short-term, are overall promising.
16:42 - 16:50	A PILOT COHORT COMPARISON STUDY OF 2 NOVEL SURGICAL TECHNIQUES FOR IRREPARABLE CUFF TEARS A See; M Barrett; G Hourston; H Kankam; G Tytherleigh-Strong; N Kang

	Cambridge University Hospitals NHS Foundation Trust; School of Clinical Medicine, Cambridge University, Cambridge Background: Irreparable rotator cuff tears have traditionally been difficult to treat with a resultant myriad of surgical solutions. Evolving techniques are available for irreparable tears but vary with regards to surgical technique and cost. We compared the short-term outcomes of allograft reconstruction versus subacromial spacer in the treatment of irreparable rotator cuff tears. Methods: All patients with a symptomatic irreparable tear without arthritic change and who had undergone either an allograft reconstruction or a subacromial spacer were in the study. The primary outcomes were the Oxford Shoulder Score (OSS), EQ5D-5L and reoperations. Secondary outcomes included the American Shoulder and Elbow Score (ASES, postoperative only). The outcome scores were assessed prospectively and the case notes analysed retrospectively. Results: There were 13 patients in the allograft cohort (mean age 66 years (48 – 77)). The mean postoperative follow-up was 13.9 months (7– 18). The mean OSS improved from 30.6 to 35.7 ($p<0.05$). Additionally, mean pain VAS scores improved from 7.7 to 1.5 ($p<0.01$). Mean satisfaction for the surgery was 7.8 out of 10. Complications included 1 re-rupture (7.7%), 1 infection (7.7%) and 1 case of no improvement, requesting a reverse TSR (7.7%). In the subacromial spacer group, there were 13 patients (mean age 69 years (58 – 83). The mean postoperative follow-up was 10.2 months (6 – 19 months). The mean OSS improved from 23.5 to 34.4 ($p<0.01$). Similarly, pain scores decreased from 6.8 to 3.0 ($p<0.01$). Mean satisfaction was 8.1. There were no complications. One patient, who did not improve and underwent a subsequent allograft reconstruction. Conclusion: Both treatments demonstrated an improvement in both pain and function in the majority of patients in this short term follow up. A formal, prospective comparison trial is advocated, which should also include a health economic cost analysis.
16:50 - 16:58	**ULTRASOUND GUIDED SUPERIOR TRUNK (C5/6) BRACHIAL PLEXUS NEUROMYOSTIMULATION AND BLOCK - A NEW PARADIGM SHIFT FOR CHRONIC SHOULDER PAIN.** <u>AR Thottungal</u> Kent and Canterbury Hospital, Canterbury Introduction: Shoulder pain is the second common MSK chronic pain problem. The current common nerve block option which is suprascapular nerve block (SSNB) does not provide complete analgesia. Neuromyostimulation / neuromodulation techniques are well known treatment modality of chronic pain. Inter Scalene Block (ISB) is the gold standard analgesic block for shoulder surgery. Superior trunk block using low volume local anaesthetic instead of ISB was described and it is gaining popularity to avoid the side effects of ISB.

	Methods: 10 elderly ASA 2/3 patients, who were unfit for surgery were selected. Pain score varied between 6-10 on the NRS and disability score 5-10. Two patients had bilateral shoulder problems. Age ranged 78-88 years. All 10 patients had superior trunk brachial plexus block (C5/6). Neuromyostimulation was done using 0.2-0.3 mA, 2 Hz, 1ms for 5 minutes. Block was performed using 4-6 ml of 0.1-0.125% L-bupivacaine and 7.6 mg of dexamethasone. Patients were followed after 10-12 weeks and successful patients were discharged or scheduled for second procedure depending up on the response. Results: Immediately following the procedure the pain and disability scores were reduced to 0-2 and 1-3 respectively. At 10-12 weeks follow up pain relief was 60-100%. Two patients proceeded to PRF after 6-8 months as the pain was returning. Seven patients were discharged back to community. One patient had the same procedure in the second shoulder and the pain relief of first shoulder is still continuing after 12 months. One patient is waiting for repeat procedure. Further studies and validation of this technique is needed to identify the superiority, long term implications and complications of this novel technique to treat chronic shoulder pain.
16:58 – 17:06	**THE IMPORTANCE OF URGENT ULTRASOUND SCAN FOR SHOULDER DISLOCATION IN PATIENTS ABOVE THE AGE OF FORTY YEARS: A PROSPECTIVE BESS PATHWAY IMPLEMENTATION STUDY** G Prasad; R Zhou; S Robinson; A Sinha Chesterfield Royal Hospital, Chesterfield Introduction: British Elbow and Shoulder Society (BESS) published its patient care pathway for the management of traumatic anterior shoulder instability with BOA in 2015. From October 2015, our institution has set up a protocol to do urgent ultrasound scan for all patients after first-time shoulder dislocation above the age of forty years to identify acute traumatic rotator cuff tears. We present our findings from one-year data following the introduction of our protocol in a District General Hospital. Method: All cases with radiological confirmation of shoulder dislocation were identified from fracture clinics and A+E admission. Patients over the age of 40 after first-time shoulder dislocation were selected. Demographics, associated fractures, ultrasound results and any operative interventions were recorded. Results: During a one-year period, 54 patients (mean age 70 years, F:M ratio - 2:1) over the age of 40 had first-time shoulder dislocation. 40 patients (74%) were captured by the pathway with average time to ultrasound scan of 19 days. Twelve were unsuitable for further investigation and 2 had surgery without having ultrasound scan. Out of all patients scanned 23 had full-thickness rotator cuff tear (FRCT), 17 patients had associated greater tuberosity fracture (9 displaced) and 13% had associated nerve injury. The incidence of FRCT steadily increased with age from 20% (age range 40 - 55 years) to over 77% over 70 years (p value=0.002).

	All patients suitable for surgery were urgently assessed in a shoulder clinic and 13 patients underwent surgery. The mean age of surgical group was significantly younger than the non-surgical group (p value=0.004). No acute post-traumatic FRCTs were missed in this period. Conclusion: The study shows a high incidence of acute traumatic cuff tears after dislocation, hence supports the need for urgent USS in patients over 40. The protocol helped in reducing time in definitive diagnosis and management.
17:06 – 17:14	ACCURACY OF ULTRASOUND IN DIAGNOSING A SUBSCAPULARIS TEAR ND Mackay; P Upaghyay; KF Chin; G Bhabra; CS Modi; TM Lawrence; SJ Drew University Hospital Coventry and Warwickshire, Coventry Purpose: USS accuracy in diagnosing full thickness superior rotator cuff tears has been reported to be as high as 96%, but this drops to 76% for subscapularis tears. We reviewed the accuracy of USS in our institute by comparing it with the intraoperative arthroscopy findings. Method: USS and arthroscopy findings for 409 patients with rotator cuff pathology were retrospectively reviewed. Data analysed included age, gender, size of cuff tear, LHB pathology and presence of subscapularis tears. Results: Pre-operatively 409 patients had USS. 120 subscapularis tears were identified at arthroscopy. The prevalence of full thickness subscapularis tears amongst patients who underwent arthroscopy for cuff pathology was 29.3%. Fifteen patients had isolated subscapularis tears without associated superior cuff tears. The USS identified 10.8% of the full thickness subscapularis tears which required repair. The sensitivity, specificity, positive and negative predictive value with 95% confidence interval for USS diagnosis of a subscapularis tear was 10.83% (5.9-17.81), 99.65% (98.1-99.99), 92.86% (63.23-98.99) and 72.91% (71.65-74.13) respectively. Of the 120 subscapularis tears 28.3% were large retracted tears. 47.2% of partial thickness tears identified on the USS were full thickness tears at arthroscopy. 24 of these were small non-retracted upper half tears. The accuracy of USS in detecting small full thickness subscapularis tears is 3.5%. 51.7% of patients with a subscapularis tear had LHB pathology requiring tenotomy or tenodesis. In contrast, 78.4% of patient who had normal LHB also had a normal subscapularis which is a good negative predictive value. Linear regression study showed that a large subscapularis tear is associated with the presence of a large superior cuff tear +/- biceps pathology (regression coefficient 0.06, p=0.04). Conclusion: Full thickness subscapularis tears are frequently missed by USS in our institute. Further studies are needed to establish a more accurate systematic approach to identify subscapularis tears pre-operatively.
17:14 – 17:22	POINT OF CARE ULTRASOUND UTILISING THE BESS WORKING GROUP PROTOCOL - CAN NURSES DO IT TOO?

	P Blake; H Brownlow Circle Reading Hospital, Reading Purpose: To utilise the BESS learning protocol to train a nurse specialist without prior experience in USS to perform point of care shoulder ultrasound to identify full thickness rotator cuff tears. Methods: Training took place over 6 months under the guidance of a consultant orthopaedic shoulder surgeon proficient in shoulder USS. In accordance with the BESS protocol the nurse undertook 20 supervised outpatient scans to become familiar with equipment and technique and attended a 1 day shoulder USS masterclass. The nurse then performed 50 consecutive pre-operative scans on the same day as arthroscopy. Feedback by direct observation of arthroscopic findings was undertaken by the nurse who was present in theatre for all cases allowing immediate learning from diagnostic errors. Results of the first 50 patients were analysed to identify accuracy, sensitivity and specificity. Thereafter a second group of 50 consecutive pre-operative scans were performed and the results were again analysed. Results: After the first 50 scans the nurse demonstrated 85% accuracy, 94% sensitivity, and 82% specificity for identifying full thickness rotator cuff tears. Following the second 50 scans the results improved to accuracy 92%, sensitivity 92% and specificity 92% for identifying full thickness rotator cuff tears. Conclusion: The published accuracy of radiologists and surgeons using USS to diagnose full thickness rotator cuff tears is about 90% sensitivity and 90% sensitivity. Our study shows that a non-surgeon, using this BESS protocol, can learn to accurately and reliably diagnose full thickness rotator cuff tears with USS. This has potentially important implications for cost savings, efficiency and patient experience. It offers the option of expanding the roles of extended scope nurses and allied health practitioners within the shoulder team. As far as we are aware this is the first example of a nurse in the UK undertaking point of access shoulder ultrasound.
17:22 – 17:30	THE STRUCTURAL INTEGRITY OF THE ROTATOR CUFF 16 YEARS POST REPAIR: AN ULTRASOUND ANALYSIS R Elliott; S Bell; J Coghlan; Y Lim; J Troupis Melbourne Shoulder and Elbow Centre, Monash University, Melbourne Aim: To report the clinical results and ultrasound findings following previous rotator cuff repair 16 years post index surgery. Background: There are few studies reporting long-term rotator cuff integrity following repair of a tear. It is important to ascertain how much in the long term a rotator cuff repair alters the natural history of rotator cuff degeneration. Method: The prospectively studied clinical outcomes at short, medium and long term follow up in 27 shoulders in 25 patients treated with arthroscopic subacromial

	decompression and mini-open rotator cuff repair have previously been reported. The functional outcomes scores recorded were the UCLA, ASES and SST patient reported outcome measures. These patients then underwent at long term an ultrasound scan assessment of the shoulder and the integrity of the repair. Results: At average 16.25 years post-surgery a recurrent tear was noted in 37% of patients. Only one recurrent tear had an increased size. Two patients required repeat surgery. Patients had a mean UCLA score of 30, ASES of 91.3 and SST of 9.5 with an 85% level of satisfaction with surgery. Patients with a recurrent tear had equivalent outcome scores to those with an intact rotator cuff. No independent risk factors were identified as predictors for recurrent tear; however, there was a trend to poorer healing in the older age group. Conclusion: Patients following a rotator cuff repair showed sustained benefit and satisfaction at long-term follow up, despite a 37% recurrence of full thickness supraspinatus tear.
17:40 – 18:40	**Industry Workshop: Arthrex (Room: Legends Lounge (Ground Floor))**
	Arthrex's commitment to dynamic Medical Education will be showcased again at BESS 2017 with Live Cadaveric Demonstrations from the MobileLab™. The 5:40pm symposium on Wednesday in the Legends Lounge will be hosted by Mr Peter Brownson (Liverpool) and Mr Graham Tytherleigh-Strong (Cambridge). Utilising state of the art Synergy 4K camera systems delegates will observe demonstrations of Superior Capsular Reconstruction (Mr Matt Ravenscroft, Stockport), Instability Repair (Miss Julie McBirnie, Edinburgh) and Reverse Arthroplasty (Dr Dirk Petre, Belgium). Entry will be first come first served, with liquid refreshments provided.
17:40 - 18:40	Industry Workshop: Wright Medical (Room: Aylesford Suite (2nd Floor))
	AEQUALIS™ PERFORM™ REVERSED Glenoid System Sawbone Workshop led by Mr Steve Drew (University Hospitals Coventry and Warwickshire) Wright Medical are excited to launch the new AEQUALIS™ PERFORM™ REVERSED Glenoid System at BESS 2017. We invite you to take part in this practical workshop led by Mr Steve Drew, in which delegates will have the opportunity to learn more about the features of this new product, as well as being able to practice the surgical technique on sawbone models.
17:40 - 18:40	Industry Workshop: Zimmer Biomet (Room: Zimmer Biomet Stand Number 7/8/9/10 – Ericsson Hall 2)
	Increase Knowledge - Shoulder Topics: – Inlay v Onlay – Complex Revision – Revising the Revised elbow - Where are we going? Invited Faculty: Guest - International Speaker Dr J Sperling - Mayo Clinic, USA

	Faculty Mr. A Ali - The Northern General Hospital, Sheffield
17:40 - 18:40	Industry Workshop: Smith & Nephew (Room: Jaguar Lounge (Ground Floor))
	To be Confirmed
17:40 - 18:40	Industry Workshop: DJO Global (Room: Jaguar Suite (Ground Floor))
	Reverse Shoulder Prosthesis - Mr Vipul Patel (SWLEOC, Epsom) The Reverse Shoulder Prosthesis (RSP®) was the first reverse shoulder design to successfully incorporate a centre of rotation (COR) lateral to the glenoid. The RSP® has been extensively researched in the lab and studied in the clinical setting and has excellent long-term results. Mr Vipul Patel (SWLEOC, Epsom) will discuss the rationale for the RSP® and demonstrate implantation on sawbone models. Delegates will have the opportunity to engage in discussion about the unique design features of the RSP® system, including technical tips and pearls as well as its use in challenging clinical cases based on Mr Patel's considerable experience.
19:40 - late	**Conference dinner**

Thursday, 22 June 2017

08:00 - 08:50	Master classes	
Master class A	Master class B	Master class C
Room: Premier Lounge	Room: Jaguar Suite	Room: Legends Lounge
Should all patients over 70 years with osteoarthritis have a reverse shoulder replacement? A debate. Speakers: J Sperling; C Smith; J Kitson Moderators: T Lawrence; C Modi	**The role of arthroplasty in the management of proximal humeral fractures in the elderly** Speakers: A Ekelund; R Emery Moderators: M Stanislas; S Drew	**Essential knowledge for elbow arthroscopy – indications and techniques** Speaker: A Watts; A Hearnden; S Hay Moderator: G Bhabra

09:00 - 10:15	SESSION 3: Elbow
Chairs: Mike Thomas and Ro Kulkarni	
09:00 - 09:08	**OUTCOME SCORING SYSTEMS IN INTERVENTIONAL ELBOW STUDIES - AN ASSESSMENT OF TRENDS AND DISTRIBUTION OF USE** JP Evans; CD Smith; N Fine; I Porter; J Gangannagaripalli; JM Valderas Health Services and Policy Research Group, University of Exeter and Royal Devon and Exeter NHS Foundation Trust, Exeter Aim: Although attempts to assess the quality of outcome measures in elbow pathology have been undertaken, this study aims to be the first to explore their application in the contemporary research literature.

	Background: Outcome measures are used in clinical trials to assess the change in health-related quality of life experienced by patients following an intervention. Outcome measure choice should be dependent on the validity of the instrument. Methods: A search strategy was developed to identify all studies reporting the use of outcome measures in the elbow literature. The strategy run from inception in Embase, CINHAL and Medline. Data extraction identified the data of publication, country of data collection, pathology assessed and outcome measure used. Results: 831 interventional studies were identified that reported outcome measure use. 62 separate outcome measures were identified. 39% of studies used two or more separate measures. Overall 43% of studies used the Mayo Elbow Performance Score (MEPS). For Arthroplasty 73% used MEPS. For Trauma 54% used MEPS, 19% used the Morrey Score, 13% used Disabilities of Arm, Shoulder and Hand (DASH). For tendinopathy, 29% used DASH, 18% used Patient-Rated Tennis Elbow Evaluation, 15.1% used MEPS. Limited variation over time and country of use was noted. Conclusions: This study has identified the wide choice and usage of outcome measures in the elbow literature. It is the first study to identify both the persistent heterogeneity of use and the tenacious hold of historical systems. Reporting multiple systems increases participant burden and is unwarranted. Though there is an emergence of Patient Reported Outcome Measures (PROMs), numerous studies report measures without a history of either pathology specific or cross-cultural validation. Interpretability and comparison of outcomes, both within and between, clinical trials is dependent on the unification of outcome measure choice. This is not currently demonstrated in the elbow literature.
09:08 - 09:16	**A RANDOMISED CONTROLLED TRIAL OF TENEASE VERSUS CONSERVATIVE THERAPY FOR THE TREATMENT OF TENNIS ELBOW** A Phillips; S Gallacher; JC Beazley; J Evans; A Toms; W Thomas; C Smith Royal Devon and Exeter Hospital, Exeter Aim: To determine if Tenease (a mechanical, high frequency vibratory stimulation device) can improve pain and function at 6 months for the treatment of tennis elbow as compared with conservative treatment. Background: Two previous studies have examined the use of Tenease for the treatment of a heterogeneous group of patients with musculoskeletal pain and reported good results. To date no study has examined the use of Tenease specifically for the treatment of tennis elbow. Methods: Adults presenting to our outpatient clinic with a clinical diagnosis of tennis elbow and considered suitable for conservative treatment were randomised to either conservative treatment with activity modification and analgesia or conservative treatment plus Tenease therapy. Tenease therapy consisted of 6 weeks of treatment utilising the

	Tenease machine with up to three 10 minute episodes administered by the patient a day. The primary outcome measure was quick DASH at six months with secondary outcome measures of PRTEE and EQ5D. Results: Fifty patients were included in the study. Eight patients withdrew, leaving 42 patients for assessment. Nineteen were randomised to conservative treatment and 23 to Tenease therapy. Both groups reported statistically significant improvements in qDASH and PRTEE ($p<0.05$)(Mean (SD)) from baseline (Control DASH 51.2 (18.2), PRTEE 57.3 (19.5) vs Tenease 55.6 (16.7), 59.5 (17.2)) to 6 months (32.2 (16.0), 39.5 (19.7) vs 20.4 (18.3), 27.5 (22.5)) but no significant difference was demonstrated between the groups at six weeks or six months. No complications were noted in either group. Conclusions: In our randomised controlled trial of Tenease versus conservative treatment we observed no difference in our primary end point of quick DASH at six months between either group. On this basis we could not recommend Tenease for the treatment of lateral epicondylitis.
09:16 - 09:24	**PLATELET RICH PLASMA INJECTION UNDER ULTRASOUND GUIDANCE: A COST-EFFECTIVE TREATMENT ALTERNATIVE TO SURGERY FOR TENNIS ELBOW?** F Khan; T Matthews Cardiff and Vale Orthopaedic Centre, University Hospital Llandough, Wales Purpose: Although tennis elbow is a self-limiting condition, a proportion of cases will remain symptomatic despite conservative measures, these require further treatment. Our aim was to show that ultrasound guided platelet rich plasma (PRP) injection is an effective treatment at this stage and considerably cheaper and less invasive option than surgery. Methods: A retrospective review of 92 elbows in 83 patients who presented with symptomatic tennis elbow after failure of conservative treatments was undertaken. There were 32 males and 51 females. The average age was 48.5 years (Range 26 to 71 years). There were 47 right, 27 left and 9 bilateral elbows. The average pre-injection Oxford Elbow Score was 18.8 (Range 1 to 29). The procedure was undertaken under local anaesthetic in theatre as a day case under ultrasound guidance. They underwent rehabilitation under physiotherapy supervision and clinical follow-up at 6 weeks and 6 months. Results: The mean post injection Oxford Elbow Score was 38.1 (Range 35-47) for 76 (82.7%) elbows who had good symptomatic relief and were discharged. The mean score was 19.9 (Range 1-30) for 13 (14.1%) elbows that had a poor result or recurrence and thus proceeded to surgery. The total cost for the PRP injection was £487 compared to £1595 for open tennis elbow release. There is a significant saving not only in monetary terms but also in relation to pre-assessment clinic appointment, general or regional anaesthesia (with possible complications), theatre time, post-operative recovery time and time to discharge. Conclusions: In conclusion, we have demonstrated that ultrasound guided PRP injection is

	an effective treatment for tennis elbow, refractory to conservative management, as an alternate to surgery with significant cost savings.
09:24 - 09:32	**SHORT TERM OUTCOMES OF LATERAL EPICONDYLITIS TREATED WITH PLATELET RICH PLASMA INJECTIONS** D Neilly; T McMillan; T Gardner; D Cairns; K Kumar; S Barker Aberdeen Upper Limb Unit, Woodend Hospital, Aberdeen Background: Lateral Epicondylitis is a common condition caused by angiofibroblastic hyperplasia of the tendinous insertion. Treatment includes rest, physiotherapy, corticosteroid injection and surgical release. The role of Platelet Rich Plasma (PRP) injections have recently been explored, with positive results. Although the exact mechanism remains unclear, it is thought that the growth factors contained within the platelets stimulate collagen synthesis, angiogenesis and also provide an anti-inflammatory effect. Objective: To assess the outcomes of lateral epicondylitis treated with both ultrasound guided and blind PRP injection. Methods: This was a single centre prospective cohort study. All patients had recalcitrant lateral epicondylitis that had failed to respond to conservative treatment. PRP was injected into and around the common extensor origin either with or without ultrasound guidance. Patients were assessed with the Disabilities of the Arm, Shoulder and Hand (DASH) Score. Neither group received physiotherapy after injection. The primary outcome measure was DASH score at 3 months, 6 months and 1 year. Results: 67 (36F:31M) patients were recruited. The mean age was 50 years (range 31 to 79). The average pre-injection DASH score for both groups combined was 42.5 (11.7-87.5). The mean overall improvement of DASH score at 3 months follow-up was 14.91 and 8.6 at 6 months. Only 10% (n=7) of patients had no improvement in their symptoms following injection. There was no statistically significant difference in improvement in DASH score between the blind and ultrasound guided cohorts ($p<0.01$). No complications were noted. Conclusions: PRP injections are effective in the treatment of lateral epicondylitis with clinical improvement seen at 3 months and 6 months post injection. Interestingly, the use of Ultrasound guidance does not appear to improve patient outcomes. Although the short-term results are promising, longer follow up is required to fully assess the efficacy of this treatment.
09:32 - 09:40	**CADAVERIC EVALUATION OF THE SPREAD OF INJECTATE AFTER ULTRASOUND-GUIDED LATERAL ELBOW INJECTION** JP Evans; J Metz; W J Thomas; A King; R Anaspure; C Smith Royal Devon and Exeter Hospital, Exeter

	Aim: The aim of this study was to assess the intratendinous distribution and surrounding contamination of ultrasound guided injections into the Common Extensor Origin (CEO) of the elbow. Background: Injections into the tendinous portion of the common extensor origin are a common intervention in the treatment of Lateral Epicondylar Tendinopathy (LET). Clinical trials report a heterogeneous selection of injectate volumes and delivery techniques, with systematic reviews finding no clear consensus. Previous cadaveric studies have identified that unguided injections, based on anatomical landmarks, have poor accuracy. No cadaveric study has assessed the contamination of surrounding tissues and the intratendinous spread of injectate using commonly employed volumes and delivery techniques using ultrasound control. Methods: 20 cadaveric elbows were injected by a Consultant Radiologist. Elbows were randomised to equal groups of 1 or 3mls of methylene blue injection, delivered using single shot or fenestrated techniques. Following injection, each cadaver underwent a dry arthroscopy and dissection of superficial tissues. The common extensor origin was excised, set and divided into 1mm sections using a bench microtome. Each slice was photographed and analysed to assess spread and pixel density of injectate. Cross-sectional area of distribution was calculated and compared between groups. Results: In all 20 cadaveric samples, contamination of the joint was noted on arthroscopy and dissection. No differences were found in intratendinous spread of injectate between differing volumes and techniques. Conclusion: Findings from this study suggest that 1ml of injectate using a single shot technique was adequate to distribute methylene blue throughout the common extensor origin in cadaveric tissue. These findings justify further clinical trials on the therapeutic effect of reduced volume, single-shot injections. Users of elbow tendon injections should be aware that these results suggest that joint contamination may be inevitable.
09:40 - 09:48	**THE DISTAL BICEPS BRACHII ANATOMICAL FOOTPRINT ENDOBUTTON REPAIR COMPARED TO CONVENTIONAL ENDOBUTTON REPAIR: IS THERE A DIFFERENCE IN OUTCOME?** J Phadnis; S Bellringer; T Human; C Redmond; G Bain Brighton University Hospital NHS Trust, Brighton; Department of Trauma and Orthopaedics, Flinders University, SA, Australia Introduction: Forearm supination power is reduced following distal biceps rupture. Single incision cortical button fixation is a popular method of repairing distal biceps ruptures, but cadaveric data suggests an anatomic repair to the native biceps footprint may improve supination force. This has not been investigated in a clinical model. The study aimed to compare the clinical and biomechanical outcomes of patients following repair with the two techniques. Methods: 22 patients (11 in each group) following either footprint repair or conventional

	cortical button repair were included. Biomechanical performance was tested using isokinematic dynomamometry, using a validated protocol by three independent observers who were blinded to the surgery performed. Strength was assessed using peak torque, and endurance was assessed by total work, repetitive work and work fatigue for supination and flexion in the operated and non-operated arm, which was used as a control. Clinical outcome measures were the Quick DASH score and MEPS. Results: On flexion testing, there was no significant difference in mean peak torque or work fatigue between the groups. There was significantly greater total work done in the footprint group, for both the operated (p=0.02) and non-operated arms (p=0.01). On supination testing, there was significantly greater mean peak torque (p=0.03); total work performed (p=0.03) and repetitive supination endurance (p=0.04) in the footprint group in the operated arms but no significant difference in the control arms. qDASH and MEPS were good or excellent for all patients with no significant difference between groups. Conclusions: Biomechanical testing in a clinical model indicates superior restoration of supination function with a footprint repair technique compared to a conventional cortical button technique. Patient reported outcomes and complications rate were equivalent suggesting both techniques are safe and effective in treating distal biceps ruptures.
09:48 - 09:56	DISTAL BICEPS TENDON RUPTURES: A COMPARISON OF OUTCOMES FOLLOWING SURGICAL AND NON-SURGICAL MANAGEMENT DA George; A Eyre; K Juthani; V Schutzer-Weissmann; I Abdelrahman; M Thomas; A Pandit Department of Trauma and Orthopaedics, Wexham Park Hospital, Frimley Health NHS Trust, Slough Introduction: This large single centre cohort series reports the outcomes of patients undergoing distal biceps tendon repair at our Institute over a 9-year period, compared to patients treated non-operatively. Methods: All consecutive patients that presented to our Institute with a distal biceps tendon rupture from July 2007 to July 2016, with a minimum 3 months follow-up, were included in this retrospective study. Three distinct groups were analysed including those undergoing a single-incision repair with the Toggle-LocTM system or Endobutton, and those treated non-operatively. Outcomes were defined subjectively (ability to undertake activities of daily living without significant pain or disability), and objectively (DASH and Oxford Elbow Score). Results: 52 distal biceps ruptures in 51 patients were included, with a mean age of 44.4 years (SD 10.9), and included 49 male patients (96.1%). 36 injuries were treated surgically; Toggle-Loc (n=19, 52.8%) and Endobutton (17, 47.2%), and 16 non-operatively. Five patients were lost to follow-up (9.6%). Functionally, patients treated non-operatively had a statistically significant higher DASH score to surgical patients (p=0.03), otherwise no other differences were seen amongst the groups. The overall complication rate was

	9.8% (n=5); 12.5% of non-operative, 10.5% Toggle-Loc and 5.9% Endobutton, with no significant difference between the groups (p=0.638). Conclusion: We have demonstrated that a single-incision repair of a distal biceps tendon is safe, with good clinical outcomes following either an Endobutton or TooggleLoc technique. Similar outcomes are also seen when treated non-operatively with early return to function.
09:56 - 10:04	CONSERVATIVE TREATMENT OF MASON TYPE II RADIAL HEAD FRACTURES G Mouzopoulos; C Vlachos; M Ampadiotaki; K Manolakos; L Karantzalis; K Vlachos Orthopaedic Department of Sparti General Hospital, Greece Objective: To determine the efficacy of conservative treatment of Mason Type II radial head fractures. Patients and Methods: Thirty eight patients sustained an isolated Mason Type II fracture of radial head were enrolled in our prospective study. All patients were treated with a long arm cast for three weeks and the same subsequent physiotherapy program. Magnetic resonance images (MRI) of all patients were examined in order to exclude associated injuries. Elbow and forearm range of motion, the Mayo Elbow Performance Score and the Disabilities of the Arm, Shoulder and Hand Score (DASH score) were measured. Statistical packet STATA 8.0 was used to compare injured and uninjured elbow and significance was set at p<0.05. The mean follow-up was 5 years. Results: There was significant difference among the injured and uninjured side regarding the elbow extension (-2.3°±5.8° versus 1°±4°, p < 0.05) and flexion (132.3°± 4.5° versus 137.6°±5.6°, p < 0.05). No significant differences were detected regarding the forearm supination (84.3°±4° versus 89°±3.2°) and pronation (85.6°±2.4° versus 86.4°±4.5°) among the injured and uninjured side. The DASH score and the Mayo Elbow Performance Score were excellent in 87.61% and 78.6% of patients respectively. Conclusions: Conservative treatment of Mason Type II radial head fractures is associated with excellent results in terms of daily function.
10:04 - 10:12	COMPARISON OF AN ALL SUTURE REPAIR TECHNIQUE, WITH TENSION BAND WIRING OR PLATE FIXATION FOR SIMPLE OLECRANON FRACTURES AND OSTEOTOMIES A Vaughan; A Watts; J Peters; T Luokkala; J Phadnis Brighton and Sussex University Hospitals; Wrightington Upper Limb Unit Introduction: Fixation of simple olecranon fractures and olecranon osteotomies with tension band wiring (TBW) or plates is associated with high re-operation rates in the literature. The aim of this study was to compare the complication and re-operation rate between a suture only technique and TBW or plate fixation of simple olecranon fractures and osteotomies.

	Methods: A two-centre retrospective cohort study was performed. 179 consecutive olecranon fractures and osteotomies were classified according to the Mayo classification. Only Mayo type 1 and 2 fractures were included (simple undisplaced and displaced fractures without ulnohumeral instability). The primary outcome measure was the incidence of complication or re-operation. Radiographs were assessed for fracture union or fixation failure. Results: After exclusions, 156 operations were performed on 154 patients. Post-operative radiographs were available in 132 (86%) of cases. There were 129 fractures (10 Mayo type 1 and 120 Mayo type 2) and 26 osteotomies. 90 cases were treated with TBW, 38 with plates and 28 with suture only. There was no significant difference between the groups according to fracture type or patient demographics. Overall re-operation rate was 23% (36/155). Of these, 81% (n=29) was to remove prominent metalwork, 11% (n=4) was for infection and 8% (n=3) for re-fixation (two in the TBW group and one in the suture group). One other patient in the suture group had an asymptomatic non-union that did not require re-operation. All other patients achieved radiographic union between 6 and 12 weeks post-operatively. There were significantly fewer re-operations in the suture group compared to the TBW group (1/28 (3.5%) vs. 30/89 (34%), p=0.0037), but not compared to the plate group (1/28 (3.5%) vs. 4/38 (11%), p=0.6357). Conclusions: An all suture technique for fixation of simple olecranon fractures is associated with a significantly lower re-operation rate than TBW with equivalent radiographic union rates.

10:15- 10:45	**Coffee and trade exhibition**	
10:45 - 12:00	**Hot topics session**	
Chair: Mike Thomas		
10:45 - 11:00	Update on BESS clinical trials	Amar Rangan
11:00 - 11.05	NJR Steering Committee Update	Amar Rangan
11:05 – 11:15	NJR Annual Report and GIRFT	Jonathan Rees
11:15 - 11:25	Tariff: Present and future	Ro Kulkarni
11:25 - 11:30	Professional practice update	Michael Thomas
11:30 - 11:40	Journal update	David Stanley
11.40 - 11:50	Education committee report	Martin Holt
11:50 - 12:00	Research committee report	Steve Drew
12:00 – 12:40	**Presidential guest lecture**	

REGISTRY DATA IN ARTHROPLASTY OF THE SHOULDER AND THE ELBOW, LESSONS LEARNED AND POSSIBILITIES FOR THE FUTURE

Bo Olsen introduced by Michael Thomas

12:40 - 13:55	Lunch and trade exhibition
14:00 - 15:20	SESSION 4: Arthroplasty
Chairs: Amar Rangan and Stuart Hay	
14:00 - 14:08	**A COMPARISON OF EARLY COMPLICATION RATES AND LEARNING CURVES FOR SHOULDER AND ELBOW ARTHROPLASTY** JC Beazley; J Evans; C Smith Royal Devon and Exeter Hospital, Exeter Aim: To evaluate the early complication rates and learning curves of a single surgeon series of anatomic shoulder replacements (ASR), reverse shoulder replacements (RSR) and total elbow replacements (TER) over the first five years of a consultant's career. Background: There has been a significant increase in RSR over ASR over the last five years. Little comparative data however exists comparing the early complication rate of RSRs, ASRs and TERs and evaluating the learning curves of these prostheses. Methods: The first 100 ASRs, 100 RSRs and 40 TERs performed between July 2011 and July 2016 were reviewed to identify early complications. Cumulative satisfactory outcome plots and CUSUM plots were used to analyse learning curve effect. Results: Early complications were noted to have occurred in 17 (17%) of RSRs, four (4%) ASRs and two (5%) TERs. Ten (10%) of the RSRs and 1 (1%) of the ASRs required return to theatre within three months. No TERs required return to theatre. The early complication rates were observed to be significantly higher in the RSA group as compared with the anatomic group (OR 4.9 (95% confidence intervals 1.6 - 15.2, p=0.057)). An inflection point on the CUSUM plot suggestive of trend to consistent performance for ASRs and TERs was reached at 16 and 23 cases respectively. No inflection point was observed on the RSR cohort. Conclusions: We observed a significantly higher early complication rate within out RSR cohort as compared with our ASR cohort with a ten-fold increase in return to theatre in our RSR vs. ASR cohort. Whilst a trend towards consistent performance was seen at 16 and 23 cases for ASR and TER respectively the learning curve for RSR is likely to extend beyond the first 100 cases highlighting a need for extended performance monitoring.
14:08 - 14:16	**ONGOING PAIN AFTER REVERSE SHOULDER ARTHROPLASTY: AN ANALYSIS OF CAUSATIVE FACTORS** D Makki; U Bhatty; B Morgan; R Sandher; M Ravenscroft Stepping Hill Hospital, Stockport, Greater Manchester Purpose: The aim of this study was to assess the natural history of pain after reverse arthroplasty, to highlight the causes of ongoing pain and propose a management plan. Patients and methods: We reviewed 150 consecutive patients (161 shoulders) who had uncomplicated primary reverse arthroplasties over a 6-year period (minimum 12 months). Patients data included prospective documentation the Oxford shoulder score (OSS) at 3, 6

	and 12 months postoperatively. The reported level of pain was extracted from the OSS and the course of pain was determined within the first 12 months postoperatively. Patients with ongoing pain were further evaluated for the type of pain, location, causes and treatment. After infection and implant related problems have been excluded we established an algorithm for the management of these patients. Results: There were 39 males and 111 females with a mean age of 71 years (range: 51 to 91 years). Complete pain relief was only seen 16 % of patients at 3 months and this increased to 40 % and 60 % at 6 months and 12 months respectively following surgery. Seven out of 29 patients (25%) who reported severe pain at 3 months had acromial stress fractures. Seven out of 10 patients (70%) who reported moderate pain at 6 months postoperatively had identifiable source of pain that required treatment more commonly AC joint OA. None of patients who had mild pain at 12 months had any identifiable source. Conclusions: Patients should be aware that around 40 % of patients would still report mild pain at one year postoperatively. Severe pain at 3 months is likely to be attributed to stress acromial fracture. When pain level remains moderate at 6 months some sources can be found.
14:16 - 14:24	**IS HYBRID SINGLE-PHOTON EMISSION COMPUTED TOMOGRAPHY WITH CT USEFUL IN INVESTIGATING PAIN FOLLOWING SHOULDER ARTHROPLASTY?** A Gulihar; G Talawadekar; NJ Little; VR Patel Epsom and St Helier NHS Trust, Epsom Background: To present our experience in using 99mTc-HDP SPECT-CT and evaluate its usefulness in the assessment and management of 29 patients with persistent pain following shoulder replacement, largest published series to date being just 4 patients. Methods: We identified patients presenting with shoulder pain following shoulder arthroplasty who were investigated with SPECT-CT imaging at our institution. For each patient the clinical records, pre- and post-procedure imaging including plain radiographs were examined. Results: Thirty SPECT-CT scans were undertaken in 29 patients. Procedures performed included 19 hemi-arthroplasties and 11 total shoulder replacements. In all patients, the scan contributed useful information and helped formulate a treatment plan. In 22/30 (73%) shoulders, the SPECT-CT reaffirmed the clinical diagnosis. In nine patients the SPECT-CT findings did not correlate with suspected clinical diagnosis. In seven patients, it ruled out implant loosening and in the 8th, it excluded glenoid wear. The latter patient successfully underwent arthroscopic tenotomy of the long head of biceps. Glenoid erosion was the most common abnormality identified (n=16) of which it was clinically suspected in 15. All patients who underwent repeat intervention guided by SPECT diagnosis reported symptom improvement. In one patient with humeral resurfacing, SPECT-CT identified stress fracture of scapular spine with glenoid wear. Following fixation of fracture, patient's symptoms improved, thus avoiding a revision arthroplasty. One patient underwent scanning on two separate occasions, to rule out infection, following revision

	surgery for persistent pain. On both occasions the scan was positive but was not specific for infection. The accuracy, sensitivity, and positive predictive value of SPECT-CT for glenoid wear were, 91.6%, 91.6% and 100% respectively. Conclusions: 99mTc-HDP SPECT-CT imaging of painful shoulder replacements provides important diagnostic information that can direct clinical management, especially in diagnosis of glenoid erosion, distinguishing it from aseptic humeral implant loosening.
14:24 - 14:32	**A COMPARISON OF SHOULDER HEMIARTHROPLASTY WITH REVERSE SHOULDER ARTHROPLASTY FOR PROXIMAL HUMERAL FRACTURES - AN AVERAGE 2 YEAR FOLLOW UP STUDY** A Eyre-Brook; M Cooper; B Ketzer; M Bhamra; B Venkateswaran Mid Yorkshire Hospitals NHS Trust, Wakefield Introduction: Recent evidence has shown a better range of motion (ROM) and functional outcome scores with reverse total shoulder replacement (RTSR) than hemiarthroplasty (HA) for proximal humeral fractures (PHF). Purpose: To determine whether the type of shoulder arthroplasty performed affects the functional outcome of patients in our trust. Methods: We used a prospectively-collected hospital orthopaedic database to identify 23 patients who underwent surgery for PHF not amenable to fixation (10HA, 13RTSR) between May 2012 and January 2016. Patients with incomplete data or <1 year follow-up were excluded (3 deceased and 2 advanced dementia in care). At follow-up, the remaining 18 patients (9HA, 9RTSR) had radiographs, their ROM and power measured and completed Oxford Shoulder Scores (OSS). Statistical analysis was performed using GraphPad Prism. Results: Of the 18 patients, 15 had four-part fractures (3 dislocations), 1 had a non-union of a 2-part fracture with significant displacement and the remaining 2 had two-part and three-part fracture dislocations, respectively. The average age was 77 (69-91) and 14 were female and 4 male. After an average follow-up of 2.2 years (range, 1.0-3.9), there was no difference between HA and RTSR in OSS (34.4 v 31.0 respectively, p=0.34), forward flexion (76.3 v 90.0, p=0.75) or abduction (68.8 v 85.7, p=0.26). Tuberosity healing in post-operative radiographs was satisfactory in all HA and RTSR, with the exception of one RTSR patient who showed lucency throughout the cement bone interface of the shaft at 30 months but had no symptoms (OSS 37). 6 patients (3 post-HA, 3 post-RTSR) had stiffness where OSS was <27. There were no infections, dislocations or nerve injuries from surgery. Conclusion: There is no discernible difference between RTSR and HA in our trust. Data collected from the National Joint Registry will determine whether this is the case nationally.
14:32 - 14:40	**CLINICAL AND RADIOLOGICAL OUTCOMES OF ARTHEX ECLIPSE TOTAL SHOULDER ARTHROPLASTY** S Gallacher; J Beazley; J Kitson; C Smith; W Thomas Royal Devon and Exeter Hospital, Exeter

	Purpose: The Eclipse humeral head replacement (Arthrex, Germany) is a short-stemmed, metaphyseal fixation device which has shown encouraging outcomes from the designer's series with 5-8 years follow-up but has not been reported independently. Methods: A clinical and radiological follow-up of a consecutive series of 100 Eclipse total shoulder replacements from our institution were reviewed at minimum two years post implantation. The surgical indication was degenerative joint disease with an intact rotator cuff. The primary outcome was Oxford Shoulder Score (OSS). Secondary outcomes include: further surgery; range of motion; patient satisfaction; EQ5D and radiographic assessment. Results: The mean age was 71 years (44-90) and mean follow-up duration was 35 months (24-84). There was a statistically significant improvement in OSS ($p<0.0001$, mean +20 points, SD10), arm elevation ($p<0.0001$, mean +41 degrees) and external rotation range ($p<0.0001$, mean +31 degrees), with a mean follow up OSS of 38 (9-48, SD9.1), arm elevation of 132 degrees (10-180; SD35) and external rotation of 45 degrees (0-90; SD 18). Rotator cuff failure indicated revision surgery in four patients and was treated conservatively in a further four patients. One patient had a subsequent biceps tenotomy. No infections or revisions for aseptic loosening were recorded. In five cases, significant radiolucent lines (>0.5mm) or osteolysis at the bone-implant interface was observed. In 26 others, minor changes were noted. Conclusion: The outcomes at two years from an independent institution are comparable to conventional total shoulder replacements with the benefits of metaphyseal fixation (anatomical restoration, intra-operative fracture risk reduction) and improved revision options. The stress shielding noted at the bone-implant interface requires longer-term follow-up.
14:40 - 14:48	LONGTERM CLINCAL RESULTS OF COPELAND RESURFACING HEMI-ARTHROPLASTY IN A CONSECUTIVE SERIES OF 264 PATIENTS FROM A NON-DESIGNER CENTRE N Joshi; M Morgan; D Bhatt; ME Espag; AA Tambe; DI Clark Royal Derby Hospital NHS Trust, Derby Aim: To investigate survivorship and clinical outcomes of Copeland's Resurfacing Hemi-Arthroplasty (CRHA) in a spectrum of shoulder arthritis. Methods: We present the results of a consecutive series of 290 CRHAs in a cohort of 264 patients, over a period of 12 years from 2002 until 2014 with a follow up range of 2-14 years. 236 CRHAs were undertaken for osteoarthritis, 35 for Inflammatory Arthropathies and 19 patients for cuff arthropathy. The data was obtained from the electronic upper limb arthroplasty database and cross-referenced with the electronic hospital records. Patients were reviewed in an independent clinic by an arthroplasty practitioner. Returning patients completed Oxford Shoulder Score (OSS), Constant Score (CS) and patient satisfaction score along with radiological and clinical review.

	Results: The mean age of the patients was 70 years. The M:F ratio was 1:2.5. The mean follow-up was 7.14 years. 74 patients died and only 10 patients were lost to follow up. The median OSS at the final follow-up was 34. The median Constant Score was 45. There were 34 revisions to total anatomic or reverse polarity shoulder replacements. The overall survivorship was 89.0%. The survivorship in the osteoarthritis and inflammatory arthropathy group was 93.6% and 91.4% respectively but was found to be significantly lower in the cuff arthropathy group at 52.6%. The patient satisfaction data from the remaining 182 CRHAs showed that 94% responded positively when asked if they would have the procedure again with 92% patients indicating that they would strongly recommend the procedure to friends and relatives. Conclusion: Our results represent the largest series of patients having had the CRHA outside the designer centre. Our data and patient satisfaction outcomes show that this procedure is a reasonable option for patients with osteoarthritis and inflammatory arthropathies. The results are poor in patients with cuff arthropathy
14:48 - 14:56	RESURFACING HEMIARTHROPLASTY OF THE SHOULDER FOR PATIENTS WITH JUVENILE IDIOPATHIC ARTHRITIS EF Ibrahim; A Rashid; M Thomas Wexham Park and Heatherwood Hospitals, Frimley Health NHS Foundation Trust, Berkshire Aim: To present a case series of young adult patients with end-stage Juvenile Idiopathic Arthritis (JIA) affecting the glenohumeral joint treated with resurfacing hemiarthroplasty (RHA) of the humeral head as a bone-sparing alternative to a stemmed prosthesis. Methods: Fourteen uncemented RHA procedures were performed for 11 consecutive patients (9 females, 2 males) who required surgery because of JIA. Mean clinical follow-up was 10.4 years (range 5.8-13.9 years). Mean age at surgery was 36.4 years (range 18-49 years). Significant humeral head erosion (up to 40% surface area) was found in 7 cases and filled with bone graft from the distal clavicle (3 shoulders required additional femoral head allograft). At index procedure, acromioclavicular joint excision was performed in all shoulders, biceps tenodesis in 4 and glenoid microfracture in 2. Results: At latest follow-up, no patient had required revision. There was excellent relief from pain. Mean forward elevation improved from 69.3 degrees to 110.0 degrees ($p = 0.003$) and mean external rotation improved from 12.1 degrees to 32.9 degrees ($p < 0.001$). Mean Oxford Shoulder Score (OSS) and Constant-Murley Score (CMS) had improved significantly (OSS: 24.2 point improvement, range 7-38, $p < 0.001$; CMS: 41.8 point improvement, range 16-68, $p < 0.001$). No shoulder had a poor outcome and 6 had a very good or excellent outcome. Worse outcome was associated with the intra-operative finding of significant humeral head erosion ($p = 0.005$). Two patients required early subacromial decompression but there were no other re-operations. There were no instances of radiographic implant loosening or proximal migration. Glenoid erosion of up to 5mm was seen in 5 shoulders but not associated with poor outcome.

	Conclusions: The mid-term results of RHA for JIA are extremely encouraging and at least comparable to those for stemmed hemiarthroplasty. Worse outcome is associated with significant humeral head erosion.
14.56 - 15.04	**AUTOLOGOUS BONE-GRAFT GLENOID RECONSTRUCTION WITH THE SMR TT METAL-BACK PROSTHESIS: THE FIRST FIFTY CASES AT TWO YEARS FOLLOW-UP** A Malhas; S Brookes-Fazakerley; M Walton; P Monga; S Bale; I Trail Wrightington Hospital, Wigan Aim: We present our experiences with the use of the SMR TT metal-backed prosthesis and bone grafting in the treatment of gross glenoid bone deficiency. Method: A prospective cohort study of the first 50 shoulder replacements using the SMR TT metal-back glenoid (in both anatomic (ASR) and reverse replacements (RSR)) was performed. Results: A total of 50 shoulder replacements were performed in 49 patients (mean age 64 (range 35-89). 45 (90%) of those patients required structural autologous bone graft. 14 patients underwent ASR and 36 patients underwent RSR. The indications for surgery were: 28 primary replacements in cases of severe glenoid erosion; 12 revision of hemiarthroplasty/resurfacing; 6 aseptic glenoid loosening; 4 infected implants. At ›3months post-op, 42/50 patients received a CT scan. In 41 of 42 cases (97%) the metal baseplate`s peg achieved ›50% integration. In 39 of 42 (93%) cases the graft was fully or partially integrated with no evidence of lysis. There were seven revisions (14%) but only 3 (6%) required a change of baseplate. Three of the ASR sustained a cuff failure and were revised to a RSR. Two patients suffered a deep infection requiring a staged revision. In one patient, the glenoid fixation failed and one patient required an exchange to a larger glenosphere. Pre- and post-operative function were as follows: Oxford shoulder scores improved from 15 to 30; ASES scores improved from 33 to 69 and the quick DASH scores fell from 66 to 35. Improvements were similar between ASR and RSR. Conclusion: The use of a metal baseplate with a trabecular titanium surface in conjunction with autologous bone-graft provides a reliable method of addressing glenoid bone defects in both the primary and revision procedures setting.
15.04 - 15.12	**OUTCOMES USING POSTERIOR AUGMENTED RTSA BASEPLATES FOR GLENOID WEAR: A MINIMUM TWO YEAR FOLLOW-UP COMPARISON TO AN AGE, GENDER, FOLLOW-UP MATCHED CONTROL** S Antuna (1); T Vanasse (2); PH Flurin (3); T Wright (4); J Zuckerman (5); S Grey (6); CP Roche (2) (1) Hospital Universitario La Paz, Madrid; (2) Exactech, Gainesville, FL; (3) Bordeaux-Merignac Clinic, France; (4) University of Florida, FL; (5) Hosp Joint Dis, NY; (6) Ortho Center of the Rockies, Fort Collins, CO Purpose: This clinical study compares 2-year minimum outcomes of rTSA using a posterior augmented glenoid baseplate to correct posterior glenoid defects to an age, gender, follow-up matched cohort of rTSA patients with a non-augmented baseplate.

	Methods: 106 patients (mean 72.2 years) were treated with rTSA for CTA or OA+RCT by 9 surgeons using either an 8° posterior augment baseplate or a standard non-augmented glenoid baseplate. 53 patients received an augmented baseplate (23F/30M) and were matched for sex/age with 53 patients who received a standard baseplate. All patients were scored preoperatively and at latest follow-up using SST, UCLA, ASES, Constant, and SPADI metrics; active abduction, forward flexion, and active and passive external rotation were measured. The average follow-up for all patients was 31.3 months (augmented = 30.8; standard = 31.9). Differences were identified using Student's two-tailed, unpaired t-test ($p<0.05$). Results: All patients demonstrated significant improvements in pain, ROM, and functional scores following treatment with rTSA using either augmented or standard baseplates. Preoperatively, each cohort was statistically similar except posterior augment patients had significantly less active internal rotation. At latest follow-up, the posterior augment cohort had significantly better outcomes as measured by UCLA ($p = 0.0471$) and ASES ($p = 0.0384$) metrics, while the SPADI metric trended toward significance ($p = 0.0516$). Posterior augment baseplates had significantly more active abduction ($p = 0.0002$), while trending toward significantly more active external rotation ($p = 0.0771$). No differences were observed in pre-to-post improvement of any outcome metric or ROM measurement, complication rate, or scapular notching rate. Discussion: The results of this rTSA study suggest that similar short-term outcomes can be achieved using the novel posterior augmented baseplate. The significantly better post-operative outcomes and motion relative to the standard baseplate is promising, but longer-term follow-up is needed to confirm these findings.
15.12 - 15.20	**4 TO 12 YEARS OF FOLLOW-UP FOR A NOVEL IMPACTION BONE GRAFTING TECHNIQUE FOR HUMERAL FIXATION IN UNCEMENTED REVERSE TOTAL SHOULDER ARTHROPLASTY** C Witney-Lagen; P Consigliere; L Natera; G Arealis; E Atoun; R Abraham; G Sforza; J Bruguera; O Levy Reading Shoulder Unit, Reading Introduction: Reverse total shoulder arthroplasty (rTSA) has become increasingly prevalent. Many patients are elderly, have rheumatoid arthritis, or are revision cases. Such patients often suffer from osteoporosis, large bone cysts and marked bone deficiency. Traditionally, humeral bone deficiency has been a challenge for surgeons. Many surgeons choose long cemented stems due to their concerns about whether uncemented implants could provide solid fixation. Aim: To determine whether impaction bone grafting can restore humeral bone stock, to achieve solid fixation of an uncemented rTSA. Patients and methods: 232 patients underwent humeral impaction bone grafting of an uncemented rTSA between 2005 and 2013. There were 181 females and 51 males. The

	mean age was 75 years (range 38-93 years). All patients were followed up for a minimum of 4 years (range 4-12 years). All resected autologous bone, including humeral head bone, is morselised using bone-nibblers. In cases of severe bone deficiency, autologous bone is mixed with synthetic bone chips. The bone is then impacted into the humerus using the implant trial punch. This creates a stable implant bed allowing good initial press-fit fixation. Subsequent bone ingrowth occurs. Outcome data was collected prospectively and included Constant score, satisfaction, range of movement and radiological evaluation. Results: Statistically and clinically significant improvements occurred in all outcome measures. Constant score improved from 15.5 preoperatively to 61.1 (adjusted 88.7) postoperatively. Mean satisfaction was 8.4/10. Mean postoperative movement was 134° forwards flexion, 50° external rotation, and 64° internal rotation. Radiographic evaluation showed excellent incorporation of the impacted bone. At last follow-up (4-14 years) there were no lucencies, subsidence, stress shielding or implant loosening. Conclusion: Humeral impaction bone grafting provides consistently good restoration of bone stock. Consequently, even patients with significant bone defects can be confidently treated with uncemented rTSA.
15:20 - 16:00	Coffee and trade exhibition
16:00 - 17:30	BESS Annual general meeting (members only)
18:00 – 19:00	Evening drinks reception

Friday, 23 June 2017

08:00 - 08:50	Master classes	
Master class A	Master class B	Master class C
Room: Premier Lounge	Room: Legends Lounge	Room: Jaguar Suite
Management of adolescent traumatic shoulder instability Speakers: L Funk; J McBirnie Moderator: S Drew	**Assessment and management of the failed elbow arthroplasty** Speakers: M Falworth; D Higgs Moderators: C Modi; T Lawrence	**Transitioning from palpation to ultrasound guided injections; do the means justify the end?** Speakers: M Maybury Moderators: H Bush; G Bhabra

09:00 - 10:20	SESSION 5: Physiotherapy and miscellaneous
Chairs: Clare Connor and Martin Holt	
09:00 - 09:08	**PHYSIOTHERAPISTS USE OF SUPRASCAPULAR NERVE BLOCKS: AN ONLINE SURVEY** E Salt (1)(2); D Van der Windt (1); L Chesterton (1); C McRobert (1); NE Foster (1) (1) Research Institute for Primary Care, Health Services, Keele University; (2) Burton Hospitals Foundation Trust, Staffordshire

	Purpose: To explore if physiotherapists who manage musculoskeletal shoulder pain are using suprascapular nerve blocks SSNBs and identify how commonplace this practice is in the United Kingdom (UK) and internationally. Methods: Physiotherapists were invited to form a convenience sample for an online survey using a targeted, multi-modal recruitment strategy including email, research adverts and social media. Physiotherapists were invited to complete an online survey. The questionnaire captured respondents demographic and professional practice characteristics, their knowledge and use of SSNBs and their views and experiences regarding SSNBs as a treatment for shoulder pain. The primary analyses focused on the practice of physiotherapists in the UK. Results: In total, there were 529 responders to the survey. Of these, 492 were eligible and formed the sample for analyses. The majority of responders (290/492; 59%) were from the UK. Of these, just over half (150/290; 52%) were familiar with SSNBs as a method of treatment for shoulder pain, although a minority (37/149; 26%) reported regularly using SSNBs in their clinical practice. Only 8 of 287 of responders from the UK (3%) reported delivering SSNBs to patients themselves. Patients with persistent, complex and multi-component shoulder pain for whom shoulder surgery was either not an option or not preferred were considered to be most suitable for SSNBs Conclusions: This survey provides preliminary evidence that the use and delivery of SSNBs by physiotherapists is uncommon. Future research is required to investigate the potential value of physiotherapists using this treatment option for their patients with shoulder pain.
09:08 - 09:16	PHYSIOTHERAPIST-LED SUPRASCAPULAR NERVE BLOCKS FOR PERSISTENT SHOULDER PAIN: EVALUATION OF A NEW SERVICE IN THE UNITED KINGDOM E Salt (1)(2); D Van der Windt (1); L Chesterton (1); N Ashwood (2); F Mainwaring (2); NE Foster (1) (1) Research Institute for Primary Care, Health Services, Keele University; (2) Burton Hospitals Foundation Trust, Staffordshire Purpose of the study: The purpose of this service evaluation was to explore and report findings from a new physiotherapist-led service offering Supra Scapular Nerve Blocks (SSNBs) to patients with persistent shoulder pain. Methods: We collected data from consecutive patients with persistent shoulder pain receiving a physiotherapist-administered SSNB via a landmark-guided approach, or anaesthetist-administered SSNB using ultrasound guidance. Patient-reported pain (numerical rating scale (NRS 0 to 10)), patient specific functional score (PSFS), and health-related quality of life scores (EQ5D-5L) were collected pre-injection, and at 6 weeks and 6 months follow-up. Exploratory analyses compared baseline and follow-up scores of patients treated by each clinician group (physiotherapists, anaesthetist). Results: 40 patients (mean age 57 (SD 12); female 63%) received a SSNB from a

	physiotherapist, 8 patients (mean age 59 (SD 11); female 88%) received a SSNB by an anaesthetist. Mean baseline pain (NRS) was 7.7 (SD 1.1) and 7.8 (SD 1.4) in the physiotherapy and anaesthetist groups respectively. At 6 weeks follow-up, the physiotherapy group showed a mean reduction in pain: 2.2 (95% CI 1.3 to 3.0) and improvement in function: -1.1 (95% CI -1.9 to -0.4). Similar changes were found in those treated by the anaesthetist (pain 1.3, (95% CI -1.18 to 3.80); function -1.4 (95% CI -3.18 to 0.35). Very small changes, that were not statistically significant, were found in quality of life (EQ5D) scores. At 6 months follow-up, the mean reduction in pain (NRS) was 2.0 (95% CI 0.99 to 2.95) for the physiotherapy group. Conclusions: The results provide early, exploratory evidence that patients with persistent shoulder pain treated by physiotherapists using palpation-guided SSNBs achieve clinically important changes in pain and function in the short and medium term. Research is needed to more robustly investigate patient outcomes from SSNBs provided by physiotherapists.
09:16 - 09:24	**WHAT IS THE VALUE OF SPECIALIST SHOULDER PHYSIOTHERAPY? A COST-UTILITY ANALYSIS** MA Scott; MD Smith Nottingham University Hospitals NHS Trust; University of Lincoln We have evaluated the cost-effectiveness of specialist shoulder physiotherapy in routine practice. When commissioning health services, it is helpful to understand the costs and benefits associated with treatments. Well established generic measures such as the EuroQol (EQ-5D) can be used to estimate health-related quality of life (QALY) thus identifying the benefits of treatment derived by the patient. EQ-5D responses pre- & post-treatment were obtained from a sample of n=142 patients undergoing routine physiotherapy treatment at a specialist Shoulder Unit over the period 2011-17. Patients were discharged from treatment when symptom-free. Health-related utility scores were calculated using the UK tariff and QALYs were calculated by the area under the curve method (Manca 2005). Simplified treatment costs were calculated from the NHS perspective and assigned using event-weighted average of outpatient physiotherapy attendances reported in NHS Reference Costs 2014-15. The comparator was no treatment, incurring zero treatment cost and no QALY gain assumed. In the sample: 69 male, 73 female; mean age 35.7 years (SD=18.9); duration of symptoms averaged 4.9 years; mean number of treatments 5 (max=20) over a period averaging 6.7 months (max=2.6 years). 76/142 had a prior course of physiotherapy for the same complaint. 59 had dominant arm problems, 20 were bilateral. There were 17 different diagnoses, with most patients having atraumatic glenohumeral instability or myofascial tightness of the upper quadrant. Treatment costs averaged £297 per patient (SD=186). Mean utility pre-treatment 0.64

	(SD=0.23) differed significantly the mean post-treatment 0.79 (SD=0.23) paired t=8.8 p<0.01. Incremental Cost-Effectiveness Ratio (ICER) £774 per QALY gain. NICE guidelines suggest that an ICER below £20000/QALY is indicative of cost effectiveness within the NHS. Subject to our assumptions, the results imply that specialist shoulder physiotherapy may provide the NHS with excellent value for money, even for patients with long-standing problems who have previously failed to benefit from physiotherapy.
09:24 - 09:32	**ROTATOR CUFF DISORDERS: A SURVEY OF CURRENT (2016) UK PHYSIOTHERAPY PRACTICE** J Bury; C Littlewood School of Health and Related Research, the University of Sheffield; Doncaster and Bassetlaw Teaching Hospitals NHS Foundation Trust; Arthritis Research UK Primary Care Centre; Keele Clinical Trials Unit, Keele University Purpose: The purpose of this study was to undertake a survey of current UK physiotherapy practice for the management of rotator cuff (RC) disorders and to determine whether physiotherapy practice has changed over a five-year period since a previous survey was conducted. Methods: A cross-sectional online survey of UK physiotherapists based on a patient vignette. Participants were currently involved in the management of patients with RC disorders and were characterised as having a special interest in RC disorders or not. Data was analysed descriptively and chi-square tests were used to evaluate differences in response between those with and without a special interest. Results: 191 respondents completed the survey. The results showed that the most commonly used management strategies were advice/education (91%) and some form of exercise therapy, including isotonic (67%); isometric (53%); a global exercise approach (50%); and scapula stabilisation exercises (50%). However, there is a clear lack of agreement regarding the principles underlying exercise prescription. The data from this survey suggests less reliance on both physical tests and further investigations to inform treatment, as well as less use of passive modalities. Conclusions: The data from this survey indicates that practice has evolved over the last 5 years in line with the current evidence with greater emphasis on exercise-based management and less reliance on passive modalities and the findings of specific physical examination tests and imaging to inform treatment. Practice remains variable but encouragingly, in comparison to a previous survey, research appears to be impacting on practice, which is a positive finding.
09:32 - 09:40	**RELIABILITY OF THE SHOULDER SYMPTOM MODIFICATION PROCEDURE AND ASSOCIATION OF WITHIN - AND BETWEEN-SESSION CHANGES WITH FUNCTIONAL OUTCOMES** A Meakins; C Cook; S May; C Littlewood Spire Bushey Hospital, Bushey, Hertfordshire

	Background: Despite being a common problem, there is considerable diagnostic uncertainty with regards to shoulder pain. This uncertainty relates to the reliability and validity of current examination tests. The Shoulder Symptom Modification Procedure (SSMP) has been proposed as an alternative to existing approaches. Objectives: To evaluate inter-clinician reliability of the SSMP and the association of within- and between-session changes on clinical outcome at one week, one and three months. Design: A single-centre reliability study, with prospective follow-up. Method: Twenty-six patients with shoulder pain were recruited. Following an initial SSMP based examination, a second examination by a second physiotherapist, blinded to the results of the first examination, was undertaken. Clinical outcome data was completed after one week, one month and three months via a Numeric Pain Rating Scale and the Shoulder Pain & Disability Index. Reliability was evaluated using Kappa and associations were evaluated using Spearmans's rho. Results: Inter-rater reliability of the SSMP was moderate (K = 0.47). Association of within-session changes ranged from fair to poor in the short-term (r = 0.24 to 0.01) to poor in the mid-term (r = -0.03). The association of between-session changes ranged from substantial to moderate in the short-term (r = 0.74 to 0.47) but slight in the mid-term (r = 0.22). Conclusions: Based on this study, there is insufficient evidence to recommend the SSMP as a reliable tool for physical examination of patients with shoulder pain. The importance of within- and between-session changes remains uncertain. Further research is indicated to draw definitive conclusions.
09:40 - 09:48	ACCELERATED REHABILITATION PROTOCOL FOLLOWING REVERSE TOTAL SHOULDER ARTHROPLASTY. A NEW CONCEPT E Fawzy; P Consigliere; J Lee; C Witney-Lagen; L Natera; J Bruguera; G Sforza; E Atoun; O Levy Reading Shoulder Unit, Royal Berkshire and Berkshire Independent Hospitals, Reading Purpose: Establish an accelerated rehabilitation protocol following reverse shoulder arthroplasty (rTSA) and evaluate its effectiveness against more conservative rehabilitation routines. Methods: Between 2005 and 2016, 305 shoulders (273 patients, 32 bilateral) underwent a primary rTSA. Patients were divided in 3-groups depending on the rehabilitation protocol undertaken (6weeks, 3weeks and 1week of postoperative immobilisation respectively for group 1, 2 and 3). Antero-superior approach was used and a double row equivalent intraosseous technique was used to reattach the deltoid to the acromion. Constant Score (CS), Subjective Shoulder Value (SSV), Patient Satisfaction Score (PSS) were used and patients prospectively assessed both clinically and radiographically preoperatively, at

	3weeks, 3months, 6months, 1-year and yearly postoperatively. Results: Mean age at surgery was 74.8 years (range 52 - 93). At 1 year follow-up, Constant Score (CS) improved from 15.5 (adjusted 22) to 63.2 (adjusted 89.6) in group 1 (n=134), from 22.1 (adjusted 30.4) to 63,3 (adjusted 91.1) in group 2 (n=141) and from 23,4 (adjusted 32.9) to 65 (adjusted 104) in group 3 (n=33). Pain improved from 14.4/15 preoperatively to 2.9/15 postoperatively in group 1, from 12,6/15 to 3,5/15 in group 2 and from 12,44/15 to 2,9/15 in group-3. Mean range of movement (ROM) improved to 131 flexion and 129 abduction in group 1, 150 flexion and 141 abduction in group 2 and 170 flexion and 156 abduction in group 3. No statistical significance differences were observed in CS, SSV, PSS and ROM in group 3 compared to group 1 and 2. Conclusions: Despite no statistical significance differences, rehabilitation centred on deltoid conditioning and early passive and active recovery of the ROM allows quicker recovery, reliable outcome and reduce prolonged immobilisation discomfort. A strong repair of the deltoid is mandatory to reach this purpose.
09:48 - 09:56	DO COMPUTERISED EXERCISE GAMES (EXERGAMES) ADDRESS PHYSIOTHERAPY GOALS IN SHOULDER REHABILITATION? E Ani; W Marley; J Wilson; A Barratt; R Davies; B Roy Trafford General Hospital, Central Manchester University Hospitals, Manchester Aim: Our study was designed to assess whether the movement and exercise objectives of physiotherapy can be achieved using a computer-based Exergame rehabilitation programme in patients with shoulder pathology. Methods: A Delphi process was utilised with an expert focus group composed of the multidisciplinary team in identifying the key objectives of physiotherapy. Significant themes identified included patient education, pain relief, improved range of movement and exercise. The movement and exercise category was further divided into 5 key domains including range of movement, control, speed, activation of the kinetic chain and improvement in strength. The software in this study was developed by MIRA Rehab Ltd. (Medical Interactive Recovery Assistant (MIRA)). Combined with a Microsoft Kinect TM device it allows patients to play different games as part of their rehabilitation. To assess the technology, specialist shoulder physiotherapists played ten different Exergames and were asked to grade them in their relative weighting in their ability to deliver each of the five key domains. Each assessor was blinded from the other therapists. Analysis was conducted using Krippendorff's Alpha method to calculate the intraclass correlation coefficient (ICC) using 95% CIs used to evaluate inter-rater agreement. Results: 150 data points were available for assessment. The ICC was calculated as 0.28 (95% CI 0.08-0.47). The pooled data shows significant correlation between the therapists. Conclusions: Goal based rehabilitation can be used in a computer-based exergame rehabilitation programme. The targeting of specific physiotherapy goals is possible which

	may in turn encourage patient activation and motivation through enjoyment of the gaming process as well as being provided with instantaneous feedback.
09:56 - 10:04	**THE ROLE OF STRUCTURED PHYSIOTHERAPY IN TREATING PATIENTS WITH ATRAUMATIC SHOULDER INSTABILITY MEDIUM-TERM RESULTS FROM A PRAGMATIC, CASE SERIES STUDY** MA Scott; NP Sachinis; BWT Gooding Nottingham University Hospitals NHS Trust, Nottingham Purpose: To prospectively assess the results of structured specialist physiotherapy in a cohort of patients with atraumatic shoulder instability. Methods: This single-centre study prospectively included patients suffering from atraumatic shoulder instability, which was defined as anterior, posterior or multidirectional. A total of 85 patients were enrolled and received a structured protocol of physiotherapy. Patient reported outcomes were recorded prior to therapy initiation and at the day of discharge. The Oxford Shoulder Instability Score (OSIS) and the Western Ontario Shoulder Instability Index (WOSI) were used. Further review was conducted to identify patients re-referred for the same condition (minimum 12 months, maximum 72 months). Results: Median OSIS improved from 21 (range: 2-47) to 39 (range 11-47). Median WOSI improved from 1117 (range: 306- 2028) to 485 (0-1569). Patients with posterior instability demonstrated better outcome scores when compared with other groups groups (OSIS change, p=0.025; WOSI change, p=0.060). A significant correlation was observed in patients referred for structured physiotherapy sooner after initial diagnosis and improved outcome (OSIS change, p=0.004, rs= -0.4; WOSI change, p=0.047, rs= 0.24). A total of 21 patients (24.7%) were re-referred after discharge, 7 of them for repeat physiotherapy and 13 of them for surgery. Previous surgery significantly affected the possibility of a further referral (p<0.001). In those re-referred after discharge, initial diagnosis was significantly correlated with surgery as a subsequent outcome (p=0.032); 7/8 patients with anterior instability, 5/6 patients with multidirectional and 2/7 with posterior instability underwent surgery after re-referral. Conclusion: Early referral to physiotherapy may produce better final results. Patients with posterior instability responded better to physiotherapy. Previous surgery increased the risk of re-referral and further operation. Patients re-referred after discharge were most likely to undergo surgery for anterior instability and multidirectional instability versus those with posterior instability managed with further physiotherapy.
10:04 - 10:12	**THE SCAPULAR DYSKINESIS TEST: IS IT RELIABLE AND VALID?** MJ Smith; R Goldsmith; K Nicholas; S Owen School of Healthcare Sciences, College of Biomedical and Life Sciences, Cardiff University, Cardiff Purpose of the study: To investigate the reliability and ecological validity of a clinical tool for assessing scapular movement and control (during humeral elevation (HE) with a hand

	held weight) in a subacromial impingement syndrome / rotator cuff tendinopathy (SIS/RCT) patient population within an NHS secondary care setting. Methods and results: Videos of scapular movement were recorded from 76 SIS/RCT patients performing HE. Where tolerated this was repeated with a hand held weight (loaded trial). A nested sample of 30 SIS/RCT patient videos was used for an inter-rater reliability study between 2 experienced musculoskeletal physiotherapists. Agreement was calculated via linear weighted Kappa. Agreement between the 2 raters was fair (Kappa of 0.33, p=0.002) for the nested sample who had a mean (standard deviation) BMI and active humeral range of movement (ROM) of 29.0kgm-2 (6.3kgm-2) and 138° (25°). Forty-two percent of patients from the main study were unable to perform a loaded trial. Conclusion: Reliability of the SDT (Kappa = 0.48 to 0.61) was originally established within an athletic population but its utility within an NHS population has not been established. The lower inter-rater reliability in the current study may be explained by the higher BMI of patients in secondary care making identification of bony landmarks more challenging when compared to the college level overhead athletes in the original publication, whose inclusion criteria included BMI ‹30kgm-2. Furthermore, the impaired ROM of the SIS/RCT patients could have led to failure to achieve portions of the HE range where less subtle scapular dyskinesis may be present. Combined with the inability for over 2/5ths of the main study cohort to perform HE with a hand held weight, this provides evidence that the SDT in its published form cannot be applied reliably with – and lacks ecological validity in – NHS secondary care SIS/RCT patients.
10:12 - 10:20	DIAGNOSTIC AND TREATMENT CONCORDANCE BETWEEN A PHYSIOTHERAPIST AND A CONSULTANT ORTHOPAEDIC SURGEON FOR PATIENTS PRESENTING WITH SHOULDER PAIN TO AN ADVANCED PRACTICE PHYSIOTHERAPY CLINIC C Gilsenan; J Ashton; H Mullet Beaumont Hospital, Dublin Purpose: Emerging evidence suggests that advanced practice physiotherapy (APP) roles provide equal care in comparison to physicians in terms of treatment effectiveness and use of healthcare resources for patients presenting with hip and knee complaints (Desmeules et al, 2013). The aims of this study are to: i) evaluate the diagnostic agreement between a physiotherapist and consultant orthopaedic surgeon for patients presenting with shoulder pain and ii) to evaluate their level of agreement for treatment recommendations. Methods: Ethical approval was obtained. All patients triaged as suitable for the APP clinic were invited to participate. Consenting patients were assessed independently by the APP and consultant orthopaedic surgeon. After assessing the patient, the surgeon and the APP each completed a form, indicating their primary and secondary diagnosis from one of 10 possible diagnoses. They had access to the patient's medical file and any previous imaging. They recorded any investigations they wished to order and their treatment recommendations. Completed forms were sealed in an envelope. Diagnostic and

	management recommendations were compared by an independent assessor and a percentage of concordance determined. Kappa statistics were calculated to augment these findings. Results: 20 new patients presenting with shoulder pain agreed to partake in the study. Raw diagnostic concordance was found to be 70%. This increased to 90% when the secondary diagnosis was considered with a Kappa score of 0.87, representing 'very good' agreement. There was 90% agreement between the treatment recommendations. All patients were managed conservatively. 18 patients received a steroid injection as part of their initial management, 16 of which were administered by the APP in the clinic. There was 70% agreement on further investigations required. Conclusions: The results of this study show high diagnostic concordance between an APP and consultant orthopaedic surgeon for patients presenting with shoulder pain. Our results further support the APP model of care.
10:20 - 10:50	Coffee and trade exhibition
10:50 - 12:25	SESSION 6: Instability
Chairs: Peter Brownson and Duncan Tennent	
10:52 - 11:00	**OUTCOMES OF ACUTE AND DELAYED ACROMIOCLAVICULAR JOINT RECONSTRUCTION FOR HIGH GRADE DISLOCATIONS USING LOCKDOWN** <u>JWG Ng</u>; BW Gooding; MD Wijeratna Nottingham University Hospitals NHS Trust, Nottingham Purpose: This study investigates the result of using Lockdown in acute and delayed acromioclavicular joint dislocations. Methods: We reviewed all the acute and delayed ACJ reconstructions in our institution from 2008-2015. We compared their demographics, Rockwood grade and outcomes, including Oxford Shoulder Score, DASH score and any complications which have arisen. 145 patients were identified, 72 were acute and 73 were delayed reconstructions. Mean age was 40.3 (36.0 for acute; 44.5 for delayed). There were 121 male and 24 females. 6 grade III, 38 grade IV and 28 grade V injuries were reconstructed acutely, as compared with 21 grade III, 33 grade IV and 19 grade V in delayed reconstruction. Results: The median post-operative Oxford Shoulder Score in acute reconstruction was 47 (interquartile range, 41.5-48) and 45.5 (interquartile range, 44-48) in delayed reconstruction (p=0.376). The median post-operative DASH scores for acute and chronic reconstructions were 2.5 and 7.5 respectively (p=0.204). The mean follow up duration was 28.2 months. There were 2 deep infections and 2 periprosthetic fractures following further injury. Only 2 patients had their implants removed due to prominent screw. Conclusions: In conclusion, this study has shown that Lockdown is a suitable implant for acute ACJ reconstruction and this has not been previously investigated in the literature. However, outcomes of acute and delayed reconstruction are similar. Patients with grade

	III-V ACJ dislocation should be managed with a trial of conservative treatment before consideration for reconstruction using ACJ Lockdown. There is further need for randomised controlled trial to investigate this.
11:00 - 11:08	**ARTHROSCOPIC-ASSISTED REPAIR OF ACUTE ACROMIOCLAVICULAR JOINT DISRUPTION USING THE DOGBONE SUSPENSORY SYSTEM: EARLY RESULTS FROM TWO CENTRES** R Dhir; Q Tang; A Wahab; D Griffiths; T Baring Homerton University Hospital NHS Trust; St Marys Hospital NHS Trust, London Aim: To establish clinical and radiological outcomes of arthroscopic-assisted stabilisation of acute acromioclavicular joint (ACJ) disruption using the 'Dogbone' suspensory implant Methods: 35 patients at two centres with acute ACJ disruption were treated using the Dogbone suspensory device™(Arthrex,FL). Functional scores and radiographic data were collected postoperatively with mean follow-up of 8.13 months (range 1-19). The mean time to operation from injury was 16.1 days (range 2-36) and patients were divided into an early group (operation ‹14 days) and late group (›14 days). Failure of procedure was defined as more than 100% loss of reduction. Results: The early group (n=15) had a mean age of 30 (range 20-50) and initial injury was classified as grade V in 10 patients, IV in 4 patients and III in 1. The mean oxford shoulder score (OSS) at last follow-up was 43 (range 29-48). The late group (n=20) had a mean age of 37 (range 19-55) and the injury was classified as grade V in 12 patients, grade IV in 4 and III in 4. Mean OSS at last follow-up was 44 (range 31-48). A comparison of OSS at final review did not demonstrate a significant difference between groups (p-value 0.85). In both groups, there was radiological evidence of clavicle tunnel erosion (10/35 cases). There were 5 failures (14%) in total (3 in early group managed conservatively and 2 in the late group requiring revision). Other complications were similar in both groups and included knot irritation (1/35 cases), frozen shoulder (3/35 cases). Conclusions: Early results of acute arthroscopic assisted ACJ repair using the Dogbone system without additional AC joint capsular repair display a relatively high radiographic failure rate, despite generally good functional scores. The belief that acute primary repair needs to be performed within 2 weeks of injury is not supported by this study.
11:08 - 11:16	**CLINICAL AND RADIOLOGICAL OUTCOME OF USE OF AN ARTIFICIAL LIGAMENT IN ACROMIOCLAVICULAR JOINT RECONSTRUCTION, OSTEOLYSIS OF THE CLAVICLE AND CORACOID NOTED IN THE PRESENCE OF EXCELLENT CLINICAL RESULTS** C Lawrence; D Prince; C Burr; N Furness; A Cole; C Hand University Hospital Southampton, Southampton Purpose: To evaluate the clinical and radiological outcome of use of an artificial ligament in acromioclavicular joint reconstruction.

	Introduction: The LockDown™ device was developed for the surgical management of acromioclavicular joint (ACJ) dislocation. Published case-series have reported excellent clinical outcomes however, reports have been published describing associated osteolysis of the distal clavicle. We therefore undertook an analysis of our cohort of patients who had undergone ACJ reconstruction for acute and chronic injury using this device to investigate both the clinical and radiological outcome. Method and Results: 25 patients underwent ACJ reconstruction with the LockDown™ device between 2009 and 2015. 22 were available for clinical & radiological follow-up. Clinical outcome was measured with use of the Constant Score, Oxford Shoulder Score, PREMS (patient reported expectation measures) and pain VAS (visual analogue score). Standard AP and axillary view radiographs of the shoulder were performed, and a simple grading technique was developed to classify any osteolysis of the clavicle and coracoid. Mean follow-up was 26.4 months (range 8-72 months). The mean post-operative Oxford shoulder score was 44.5 (range 34-48, SD 3.55) and mean Constant score was 86.9 (range 56.5-98, SD 9.63). Pain scores showed a mean of 1.9 out of 10 (range 0-8), with 55% of patients rating their current pain levels at ↖1.0. 95% of patients (21/22) were very satisfied or greater with their overall post-operative outcome and 95% (21/22) of patients reported that they would have the procedure again. Osteolysis of the distal clavicle in the zone of contact by the ligament was seen on standard postoperative radiographs in 22 patients (100%). Osteolysis of the coracoid was noted in 17 patients with three having developed a coracoid fracture, 2 of which were asymptomatic. Screw removal was performed in 8 patients at a minimum of 1-year post-op in an attempt to prevent any progression in osteolysis. This led to no recurrence of deformity and no complications. Conclusion: The LockDown™ device is a highly effective treatment for the management of acromioclavicular joint disruption, resulting in mean Constant scores of 86.9 and mean Oxford shoulder Scores of 44.5, with 95% patient satisfaction. Radiological findings showed frequent evidence of osteolysis, which although unassociated with adverse clinical outcomes, raised cause for concern. Consideration could be given to screw removal after adequate host tissue in-growth. Further long term follow up of the use of artificial ligament reconstruction in AC Joint injury is required. Patients should be counselled preoperatively about possible osteolysis after use of this technique.
11:16 -11:24	**IMPACT OF MULTIDISCIPLINARY REHABILITATION ON THE SOCIOECONOMIC BURDEN OF SHOULDER INSTABILITY - A PROSPECTIVE STUDY** <u>T Douglas</u>; E Cobb; A Gilbert; A Jaggi Royal National Orthopaedic Hospital, Stanmore Aim: To investigate the socioeconomic burden of shoulder instability and the impact of multidisciplinary (MDT) rehabilitation. Background: Shoulder instability results in an inability to function physically, socially and

	emotionally, impacting on individuals and their environment. This prospective study aims to evaluate the effect of shoulder instability on attendance at work and school, reliance on emergency services and the clinical effectiveness of MDT rehabilitation. Methods: Prospective data was collected at admission, 6/52, 6/12 and 1 year from patients attending a shoulder rehabilitation program between November 2009-December 2010. Data included patient reported outcome measures (PROMs) e.g. OISS, SF-36 as well as impact on work/school, hobbies and A&E attendance. The rehabilitation programme involved an inpatient admission including physiotherapy, occupational therapy and psychology individualised to patients' needs. Outcome Measure Data was entered into IBM SPSS v23 for analysis and assessed for distribution prior to the selection of statistical test. Missing data was excluded list wise. Results: Data was gathered from 72 patients (55 adults, 17 children); average duration of symptoms was 38 months. All outcome data met parametric assumptions and the paired t-test was used. The differences between baseline and 6 weeks, 6 months and 1 year for the PROMs were statistically significant (p=<0.003). On admission, 50% of patients were dislocating more than twice a week.37% of patients (31% adults, 53% paediatrics) were attending A&E for their dislocations. At one year follow up only one paediatric patient still required A&E assistance. Only 30% of adults were in full time work prior to admission, this increased to 54% by six months. Conclusions: This study demonstrates the burden shoulder instability can have on work and healthcare provision. A focus on self-management strategies and return to function can improve outcomes, return to work and reduced dependency on emergency services. Early referral to specialist care is recommended.
11:24 - 11:32	**AN ASSOCIATION BETWEEN DEVELOPMENTAL MILESTONES AND THE PRESENTATION OF ATRAUMATIC SHOULDER INSTABILITY** D Williams; A Gilbert; T Douglas Royal National Orthopaedic Hospital, Stanmore Aim: To investigate whether there is an association between whether an infant crawls as their first mode of mobilisation and the later presentation of atraumatic shoulder instability. Background: The aetiology of atraumatic shoulder instability is not fully understood. Classification of shoulder instability using the Stanmore classification triangle is based largely on patient history. It has been shown that there is a relationship between age of independent walking and scapular position and rhomboid strength (Nof, L. & Rosenthal, R. (2005) http://ijahsp.nova.edu 3(1)). This has led to the hypothesis that there may be a relationship between developmental milestones and the later onset of atraumatic shoulder instability. Method: A retrospective cohort of 50 consecutive patients who had presented to a

	specialist centre for shoulder instability between February 2012 and February 2014 (classified as a type III, II/III or III/II on the Stanmore Classification triangle (Lewis et al. (2004). Doi:10.1016/j.cuor.2004.04.002) were compared with a cohort of 50 members of staff who did not have shoulder instability. Primary outcomes were presence of atraumatic shoulder instability and whether or not the subject crawled as their first mode of mobility. A Pearson chi-squared test was used to evaluate associations. Results: There was a significant association between crawling and shoulder instability (X2(1)›=11.93, p=0.001) with a higher prevalence of non-crawlers in the group with shoulder instability compared to the group of normals. Conclusions: There is an association between developmental milestones and atraumatic shoulder instability. It cannot be concluded from this study that this association is a causal one and additional research would be needed to investigate this relationship further. Asking patients presenting with shoulder instability about their developmental mile as part of a full subjective history could assist in the classification of type III instability and therefore in selecting the appropriate management. Keywords: Developmental milestones, crawling, shoulder instability.
11:32 - 11:40	THE ROLE OF PAIN SENSITISATION IN YOUNG ADULTS WITH SHOULDER PAIN M Clarke; C Gilsenan; H Mullet; C Doody Beaumont Hospital Dublin; University College Dublin, Dublin Objectives: The aim of this study was to investigate for the presence of pain sensitisation in young adults with non-traumatic shoulder pain compared to an age and gender matched control group. Methods: 14 patients with shoulder pain and 14 age and gender matched pain-free controls were assessed by methods of quantitative sensory testing (pressure-pain thresholds, mechanical temporal summation), tests for neural mechanosensitivity and questionnaires (shoulder pain and disability index, central sensitisation inventory and Beighton hypermobility score). Quantitative sensory testing was carried out at a local (acromian), distal (brachioradialis) and remote (tibialis anterior) site. Pairwise comparisons using Wilcoxon signed-rank tests were used for within group and between group comparisons. Bivariate correlation analysis was conducted using Spearman's rho analysis between questionnaires/ quantitative sensory testing variables. Results: Significantly reduced pressure-pain thresholds and enhanced temporal summation were observed between the symptomatic and asymptomatic side in the clinical group (p‹0.021) and between the symptomatic side of the clinical group and the control group at both local, distal and remote sites (p‹0.013). Significant differences for nerve palpation were observed between sides in the clinical group (p‹0.003) and between the affected side of the clinical group and the control group (p‹0.005). No significant associations were observed between hypermobility (using Beighton questionnaire) and any measures of pain sensitisation (p›0.05).

	Conclusion: The results of this pilot study demonstrate features of both peripheral and central sensitisation in this population. Further research is required to make determinations about the association between hypermobility in this population and level of pain sensitisation. This research is novel in that these features have not been described in the younger population to date.
11:40 - 11:48	**CLINICAL SIGN OF AXILLARY NERVE DYSFUNCTION FOLLOWING SHOULDER DISLOCATION** MJC Stanislas; V Hegde South Warwickshire Foundation Trust; University Hospital Coventry and Warwickshire, Coventry Aim: To describe a test for axillary nerve dysfunction following acute shoulder dislocation, correlate and validate the findings with Nerve Conduction Studies. Test: The described sign / test is a Dynamic one and in two parts, with the contralateral side being the control. Part 1. Patient to place pronated hands on Iliac crest Part 2: Patient to place pronated hands under the axilla Method : All patients attending the author's shoulder clinic following reduction of an isolated, traumatic, anterior dislocation of the shoulder in the Emergency department were examined for the clinical sign. 38 patients, over a seven year period, demonstrated a positive sign. Examination for brachial plexus lesion by Electromyography and Nerve Conduction Studies, 2 to 6 weeks following the injury, confirmed axillary nerve injury of varying severity in all 38 patients. The test was positive even in patients with mild neuropraxia as confirmed on Nerve Conduction Studies. Patients were monitored in clinic repeating the clinical test, nerve conduction and EMG studies to assess recovery. The degree of reduction in abduction of the shoulder, compared to the contralateral side, is indicative of the severity of axillary nerve injury. In severe injury to the axillary nerve, the patient finds it difficult to place the hand (pronated) on the iliac crest or raise it to the axilla. As the nerve recovers abduction of the shoulder (as the pronated hand is raised to the axilla) increases, restoring the symmetry to the contralateral shoulder. Conclusion: This is a simple clinical test to assess and monitor isolated Axillary nerve injury following shoulder dislocation.
11:48 - 11:56	**A NEW CLINICAL PATHWAY FOR ACUTE TRAUMATIC SHOULDER DISLOCATIONS IN A TEACHING HOSPITAL SETTING: QUALITY IMPROVEMENT PROJECT** AG Titchener; P Hallikeri; A Krishan; M Bateman; AA Tambe; M Espag; T Cresswell; DI Clark Royal Derby Hospital, Derby Purpose: To evaluate the quality improvement effect of the introduction of our newly introduced pathway for first-time traumatic shoulder dislocations.

	Methods and results: Evidence indicates that acute first time shoulder dislocations have been historically managed quite variably. We have developed a pathway for first time traumatic shoulder dislocations in our hospital adopting principles from the BESS (British Elbow and Shoulder Society) guidelines. Patients are either seen in a general or upper limb specific fracture clinic or a physiotherapist-led soft tissue shoulder clinic run in parallel with the upper limb clinic. From here our guidelines signpost a specific pattern of referral and investigation. Two changes were MR Arthrograms for all patients age 18-25 and ultrasound for all patients over 40 years eligible for surgery. All patients attending our hospital with a first-time shoulder dislocation in 2013 were retrospectively reviewed for investigations performed and referral patterns. Intervention in the form of surgeon education and clinic posters was performed in September 2016 and the same data was prospectively collected until March 2017. Before intervention, 6% of patients age 18-25 with first time traumatic shoulder dislocation underwent an MR arthrogram; after intervention 80% of eligible patients were correctly referred. Before intervention 39% of eligible patients over 40 years old were referred for ultrasound; 62% of these scans were positive for rotator cuff tears. After intervention 92% of eligible patients underwent ultrasound; 83% of these demonstrated cuff tears and these patients have had informed consultations regarding early surgery. Conclusions: Our intervention has changed referral patterns in a manner which evidence suggests will improve long term outcomes. Long term follow up of this cohort will confirm this. This intervention has improved the quality of our service and is applicable in other centres.
11:56 - 12:04	LATARJET PROCEDURE FOR ANTERIOR SHOULDER INSTABILITY – A COMPARISON OF CLINICAL AND FUNCTIONAL OUTCOMES IN PRIMARY AND REVISION PROCEDURES LZ Yapp (1); C McCallum (2); JA Nicholson (1); KF Chin (1); D Macdonald (2); CM Robinson (1) (1) Royal Infirmary of Edinburgh, NHS Lothian; (2) University of Edinburgh Introduction: Recurrent anterior gleno-humeral (GH) dislocation is a significant condition affecting a predominantly young and active patient population. Glenoid bone loss and the presence of an engaging Hill-Sachs lesion have been shown to be predictive of recurrent anterior instability following arthroscopic soft-tissue stabilisation. Subsequently, bone-blocking procedures such as the Latarjet have become increasingly used as the primary operation for these high-risk patients. Study Purpose: To compare the clinical and functional outcomes of the Latarjet procedure when used as a primary or revision treatment for recurrent anterior GH instability. Methods: We retrospectively analysed a prospectively collected clinical database to identify suitable patients. Date of discharge, need for revision and further dislocation were used as clinical end-points. Prospectively collected functional outcomes were obtained using the Western Ontario Shoulder Instability Index (WOSI) and Quick Disabilities of the Arm, Shoulder and Hand (Quick DASH) score.

	Results: 199 consecutive patients were followed-up from initial presentation to discharge during the period 2006 to 2015 (Median time from surgery to follow-up 4.6 years (55 months); Range 1-10 years). 55 patients had experienced failure of a previous surgical stabilisation requiring revision to the Latarjet procedure. There were no significant differences observed in terms of recurrent dislocation, need for further surgery or complications. Patients who underwent primary Latarjets were less likely to complain of ongoing subjective instability. However, there were no significant differences identified in overall levels of satisfaction, QuickDASH and WOSI scores when comparing each treatment group. Conclusions: The Latarjet procedure has a high success rate with low risk of recurrent shoulder dislocation. The overall risk of operative complication is low and need for revision procedure is rare. Patient-reported functional outcomes suggest no difference between primary and revision procedures. Longer term studies are required to comment on the subsequent development of arthritis.
12:04 - 12:12	RECURRENT INSTABILITY FOLLOWING ARTHROSCOPIC LABRAL REPAIR IN ADOLESCENT ATHLETES E Torrance; CJ Clarke; L Funk; M Walton The Arm Clinic at the Wilmslow Hospital, Wrightington Upper Limb Unit, University of Manchester, University of Salford, Manchester Aim: The aim of the current study was to investigate the recurrence rate of shoulder instability following arthroscopic capsulo-labral repair in an adolescent sporting population. Background: Traumatic glenohumeral dislocation of the shoulder is one of the most common shoulder injuries but especially among adolescent athletes. The management of instability in the young sporting cohort has been continually controversial due to high recurrence rates. Methods: A total of 92 patients, under the care of three senior shoulder surgeons were identified over a five-year period. The mean age of the cohort was16.3±0.9 (range 13-17) and consisted 8 females and 84 males. Demographic, clinical and intra-operative data were recorded on our database. Recurrence rates and relative risks were calculated. Results: At a follow-up of 33 months (±20 months), thirty-three patients presented with one episode of recurrent instability. Therefore, we highlight a recurrence rate of 36% in adolescent athletes following arthroscopic labral repair surgery. The mean time to recur was 62.4 weeks (±45.3 weeks). All recurrences were following a sporting injury. Of the thirty-three patients with a recurrence of instability, 25 had a further surgical procedure and the remaining eight patients underwent conservative rehabilitation. A subsequent Latarjet was the performed in 22/25 cases of recurrence, with three patients undergoing a revision arthroscopic soft tissue procedure. Relative risk analysis detailed that athletes who undergo primary arthroscopic shoulder stabilisation under 16 have 2.5 times the risk

	of developing a further instability episode, compared with athletes over the age of 16 at the time of index surgery(p=0.0002). Conclusion: A recurrence rate of 36% was described in adolescent athletes undergoing arthroscopic labral repair surgery. Athletes who undergo primary arthroscopic shoulder stabilisation under 16 have 2.5 times the risk of developing a further instability episode, compared with athletes over the age of 16 at the time of index surgery.
12:12 - 12:20	THE RESULT OF ANTERIOR SHOULDER STABILISATION IN YOUNG ADOLESCENTS, WITH AND WITHOUT A GLENOID BONE GRAFT M Silagy; S Bell; J Coghlan Melbourne Shoulder and Elbow Centre, Monash University, Melbourne Aim: To analyse the results of an anterior shoulder stabilisation procedure, with or without a glenoid bone graft, in a cohort of young adolescent patients. Background: Young patients with chronic anterior shoulder instability, in particular with glenoid bone loss, present a difficult management problem. Materials and methods: The details and results of anterior shoulder stabilisations in patients 18 years old were extracted from a prospectively collected database of patients having operative treatment for instability. The stabilisation procedure in 11 was arthroscopic, in 65 open with subscapularis split, and in 17 open with a free bone graft (Eden-Hybinette) to the glenoid. The follow up details at 2 years were analysed. Results: There were 93 patients (90% male) with a mean age of 16.9 years (14-18). There was a bony Bankart in 41%, and a large Hill-Sachs in 20%. At 2 year follow up the redislocation rate was 19% (18 patients). An additional 14% experienced subluxation. No patient with a bone graft redislocated. There was no difference in the instability rate between arthroscopic (25%) and open stabilizations (23%) (OR:1.12, 95%CI 0.21-6.12). Conclusion: The failure rate of anterior shoulder surgical stabilisation in the younger age group is high. A free glenoid bone graft seems to diminish this rate.
12:25 - 12:45	BESS awards
12:45 - 12:55	BESS 2018
12:55 - 13:10	Closing remarks
13:10 - 13:40	Lunch

POSTER PRESENTATIONS

Poster presentations can be found in the exhibition hall by the BESS stand. They will be available to view for the entire conference on touch screen displays.

THE EFFECTIVENESS OF AUTOLOGOUS CONDITIONED SERUM (ORTHOKINE) INTRA-ARTICULAR INJECTION IN THE MANAGEMENT OF GLENOHUMERAL ARTHRITIS

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Aim: To assess the effectiveness of autologous conditioned serum (ACS), with a high level of an interleukin 1 inhibitor, in the treatment of glenohumeral arthritis (GH-OA).
Background: Current non-surgical treatments for GH-OA are relatively ineffective. ACS is derived from patients' own blood and has an anti-inflammatory effect. The study objective was to determine if intra-articular ACS could reduce pain and disability in patients with GH-OA, and if the effect related to the Walch classification and degree of arthritis in the GH joint.

Patients and Methods: Forty-four shoulders, in 39 patients, with painful GH-OA were included in a prospective longitudinal study of ACS injections for GH-OA. The Walch GH-OA classification was determined. The primary efficacy objective was a decrease of the total shoulder pain and SPADI disability index of at least 8% post-treatment. The clinical benefit was assessed, including range of motion, and by two scores: ASES and the Constant.

Results: At 3 months post treatment a significant decrease of the total SPADI score (mean -14.06%, 95% CI -21.68 to -6.43; p = 0.001), as well in both sub-scores in the SPADI for pain and disability was recorded, with 95% having some reduction in pain. Both active and passive motion significantly improved (abduction p=.002). There was a significant increase in the Constant score (p=.025). The effect of ACS was not related to the Walch classifications or the degree of joint space narrowing. Ten patients since study completion have had a shoulder replacement, and all but one reported little or no improvement from the ACS injections.

Conclusion: Our data show a significant decrease of symptoms of pain and disability in most patients after ACS treatment. Neither the radiological type nor degree of GH-OA seems to influence the effect.

METAPHYSEAL REVERSE TOTAL SHOULDER ARTHROPLASTY - LONG-TERM RESULTS WITH 5 - 11 YEARS FOLLOW-UP

P Consigliere; L Natera; C Witney-Lagen; J Bruguera; G Sforza; E Atoun; O Levy
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To evaluate the 5 -11 years long-term clinical and radiological outcomes using a short metaphyseal reverse total shoulder arthroplasty (rTSA) without a diaphyseal stem.
185 consecutive shoulders underwent rTSA between 2005 to December 2011, 159 with stemless implant and 26 with stemmed implant.

Mean follow-up 89 months (7 years & 5 months) (range 60 - 138 months). There were 141 females and 44 males; Mean age at surgery 74.8y (range 38-93y). Aetiology: 108 cuff arthropathy, 22 fracture sequelae, 24 rheumatoid arthritis, 14 failed RC repair or massive irreparable cuff tear, 3 osteoarthritis with cuff

deficiency or eroded glenoid, 8 failed anatomical prosthesis with cuff deficiency, and 6 for acute trauma. 14 patients underwent bilateral (staged) rTSA at that period. 50 patients were operated as revision arthroplasty.

Patients' satisfaction (SSV) improved from 0.8/10 to 8.2/10. Mean Constant Score (for all diagnoses) improved from 15.6±8.6 preop to 59.0±20.4 (Age/sex adjusted 86.8±30.3) at the last follow-up ($p<0.0001$). Mean active range of movement improved from 53° to 129.5° elevation, 10° to 50.6° active external rotation and 24° to 67.2° active internal rotation. Radiographic analysis showed no lucencies, subsidence or stress shielding around the humeral or glenoid components.

Glenoid notching was found in 38 patients (20.5%) (36 grade 1-2, 6 grade 3).
The short metaphyseal rTSA (without a diaphyseal stem) shows encouraging long-term results with excellent pain relief and shoulder function, restoration of good active range of motion and high patients' satisfaction scores. The design of this implant seems to result in improved rotational movements, low incidence of glenoid notching and no implant loosening, subsidence or stress shielding.

DYNAMIC STABILITY ASSESSMENT OF PEGGED GLENOID COMPONENT AFTER TOTAL SHOULDER ARTHROPLASTY USING RADIOSTEREOMETRY

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This study aimed to determine whether dynamic movement of the glenoid under load could be measured reliably. Secondly, whether early dynamic movement of the implant may be associated with migration.

One millimetre diameter Tantalum markers were inserted into the scapula and the glenoid implant. Patients were imaged supine by RSA at 1, 6, 13, 26, and 52 weeks. Additionally they were imaged with the arm abducting against a normal force of 12N at the wrist at 13,26 and 52 weeks. Movement of the implant was determined relative to the bone. Additionally, the contact point of the humeral head on the implant was determined using CAD models of the glenoid implant.

Seven patients were followed up to 13 weeks. The principal migrations (in degrees), given as mean (minimum, maximum), at 13 weeks were 3.0 (-0.7 to 8.3) posterior tilt, 0.6 (-0.5 to 1.8) superior tilt, and 0.6 (0 to 1.8) mm posterior translation. The predominant dynamic movement at 13 weeks was 1.40 (-1.6 to 5.4) posterior tilt, 1.20 (0.1 to 3.3) degrees Superior tilt, and 0.1(-0.4 to -0.6) mm posterior translation. For both superior and posterior tilt, dynamic movement at 13 weeks was correlated to migration at 6 and 13 weeks. The position of the humeral head contact point correlated with the observed tilt of the glenoid.

We have shown that dynamic glenoid instability can be measured reliably, and it is observed as early as 3 months. In addition the observed movements are related to offset head position on the glenoid bearing surface.

DOES THE TERES MINOR MUSCLE STATUS AFFECT THE ACTIVE ROTATION MOVEMENT IN REVERSE TOTAL SHOULDER ARTHROPLASTY?

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Reverse total shoulder arthroplasty (rTSA) provide good active elevation, however, there are concerns regarding deficient or absent active external rotation (AER). Teres Minor (TM) degeneration and fatty infiltration has been implicated. This study assesses the correlation between TM integrity and fatty infiltration and postoperative AER in patients operated with rTSA.

Between 2005 and 2015, 109 shoulders in 97 patients (mean age 75.7±8.9; 31M, 66F) underwent a primary short metaphyseal rTSA for painful cuff tear arthropathy or massive irreparable rotator cuff tear with glenohumeral joint degeneration. Patients were prospectively clinically assessed preoperatively, at 3weeks, 3, 6, 12 months and yearly postoperatively: Constant Score (CS), Subjective Shoulder Value (SSV), Patient Satisfaction Score (PSS) were used.

TM fatty infiltration was evaluated according to Goutallier classification, while TM muscular degeneration according to Walch morphological classification. Consequently, all the shoulders were divided in 2 groups respectively: group A, Goutallier grade 0-1-2; group B, Goutallier grade 3-4 and group A1, Walch hypertrophic/normal and group B1, Walch atrophic/absent (Table)

Goutallier and Walch classification subgroups

Group A	Group A1	Group B	Group B1
68 shoulders	36 shoulders	41 shoulders	73 shoulders

The CS, SSV and AER improved significantly at 12-month follow-up assessment in all the patients (p ‹0.001). However, CS, AER and SSV have not shown statistically significant differences when comparing the different subgroups (A/B and A1/B1). Mean AER improved from 22.4±21.6 preoperatively to 40.6±17.5 postoperatively (+18.1±21.5) with no statistically significant difference (p = 0.43 A/B; p = 0.85 A1/B1).

It seems that TM degeneration does not affect AER in patients who underwent rTSA for cuff tear arthropathy with the specific design of rTSA implant. It may, however, relate to specific design concepts of the implant used. Additional clinical and biomechanical studies are necessary to understand the reasons that have led to these results.

EXPECTED PROGRESS FOR PAIN AND FUNCTION AFTER REVERSE TOTAL SHOULDER ARTHROPLASTY

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Purpose: To inform patient expectations for the progress of function and pain in the early post-operative phase following reverse total shoulder arthroplasty (RTSA).

Methods: The Oxford shoulder score (OSS) and Quick DASH scores were collected prospectively at 6 weeks, 3 months and 6 months following RTSA. Scores were examined to evaluate patient progression in the early stages following RTSA in both elective and trauma populations. The OSS was further scrutinised to identify how patients rated their usual pain and night pain at each of the post-operative stages.

Results: In both groups there was consistent improvement in OSS and QD from 6 weeks post-op to 6 months, when improvement plateaued. The greatest improvement in scores occurred between 6 weeks and 3 months post op. In the elective group the number of patients describing their pain as severe reduced from 49 to 7% from pre-op to 6 weeks post op, at this time point 49% of patients described their pain as none-mild. By 3 months over 70% of patients described their pain as none-mild. This increased to 84% at 6 months post op. In the trauma group, at 6 weeks 34% of patients reported their pain as none-mild, increasing to 60% at 3 months and over 70 % from 6 months.
In the elective group 75% of patients described being troubled by pain at night most nights or every night pre-operatively. This reduced to 46% at 6 weeks, 23% at 3 months and 13% at 6 months post-op. In the trauma group 33% of patients reported pain at most or every night at 6 weeks post op, reducing to less than 10% from 3 months.

Conclusion: These findings describe the pattern of progress in function, usual pain and night pain following RTSA and can help to inform patient expectations for post-operative progress.

5-YEAR OUTCOMES OF THE DISCOVERY TOTAL ELBOW REPLACEMENT

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Cambridge University Hospitals NHS Foundation Trust; School of Clinical Medicine, Cambridge University

Background: The aim of this study is to assess the clinical and radiological outcomes of primary Discovery total elbow replacements (TER) performed at our hospital using validated outcome measures.

Methods: All patients who had a Discovery TER implanted at our hospital were invited to take part in the study. The following outcome measures were recorded: current Mayo Elbow Performance Score (MEPS); pre- and post- operative Oxford Elbow Score (OES); elbow range of movement post-operatively (flexion-extension and supination-pronation). A retrospective case note analysis was performed to gain the perioperative details for each participant. Participants were also radiologically reviewed.

Results: 19 patients (24 elbows) were reviewed out of a total of 59 patients (72 elbows). 18 patients were deceased at the time of follow-up and 22 were lost to follow-up. Mean age was 66 years (range 38 to 86). Mean time to clinical follow-up was 5.2 years (median 5.0). The mean OES improved from 12.4 preoperatively to 43.4 ($p<0.01$). The mean postoperative flexion-extension arc was 111. The most common indication for surgery was rheumatoid arthritis (54.2%). Complications of the surgery were superficial infection (4.2%), ongoing mild pain (4.2%), nerve injury (8.3%), coupling loosening (4.2%), which required revising, and fracture (4.2%). Radiologically, there was 1 case (4.2%) of prosthetic loosening. The patient time incidence rate was 0.80.

Conclusion: The Discovery TER provides significant improvement in functional outcome scores. In our series, 96% of patients reported no pain following TER. This is equivalent to those reported for other elbow prostheses (Acclaim 64%, Souter-Strathclyde 67%, GSB III 50-92%, and Coonrad-Morrey 60-100%). A postoperative arc of movement of 111 offers an acceptable functional range of motion to allow patients to be able to undertake activities of daily living.

SHOULDER HEMIARTHROPLASTY CAN GIVE RELIABLE OUTCOME FOR PATIENTS WITH SICKLE CELL AVASCULAR NECROSIS OF THE HUMERAL HEAD

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Objective: We present our results of shoulder hemiarthroplasty performed on patients with established humeral head avascular necrosis secondary to sickle cell disease.

Methods: All patients who have had shoulder hemiarthroplasty for humeral head avascular necrosis (AVN) secondary to sickle cell disease in our institute from Sep 2009 to Dec 2016 were included. Pre and post-operative range of movement (ROM), Oxford Shoulder score (OSS), Visual analogue score (VAS) and DASH score questionnaires were collected along with radiographs.
Results: A total of 14 patients (15 shoulders) had shoulder hemiarthroplasty for humeral head AVN; all were done by single surgeon in one hospital. One patient did not complete the assessment scores and was therefore excluded. Average follow up was 42 months (12 – 85 months), with mean age at surgery 41 years (range 29 – 47). Preoperative FICAT classification (Creuss modification) for these patients was II to IV.

All patients except for one reported moderate to significant improvement in shoulder pain post operatively, VAS average 4 (0 – 8), OSS mean 35, DASH score mean 50.

ROM at follow up were abduction mean 124 degrees (70 – 180), forward flexion mean 135 degrees (80 – 180), external rotation mean 66 degrees (40 – 90) and internal rotation mean 52 degrees (30 – 80).
One patient had intra-operative fracture of the humeral shaft, was treated with circlage wiring.
One patient had sickle crisis despite intensive specialist input from haematology and anaesthetic teams.

Conclusion: AVN of the humeral head in sickle cell disease can result in significant pain and disability in a young patient population. Shoulder hemiarthroplasty can give reliable outcome with significant improvement in pain level and function. Whilst we accept that treatment of these patients has not been completely standardised, to our knowledge this is the largest series in the current literature.

SUPRASPINATUS DETACHMENT CAUSES MUSCULOTENDINOUS DEGENERATION AND A REDUCTION IN BONE MINERAL DENSITY AT THE ENTHESIS IN A RAT MODEL

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Purpose: The purpose of this study was to assess the development of osteopenia at the enthesis and rotator cuff degeneration following tendon detachment in a rat model.

Methods: Eighteen female Wistar rats underwent unilateral detachment of the supraspinatus tendon. Specimens were retrieved at three (n = 6), six (n = 6), and nine weeks (n = 6) postoperatively for histological analysis and peripheral quantitative computer tomography.

Results: Three weeks following tendon detachment there was a significant increase in the modified Movin score (indicating degeneration), fatty infiltration, an increase in musculotendinous cellularity, loss of normal collagen fibre structure/arrangement, rounded tenocyte nuclei, and an increase in the number of

vascular bundles. This was accompanied by a reduction in bone mineral density at the tendon insertion site. After six weeks though, these changes were less prominent.

Conclusions: This study has shown that three weeks after surgical detachment, the supraspinatus musculotendinous unit in a rat undergoes degeneration, and the greater tuberosity exhibits a reduction in bone mineral density. These changes are similar to those that occur in the clinical setting following a chronic rotator cuff tear, with the difference that scar tissue bridges the defect in a rat whereas in a human the tendon-bone gap is largely maintained. These findings suggest that the detached rat supraspinatus tendon, after three weeks, could represent a suitable model for investigating biological strategies targeted towards improving tendon-bone healing in chronic rotator cuff tears.

PREDICTING IMPROVEMENT IN PATIENTS WITH SUBACROMIAL IMPINGEMENT SYNDROME / ROTATOR CUFF TENDINOPATHY FOLLOWING PHYSIOTHERAPY

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Purpose of the study: To identify which baseline variables predict improvement in function and pain following physiotherapy for Subacromial Impingement Syndrome / Rotator Cuff Tendinopathy (SIS/RCT).

Methods: Baseline data was collected on 76 patients with a clinical diagnosis of SIS/RCT immediately prior to commencing physiotherapy. Candidate variables were demographics, clinical history, patient reported measures of pain, psychological symptoms and function (via the Shoulder Pain and Disability Index; SPADI), point-of-care diagnostic ultrasound and clinical measures of shoulder strength, range of movement and scapular control. Change in function and pain was determined by the Oxford Shoulder Score (OSS) performed at baseline, upon discharge following pragmatic treatment (model 1) and 3 months post discharge (model 2). Multivariate stepwise regression was performed for each model using a process of forward selection and backward elimination.

Results: Age and the total SPADI score were the only variables retained in model 1 and collectively accounted for 15.7% of the variance in OSS change ($p=0.004$). The values of -0.268 and 0.367 reflected that greater age was associated with less improvement in OSS whilst a higher total SPADI (greater pain and disability) was associated with a greater improvement in OSS.
Only total SPADI was retained in model 2, accounting for 9.6% of the variance in OSS change ($p=0.017$) where a higher total SPADI was again associated with a greater improvement in OSS.

Conclusion: The study findings provide evidence of a limited ability to predict outcome in SIS/RCT patients in this prospective cohort study which combined the novel elements of pragmatic treatment, follow up determined by actual treatment duration and point-of-care ultrasound as a potential predictor. Neither clinical nor diagnostic measures were identified as having a predictive role. Nonetheless, knowledge of age and baseline function provides a basis for patient triage and patient-clinician discussion around likely outcome.

ASSESSING CONDITION-SPECIFIC HEALTH-RELATED QUALITY OF LIFE IN LATERAL EPICONDYLAR TENDINOPATHY: A SYSTEMATIC AND STANDARDISED COMPARISON OF AVAILABLE INSTRUMENTS

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Aim: This studies aim was to systematically assess the evidence relating to an outcome instruments ability to quantify Health-Related Quality of Life (HRQoL) in Lateral epicondylar tendinopathy (LET). Background: LET is a common, painful condition. It confers significant patient morbidity has a high associated socioeconomic cost. The quest for efficacious treatments in LET relies on the ability to accurately quantify HRQoL.

Methods: Systematic review of the literature, using the PRISMA guidelines, of the Medline, Ovid and Embase databases was conducted. Of the 6448 articles identified, those reporting the development, assessment of metric properties, or use of instruments aiming to quantify LET-specific HRQoL were extracted. Each instrument was assessed by two reviewers, using the Evaluating Measures of Patient-Reported Outcomes (EMPRO) tool, reporting both overall and attribute-specific scores relating to the instruments properties.

Results: 15 instruments were identified. 57 articles reported instrument development or metric assessment (1-18 per instrument), 172 articles reported instrument use. Overall summary scores ranged from 21.6 to 72.5/100. Four instruments met a threshold criteria of an overall score›50, the qDASH(72.5), DASH(66.9), OES(66.6) and PRTEE(57.0). Assessment of instruments use in the literature found the DASH to be reported most frequently (29.7% articles) followed by the PRTEE (25.6%), MEPS (15.1%) and qDASH (8.1%).

Conclusions: Four instruments were found to meet the overall criteria for recommendation of use to quantify HRQoL in LET, with the qDASH scoring the highest. Though these four instruments are frequently reported, the remaining 11 scores, with insufficient evidence of LET-Specific validity, continue to be used.

The choice of a validated outcome measure is vital for the design and interpretation of clinical trials. This is the first study to provide guidance on the choice of outcome measures in LET. It has also highlights areas of deficiency in commonly used measures, which may assist in further metric property assessment.

OUTCOMES OF ELBOW HEMIARTHROPLASTY FOR UNRECONSTUCTABLE DISTAL HUMERAL FRACTURES

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Purpose: To evaluate the outcomes of elbow hemiarthroplasty as a suitable treatment of unreconstructable distal humeral fractures.

Methods: Patients were identified from coding. All patients were included who had a distal humeral fracture treated with a hemiarthroplasty and at least 6 months follow up between 2012 and 2017. The AO classification was used for fracture classification by 2 separate surgeons who were blinded to each other. Patients notes reviewed for clinical details. DASH and Oxford elbow scores were collected.

Results: 8 patients were included 4 excluded for insufficient follow up. Mean age of 69 (58-85). Mean follow up 24 months (12-51 months). 7 patients had 13-C3 AO fracture patterns, 1 with 13-B3. Mean ROM was 91 degrees (0-175). 7 of the 8 patients recovered full pronation and supination in comparison to the other side. 1 patient developed hypertrophic ossification and ankyloses of the joint and is awaiting revision. Mean OES was 30 (16-42). Mean DASH was 50.8 (20.0-80.2).

Conclusion: This is a salvage procedure for unreconstructable distal humeral fractures often in the elderly with poor bone quality. This series demonstrates that a functional ROM can be achieved in a majority of patients who are frail and have poor bone quality. Hemiarthroplasty also allows early rehabilitation. This should be considered for isolated distal humeral fractures in patient who have poor bone quality or the fracture pattern does not allow for surgical fixation.

A NOVEL GLENOHUMERAL JOINT STABILITY INDEX: APPLICATION TO ROTATOR CUFF TEARS

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Introduction: Numerous studies have been conducted to investigate the factors contributing to glenohumeral joint stability. There is no universal method to quantify this. Based on the concept of concavity compression and scapulohumeral balance mechanism, we propose a new stability index. This index accounts for: (1) Deviation of the contact pressure centre from the geometrical centroid of the glenoid; (2) Joint conformity; (3) Direction of the bone-on-bone force with respect to the normal direction of the glenoid; (4) Magnitude of the normal compressive component of the bone-on-bone force.

Aim: The aim of this study was to examine the effect of increasing rotator cuff tear size on glenohumeral joint stability.

Methods: We used a large-scale subject-specific finite element model of the shoulder complex that we constructed and rigorously validated in a fixed joint position of 30o abduction in the scapular plane. The simulation was conducted in the context of three rotator cuff tear scenarios: a full-thickness tear of the supraspinatus tendon; a full-thickness tear involving the supraspinatus and infraspinatus tendons; and a complete tear extending into the teres minor tendon. Glenohumeral joint stability was quantified using the joint stability index.

Results: From the simulation results we found that with increasing tear size, a humeral anterior-superior movement from the glenoid was observed. The stability index for each rotator cuff tear scenario was calculated as 96.51%, 47.35% and 0.41%, respectively, compared with an index of 100% in a normal shoulder.

Conclusion: We have demonstrated that there is no evidence that stability of the glenohumeral joint is affected when rotator cuff tears involve just the supraspinatus tendon. The findings of this study demonstrate the contribution of the rotator cuff to the dynamic stability of the glenohumeral joint, and we propose that the joint stability index be used to quantify this in further studies.

INTEGRATED TRIAGE ASSESSMENT AND TREATMENT IMPROVES COST-EFFICIENCY IN SHOULDER MUSCULOSKELETAL SERVICES

DLJ Morris; BWT Gooding
Circle Health

Purpose: To assess the impact of a capitated budget whole CCG integrated MSK shoulder service on outcomes and cost efficiency.

Methods: Analysis of prospectively collected data for all shoulder patients referred from primary care since commissioning of the service in April 2014 to December 2016. Pathway innovations include: capture of all referrals into a hub; electronic referral templates; evidence based triage with documented triage and assessment pathways; structured physiotherapy including injections; a GP specialist community clinic; renewed contracting with secondary care providers.
Results: From April 2014 secondary care admitted activity for rotator cuff and shoulder impingement pathology has decreased by 46% in a linear fashion from mean 24.3 admissions per month in the first 6 month period to 13.3 in the last 6 months.

Since April 2016 there has been a 68% increase in community injection activity for shoulder related conditions whilst there has been a linear decrease in onward referral to the GP specialist clinic and secondary care.

Total spend on shoulders has decreased by 45% from April to December 2016 whilst the overall number of patients in the system including in physiotherapy has remained consistent.

Within the GP specialist clinic 691 patients received shoulder injections with pre-injection mean EQ-5D 0.53 increasing at discharge to 0.59 ($p<0.001$). 16 patients received shockwave therapy for shoulder calcific tendonitis with no significant improvement in EQ-5D (0.58 to 0.60, $p=0.807$).

Conclusion: Whilst the prevalence of patients with shoulder problems in the integrated system has remained level, the cost has significantly decreased, with more patients receiving community injections and reduced secondary care admission. This suggests pathway innovations have resulted in more effective community management including physiotherapy led injections with reduced need for onward referral.

MANAGEMENT OF ADULT MEDIAL CLAVICLE FRACTURES: A SYSTEMATIC REVIEW OF 187 FRACTURES

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A systematic review of the literature relating to medial clavicle fracture in adults to identify best management.

The English language literature was searched. Only fractures of adult medial clavicles were included. Papers pertaining to tumours or non-union or isolated dislocation of the clavicle or physis were excluded. Case reports, case series and epidemiological studies were included. There were no randomised controlled trials. 27 papers met the criteria describing 187 medial clavicle fractures and subsequent management in the adult patient.

There were 6 observational cohort/epidemiology studies, 7 case series and 14 case reports.

Results: Various management options were described. Plate fixation was the most frequently used surgical option (n=46) including locking and non-locking. There was no difference in union rates between non-operative and operative management. Complications were higher in the operative group plate irritation (n=17) was the most frequent. There were no reports of iatrogenic injury.
Only 7/27 papers reported a functional outcome score. Pain was poorly reported with 40% of papers failing to report presence or absence at final follow up.
Results: There are no randomised controlled trials of management modalities for medial clavicle fractures. Medial clavicle fractures are reported as rare injuries, with CT being a useful modality.

Conclusion: Undisplaced extra-articular fractures are probably suitably managed non-operatively in a collar and cuff until pain subsides.

Open reduction and internal fixation can be safely carried out with vigilance. There are currently no dedicated medial clavicle plates, but various locking plate devices have been used with success. Plate irritation is the most frequently encountered complication.
Pragmatic interventional studies including functional outcomes and VAS pain scores at rest, activity and heavy activity are most likely to answer the question of best management of medial clavicle fractures. With the rarity of the injury, multi-centre studies will likely be the best study design.

BEST RADIOLOGICAL IMAGING TECHNIQUE AND INDEX FOR ROTATOR CUFF TEARS: A SYSTEMATIC REVIEW

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University of Leicester

This systematic review aimed to identify the common indices used when imaging full-thickness rotator cuff tears and retears in studies where the morphology of the tears was confirmed at surgery. The aim was also to determine which indices are used the most, and if it differs for primary tears and retears.

The literature was reviewed to look at full-thickness tears and retears of the rotator cuff. Only studies with radiological imaging and clearly specified indices that were confirmed at surgery were included. The accuracy of the imaging techniques and indices were compared.

11 papers were included in our data set. For MRI, using the indices of length (L) and width (W) of the tears was the most accurate way of predicting a full-thickness tear, specifically crescent shaped with L<2cm, with an accuracy of 98%. Using MRA, coronal and sagittal dimensions were the most accurate with ICCs of 0.98, when reviewed by radiologists, looking at full thickness tears. Fat and muscle composition seen in infraspinatus pre- or post-operative CTA and supraspinatus post-operative CTA are the most accurate, looking at full-thickness tears. Using MRI to look at retears; the degree of retraction of the torn tendon found pre-operatively was the most accurate predictive index.
Medial-lateral length and anterior-posterior length of the tears are the most accurate indices when looking at full-thickness rotator cuff tears on MRI. MRA is consistently the most accurate radiological investigation for imaging full-thickness rotator cuff tears, but is invasive. These need to be used consistently in reporting of the scans for rotator cuff tears.

SUBACROMIAL IMPINGEMENT SYNDROME –WHAT DOES THIS MEAN TO AND FOR THE PATIENT: A QUALITATIVE STUDY

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The validity of the acromial impingement model has been challenged from both a theoretical and practical perspective: The purpose of this study was to explore how patients understand their problem and how this might impact on their perception of physiotherapy.

A qualitative study. Data was collected using semi-structure interviews and analysed using the Framework method. One NHS Physiotherapy department in South Yorkshire. Nine patients diagnosed with subacromial impingement syndrome were purposively sampled.

Three main themes were generated: (1) The diagnostic experience, (2) Understanding of the problem, (3) Expectation of the treatment required; with one subtheme: (3b) Barriers to engagement with physiotherapy.

The findings from this study suggest that diagnosis of shoulder pain remains grounded in a biomedical model. Understanding and explaining pain using the subacromial impingement model seems acceptable to patients but might have significant implications for engagement with and success of physiotherapy. It is suggested that clinicians should be mindful of the terminology they use and consider its impact on the patient's treatment pathway with the aim of doing no harm with the language used.

THE ROLE OF CLOSED SUCTION DRAINAGE FOR REVERSE SHOULDER ARTHROPLASTY

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Warrington Hospital

Background: Role of closed suction drains have been extensively investigated in the field of lower limb arthroplasty. Reverse shoulder arthroplasty (RSA) creates a significant dead space under the deltoid muscle. The use of drains in this procedure seems to be even more relevant.
Methods: A retrospective review was conducted of all the reverse shoulder arthroplasty procedures conducted at our trust. We compared the patients with RSA who had closed suction drains inserted with the patients who did not, with regards to demographics, ASA grade, body mass index, indication for RSA (trauma vs elective), type of RSA (cemented vs uncemented) and preoperative haemoglobin. Average drop in haemoglobin on first postoperative day, length of stay, rate of blood transfusion and complications specifically, infection, prolonged wound drainage or hematoma formation were considered as main outcomes. Quantitative data was compared using Mann- Whitney U test and categorical data using Chi-squared data.

Results: A total of 43 RSA have been carried out by 2 shoulder surgeons since 2013 at our trust. There were 25 RSA in which closed suction drains were used and 18 with no drains. There was no statistically significant difference between the 2 cohorts with regards to age, gender ratio, right or left side operation, ASA grade, indication for RSA, BMI, cemented or uncemented RSA and preoperative haemoglobin. The average drop in haemoglobin was 24.68 units (range 3-49) in the cohort with drains while 23.16 units (5-43) in the group with no drains (p=0.379). There was not a significant difference in between the groups

with regards to rate of blood transfusion (Drains 20% vs no drains 11.11%, p=0.436), length of stay (p= 0.393) and no complications were recorded.

Conclusion(s): The utility of drains in RSA could not be proved in this retrospective case-control study