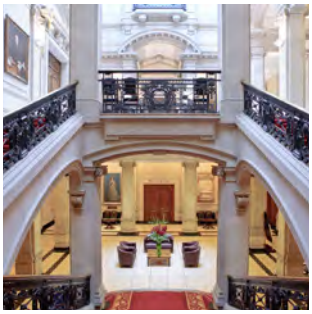
BSSH

The British Society for
Surgery of the Hand



AUTUMN SCIENTIFIC MEETING

15–16 OCTOBER 2015
ONE GREAT GEORGE STREET, LONDON

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PRESIDENT'S FOREWORD

Vivien Lees
President

Dear Members and Guests

I would like to welcome all of you to the Autumn Scientific Meeting of the BSSH at One Great George Street, London where the theme of the meeting will be 'Progress through Science.'

The programme explores the themes of the distal radioulnar joint and management of complex disorders of forearm rotation. Technological innovations will be addressed including the application of 3D computer technology in reconstruction of the distal forearm. By contrast we will be looking at advances in nerve repair from basic sciences through to strategies for management of nerve injury and techniques of nerve repair.

I am delighted to welcome as guest speakers Dr Luis Scheker from Louisville, USA, Professor Susan Mackinnon from Washington University School of Medicine, St Louis and Dr Frederik Verstreken from University Ziekenhuis, Antwerp, Belgium. I know that you will be both informed and entertained by what each has to share with us.

We will be updated on the projects that we are developing with the Healing Foundation, funding research in hand surgery.

As ever there are a wealth of stimulating papers contributed by our members with several topics emerging as areas of current interest.

Our Society dinner on the Thursday evening will be held at the recreated Globe Theatre on the south bank of the Thames with water taxis to take us back at the end of the evening.

THURSDAY 15 OCTOBER 2015

09:00 Registration and refreshments
09:30 Welcome by the President
09:35 Free paper session
10:45 Refreshments and trade exhibitions
11:15 Stack Fellowship report
11:30 Douglas Lamb Lecture: Understanding the distal radioulnar joint
12:20 BSSH / Healing Foundation
12:45 Lunch and trade exhibitions
13:45 Free paper session
14:35 Symposium: Managing complex disorders of the forearm
15:35 Refreshments and trade exhibitions
16:00 Plenary Session: Deformities of the fingers in inflammatory arthritis
17:00 Keynote Lecture: Examination of mechanical disorders of the forearm
17:30 Annual General Meeting (open to Members and Associates of the Society only)
19:15 (for 20:00) Society Dinner - Shakespeare's Globe Theatre

FRIDAY 16 OCTOBER 2015

08:15 Registration
08:45 Keynote Lecture: Anatomy / physiology of nerve injury
09:30 Keynote Lecture: Specialised service development as a new consultant
10:00 Updates / Presentations
10:25 Keynote Lecture: Strategies for nerve repair
11:00 Refreshments and trade exhibitions
11:30 Free Paper Session
12:30 Presidential Handover
12:40 Lunch and trade exhibitions
13:35 SWIFT Update
13:45 Keynote Lecture: Paradigm shifts in nerve surgery
14:30 Free Papers: Rapid Fire Session
15:30 How I Do It
16:30 Close of meeting

GUEST SPEAKERS

Miss J S Arrowsmith, FRCS(Plast)
Consultant Hand & Plastic Surgeon, Pulvertaft Hand Centre, Derby

Speaking in: Deformities of the fingers in inflammatory arthritis – Thursday, 16:00hrs

Mr R Amirfeyz, MD MSc(Orth) FRCS(Tr&Orth)
Consultant Hand Surgeon, Southmead Hospital, Bristol

Speaking in: Deformities of the finders in inflammatory arthritis – Thursday 16:00hrs

Mr J P Compson, FRCS(Orth) FRCS
Consultant Orthopaedic Surgeon, Kings College Hospital, London
Qualified in 1980 St Marys Medical School London. Trained in Orthopaedics on Guys and St Thomas' Hospital training circuit. Consultant orthopaedic surgeon with a specialist interest in upper limb reconstruction (wrist and elbow) at Kings College Hospital London since 1996.

Speaking in: Managing complex disorders of the forearm – Thursday, 14:35hrs

Mr G E B Giddins, FRCS(Orth) FRCSED
Consultant Orthopaedic Surgeon, The Royal United Hospital, Bath

Grey is a Consultant Orthopaedic and Hand Surgeon in Bath and a Visiting Professor at the University of Bath. He has been a Council member of the BSSH and is the Vice-President Elect. He has been the Editor-in-Chief of the Journal of Hand Surgery (European) since 2012. The impact factor has risen to >2 and the Journal now ranks as the No 1 Journal in Hand surgery. He is a Council Member of the British Orthopaedic Association.

He runs a clinical research programme centred on output especially the non-operative treatment of common hand injuries, systematic reviews and biomechanical studies of the wrist and finger joints. He has designed and marketed a new type of wrist guard which has been incorporated into a glove. This is based on a research programme looking at the mechanisms of wrist fractures and DRUJ injuries.

When not working he plays a number of sports including lawn and real tennis, golf, cycling and running around after his children. He has also been known to wear red trousers.

Speaking in: How I do it – Friday, 15:30hrs

Mr Henk Giele, FRCS FRACS(Plast)
Consultant Plastic Surgeon, John Radcliffe Hospital, Oxford

Henk Giele has been a consultant hand and plastic surgeon in Oxford at the Radcliffe Hospitals and Nuffield Orthopaedic Centre (now merged to Oxford University Hospitals) since 1996. His speciality interests are in musculoskeletal infection, bone and soft tissue sarcoma, microsurgical reconstruction after trauma, tumour or anomalies, hand surgery including congenital upper limb anomalies, brachial plexus and peripheral nerve conditions, trauma and degenerative conditions.

His research interests are surgical innovation, clinical research into the genetic and molecular basis and treatment of congenital upper limb anomalies, the genetic basis and treatment of Dupuytren's disease, the management of sarcoma, clinical trials in hand surgery, and the transplantation of composite vascularized tissue.
He is a specialist advisor to the NICE new technology assessment committee. He sits on the Clinical commissioning Reference Groups for both sarcoma and specialist children's surgery. Henk Giele has published over 110 articles, 17 book chapters and a book, the Oxford Hand book of Plastic Reconstructive Surgery.

Speaking in: How I do it – Friday, 15:30hrs

Professor AM Hart, MBCB BSc(Hons) MRCS AFRCS MD(Hons) PhD FRCS(Plast)
Consultant Plastic & Hand Surgeon, Canniesburn Plastic Surgery Unit, Glasgow Royal Infirmary

Speaking in: Anatomy/physiology of nerve injury – Friday, 08:45hrs

Mr M J Hayton, FRCS(Tr&Orth) FFSEM
Consultant Orthopaedic Hand Surgeon, Wrightington Hospital, Wigan

Mr Mike Hayton is a Consultant Orthopaedic Hand Surgeon. He works at Wrightington Hospital in the North West of England. Mike's clinical practice is exclusively hand, wrist and elbow surgery and he has a particular interest in sports injuries. He lectures widely in Europe and North America and has published many peer-reviewed articles and written several book chapters.

Speaking in: How I do it – Friday, 15:30hrs

Miss C Hernon, MBChB BSc(Plast) MD
Consultant Plastic Hand & Reconstructive Surgeon, Leeds General Infirmary
Consultant Plastic Hand & Reconstructive Surgeon, Leeds General Infirmary

Cath Hernon has been a consultant plastic, hand and reconstructive surgeon at Leeds Teaching Hospitals Trust since 2010. She completed her specialist training in plastic and reconstructive surgery in the Yorkshire region and then gained further experience in hand surgery by undertaking hand fellowship posts in Leeds and the St Andrews centre for plastic surgery and burns in Chelmsford.

She also spent a year as a microsurgical fellow in Taiwan gaining further experience in microsurgical and nerve reconstruction at the E-Da hospital in Kaohsiung and at the Chang Gung Memorial Hospital in Taipei. Prior to starting her consultant post she spent a sabbatical in Norrland's University Hospital in Umea, Sweden furthering her experience in the surgical treatment of upper limb spasticity.

Her specialist interests are in adult hand surgery, peripheral nerve and brachial plexus injury, upper limb spasticity and microsurgery.

Speaking in: Specialised service development as a new consultant – Friday 09:30hrs

Miss A Karantana, FRCS(Orth) FRCS (Tr&Orth) PGDip (Health Research) Dip Hand Surg PhD
Associate Research Fellow, University of Nottingham, Nottingham

Alexia Karantana was born and educated in Greece. She came to the UK as an Erasmus fellow with the University of Bristol. This was followed by basic surgical training in Bristol and specialist registrar training on the Mid-Trent orthopaedic rotation. During her registrar training, she completed a PhD with the University of Nottingham. She has trained in hand surgery in Derby, Birmingham and as ATP Hand Surgery fellow in Manchester. Her research interests include outcome of distal radius fractures, clinical trial methodology and economic evaluation.

Speaking in: BSSH/Healing Foundation – Thursday, 12:20hrs

Professor S Mackinnon, MD FRCS(C) FACS

Department of Surgery, Washington University School of Medicine, St Louis, USA

Professor Mackinnon graduated from medical school at Queen's University in Kingston, Ontario, Canada, in 1975. She trained in general surgery at the same institution and completed her plastic surgery training at the University of Toronto. She then completed a year of peripheral nerve research at the University of Toronto in the Division of Neurosurgery and a hand surgery fellowship in Baltimore at the Raymond Curtis Hand Center. Professor Mackinnon joined the surgical staff at the University of Toronto in 1982. In 1988 she was awarded the Medal Prize in Surgery from the Royal College of Physicians and Surgeons for her work on nerve regeneration.

In 1991 Professor Mackinnon joined the Department of Surgery at the Washington University School of Medicine. Her research work in St. Louis has been funded through the National Institute of Health since 1993 and has investigated nerve allotransplantation and nerve regeneration. This work has resulted in new strategies to reconstruct nerve injuries. She has been Chief of Plastic Surgery since 1996.

She has published a classic textbook on Nerve Surgery, 454 peer reviewed publications and 154 Book Chapters. Her free access website provides surgical videos with all the secret ingredients and are used globally to improve the care of nerve injured patients. Professor Mackinnon is Past President of the American Society for Peripheral Nerve, American Association of Hand Surgery, American Association of Plastic Surgery, and Plastic Surgery Research Council and is a member of the Institute of Medicine. She is the recipient of the Jacobson Innovation Award from the American College of Surgeons for 2013 for her pioneering work on nerve transfers.

Professor Mackinnon married Dr Alec Patterson, Chief of Cardiothoracic Surgery at Washington University in 1972 and has four talented children. Lachlan, a James Beard award winning Chef, Megan, an Orthopaedic hand surgeon, Brendan is an Orthopaedic resident and Caitlin, a hospital administrator. She has seven adorable grandchildren and three more on the way.

Speaking in: Strategies for Nerve Repair – Friday, 10:25hrs
Paradigm shifts in nerve surgery - Friday, 13:45hrs

Mr M Nixon, MD FRCSEd(Tr&Orth)

Consultant Upper Limb and Hand Surgeon, Countess of Chester Hospital

Mr Nixon has two complementary main jobs – in Chester he sees mainly adult upper limb and does a general on-call, but increasingly sees more tertiary referrals for paediatric upper limb and adult neuromuscular conditions. In addition he has a weekly clinic and list in Royal Manchester Children's Hospital where he has a tertiary referral practice for paediatric upper limb conditions. He regularly transfers skills from each job to compliment the other and is rapidly developing a specialist practice.

Speaking in: Managing complex disorders of the forearm – Thursday, 14:35hrs

GUEST SPEAKERS

Dr L R Scheker, MD

Associate Professor of Plastic and Reconstructive Surgery, University of Louisville, USA

Luis R Scheker, Born in the Dominican Republic, graduated as physician and surgeon from Universidad Autonoma de Santo Domingo, trained in Plastic and Reconstructive surgery in West Middlesex Hospital, London, England and Canniesburn Hospital, Glasgow Scotland. Hand fellowship in the C.M. Kleinert Institute for Hand and Microsurgery. Is a partner of the Kleinert Kutz Hand Surgery Service and an Associate Professor of Plastic and Reconstructive Surgery at the University of Louisville and Assistant Consulting Professor of Surgery, Duke University Medical Center. His main interest has been in reconstructive microsurgery, congenital hand surgery and joints reconstruction including the first carpometacarpal joint, the proximal and the distal radio ulnar joints.

Speaking in: Understanding the distal radioulnar joint – Thursday, 11:30hrs
Managing complex disorders of the forearm – Thursday 14:35hrs

Professor I A Trail, MD FRCSEd FRCS

Consultant Orthopaedic Surgeon, Wrightington Hospital, Wigan

Speaking in: Deformities of the fingers in inflammatory arthritis – Thursday, 16:00hrs

Dr F Verstreken, MD

Consultant Hand Surgeon, Monica Hospital, Antwerp, Belgium

Dr Frederik Verstreken trained in Orthopedic Surgery at the University Hospitals of Leuven, Belgium (1998) and did a hand surgery fellowship at the Kleinert Institute in Louisville, USA in 1999.

Since 1999 he has been a consultant hand surgeon at the Monica Hospital in Antwerp, Belgium and at the Antwerp University Hospital.

His main research focus is on scaphoid fracture fixation and on the application of 3D technology into orthopedic surgery, specifically for the correction of wrist and forearm malunion.

He is a board member of the Belgian Hand Group and an active member of the examination committee of the European Board of Hand Surgery, the Federation of European Societies for Surgery of the Hand (FESSH) and the American Society for Surgery of the Hand (ASSH).

Speaking in: Managing complex disorders of the forearm – Thursday 14:35hrs

09:00 Registration and refreshments

09:30 Welcome by the President

Free Papers

Chairs: Mr L Muir / Mr R Eckersley

09:35 **Pyrocarbon metacarpophalangeal joint arthroplasty in non-inflammatory arthritis: Minimum of five-year follow-up**

Mr S Talwalkar, Mr D Dickson, Mr R Badge, Professor A Watts, Mr M J Hayton, Professor I A Trail (Wrightington)

Introduction: There are few reports in the literature exploring metacarpophalangeal joint arthroplasty in non-inflammatory arthritis. We report the outcomes, complications and survivorship using a pyrocarbon implant at a minimum of five years follow-up.

Methods: We retrospectively reviewed fifty-one joints in 36 patients. Demographics, complications, need for further surgery and implant revision were recorded. Subjective outcome was assessed by Patient Evaluation Measure (PEM); Quick Disabilities of the Arm, Shoulder and Hand score (Quick-DASH) and visual analogue scores for appearance, satisfaction and pain. Objective outcome was assessed by grip strength, range of motion and radiological assessment of alignment, loosening and subsidence.

Results: Average follow-up time was 8.5 years. Joint involvement consisted of the index in thirty-five cases and middle finger in 16 cases. Mean arc of motion was 54° (range 20-80°). Grip strength was not significantly different between the operated and non-operated side. Six joints have undergone revision implant surgery with a further three undergoing additional surgery. The average PEM and Quick-DASH scores were 26.5 and 28.9 respectively. Visual analogue score for pain was 0.9 (range 0-7). Scores for satisfaction and appearance were similarly good. Radiological analysis revealed evidence of migration, loosening and subsidence but these did not correlate with outcome.

Conclusion: Kaplan Meier analysis reveals an implant survival of 88% at ten years. The implants that have required revision were all undertaken within eighteen months of surgery and may represent technical issues rather than issues with the implant.

09:40 Discussion

09:42 **Injected novel legal highs associated with severe soft tissue infection: A regional hand unit's experience**

Miss L Y Yong, Dr K M Milto, Mr Z Sheikh, Miss C Simpson (Edinburgh)

Introduction: There has been a recent rise in the popularity and abuse of new psychoactive substances, "legal highs", in Scotland. We present a case series of patients presenting to a regional hand unit covering South East Scotland who had severe soft tissue infections as a consequence of injecting such substances.

Methods: Retrospective case note analysis over a ten-month period.

Results: Nine patients were identified with a 2:1 male to female ratio, mean age was 38 years. 88% of patients injected a substance called 'Burst'. Mean hospital stay was fourteen days, with a total accumulated hospital stay of 123 days, including two days in ITU. All patients developed a severe soft tissue infection requiring up to five operative procedures with two to five different intravenous antibiotics. The most common organism isolated in 66% of patients was Streptococcus Pyogenes Group A (SPGA). Five patients shared the same strain. 33% of patients had both SPGA and Staphylococcus Aureus (SA), 22% of patients had SA and 12% had multiple organisms. 22% of patients required split thickness skin grafts to reconstruct their resultant tissue defects, 22% had a Foucher flap and 11% had a flag flap.

Conclusion: Recreational use of injectable legal highs can lead to aggressive soft tissue infections. Treatment is complex, requiring multiple debridements, poly-antimicrobial therapy and reconstruction. Health providers who suspect soft tissue infections associated with legal high injections should consider prompt antibiotic treatment and surgical review.

09:47 Discussion

09:49 **The long-term outcome of four-corner fusion**
Professor I A Trail, Professor R Murali, Professor J K Stanley, Mr M J Hayton, Mr S Talwalkar, Mr R Sreekumar, Mrs A Birch (Wrightington)

Introduction: Four-corner arthrodesis with excision of the scaphoid is an accepted salvage procedure for scapho-lunate advance collapse (SLAC) and scaphoid non-union advance collapse (SNAC) and has been undertaken in our unit for over twenty years. We have undertaken a retrospective review of one hundred and sixteen of these procedures performed in 110 patients between 1992 and 2009. Fifty-eight patients attended for a clinical evaluation and 29 responded by postal questionnaire.

Methods: The surgical technique undertaken was standard. That is through a dorsal approach the scaphoid and tip of the radial styloid were excised. The capitate, lunate, triquetrum and hamate articular surfaces were then prepared down to bleeding bone. Bone graft from the scaphoid and radial styloid were then inserted and fixation undertaken. For the latter various methods were used including k wires, staples, bone screws, but predominantly the Spider plate (Integra Life Sciences, USA). Thereafter the wrist was immobilised for a minimum period of two weeks prior to rehabilitation.

Results: Follow-up was a mean of nine years and four months, (range 3 – 19 years). All patients reported a significant improvement in pain relief and approximately 50% of flexion extension, although only 40% of radio-ulnar deviation. Grip strength was again approximately 50% on the contralateral side. Most patients reported a significant improvement in function with 87% returning to work. In addition, radiological evaluation identified twenty-eight patients (31%) who demonstrated ongoing signs of non-union, particularly around the triquetrum. Fourteen of these (15%) had undergone a further procedure, generally with success. Finally, none of the patients demonstrated any arthritic changes in the lunate fossa on follow-up X-ray and all secondary procedures were undertaken within two years of the primary.

Discussion: This research has demonstrated that four-corner fusion fixed with a circular plate can result in a satisfactory outcome with a reduction in pain, a functional range of motion and a satisfactory functional outcome. The bulk of the complications appear to occur in the first two years after surgery. Thereafter analysis shows long term satisfaction with little deterioration. Non-union particularly around the triquetrum continues to be a problem but it may be that this bone should be excised along with the scaphoid resulting in a three-part fusion only. Alternatively a simple capito-lunate fusion may be satisfactory.

09:54 Discussion

09:56 **An anatomical study of the volar branches of the digital nerves**
Miss R Filfilan, Miss L Y Yong, Miss A Kinsella, Mrs D M Davidson (Edinburgh)

Introduction: The cutaneous innervation of the proximal palm and volar digits is well described, but there is little in the literature about the innervation of the distal palm. As this area represents the site of several common hand procedures we aim to address this deficit.

Method: Dissection was performed on ten (five matched pairs; three male, two female) fresh-frozen cadaveric hands. Hand length measurements were taken. Volar branches (VBs) of the common digital nerves (CDNs) and proper digital nerves (PDNs) in the distal palm were carefully dissected under 3.0 x loupe magnification. Their origin was documented in relation to the A1 pulley and the palmar digital crease (PDC).

Results: Mean hand length was 184.8mm (range 161.3–199.0). VBs were identified on both sides in 94% of digits. No VB was identified on one side of one digit in six hands (6%), usually a border digit. In general, a single VB originated from each radial and ulnar PDN. However, in three hands, multiple VBs were found on the ulnar side of the little finger. The VBs originated at the proximal margin or alongside the A1 pulley in the majority of digits (84%). The VB-PDC distances were fairly constant and similar on both radial and ulnar sides, with a mean of 21.3mm (range 15.6 – 29.2).

Conclusion: Our study provides a detailed anatomical description of the volar sensory branches arising from digital nerves in the distal palm. We hope this will provide valuable insight for hand surgeons to help guide safe dissection and minimise the risk of neuroma formation.

10:01 Discussion

10:03 **Fifteen-year experience of successful reconstruction of scaphoid fracture non-union with distal radius vascularised bone grafts**
Ms M Spiteri, Ms H Whalley, Mr I McNab (Oxford)

Aim: We report on a single surgeon's experience with Zaidemberg and Kuhlmann VBGs.

Method: Review of medical notes, imaging, outcomes and complications.

Results: Over fifteen years, 100 patients were treated. Mean age at surgery was twenty-six years (range 17-41), with a mean time form injury to surgery of 23 months.

A 1.2 intercompartmental supraretinacular artery graft was used for proximal third fractures (59 cases). A volar carpal artery graft was used for middle third fractures (41 cases). These grafts were used as interposition wedge grafts to restore scaphoid anatomy and stable fixation was achieved with cannulated headless compression screws +/- supplementary K-wires.

Crossing trabeculae were seen on radiographs in most patients at three months. We found two non-union cases and two cases of delayed union. Eight patients were active smokers and eighteen patients stopped smoking peri-operatively.

Post-operatively the mean flexion-extension arc was 95º, grip strength improved and the Michigan hand score was 87 and 86 in Zaidemberg and Kuhlman grafts respectively. The incidence of serious complications was low.

Conclusion: This review shows successful utilisation of a systematic approach to the use of scaphoid VBGs based on the location of the fracture. Reconstruction by means of an interposition wedge graft and stable cannulated headless compression screw fixation has shown union rates of ninety-six percent with few complications. This approach aims to address both the biology and mechanics of the fracture. We recommend VBGs for the treatment of all proximal third scaphoid fracture non-unions; middle third non-unions with hypovascularity and all revision cases.

10:08 Discussion

10:10 Medium-term outcomes of the Universal-2 total wrist arthroplasty for rheumatoid arthritis

Mr R Badge, Mr D Dickson, Mr S Talwalkar, Mr M J Hayton, Professor R Murali, Professor I A Trail (Wrightington)

Introduction: Total wrist arthroplasty (TWA) for rheumatoid arthritis provides pain relief and preservation of function.

Aims: The aims of the current study were to evaluate the clinical and radiological outcomes of the Universal-2 TWA at a tertiary institute.

Materials and Methods: The retrospective review of ninety-five Universal-2 wrist arthroplasty procedures performed from 2003 to 2012. Six patients were lost to follow-up and two patients died of unrelated causes. There were sixty female and 15 male patients with a mean age of 59 years (26 – 86 years). Eleven patients had bilateral arthroplasties therefore 75 patients with 86 wrist replacements with a mean follow-up of 53 months (24–120 months) were reviewed. Pain score, patient satisfaction, range of movement and DASH score were used as an outcome measure.

Results: The pain scores improved from an average 6.5 to an average of 3.5 at latest follow-up. The mean satisfaction score was 69 on a VAS. Movements were preserved with mean dorsiflexion of 29° and palmarflexion of 21°. Grip strength improved from a mean pre-operative value of 4.8 kg to 10.2kg post-operatively. The function scores improved from 7.9 to 5.9. The Kaplan-Meier probability of survival using the removal of the implant as the end point was 91% at 7.8 years. The incidence of major complications was 7% (n=6), including revision arthroplasty (n=3) and salvage arthrodesis (n=3).

Conclusion: This is the largest case series with Universal-2 TWA. With the results available from this study we recommend Universal-2 TWA for pain relief and preservation of function in patients with rheumatoid arthritis.

10:15 Discussion

10:17 'An-art-omy": The use of art in the study of anatomy
Dr J Edet, Mr D Thornton (Leeds)

The use of art in medicine extends as far back as the ancient Egyptian wall paintings and remains a vital part of medical teaching today through illustrations and three-dimensional artistic models. The study of anatomy in particular has benefitted from the advent of medical artistry and its use in helping depict anatomical structures and their relation to each other in the human body.

Whilst anatomy naturally lends itself to artistic modalities of teaching, these usually comprise textbook images of physical structures represented in two-dimensional format. We felt that such presentation was less conducive with understanding the three-dimensional context essential to anatomical study. We therefore devised a teaching aid that builds up the anatomy in front of the learners' eyes allowing multi-dimensional appreciation of anatomical structures. Its beauty is in its simplicity and as such is appropriate for all healthcare professionals and students alike. We present this educational adjunct and feedback which demonstrates high satisfaction and its usefulness as a learning aid, revision tool and as a reference, particularly when describing anatomy of upper limb injuries and anticipating what structures may be involved. It has been of great value on induction of our plastic surgery junior staff allowing rotating doctors a simple and quick way to refresh their anatomy knowledge, and has also been trialled in the Accident and Emergency Department whose staff commonly deal with upper limb injuries and have fed back that it has helped in their management/referral of such injuries.

10:22 Discussion

10:24 Low fusion rates and lunate extension following crossed screws for four-corner fusion: A cautionary tale
Mr G Cox, Miss E Balabanidou, Professor D Warwick (Southampton)

Introduction and Aims: Four-corner fusion with scaphoid excision is used to treat radio-scaphoid arthritis when the radio-lunate joint is preserved but the midcarpal joint is degenerate. Various methods of fixation are suggested; we present our disappointing experience with crossed screws.

Materials and Methods: Patients who underwent four-corner fusion with crossed screws were prospectively identified and followed up clinically, radiographically and with note review.

Results: Thirteen cases in 12 patients (eight males) were identified, one having a bilateral procedure. Median age was fifty-six (31-73). The indications were SLAC (n=10), SNAC (n=2) and failed STTJ fusion (n=1). Crossed cannulated double headed screws (n=11) and continuous variable thread screws (n=2) were used in a crossed fashion (lunate-hamate/triquetrum-capitate). Post-operative radiographs showed that the proper surgical reduction of lunate DISI deformity, recurred post-operatively in six cases (mean change = 17.3°, SD 14.4). Fusion failed on three occasions and these cases were revised using a spider plate and grafting. Three screws penetrated the cortex; two symptomatic screws were removed and one asymptomatic was retained.

Conclusion: We found a reoperation rate of 38% and non-union rate of 23% using this technique. We suggest this is due to failure of stable fixation, with cancellous rather than cortical purchase. We found these results to be unacceptable and have converted to circular plate fixation.

10:29 Discussion

10:31 **Comparing radioscapholunate fusion, four corner fusion and proximal row carpectomy on the range of dart thrower's motion**
Miss L Manojlovich, Dr R Wallace, Ms P Rust (Edinburgh)

Introduction: Dart thrower's motion (DTM) is the functional movement of the wrist from radial extension to ulnar flexion. Several different operations are commonly performed to treat patterns of arthritis seen at the wrist. Although studies have evaluated wrist flexion/extension, none have assessed DTM.

Aim: To evaluate DTM following three different surgeries: radioscapholunate fusion with distal pole scaphoid excision (RSL), four corner fusion with scaphoid excision (4CF) and proximal row carpectomy (PRC).

Methods: Six fresh-frozen cadaver forearms were dissected to expose extensor carpi radialis tendons and flexor carpi ulnaris and mounted on a custom jig for measurement of DTM. Sequential loading of these tendons resulted in radial extension and ulnar flexion. DTM was measured at end range for each specimen firstly before surgery then after RSL, 4CF, and PRC.

Results: DTM was compared to pre-surgery for each operation. After RSL, 74% ROM was maintained at both RE ($p < .01$) and UF ($p < .001$). After 4CF, ROM decreased to 53% RE ($p < .001$) and 84% UF ($p < .031$). PRC did not significantly alter RE, but decreased ROM in UF to 87% ($p < .05$).

Conclusion: Range of DTM decreased following each individual surgery. However 74% was maintained following RSL, which is sufficient for daily activities.[1] PRC maintains greater motion than 4CF ($p < .001$), this can be considered when planning surgery for stage II scapholunate or scaphoid nonunion advanced collapse.

10:36 Discussion

10:38 **The role of selective peripheral neurectomy in the treatment of upper limb spasticity: A systematic review**
Miss L Y Yong, Dr C H L Wong, Mr M Gaston, Mr W L Lam (Edinburgh)

Management of upper limb spasticity remains challenging. Selective peripheral neurectomy (SPN) is a relatively recent intervention for cases refractory to medical therapy. The aim of this study was to conduct a systematic review looking at the efficacy and outcomes of SPN, in order to clarify the patient selection criteria and surgical technique.

A search of MEDLINE, EMBASE, Cochrane Central Register of Controlled Trials, Web of Science Core Collection, Open Grey and CINAHL was conducted. Inclusion criteria included studies comparing pre- and post-operative outcomes for SPN, neurectomy, fasciculotomy and upper limb spasticity.

Only case series were reported with no randomised controlled trials found. Seven studies met the inclusion criteria with a total of 174 patients. A meta-analysis was not possible due to the degree of baseline heterogeneity. All studies had no control arm for comparison of outcomes, with a high risk of bias due to poor internal and external validity, as well as design and performance bias.

Surgical techniques differ vastly between studies, with percentage of fascicles ablated between 30-80% and length of neurectomy between 5-10mm. Some advocated removing end branches while others performed fascicular SPN proximally. Thirteen patients underwent orthopaedic or neurosurgical procedures, which are both confounding factors. All studies reported an improvement in spasticity although functional outcomes were reported with non-standardised measures. Recurrence rates were reported to be 0-16.1%(mean 3.72%).

1 Brigstocke JHS 2014;39:373-8.

From this systematic review, SPN appeared to be a useful technique in selected cases, but overall no firm conclusions can be drawn regarding the best surgical technique, or the extent of functional improvement.

10:43 Discussion

10:45 Refreshments and trade exhibitions

11.15 Stack Fellowship report
Mr Z Naqui (Manchester)

Douglas Lamb Lecture
Chair: Professor V C Lees

11:30 Understanding the distal radioulnar joint
Dr L R Scheker (Louisville)

BSSH/Healing Foundation
Chair: Professor T R C Davis

12:20 Chief Executive, The Healing Foundation
Mr B Eley (London)

12:35 BSSH / HF Academic Post in Hand Surgery
Miss A Karantana (Nottingham)

12.45 Lunch and trade exhibitions

Free Papers
Chairs: Mr G E B Giddins / Mr I Grant

13:45 Flexor mechanism in radial polydactyly
Miss L Ng, Miss S Stevenson, Miss B Crowley (Newcastle upon Tyne)

Background: Radial polydactyly (RP) comprises a diverse group of anomalies. The complexity of anatomy may be underestimated resulting in poor primary surgical results and late deformities. There is a paucity of literature regarding flexor mechanisms in RP. This study focuses on flexor anatomy and procedures to address anomalies of flexor tendons and pulleys.

Method: This is a prospective study of flexor tendon (FPL) and pulley anatomy, anomalies and associated surgical procedures recorded in operation records of patients undergoing primary correction of RP.

Results: Of fifty-four thumbs undergoing primary surgery, FPL inserted into both duplicates in 40 out of 54 (74%), ulnar duplicate only ten out of 54 (19%) and radial duplicate only three out of 54 (5%). FPL was absent in one out of 54 (2%). FPL hypoplasia, poor excursion and deficient pulley systems were observed. Procedures undertaken included FPL transfer to dominant duplicate, centralisation of FPL and release of abnormal insertions/connections (27 procedures). Twenty-nine out of 54 (53%) thumbs required pulley reconstruction, the majority in Wassel groups III and IV.

Discussion: Flexor anatomy in RP is complex. We advocate systematic exploration of the flexor mechanism at primary surgery and an anatomical approach to reconstruction. This optimises results from primary surgery, provides valuable prognostic information and guides management of late deformity.

13:50 Discussion

13:52 **The expression of nAG and Prod-1 in terminal phalanx amputation stumps of adult mice: An experimental model of digital regeneration**
Professor M M Al Qattan (Riyadh)

Introduction: nAG and Prod-1 are two proteins responsible for the regeneration of completely amputated limbs in salamanders (which are lower vertebrates).

Aim: To introduce an experimental distal phalanx amputation model in mice (which are higher vertebrates) in which nAG and Prod-1 are expressed in the amputation stumps.

Materials and **Methods:** Twelve mice with amputation of the distal two thirds of the distal phalanx were utilised. One hind limb was used and the central three digits were amputated. Injection of nAG and Prod-1 plasmids was done in the foot pad twice weekly in experimental mice (n= 6) and injection of solution only (without the plasmids) was done twice weekly in control mice (n= 6).

Results: nAG and Prod-1 were expressed in experimental stumps only. This expression results in quicker and more mature bone regeneration in experimental animals and this was shown using histology as well as immune stains to osteocalcin (a bone maker). Finally, quantitative mRNA showed 21-fold increase of osteocalcin in experimental stumps and this was statistically significant.

Conclusion: Injection of nAG and Prod-1 in the foot pad will result in their expression in the distal amputation stumps and this will enhance bone regeneration in the model described.

13:57 Discussion

13:59 **Comparison of the IFSSH and Oberg, Manske and Tonkin (OMT) classification systems for congenital hand differences: A feasibility study in a children's hospital**
Ms M Anderson, Miss A Choa, Dr M Davey, Mr W L Lam (Edinburgh)

Despite ongoing dissatisfaction, the IFSSH classification of congenital hand differences (CHD) remains popular due to its simplicity. The Oberg, Manske and Tonkin (OMT) classification groups CHDs according to embryological bases (malformation/ deformation/ dysplasia/syndromes) was recently introduced as a potential replacement. We share our experience with the OMT system within our department.

A retrospective analysis of outpatients (last eighteen months) was performed (n=150, 35 different CHDs) and classified according to three systems: 1. IFSSH, 2. OMT-abbreviated (headings only) and 3. OMT-expanded. A congenital hand surgeon, a developmental biologist (DB) and trainees at different grades participated. Certainty levels and timing of each grouping exercise were recorded.

There was widespread disagreement within the IFSSH system (mean 62%). Certainty levels were high for consultant and DB (mean 90%) but low for trainees (mean 56%). With OMT-abbreviated, certainty levels for trainees were even lower (33%), indicating poor knowledge of embryology. With OMT-expanded, participants simply matched the CHDs on the prescribed form, with high certainty scores (85.6%) but discrepancies continue, indicating disagreements with the proposed OMT embryological bases of CHDs. Significant time differences were observed: (IFSHH 8.13min; OMT-abbreviated 7.20min; OMT 17.10min).

The IFSSH system initially appeared intuitive especially for clinicians but lacks coherence. The OMT system appeared logical for DBs but trainees found the level of embryological knowledge prohibitive. Widespread adoption of the OMT system requires clinician willingness to increase embryological knowledge but can foster closer collaborations with DBs.

14:04 Discussion

14:06 **A systematic review of central slip examination techniques and their diagnostic accuracy**

Dr M Field, Miss R Zarb Adami, Dr L Dingle, Mr D Nikkhah, Mr Z Shariff, Mr J Rodrigues (Aylesbury)

Introduction: Extensor zone three injuries involve the extensor mechanism's central slip. They may be missed, with delayed morbidity if a boutonniere deformity develops. Poor central slip examination knowledge and skills may compound this. A range of central slip examination techniques exists. This study catalogued different techniques, and appraised evidence comparing them.

Methods: OvidMedline (including in process), Embase and AMED were searched using a multipurpose search strategy that combined index and free text searching to identify articles in both indexed and non-indexed literature. Studies providing an original description of an examination technique or comparing more than one technique were included, using standardised exclusion criteria.

Results: One hundred and fifty-two abstracts were screened. A range of examination techniques was identified. These varied from Bouvier's test of 1851 through to the relatively well-known Elson's test of 1986. However, more modern alternatives also exist, including Schreuders' 2006 modification of Elson's test for use in open injuries. Some tests may be more practical when assessing acute injuries than others. There was limited comparative data, though what was identified demonstrated that not all tests have the same diagnostic accuracy.

Conclusions: Hand surgeons and primary emergency care providers should be aware of the range of central slip examination techniques, and in the absence of more comparative data, might consider using multiple techniques to exclude central slip injury.

14:11 Discussion

14:13 **Squamous cell carcinoma of the nailbed: Evaluation of management and outcomes in a series of twenty-eight cases**

Ms T Laing, Ms A Breahna, Mr N El Muttardi, Dr D Kamel, Mr M Sood (Chelmsford)

Introduction: Squamous cell carcinoma involving the nail complex is a rare condition with a widely variable presentation. Surgical treatment aims to achieve clear resection margins of all involved tissues. There is little guidance in the literature regarding optimal margins and treatment is therefore variable. We present a review of the experience in our institution of managing these rare cases.

Methods: A retrospective review of case notes, operative notes, and histological specimens of all nailbed SCC's presenting to our hospital was undertaken. Data gathered included patient demographics, presentation, treatment including operative data, histological data, length of post-operative follow-up, recurrence rates and functional outcomes.

Results: There were twenty-eight cases of nailbed SCC's treated at our hospital over a 12-year period from January 2003 to May 2015. There were nineteen males and nine females. The presentation was highly variable but many had a long history. The tumour infiltrated bone in five cases. The majority (18) were managed with amputation at or more proximal to DIP joint level. Patients were followed for an average of twenty-seven months. There was one local recurrence at six years post curettage and cautery. Many patients who underwent amputations had residual functional problems whereas the best functional outcomes were achieved with wide local resection and reconstruction with a dorsal adipofascial (Tremolada) flap (four cases).

Conclusion: This large series of nailbed SCC's demonstrates low recurrence rates when excision is complete regardless of the surgical procedure. Wide local resection may provide optimal functional and cosmetic outcome without compromising oncological clearance.

14:18 Discussion

14:20 **A review of paediatric camptodactyly in a supra-regional paediatric hand unit - Management and outcomes**
Miss C Lipede, Mr M Chan, Mr R Pearson, Mrs J Barker, Mr S Rannan-Eliya, Miss B Crowley (Newcastle upon Tyne)

Introduction and Aims: Camptodactyly is poorly understood with controversy over management, including debate over efficacy and relevance of surgery. Most use passive stretching and external splinting.

Materials and Methods: We reviewed the records of forty-six children treated in our paediatric hand unit between 2007 and 2015 for clinical findings, management, and outcome.

Results: Nineteen males and 27 females, ranged from 0-15 years old at referral. Camptodactyly was first noticed in twenty-six children before the age of two years old, two children between two and four years old, five between five and ten and 13 children were over ten years old. Unilateral little fingers in isolation occurred in 41% and bilaterally in 30%. Two patients each had either bilateral ulnar two digits or bilateral ulnar three affected, whilst two had index fingers involved. Initial management was always conservative using passive stretching, supported by therapist splinting. Reported non-compliance was 50%. Nonetheless 59% achieved measurable improvement with 28% preventing progression. 41% were satisfied to allow discharge. Four underwent surgery with a good outcome in 80% of digits.

Conclusion: Despite good surgical outcomes, our results support conservative management of most camptodactylies, achieving good response and patient satisfaction. Compliance is problematic and splinting expensive and time consuming. To improve cost effectiveness, we are trialling pictorial material, teaching stretches, and strategies for improving therapy compliance. Using a proforma for consistent clinical recording, should show that such measures can further improve outcomes.

14:25 Discussion

14:27 **Insights into the embryological bases of pre-axial and forearm duplication conditions based on experimental manipulations of sonic hedgehog signalling**
Mr W L Lam, Dr E Johnson, Dr M Davey (Edinburgh)

In limb development, the sonic hedgehog (SHH) pathway regulates anterior-posterior digit patterning within the zone of polarising activity in the posterior limb bud. SHH abnormalities are thought to result in various preaxial polydactylous (PPD) conditions but the exact mechanism remains unclear. This study aims to further define the boundaries of SHH-influence in limb embryogenesis, and suggests a possible embryological classification of PPD morphologies according to intensity/timing of SHH-signalling.

Using the chicken model, smoothened agonist (SAG), a SHH-activator was applied imprecisely to twenty-nine whole embryos during early limb development (15-17HH). Additionally, to induce precise and stronger ectopic SHH expression, retinoic acid (RA) beads, another potent SHH-activator, were applied to the anterior borders of twenty-six developing limb buds at latter stages (18-22HH). Ulna/radius and digit morphologies were identified and correlated to human malformations.

Inexact SAG application caused malformations in 97% of limbs. The majority (71%) presented as PPD with 29% developing forearm anomalies, including ulnarisation of the radius. Precise ectopic SHH-manipulations with RA caused limb malformations in 92%, with again high occurrences of PPD (73%). However, there were much higher incidences of forearm involvement (76%), with 21% exhibited both PPD and radial dysplasia, 21% with ulnarisation of the radius, and 15% displayed true ulnar dimelia with mirror hand deformities.

This study demonstrated that PPD, ulna dimelia with mirror hands and also radial dysplasia potentially belong to one distinct embryological group. A possible embryological classification based on the intensity/timing of SHH-signalling is presented.

14:32 Discussion

Symposium - Managing complex disorders of the forearm
Chair – Mr D P Newington

14.35 Restoring forearm rotation
Mr J P Compson (London)

14:50 Forearm deformity correction
Mr M Nixon (Chester)

15:05 The use of 3D technology for correction of deformities of the distal forearm bones
Dr F Verstreken (Antwerp)

15:20 Case discussions
Mr J P Compson (London), Mr M Nixon (Chester), Dr F Verstreken (Antwerp), Dr L R Scheker (Louisville)

15:35 Refreshments and trade exhibitions

Plenary Session - Deformities of the Fingers in Inflammatory Arthritis
Chair: Mr S L Knight

16:00 Surgical management of the Boutonniere deformity
Miss J Arrowsmith (Derby)

16:20 Surgical management of the Swan Neck deformity
Mr R Amirfeyz (Bristol)

16:40 Indications for PIPJ replacement in inflammatory arthritis
Professor I A Trail (Wrightington)

THURSDAY 15 OCTOBER

17:00–

Keynote Lecture

Chair: Mr J L Hobby

17:00 **Examination of mechanical disorders of the forearm**
Dr L R Scheker (Louisville)

17:30 **Annual General Meeting**
(open to Members and Associates of the Society only)

19:15 **(for 20:00) Society Dinner**
Shakespeare's Globe

BSSH

The British Society for Surgery of the Hand

08:15 Registration

Keynote Lecture
Chair: Miss G D Smith

08:45 Anatomy / physiology of nerve injury
Professor A M Hart (Glasgow)

Keynote Lecture
Chair: Mr D J Brown

09:30 Specialised service development as a new consultant
Miss C Hernon (Leeds)

Updates / Presentations

10:00 The updated BSSH website
Mr C A Pailthorpe (Reading)

10:15 Hand Diploma presentations
Miss M E Birks (Sheffield)

Keynote Lecture
Chair: Professor V C Lees

10.25 Strategies for nerve repair
Professor S E Mackinnon (St Louis)

11:00 Refreshments and trade exhibitions

Free Paper Session
Chairs: Mr C A Pailthorpe / Mr S P Hodgson

11:30 Denervation of the scaphotrapeziotrapezoid joint
Mr J Arenas-Prat, Mr G Prasad (Derby)

Introduction and Aims: Scaphotrapeziotrapezoid (STT) joint arthritis is the second most common form of wrist osteoarthritis and a frequent condition hand surgeons have to deal with. The surgical options, as with other forms of arthritis, traditionally include arthrodesis, resection of the distal pole of scaphoid or proximal trapezoid with trapeziectomy. These procedures interfere greatly with wrist biomechanics leading in certain cases, mainly in physically active patients, to severe complications such as DISI deformity with dorsal subluxation of capitate. In the present article, we present a surgical technique of STT denervation as a treatment option.

Materials and Methods: Nine patients underwent STT denervation during a twenty-three-month period. Age range was between forty-one and 82 years and a mean follow-up of 12 months. Three of them had concurrent first CMC joint osteoarthritis and therefore this joint was also denervated. Eight patients (88.9%) were very pleased with their surgery and would recommend it. Only one patient had minimal improvement of symptoms but did not want any further surgery. We had no complications.

Conclusion: Considering our satisfactory patient feedback following the STT denervation procedure, we would recommend this as perhaps the first line of surgical treatment in patients with STT osteoarthritis where conservative measures have failed. A potential complication of joint denervation is the development of a Charcot's joint but there is not enough evidence in the medical literature to support it. Denervation does not alter joint biomechanics or proprioception and allows patients to resume their activities much sooner than other procedures. Moreover, it

does not preclude further surgery if the outcome is not satisfactory. Prospective studies should be considered to confirm these preliminary results.

11:35 Discussion

11:37 **URAMS as a PROM for Dupuytren's contracture patients**
Professor J J Dias, Dr L Sayeed, Mr A Ullah (Leicester)

We investigated whether the URAM scale was useful as a PROM for routine monitoring of patients with Dupuytren's contracture.

We asked 1,074 consecutive patients with Dupuytren's contracture seen in our hand unit to complete a patient evaluation measure, an URAMS and to provide feedback on the ability of URAMS to represent the disability they perceived of their hand. All patients had completed a PEM when first seen in clinic. There were eight hundred and four male and 270 female (25%) patients with a mean age of 64 years. Four hundred and fifty-seven had no surgery while 617 had surgery to correct contracture. Of these four hundred and ninety responded. Four hundred and two of 490 responses form the basis of this abstract. The mean interval between the initial clinic visit and final response was 33.5 months.

The mean PEM at follow-up was 24 (SD 23) and the mean URAMS was 10 (SD 11). URAMS had a high correlation (0.78) with PEM and reflected the degree of contracture of the worst affected finger (Pearsons Correlation 0.44). We asked patients if the URAMS captured what was important to them. 25.7% found that the URAMS did not properly represent the condition of the hand.

Using the anchor method the MCID for change for URAMS in our population was 2.8 between patients who had slight improvement and 3.6 between those who had slight worsening and no change at three years.

URAMS reflects contracture and disability but may not completely capture the state of the hand after intervention for Dupuytren's contracture and so if used should be combined with generic Hand outcome measures such as the PEM, or MHQ or the general upper limb measure DASH.

11:42 Discussion

11:44 **Coracoid osteology, morphology and vascularity with respect to its utility as a free vascularised bone graft for scaphoid and other small bone reconstruction**
Mr H P Giele, Miss R Khundkar, Mr D Armstrong, Mr P Jones, Mr N Riley, Mr C Little, Mr I McNab (Oxford)

The coracoid has been used as a pedicled bone graft in the Laterjet-Bristow procedure for shoulder stabilisation. The coracoid can be removed for coracoid impingement and in anterior shoulder releases without ill effect. We investigated the potential for free vascularised transfer of the coracoid as a vascularised bone graft/flap. We also investigated the osteology, musculo-tendinous attachements and morphology of the coracoid to compare it to the scaphoid proximal pole.

Cadaver studies of fourteen shoulders, in vivo dissection of 12 shoulders, radiological studies and comparative CT scans were utilised to demonstrate the anatomy of the coracoid for this purpose.

The coroacoid has similar size and morphology to the scaphoid proximal pole. The attachment of the conjoint tendon can replicate the scapholumate ligament. The coracoid is supplied by a previously undescribed reliable pedicle directly arising from the second part of the axillary artery.

The free vascularised coracoid could be a reliable bone flap. The shape of the coracoid and its size and attachments lends it to reconstruction of the carpus.

11:49 Discussion

11:51 **Reconstruction of scaphoid non-union with proximal pole necrosis using free vascularised coracoid**
Mr H P Giele (Oxford)

Introduction and Aims: Scaphoid non-unions with proximal pole necrosis have no reconstructive treatment options. Currently the recommended treatments are salvage scaphoidectomy and four corner fusion or proximal row carpectomy. Experimental options have included excision of the necrotic fragment and replacement with silicon or pyrocarbon spacers, or with a partially articular medial femoral condyle/trochlear vascularised bone graft/flap.

We investigated a novel treatment by excision and reconstruction of the scaphoid proximal pole with a vascularised coracoid graft/flap reconstructing the scapholumate ligament with the conjoint tendon. The osteology of the coracoid compared to the scaphoid and the vascular anatomy of the coracoid for free vascularised transfer is described for the first time, as is its clinical use.

Materials and Methods: Six patients with long-standing proximal pole necrosis having failed previous attempts at vascularised pedicled bone graft reconstruction were reconstructed with free vascularised coracoid. The coracoid is harvested, rotated axially 90° and sagitally 180° such that the chondral apophoseal fibrocartilaginous entheses of the tip of the coracoid forms the new articular surface, the cut surface is trimmed to and osteosynthesised by compression screw to the distal pole of the scaphoid, and the scapholunate ligament reconstructed. The coracoid is revascularised by anastamosis to the carpal arch vessels.

Results: All six united (X-ray and CT) by three months, had improved DASH scores, reduced pain, no donor site morbidity, and SL stability. All returned to work.

Conclusions: Free vascularised coracoid reconstruction of scaphoid proximal pole necrosis deserves further study.

11:56 Discussion

11:58 **National trends in hand injury litigious claims against Emergency Departments in England**
Dr A Trevatt, Dr O Smith, Ms J Needleman, Mr A Banerjee (London)

Introduction and Aims: Litigious claims related to hand surgery are costly to the NHS. Early diagnosis and management of hand injuries in the Emergency Department (ED) are key to providing optimum care for hand injury patients. The aim of this study was to improve patient safety by providing insight into the most common hand injury errors occurring in the ED.

Materials and Methods: A Freedom of Information request was made to the NHS Litigation Authority (NHS LA) for data on all claims in England related to hand injuries made against EDs from 2004 – 2014. Total number of yearly claims and total cost of settlements in each category were recorded.

Key Results: Three hundred and fifteen claims related to hand injury errors were made. Two hundred and eighteen of these were successful, resulting in a total cost of £6,273,688.22. Failure or delay in diagnosis was the most common successful claim (97), costing a combined total of £2,602,099.93. Failure to perform X-rays or interpret them correctly resulted in twenty-eight claims and a combined total cost of £295,625.54.

Conclusion: Hand injury diagnostic error has been the most common cause of successful litigious claims against EDs over the past ten years. Many junior doctors working in the ED are inexperienced in dealing with hand injuries and require further training in this area. Junior doctor education must emphasise the importance of clinical diagnosis of hand injuries.

12:03 Discussion

12:05 **Nerve relocation of scar-tethered smaller nerves of the upper limb with neurogenic pain**
Ms T Laing, Mr A Sierakowski, Mr D Elliot (Chelmsford)

Background: The surgical relocation of nerves of the upper limb has been proven as a reliable treatment option for painful end neuromas unresponsive to non-operative measures. To date there are no studies specifically investigating the outcomes of relocation of painful, scar-tethered nerves that are in-continuity. The current study reports outcomes of twenty-three cases of nerve relocation for this indication performed by a single surgeon.

Methods: Clinical and operative notes of all nerve relocation procedures performed between 2006 and 2014 were reviewed. A subset of patients whose nerves were clinically or operatively determined without doubt to be in-continuity was identified. Pre-operative, three and six-month post-operative pain assessment data was gathered to determine the effect of treatment.

Results: A total of one hundred and thirty-five patients underwent upper limb nerve relocation procedures over the specified time period. Of these, twenty-nine cases were determined, either clinically or at surgery, to be in-continuity nerves tethered in scar tissue and grossly intact. The most frequent aetiology was post-surgical scar tethering. The nerves involved were the smaller cutaneous nerves of the forearm and hand (superficial radial nerve, palmar cutaneous branch of the median nerve, lateral cutaneous nerve of the forearm, medial cutaneous nerve of the forearm, dorsal branch of ulnar nerve, digital nerves). Data, including pre-and post-operative pain assessments was available for twenty-three patients. Nerve relocation provided complete resolution of all associated pain in twenty-one out of 23 patients (91%) with a reduction in pain severity in a further patient. Two patients (9%) developed mild pain at the site of nerve relocation.

Conclusion: A proportion of patients complaining of neurogenic limb pain will have a scar-tethered nerve, not an end-neuroma. The relative incidence of the two conditions remains uncertain. Relocation of painful scar-tethered cutaneous nerves of the upper limb provides reliable pain relief in most cases with minimal morbidity.

12:10 **Discussion**

12:12 **Double level injuries of the suprascapular nerve identified during spinal accessory nerve to suprascapular nerve transfer using a posterior approach**
Mr T Chaudhry, Mr S Dustagheer, Miss M Mykytow, Mr D Power, Mr S Tan (Birmingham)

Introduction: The suprascapular nerve (SSN) is a priority target in reconstruction of upper brachial plexus injuries. Spinal accessory nerve (SAN) transfer onto the SSN is the preferred nerve transfer option and has traditionally been performed through an anterior approach in which the distal SSN is not routinely exposed. However, concern persists that, in cases where there has been injury around the shoulder, a second level injury to the distal SSN may be present and would explain why some nerve transfers fail. We have recently changed to using a posterior approach in which the distal SSN is explored and aim to report our experience and post-operative results.

Methods: Since April 2013 six transfers have been performed via a posterior approach. A review of injuries and operative findings is presented with post-operative outcomes.

Results: We found ruptures of the distal SSN at the suprascapular notch in three out of six cases. In all cases transfer was possible without need for nerve graft. One patient developed scapular winging. No other complications occurred. Five patients with adequate follow-up have evidence of restored SSN function with improved abduction and external rotation.

Conclusions: We found a significant incidence of SSN rupture at the suprascapular notch in patients undergoing SAN to SSN nerve transfer surgery. These injuries would not have been detected with the anterior approach and would have meant certain failure of the transfers in these cases.

12:17 **Discussion**

12:19 **Development of upper limb and hand surgery training in challenging and austere environments**
Ms S Robbins, Mr S Skaik (Gaza City)

Aim: To add to the discussion on speciality surgical training with particular reference to upper limb and hand surgery in poor resourced areas.

Introduction: Upper limb and hand surgery is usually quality-of-life saving not life or limb saving surgery. Major upper limb injuries have profound effects on the life of the individual, functionally as well as on their socio-economic life and that of their family and society. It is also well known that seemingly insignificant injuries of the hand can also disable a hand or limb. Early appropriate management of an upper limb and hand injury is of utmost importance. State of the art surgery and specialisation is a challenge in any country and the balance between service provision and training, in today's economies, is part of that challenge for all concerned.

Materials: Development of upper limb surgery as a speciality will be reviewed from published literature with particular attention to the development of hand surgery training programmes. The establishment of an upper limb and hand surgery training programme including microsurgery in a poor-resourced area will be presented with particular reference to the Gaza Strip where a French-based programme has been in place for over five years now. An up-to-date assessment of the programme will be given highlighting issues of triaging, patient care and balancing training necessities. The need also for development of other essential services such as dedicated hand physiotherapy will be reviewed.

Conclusion: Training can be achieved with determination (all) and vision (someone's) but there is still much that needs to be done with co-operation between the resourced and the poorly resourced (hand and social) for the benefit of the individual patient and trainees.

12:24 **Discussion**

12:30 **Presidential handover**

12:40 **Lunch and trade exhibitions**

13:35 **SWIFT Update**
Professor J J Dias (Leicester)

Keynote Lecture
Chair: Mr R H Milner

13:45 **Paradigm shifts in nerve surgery**
Professor S E Mackinnon (St Louis)

Free Papers - Rapid Fire Session
Chairs: Mr P G Chapman / Professor A Jain

14:30 **Interim analysis of a double-blind randomised controlled trial to determine the efficacy of NSAID injection compared to steroid injection in patients with trigger finger**
Dr S L Ng, Miss G Leow, Miss K L Chan, Dr R Hay, Dr S Acharyya, Professor D A McGrouther, Professor S C Tay (Singapore)

Background: Trigger finger is a common inflammatory condition. Current treatment methods include splinting, corticosteroid injections, percutaneous release and open surgery. A novel method of treatment of trigger finger is non-steroidal anti-inflammatory (NSAID) injection.

Aim: We aim to evaluate the outcome of NSAID and corticosteroid injection in the treatment of trigger finger.

Methods: Patients with trigger finger with no previous injections were prospectively recruited into our study. They were randomised to receive either NSAID (Ketorolac) or corticosteroid injection (Triamcinolone). Severity of trigger finger was assessed using the Quinnell grading system and pain was measured using the Visual Analogue Scale. Patients were followed up at three, six, 12 and 24 weeks.

Results: We recruited a total of fifty patients (24 in the NSAID group, 26 in the corticosteroid group) with ages from 44 to 77 years. Patients in the corticosteroid group had a more rapid improvement of pain score and Quinnell grading at three, six and 12 weeks. However, at twenty-four weeks there was no significant difference in pain score ($p=0.853$) and Quinnell grading ($p=0.112$) between both treatment groups. At twenty-four weeks, four patients (17%) in the NSAID group achieved complete resolution of trigger compared to eight patients (31%) in the corticosteroid group. Recurrence of trigger was higher in the corticosteroid group: ten patients (38%) compared to one patient (4%) in the NSAID group. There were no complications in either group.

Conclusion: Corticosteroid injections provide a more rapid resolution of trigger finger in terms of pain and Quinnell grading. However, NSAID injections have a lower recurrence rate at twenty-four weeks suggesting a more sustained relief of triggering.

14:33 Discussion

14:35 **A study to investigate the intrarater and interrater reliability of goniometric measurements of dart throwers' motion in asymptomatic wrists**
Mrs N Cliff, Mrs P Rust (Edinburgh)

Introduction: This study investigated the intrarater and interrater reliability of measuring dart throwers motion (DTM) of normal wrists with a hand held manual goniometer typically used in the rehabilitation setting.

Method: Raters consisted of three pairs of hand therapists. Working in pairs, each took three repeated measures of radial extension (RE) and ulnar flexion (UF) of both wrists using a goniometer positioned on the radiodorsal aspect of both the radius proximally and the second metacarpal distally. Raters and subjects were blinded. Measurements were read by an independent observer, also a therapist. Subjects were of varied age, gender with no wrist pathology. Subjects rated how difficult they found DTM to perform using a five-point Likert scale.

Results: Data was collected for seventy-four wrists. The intraclass correlation coefficient (ICC) for intrarater measurements of RE was 0.89 (SD 4.22˚) and UF was 0.92 (SD 3.61˚). The ICC for interrater measurements of RE was 0.83 and for UF was 0.81. There was no significant association ($p<0.05$) between reliability and hand dominance, gender, age or profession; however, SD was greater when the subject found DTM difficult to perform.

Discussion: Our study confirms good reliability when using this method to measure DTM with a goniometer by hand therapists. Reliability was slightly greater with intrarater measurements than interrater readings mirroring results of many studies investigating goniometry. Both intra and interrater effects were present when measuring DTM but these effects were small in comparison to the variation between subjects. It is suggested that DTM can be measured to compare different subjects and monitor changes, however, studies need to be undertaken with the symptomatic population.

14:38 Discussion

14:40 **Design of a patient information leaflet in a surgical centre in Cambodia**
Dr A Schade, Mr T Mendes Da Costa, Mr F Monsell (Stoke/Bristol)

Hand deformities cause a large surgical burden on Cambodian society. They significantly affect quality of life, limit hand function and can cause severe mental health issues. The visited surgical centre provides free rehabilitative surgery in Phnom Penh for those unable to afford private or public healthcare. As part of the post-operative care, a team of local Khmer physiotherapists help patients with early mobilisation, passive and active movements and functional exercises. Leaflets are widespread in high-income countries, but are scarce in low-income countries. The main challenges identified during the creation of a leaflet were the low levels of education, low literacy and poor understanding of disease process. A simple visual leaflet was created and welcomed by the staff and the patients. This will help reduce the anxiety and stress associated with hand disfigurement in this region.

14:43 Discussion

14:45 **A validation of the URAM scale in a UK population**
Mr L Dimou, Mr C Bainbridge (Derby)

Introduction: We conducted an internet survey on one hundred and sixty-seven people with Dupuytren's disease to assess their feelings about the URAM questionnaire and also an open ended survey of patient reported effects of Dupuytren's.

Materials and Methods: An internet survey was conducted between November 2012 and February 2013 with the participation of one hundred and sixty-seven people. One hundred and seventeen were male (70.06%) and 50 were female (29.94%). The affected hand was right twenty-nine (17.37%), left 18 (10.78%), both 120 (71.86%). 43.11% had involvement of feet, penis or knuckle pads. Participants answered the URAM questions and were asked to assess the relevance of the questions to their situation. They were then asked to list the three most important problems they have due to Dupuytren's and the degree of severity. Finally, they were asked to list all the ways in which Dupuytren's affects them using free text. The responses were categorised for analysis by the authors.

Results: The mean URAM score on the affected side was 11.39. Significantly lower scores were found in questions 3 and 9. Participants varied in their assessment of the URAM questions with approval ratings of 43 to 68%. Question 8 (can you lean on your hand) had the highest approval and question 1 (can you wash yourself with a flannel keeping your hand flat) the lowest.

Among the free text responses "holding things" came highest (18.05%) followed by pain (15.79%). For second ranked responses pain was scored highest with 16.8%. Overall 59% reported "holding things" as one of their top problems with (58%) reporting pain and 35% their "fingers catching".

Questions 5, 6, 7, 8 of the URAM score were hardly mentioned at all in patient free text responses (0.6%, 0.45%, 0.22% and 0.45% respectively). Cosmesis scored higher than we expected with women mentioning it more than men (22% as opposed to 10.5% and 16% to 15% on the separate sections).

Conclusion: Generally the majority of patients report that the individual questions of the URAM usefully assess the impact of Dupuytren's in their life. However, when patients were asked to list their problems themselves, results were quite different. Some of the URAM items were highly reported, but some of them were reported by a very small number of participants and many of the free text items were not included in the URAM scale, especially pain, concern for future worsening of the problem, cosmesis and catching of the finger on items (including pockets).

All other hand and upper limb PROMS include pain due to its importance. With over 50% of our respondents reporting pain we believe it should not have been excluded from the URAM scale. The cosmetic psychosocial impact of the deformity is also important.

We explored question one of the URAM in the original French and realised that the French word "gant de toilette" refers to a specific type of washing glove rather than a flannel. This perhaps explains the low relevance of this question in the English version.

In conclusion we believe that the URAM whilst useful has not been shown to adequately capture the range of disability caused by Dupuytren's and needs major revision before it is fit to be used as an assessment tool in clinical practise.

14:48 Discussion

14:50 **Evaluating the articulating surface roughness of new pyrocarbon proximal interphalangeal prostheses**
Dr A Naylor, Professor I A Trail, Mr S C Talwalkar, Professor T J Joyce (Newcastle upon Tyne)

Introduction: Clinical results for the pyrocarbon proximal interphalangeal prosthesis are mixed. In this study, the articulating surfaces of eight unused pyrocarbon prostheses were assessed as this could be linked with wear and friction (squeaking).

Methods: A coordinate-measuring machine was used to measure the radii of all components. Topographical surface measurements were taken using a white light interferometer. Ten measurements for each component were taken, providing eighty in total. Average (Sa) and R.M.S (Sq) roughnesses were obtained to a sensitivity of 1 nm. Skewness (Ssk) and Kurtosis (Sku), dimensionless quantifiers for surface amplitude and pitch respectively, were also determined.

Results: Radii were 2.5; 3.3; 4.2; and 4.7 mm for proximal, and 4.0; 5.1; 5.6 and 6.3 mm for medial components. The average, non-stratified values for the measured parameters were: Sa 20 nm (95% CI 17 nm to 23 nm), Sq 35 nm (95% CI 30 nm to 41 nm), Ssk -0.53 (95% CI -0.8 to -0.26), Sku 8 (95% CI 6 to 11). Analysis of variance (ANOVA) was used to assess the relationship between the component radii and each roughness parameter. Sa, Sq and Ssk correlated negatively with radius (p=0.001; 0.001; 0.03), whilst Sku correlated positively with radius (p=0.03). Observed trends for the smaller components are indicative of the presence of sharp asperities.

Conclusion: Of the prosthesis components evaluated, those with the smallest radii exhibited the highest roughness. Smaller components may be more difficult to polish.

14:53 Discussion

14:55 **Defining the role of intramedullary nailing for distal radius fractures: A systematic review**
Mr R Jordan, Mr A Saithna (Coventry)

Introduction: Distal radius fractures are common injuries but a consensus regarding optimal management is lacking. Intramedullary nails are an alternative to volar plating offering the potential advantages of reduced risk of tendon injury and intra-articular screw penetration. This article systematically reviews the published literature evaluating the biomechanics, functional outcome and complications following intramedullary nailing of distal radius fractures.

Methods: Medline and EMBASE databases were searched. All studies reporting outcomes of intramedullary nailing for distal radius fractures were included. Data regarding functional outcome, range of motion, strength and complications were extracted. Critical appraisal was performed with respect to validated quality assessment scales.

Results: Sixteen studies were identified. The biomechanical studies concluded that intramedullary nails had at least comparable strength to locking plates. The clinical studies reported that IM nailing was associated with comparable ROM, functional outcome and grip strength to alternative fixation techniques. However, the mean complication rate with the technique was 17.6% (range 0 to 50%), higher than contemporary studies for volar plating.

Conclusion: Despite IM nailing giving comparable clinical results to current treatment modalities, the high complication rate raises concerns about the role of this technique.

14:58 Discussion

15:00 **Management of displaced fractures of the distal radius: To plate or not to plate - A systematic review of the literature**
Mr O Akilapa, Mr A Tavakkolizadeh, Mr J Sinha (London)

Introduction: Fractures of the distal radius are extremely common. Although the vast majority of these injuries can be treated conservatively, surgery is indicated when the anatomical integrity, i.e. radial height, radial inclination and volar tilt has been significantly compromised. The two most common forms of surgical fixation are Kirschner wire fixation and locking plate fixation. To date, studies comparing the two methods have failed to unequivocally demonstrate which method translates to better functional outcomes. The aim of the review was to identify, appraise and synthesise the evidence that compares the clinical effectiveness of Kirschner wire fixation with locking plate fixation for patients with a dorsally displaced fracture of the distal radius.

Methods: The MEDLINE, EMBASE and the Cochrane databases were searched up to March 2015. All randomised or quasi-randomised trials that compared the clinical effectiveness of Kirschner wire fixation with locking plate fixation for patients with a dorsally displaced fracture of the distal radius were included.

Results: The combined search strategies retrieved two hundred and seventy-four articles. After the elimination of duplicates, a preliminary review of all titles and abstracts against the pre-defined eligibility and further assessment of full text articles, eight studies (941 patients: 468 K wire group, 473 plate group) were included in this review. At a minimum one year follow-up, there was no significant difference in clinical functional outcomes such as the Patient-Rated Wrist Evaluation, Disabilities of the Arm, Shoulder and Hand (DASH) scores between both intervention groups. Radiological outcomes such as the ulnar variance or loss of reduction was marginally better ($p<0.05$) in the plating group in two of the included trials.

Conclusion: Contrary to the current surge of surgical fixation of with the locking-plate, this review shows that there is no difference between Kirschner wires and volar locking plates for patients with dorsally displaced fractures of the distal radius.

15:03 Discussion

15:05 **MCID for the patient evaluation measure as a patient rated outcome measure for Dupuytren's contracture**
Professor J J Dias, Dr L Sayeed, Mr B Bhowal (Leicester)

Using multiple methods (ROC, Distribution, Social Comparison Approach) we investigated the MCID of PEM in four hundred and forty-six patients surveyed three years after their first visit. 27% were women and the mean age was 67 years.

The PEM was collected throughout treatment. The mean initial PEM was 42 (SD 21), the final PEM was 29.9 (SD24) and the improvement in PEM was 12 points. PEM reflected deformity (Pearson's Correlation 0.4) and correlated highly (0.79) with the 7-interval anchor question asking how the hand was, compared to before. Responses ranged from "delighted" to "terrible" with four representing "no change". Using ROC (AUC 0.79) and Youden's Index 3, point improvement in PEM classifies if patients will consider that they have improved clinically with a sensitivity of

0.85 and specificity of 0.63. This is similar to the figure of 2.8 obtained using the Social Comparison method. Common methods using statistical distribution gave varying and inconsistent values.

The PEM improved by 9.1 points over three years in the 103 patients who did not have surgery and by 13 points in the 343 patients who had surgery. 15.4% of untreated patients worsened which was the same proportion (15%) finding that they were worse after surgery. For our population of Dupuytren's contracture patients we have established that the MCID of PEM is three points.

15:08 Discussion

15:10 The epidemiology of surgical intervention for Dupuytren's contracture in England
Professor J J Dias (Leicester)

We investigated the nationally collected data (Hospital Episode Statistics) to establish the variation in interventions for Dupuytren's contracture.

We looked at data from the one hundred and forty-three NHS hospitals doing such surgery in England. The diagnosis was based on ICD-9 codes and the procedures were noted using OPCS-4.3 codes which are routinely used in the UK. Length of stay was available for each case. The population served by each hospital was derived from national datasets. Cost of treatment was calculated from the PbR Tariff of the NHS.

In England 16,068 patients had surgery for Dupuytren's contracture in 2012 costing £53 million. Surgery excises or divides the cord causing finger contracture and this is the standard established treatment. If this is extrapolated to the twenty-eight European Union countries in 2014 with a population of 507,416,607 we would have 152,414 cases needing treatment for Dupuytren's contracture and if the costs were similar to those in the UK, the annual cost of treatment for Dupuytren's contracture in Europe would be €642 million.

Only 7% had fasciotomy with 45% having palmar surgery and 37% having digital surgery. Revision surgery accounted for only 2.8% of our cases. Not only is the type of surgery done (see figure) and the rate different between hospitals but the way patients are treated also differs. The figure shows the funnel plot of Dupuytren's contracture cases treated as day cases this year in the United Kingdom. There is huge variation in the rate of surgery, the treatment choice and the LoS in England.

15:13 Discussion

15:15 Three-year review of dorsal plating for complex intra-articular fractures of the distal radius
Ms M Spiteri, Mr M Brewster, Mr W Ng, Mr J Matthews, Mr D Power (Birmingham)

The volar approach is commonly used for plating intra-articular fractures of the distal radius. Despite this, certain fracture configurations are more suitable for dorsal plate fixation. This technique has not gained favour due to reported high incidence of extensor tendon irritation and attrition ruptures. With the advent of lower profile plates with smooth tapered edges and locking screws, allowing screws to be sunk into the plate, this risk has decreased.

We report on forty-six cases performed at a tertiary hand centre between January 2011 and May 2014. All fractures had similar configurations, with dorsal more than volar comminution and minimal comminution of the radial styloid. Dorsal displacement of fracture fragments was present in all cases. The lunate fossa was always involved with a coronal split extending into the distal radioulnar joint (DRUJ) splitting this into dorso and volar-ulnar fragments.

Plate placement was performed via a single dorsal incision and was dependent on the degree of comminution in each fracture component. The combination of a dorsal and radial styloid plate was used in 52% of cases.

There were no cases of tendon rupture and one case of loss of reduction. Removal of metal was performed in eleven patients, mainly to improve motion and tendon irritation (four cases each).

Even though technically challenging, dorsal plating is useful in cases of distal dorsal fragment displacement and comminution, as well as complex AO-23C3 fractures with die-punch involvement of the lunate fossa. It allows stable reduction of dorso-ulnar fragments which is important to restore DRUJ anatomy. The rate of tendon irritation and rupture is lower when compared to earlier plate designs, and removal of metal is only necessary in a few cases

15:18 Discussion

15:20 Outcomes of revision wrist replacement

Miss E M Pinder, Mr K G Chee, Mr M Hayton, Professor R Murlai, Professor J K Stanley, Mr S Talwalkar, Professor I A Trial (Wrightington)

Introduction and Aims: Primary wrist arthroplasty is a well-established operation for painful arthritis, particularly in the low demand rheumatoid patient. Surgical options for the failed wrist arthroplasty are limited and include total wrist fusion, excision arthroplasty and revision wrist arthroplasty. Little is known about the long term outcome of revision wrist replacements therefore we aimed to identify the functional outcome of patients undergoing this procedure in our hospital.

Materials and Methods: Patients undergoing revision wrist arthroplasty from 2001 – 2014 were identified from theatre registers in the upper limb unit. Patient notes were analysed for demographic data, date of initial surgery, date of revision surgery, reason for revision, operation findings, implants used, microbiology results and complications. Patients reported outcomes were assessed using quick DASH and EQ-5D. Objective outcomes measured included range of movement and grip strength compared to the contralateral hand.

Results: Sixteen patients underwent revision wrist arthroplasty from 2001–2014. Mean age at primary wrist arthroplasty was fifty-six years (range 27–69 years) and 63 years (range 28–83 years) at revision. Revision wrist arthroplasty occurred at a mean of 8.5 years from the primary. Reasons for revision surgery included implant breakage (6), loosening (5), stiffness (2) and cut out of screws (2). Intra-operative specimens grew an organism in one patient. Long-term functional outcomes are to follow.

Conclusion: Revision wrist arthroplasty may be considered in the failed primary wrist replacement. We present long-term outcomes for a cohort of patients at our institution.

15:23 Discussion

15:25 Computer aided corrective osteotomies for malunited distal radius fractures: A systematic review of the literature

Mr O Akilapa, Mr S Aggarwal, Miss I Reichert, Mr K Karuppaiah, Mr J Compson (London)

Background: Corrective osteotomy for malunited distal radius fractures is a well-established but technically challenging treatment strategy. Pre-operative planning with conventional radiographs may fail to highlight the magnitude of the three dimensional deformities associated with malunion. Recent studies suggest that computer assisted pre-operative templating improves the surgeon's ability to restore the anatomical integrity of the distal radius with consequently better functional outcomes.

Methods: The MEDLINE, EMBASE and the Cochrane databases were searched up to December 2014. All study designs that reported on the clinical and radiological outcomes of the computer assisted corrective osteotomies were included. A systematic critical appraisal of the literature to inform the validity of this emerging novel technique was conducted against the Cochrane risk of bias framework.

Results: Two hundred and eighty citations were screened, of which six studies that fulfilled the pre-defined eligibility criteria were included. All studies relied on CT generated bone surface models, custom made surgical templates as well as simulation of deformity correction. Post-operative volar tilt and ulnar variance improved consistently across studies compared with the pre-operative measurement ($p< 0.05$). All studies demonstrated radiological union with no evident degenerative changes as at final follow-up. Patients reported significant relief of pre-operative pain as well as an improvement in the wrist and range of motion and strength. No intra-operative complications unique to computer assisted techniques were reported.

Conclusion: The review demonstrates a tendency towards higher accuracy on a short to medium learning curve that empowers surgeons to achieve consistent accuracy of very complex deformity corrections.

15:28 Discussion

How I Do It

Chair: Mr M K Sood / Mr D J Shewring

15:30 CMCJ arthroplasty
Dr L R Scheker (Louisville)

15:45 Graftless simple syndactyly correction
Mr H P Giele (Oxford)

16:00 Modified Brunelli procedure
Mr M J Hayton (Wrightington)

16:15 Dynamic external fixation of PIP joint injuries
Mr G E B Giddins (Bath)

16:30 Close of meeting

1 Use of the Patient Evaluation Measure (PEM) and Measure Yourself Medical Outcome Profile (MYMOP) questionnaires in assessing the outcomes of minor hand surgery

Mr H Nagata, Miss L Hutchings, Mr J Field (Cheltenham)

Introduction: The PEM questionnaire has been widely used to assess the results of hand surgery. The MYMOP is a patient-generated outcome instrument, allowing patients to decide which symptoms they consider most relevant. The use of these two questionnaires was compared.

Materials and Methods: Adult patients undergoing elective day case hand surgery procedures completed both questionnaires prior to their operation and at three months post-operatively. Both questionnaires score on a seven-point Likert scale. The MYMOP requires each patient to select and score two symptoms, one activity, and overall wellbeing.

Results: Twenty-five patients were recruited, with an age range of 25-83 years. Symptoms and activities chosen in the MYMOP varied widely. The mean post-operative improvement in Symptom 1 (the most important symptom) was 3.6, Symptom 2 was 2.8, and Activity was 3.2. Mean change in overall MYMOP score was 2.7 (SEM 0.25).

In the PEM, smaller changes were observed between pre- and post-operative values than seen in the MYMOP. The largest mean changes were in feeling in the hand (2.4), hand use (2.2) and activities (2.0).

Conclusions: Both PEM and MYMOP showed improvements in patient status after hand surgery. Symptoms and activities chosen by patients in the MYMOP showed greater mean change in follow-up values than those given in the PEM. Use of a patient-generated instrument may increase sensitivity to changes after hand surgery, and provide a more relevant assessment of patient outcome.

2 Distal intersection syndrome: A rare cause of radial-sided wrist pain

Miss D Wharton, Mr G Cheung, Mr D Brown (Liverpool)

Introduction and Aims: Intersection syndrome describes inflammation of the extensor tendons at the point where the tendons of the second dorsal compartment of the wrist cross those of the first. The aetiology is uncertain but radiological findings include peritendinous oedema or fluid, tendinosis, muscle and subcutaneous oedema. Radiologists have also described these findings at a more distal site where the extensor pollicis longus (EPL) crosses tendons of the second compartment. However, no clinical series of this lesser known condition have been described. We present the outcome of three patients treated for the condition described as 'distal intersection syndrome'.

Methods: Three patients presented to the senior author with symptoms of atraumatic radial-sided wrist pain. Symptoms were activity-related but clinical examination findings were non-specific. All patients were investigated using ultrasound (US) and went on to have ultrasound-guided steroid injections.

Results: The patients were male with a mean age of forty-eight years. USS demonstrated positive findings of tenosynovitis affecting EPL and at least one of the tendons from compartment two in all patients. Symptoms resolved following steroid injections, however one patient experienced EPL rupture two months later.

Conclusions: The lesser known 'distal intersection syndrome' condition is a relatively rare cause of radial-sided wrist pain and should be considered as a differential diagnosis. The diagnosis can be confirmed easily with US and treatment using steroid injections is effective. However, the condition is not entirely benign and tendinitis may lead to tendon rupture.

3 Wrong Brunelli procedures? A review of the literature

Mr M Jones (Chesterfield)

Various techniques have been described for treating scapholunate instability with reducible rotary subluxation. One such technique was described by Brunelli and Brunelli in 1995 and was subsequently modified by a number of surgeons with mixed results. Brunelli expressed his frustration at modifications to his original technique, suggesting that 'Modified' Brunelli procedures should be renamed 'Wrong' Brunelli procedures. This is a systematic review, according to PRISMA methodology, of the literature regarding original and 'Wrong' Brunelli procedures designed to address this difficult surgical problem.

The most popular modification is the three-ligament tenodesis (3-LT), which enhances/replicates the action of three ligaments: the scapho-trapezio-trapezoid, the dorsal scapholunate and the dorsal radiotriquetral, using a slip of flexor carpi radialis tendon. This technique results in low pain scores, favourable PROMs scores and good grip strength. On average, scapholunate angle is restored to around 60º and scapholunate interval to 2.7mm at final follow-up.

On average, 76% return to their pre-injury level of occupational activity after three to four months. After fifty-five months follow-up, 17% of patients had radiographic evidence of radiocarpal arthritis.

The importance of optimal tunnel placement is discussed, as well as other novel techniques to reconstruct carpal relationships including the scapholunate intercarpal (SLIC) screw and the scapholunate axis method (SLAM).

In conclusion, the 3-LT probably does have some advantages over the original Brunelli technique, but still there is room for improvement in the treatment of scapholunate instability.

4 3D printing in pre-operative planning for elective wrist surgery: Our experience

Mr S Shaunak, Mr N Briffa , Miss L Osagie , Miss S Cerovac, Miss S Umarji (London)

There have been great advances in 3D printing technology and its possible medical applications. The use of this expertise in surgery may significantly advance all aspects of the operative process. We present our initial experiences using 3D modelling for pre-operative templating in revision wrist surgery.

Data from three patients was included in the study: a revision scaphoid malunion (with broken screw in situ), a distal ulna nonunion with limited bone stock, and a failed wrist fusion. High resolution CT scans were taken at 1 mm per slice; images were exported to a 3D printer. Using CAD/CAM technology a virtual design of the model was generated. Selective laser sintering was used to create a 3D 1:1 scale polyethylene model. Defects were defined, implant type and size determined and necessary bony resection and fixation aided. Models were created at an average cost of £34 each.

In each clinical case 3D printing enabled us to accurately recreate the anatomical problem and allow templating as well as actual fixation using our implants. This accurately predicted the likelihood of intra-operative success, or otherwise.

With the push towards "personalised medicine", 3D scanning and printing is an economical and accurate method of aiding planning for complex surgical procedures. It is especially useful in revision situations or where there are anatomical variations.

5 Lead from the front: The effects of a consultant-led trauma service on patients' waiting times in the Sheffield Hand Centre

Mr S Coulson, Mr J Rodrigues, Mr Z Shariff, Mr P Lim (Sheffield)

Introduction: The formation of UK "hand units" began in the mid-1980s, aiming to centralise and concentrate expertise for dealing with hand pathology. The British Society for Surgery of the Hand (BSSH) produced guidance for the timing of surgery in certain hand injuries in 2007. The authors audited their waiting times for theatre against these criteria with both a SpR/SHO led and a consultant-led trauma service.

Method: The authors identified criteria from the BSSH working group guidelines, and audited a one month period during SpR/SHO led services and closed the loop during a one month period of consultant delivered service.

Results: The Sheffield Hand Centre received one hundred and ten hand injuries requiring theatre in the first month audited and 126 during the second month. With the advent of a consultant-led service a number of standards were improved upon. The number of open fractures being operated in less than 24 hours improved from 21% to 44%, tendon injuries operated within five days improved from 20% to 96% and similarly nerve injuries operated within five days from 93% to 100%. Open fracture review in less than 24 hours reduced from 93% to 71% and bite injuries remained static at 50% to 47%.

Conclusion: The advent of a consultant-led trauma service has resulted in an improvement in the timeliness of surgery for a number of injuries. The deterioration in review time may be a reflection of the booking system for these trauma clinics. The absence of improvement in the bite injury category may reflect that not all bite injuries/hand infections are amenable to surgery at presentation. Subjectively, there is a possibility that this change will reduce the experience gained by junior staff triaging, assessing and managing hand injuries.

6 Elective carpal tunnel surgery: Safe on warfarin and as day case

Dr J Torres-Grau, Dr S Hoult (Bristol)

With one million people on warfarin, it is still the most common long-term anticoagulant given to patients at risk of thromboembolic events. Risks and benefits of this therapy are well established, however, it becomes more unclear when these patients are to undergo elective hand surgery. There are no clear guidelines to aid in the decision-making, which is left to different institution protocols and surgeons' preference.

We describe our practice and results, aiming to emphasise the various advantages of continuing warfarin therapy and the benefits of open carpal tunnel release as a day case.

Methods: We conducted a retrospective study of patients undergoing elective open carpal tunnel release from January 2011 to January 2015. Forty patients were identified to be on warfarin, with a therapeutic INR (less than 3) on the day of surgery. All patients underwent the same procedure, by one of two senior surgeons; under LA and tourniquet control and stayed overnight in order to monitor for bleeding complications. Data was analysed for a further forty patients, not on warfarin, for comparison.

Results: None of the patients on warfarin had bleeding complications, matching results in the comparison group.

Conclusion: Stopping or bridging warfarin therapy in these patients leads to a demonstrable increase in the risk of thromboembolic events. Open carpal tunnel release on warfarinised patients should be done as a day case (British Association of Day Surgery Guidelines), under local anaesthetic and with the use of an arm tourniquet and conscientious haemostasis. This prevents the risk of thromboembolic events, has financial benefits for the trusts and reduces staff workload and patient inconvenience, with no evidence of increased risk of bleeding complications.

7 Hook of hamate fractures: A new perspective

Mr M Fageir, Mr D Hargreaves, Mr R Ray (Southampton)

Introduction: Hamate fractures have been classified by Hirano (2005) into either hook of hamate fractures or hamate body fractures. The hook fractures are thought to occur from a fall onto the outstretched hand, or due to direct impact from a racquet or bat whilst playing sport. Wright (2010) recently described a "pull test" which involved recreating the pain by asking the patient to flex the ring and little fingers against resistance whilst the wrist was held in ulnar deviation. This has the effect of the flexor tendons causing an ulnar displacing force on the hook of hamate and so causing pain.

Hypothesis: Fractures of the hook of the hamate are not caused by an impact against a handle.

Method: We have retrospectively reviewed all our cases of hook of hamate fractures that have occurred over the last nine years. All patients had been diagnosed with the benefit of MRI scan or CT scan. We compared the different mechanisms of injury and documented any associated injuries.

Results: There were seventeen patients who had sustained 18 separate hook of hamate fractures. There were fourteen males and three females. Median age was thirty-nine years (range 22-61years). The fracture was at the base of the hook in thirteen patients, through the body of the hook in four and at the tip in one case. Thirteen fractures occurred as a consequence of a fall onto the hand. Five had occurred as a consequence of gripping a tight handle. In none of the five handle cases did the patient remember an impact against the palm of the hand, just the sudden onset of pain. There were no associated injuries in the handle group, but seven of the 13 fall patients had other associated carpal fractures. There were six co-existing scaphoid fractures, one triquetral fracture, and one capitate fracture.

Discussion: We found no evidence to support the current opinion that hook of hamate fractures occur as a direct impact against a handle. It is more likely that the fracture occurs as a consequence of the tangential force from the adjacent flexor tendons (flexor digitorum profundus of the ring and little fingers) when maximal grip against a handle occurs. The tangential force is maximal when the wrist is in ulnar deviation. Further cadaver studies will be performed to show the force required to sustain such an injury.

Associated fractures of the scaphoid were found to be much more common in our series (47%) than in the current literature. Prior to this series, there were only three case reports of an associated scaphoid fracture with a hook of hamate fracture. It is our opinion that modern imaging is able to identify carpal fractures, which previously were only able to be identified on specific X-ray views. This has led to an increased rate of identifying both hook of hamate fractures and any associated carpal injury.

This study may change the current opinion of the aetiology of hook of hamate fractures and may lead to a change in how such fractures are immobilised in the acute situation.

8 Cost-benefit, safety and patient pathway comparison of procedure rooms versus day surgery in an adult hand trauma unit

Miss I Citron, Miss H Creasy, Mr A Fox (London)

Introduction: Most hand trauma units have a procedure room (PR) for minor hand trauma. However, little data exists as to their safety, benefits and cost effectiveness compared with local anaesthetic (LA) cases performed in a day surgery unit (DSU). We assessed the patient pathway, costs and outcomes of cases performed in the PR compared with equivalent LA cases performed in DSU at our unit.

Method: A retrospective notes analysis of all cases performed in the PR (n=98) and equivalent LA procedures in DSU (n=82) over a three months period (01.10.14 to 01.01.15) was performed.

Significance was tested using Fisher Exact test. Costs and local tariffs were calculated for both. Complications were also assessed.

Results: Procedures performed in the PR and DSU included washout and direct closure of hand wound (PR=33; DSU=20), nailbed repair (PR=17; DSU=26), drainage of paronychia (PR=14, DSU=6), drainage of felon (PR=2; DSU=4), repair of lip or facial laceration (PR= 22, DSU=11), others (PR=10, DSU=16). The patient pathway was significantly shorter for patients treated in PR. The time from injury to procedure was significantly reduced (PR=816mins, DSU=2,902 mins P=0.76x10-7). Patient time spent in hospital was reduced (PR= 210mins vs 340mins p=0.001). There was no difference in complications. The PR procedure's total cost was £4312 and tariff payment was £85,860. The DSU procedures total cost was £ 16,113 whilst income generated was £76,025. The departmental income difference between the groups was £21,536.

Conclusion: Compared with day surgery, procedure rooms provide a shorter patient pathway, substantial savings, increased income generation, and an equivalent safety profile for appropriate minor LA procedures. Their use should be maximised.

9 Middle- and long-term results of radial tunnel release (RTR) and combined nerve decompression including RTR

Miss L Elferink, Dr O Zöphel, Ms A Fink (Enschede)

Question: The treatment outcome of radial tunnel syndrome (RTS) is poorly described in current literature. It has been observed that RTS often occurs in combination with other nerve compression syndromes in the same extremity. This research is the largest research thus far comparing the treatment outcome between patients who underwent RTR and patients who underwent combined nerve decompression including RTR.

Methods: In this multi-centre study, patients who underwent RTR between January 2006 and January 2014 are included. Patients either underwent RTR or combined nerve decompression including RTR. All patients were asked to fill out two questionnaires: the Levine questionnaire and the VAS pain, function and contentedness questionnaire.

Results: Sixty-six patients underwent 74 RTRs. Of all returned questionnaires, 61% of patients had excellent or good Roles and Maudsley scores. Patients report low pain scores, the median average pain score is 20 (IQR 0-50), for function, the median VAS is 85 (IQR 60-100) and contentedness 80 (IQR 50-100). Of the patients who underwent combined nerve decompression 57% of results were categorised as excellent or good, for patients who exclusively underwent RTR this was 79%. The group of patients who underwent combined nerve decompression scored lower on every subject of the questionnaires.

Conclusion: This study shows that the outcome of RTR is reasonably good with a success rate of 61%. Comparing patients who underwent exclusive RTR with patients who underwent combined nerve decompression the success rates are 57% and 79% respectively. Further research, on a larger patient population, should determine if the clinically relevant difference we found between these groups is significant.

10 The Liverpool experience in prevention and early management of complex regional pain syndrome in wrist fractures

Mrs S Gillespie, Mrs F Cowell, Mr G Cheung, Mr D Brown (Liverpool)

Complex regional pain syndrome (CRPS) is a multifaceted condition which occurs in 10-25% of patients sustaining a wrist fracture (Atkins, 1990; Djkstra, 2003; Stanos, 2001) with most patients reporting symptoms within one month of injury (McBride, 2005).

The study centre is a typical NHS teaching hospital serving a population of 500,000. As a regional trauma centre it receives primary, secondary and tertiary referrals for wrist fractures.

The authors present the results of an interative series of studies and organisational learning which led to a reduction in the incidence of CRPS in this patient group, in the study centre, to a rare event. This resulted in the development of an integrated multidisciplinary CRPS management pathway.

The authors suggest that careful attention to the prevention of CRPS through staff and patient awareness, vigilance for warning signs and simple modifications to the management of wrist fractures can significantly reduce the incidence of CRPS. A collaborative model of care and a culture of shared learning have facilitated an early warning system and fast track care.

11 Effective bony mallet reduction using the principles of Elsons test

Mr A Salibi, Mr A Barabas (Sheffield)

Introduction and Aims: Mallet finger injury is common. To date there is no clear evidence to indicate the best treatment modality. However, some literature suggests that splinting alone is often adequate for managing mallet injuries, with surgery considered in a bony mallet involving more than one-third of articular surface and/or palmar subluxation. We describe a simple technique, which utilises the mechanical advantage of flexing the proximal interphalangeal joint (PIPJ) to reduce tendon forces on the distal phalanx in order to facilitate reduction of the dorsal fragment, and restore DIPJ articular congruity.

Technique: An example of a mallet finger with avulsion fracture involving 50% of the articular surface with significant displacement of the dorsal fragment and volar subluxation of the distal phalanx will be demonstrated in pictures. In order to counteract the forces of the flexor and extensor tendons, the PIPJ is held at 70-90° flexion. With the PIPJ held flexed, the central slip is pulled forward, which also advances the lateral bands, and takes tension off the extensor insertion into the fracture fragment. The dorsal fragment can then be easily reduced by applying dorsal pressure with a sheathed needle under clinic-based fluoroscopy, which also makes it easier to correct the subluxation.

Conclusion: This technique was performed on eight consecutive patients with mallet injuries who had been listed for surgery due to the extent of the dorsal fragment displacement or volar subluxation of the DIPJ. Seven had a satisfactory reduction, with two requiring a splint holding the PIPJ flexed, with no short-term complications at six to eight weeks follow-up.

12 Steroid injections in primary care setting for carpal tunnel syndrome

Ms L J Tourret, Miss R Brincat (Brighton)

Over an eighteen-month period 74 patients presented at a primary care centre with symptoms and signs of carpal tunnel syndrome and received an injection of Kenalog (40mg) pre-mixed with lidocain. The outcomes of these injections were reviewed either in person or by telephone review. We achieved a 93% follow-up and present the findings over an 82-week range with a minimum six week follow-up.

31% reported full resolution of their symptoms and were discharged. 43% requested surgery due to incomplete resolution, while a further 15% said they were no better but did not want surgery.

The referral for surgery had a large range of timing post-injection: one to 52 weeks. In fact 62% of patients requested surgery beyond the initial six-week review raising the possibility that the surgical group is likely to be significantly higher than reported here.

Whilst the wearing of splints and the provision of injections are both recommended in the primary care setting for symptomatic carpal tunnel syndrome, there remains little evidence that either is cost effective in the longer term. The Cochrane review of steroid use in carpal tunnel syndrome in 2009 concluded that there was no significant benefit over non-steroidals and splints and found no evidence of benefit beyond one month from the injection. Whilst the complication rate from injections is low there remains a risk of vascular and neural compromise as well as possible systemic effects.

We review the current evidence and in the context of our own study raise the question: With less than a third of patients reporting benefit in this limited study, a figure likely to reduce further with longer follow-up, is a delay to definitive treatment worth the time and cost incurred especially in this era of maximum cost-efficiency?

13 Readability of patient education materials on the British Society for Surgery of the Hand website

Mr A Eltorai, Mr I Sinha, Ms S Kalagara, Dr A Daniels (Province, USA)

Introduction and Aims: Informational resources on the Internet may be too complex for some patients to understand, and poor health literacy predicts worse health–related quality of life outcomes. Recommended readability of patient education materials (PEMs) by the American Medical Association (AMA) and the National Institutes of Health (NIH) should be no greater than a 6th grade reading level. This study evaluated whether the trusted BSSH website's PEMs meet recommended readability guidelines.

Materials and Methods: All twenty of the publicly accessible entries within the patient education section of the BSSH website were analysed for grade level readability using the Flesch-Kincaid formula, a well-validated tool to evaluate the text reading level.

Results: The average (SD) readability of all twenty articles was grade level 8.92 (2.09). All of the articles had a readability score above the 6th grade level, the maximum level recommended by the AMA/NIH. Readability of the articles exceeded this level by an average of 2.92 grade levels (95% CI, 1.9-3.9; $P < 0.0001$). Only five of 20 articles had a readability score at or below the 8th grade level, the average reading skill level of US adults.

Conclusion: The readability of PEMs on the BSSH website exceeds the readability level recommended by the AMA/NIH and is far beyond the average reading skill level of the majority of adults in the US. This online information may be of limited use to most US patients due to a lack of comprehension.

14 Pressures around the median nerve with the flexor carpi radialis bed approach

Mr C Mariathas, Mr J Garcia (Chesterfield)

Introduction: Volar plating for distal radial fractures is an increasingly common and popular procedure. In many units their use is a regular occurrence, not just for the hand surgeons, but also general trauma surgeons. A recent audit at our unit illustrated that median nerve injury was a significant post-operative complication for a proportion of these patients. One hypothesised reason for this was the placement of retractors during surgery, as well as the type of retraction used.

This study aims to compare the pressure exerted upon the median nerve during the common volar approach through the bed of Flexor Carpi Radialis (FCR) with different layers of retractor placement, different types of retractor and different wrist positions.

Materials and Methods: Fifteen cadaveric wrist samples were used and had FCR bed approaches performed on them down to the radius. The median nerve was carefully identified in each case and a pressure sensitive film strip was applied adjacent to it. Various methods including varieties of West's self-retractors and hand held implements such as Kilners retractors were applied to provide exposure, first superficially (deep to FCR) and then deep (beneath Pronator Quadratus).

Results: In the superficial layer, peak pressures were significantly greater when self-retainers were used, as opposed to small Langenbach type hand retractors. In the deeper layer, use of the Langenbachs resulted in greater pressures compared to a typical West retractor.

Conclusion: The differences illustrated by this study lead the authors to advise against self-retainers more superficial than Pronator Quadratus due the increased pressure around the median nerve. Their use deeper to this layer, however, is encouraged.

15 The Liverpool Integrated Care Pathway for early complex regional pain syndrome in wrist fractures

Mrs F Cowell, Mrs S Gillespie, Mr G Cheung, Dr H K Tsang, Mr D Brown (Liverpool)

Complex regional pain syndrome (CRPS) is a multifaceted condition which occurs in 10-25% of patients sustaining a wrist fracture (Atkins, 1990; Djkstra, 2003; Stanos, 2001) with most patients reporting symptoms within one month of injury (McBride, 2005). National guidelines suggest a four pillared approach to the management of CRPS with early diagnosis and treatment being considered best practice. However the guidelines acknowledge this is not yet being achieved across the UK (Royal College of Physicians, 2012.) British Orthopaedic Association Standards for Trauma (BOAST) for fracture clinic services also recommend pathways for CRPS (BOAST 7 2013).

The authors present the Liverpool Integrated Multidisciplinary CRPS Management Pathway which has been achieved through shared multidisciplinary learning and a collaborative model of care within a large teaching hospital and trauma centre.

The Liverpool CRPS care pathway includes an early warning system identifying patients at risk of developing CRPS, rapid diagnosis and monitoring using CRPS champions in trauma clinics and therapies departments and care pathways integrating orthopaedics, hand therapies and acute pain management.

16 Digital mucous cyst excision using a proximally based skin flap

Mr A Salibi, Mr J Arenas-Prat (Sheffield)

Introductions and Aims: Digital mucous cyst is a condition generally associated with osteoarthritis of the distal interphalangeal joint (DIPJ). When surgical resection is indicated, it often requires excision of the attenuated skin overlying the cyst through different access incisions. The skin defect may require a local flap or a full thickness skin graft. We describe in pictures a simple technique that facilitates full excision of the mucous cyst arising from the DIPJ whilst preserving the overlying epidermis and minimising the risk of skin necrosis.

Technique: A proximally based skin flap is raised from the eponychium to the DIPJ. The incisions should be curvilinear and extend from dorsal to volar until they reach the midlateral lines at joint level. It is important to keep the level of dissection as close as possible to the nail plate, extensor tendon, and joint capsule. The cyst is then excised leaving the dorsal section attached to the skin left undisturbed to prevent further damage to the skin. The skin flap is then re-sutured.

Results: Over a period of three years, 14 patients were operated on following this technique. No post-operative complications such as skin necrosis were recorded and the range of motion of the joint was not affected. There were no recurrences of the mucous cyst, which may be related to the secondary scaring or adhesions associated with this technique.

Conclusion: This is a simple and a reliable technique that is indicated in mucous cysts arising at the DIPJ level, but even in those extending distally and affecting the eponychial fold.

17 Denervation of the distal interphalangeal joint

Mr A Salibi, Mr J Arenas-Prat (Sheffield)

Introduction and Aims: Distal interphalangeal joint (DIPJ) osteoarthritis is one of the most common conditions hand surgeons have to deal with. We describe a new technique for DIPJ denervation as a treatment for painful degenerative or posttraumatic osteoarthritis.

Technique: A proximally based skin flap is raised from the eponychium and extended as far as 5mm proximal to DIPJ intra-articular space. Both incisions should be curvilinear and extend from dorsal to volar until they reach the midlateral line at joint level. The size of articular nerve branches are very difficult to identify and for this reason, the aim is to dissect the area rather than to visualise and divide specific nerve endings. The reflection of the dorsal flap should be as close as possible to the paratenon of the distal 1 cm of the extensor tendon. On the volar aspect dissection is performed using scissors as close as possible to the collateral ligaments and the volar aspect of the flexor sheath starting 5mm proximal to the intra-articular space and ending 5mm distally. From one side of the finger we should reach the contralateral one leaving an area of skin and subcutaneous tissue of 1 cm of length raised from the flexor sheath at joint level. After achieving complete denervation the dorsal flap is then re-sutured in place.

Results: Ten DIPJ denervations were performed over a one-year period. Seven patients were pleased with the results with good relief of their osteoarthritic pain. Symptoms remained unchanged in one patient, and two were not satisfied because of complications such as distal flap tip necrosis, and scar hypersensitivity.

Conclusion: This technique represents an easy, effective and reliable approach to DIPJ denervation with good results and minimal complications.

18 HAND it to WhatsApp!

Mr J Paniker, Mr J Casaletto, Mr V Bhalaik (Wirral)

Introduction: Social media is increasingly being used in the healthcare setting. WhatsApp is a cross-platform messaging app that allows users to exchange messages securely. It is popular amongst orthopaedic surgeons who already use it to communicate with friends and family. This popularity was utilised to create a WhatsApp group for the Hand Surgeons in the Mersey Region. We looked into the benefits and potential problems posed by the use of WhatsApp.

Materials: The Mersey Hand Group was created in January 2014 as a closed group by a consultant hand surgeon with six hand consultants as members. It currently includes sixteen hand consultants working in the Mersey region. The group uses the app to organise meetings and to regularly discuss cases. All content discussed on WhatsApp for a three-month period was reviewed to look at the usage of the forum and for any breach of patient confidentiality.

Results: All sixteen members contributed to the forum. From 1st April lo 30th June there were 424 conversations, 66 images and three literature articles. Thirty-eight cases were discussed. Of the sixty-six images, 64 were radiological images, one was a clinical image and one a hand related cartoon! None of the images had any patient identifiable information. All conversations had generic information with no patient identifiable data. The GMC Confidentiality Guidance and GMC "doctors' use of social media" guidance was followed in all cases. The forum was also used to relay information about the regional hand meeting in May and by surgeons to arrange joint cases. Some surgeons also documented in patient notes that the case was discussed at a regional forum.

Conclusion: If used cautiously WhatsApp can be a safe, secure forum for surgeons to discuss cases and organise meetings.

19 The Bamboo-Foam-Tape (BFT) digit: An innovative training model for Kirschner wire fixation of phalanges

Mr S Majumder, Dr E Cochrane, Mr J Smith (Wakefield)

Introduction: Hand trauma is common, accounting for around 20% of attendance in the Accident and Emergency Departments each year [1]. Kirschner wiring is a common treatment modality for phalangeal fractures requiring operative management, but can be technically difficult to master. Currently available training models, e.g. sawbones, are expensive and do not adequately simulate the handling properties of, and the challenges posed by, the swollen fractured finger

requiring fracture reduction and K-wiring. The authors describe the use of Bamboo-Foam-Tape (BFT) as a training model of K-wire fixation of phalangeal fractures.

Materials and Methods: The principle author (SM) has modified his previously described bamboo model for metacarpal fracture fixation[2] to create the BFT digit. The BFT digit is constructed from bamboo pieces connected longitudinally by tape (bones and joints), enveloped in foam and tape (subcutaneous tissue and skin). The BFT digit is then fixed onto a table mounted vice clamp.

The universal joint on the clamp allows the digit to be positioned optimally and stabilised to allow K-wire fixation to be performed safely. The foam and tape envelope accurately simulates the swollen soft tissues surrounding the bone of a fractured digit, whilst the bamboo "phalanges" with its hard, radio-opaque "cortex", and medullary components, completes the 3-dimensional model.

The advantages of the model are further enhanced by the wide availability and low cost nature of the components of the BFT digit.

Conclusion: The authors commend the BFT digit as an inexpensive model to enable uniquely realistic simulation training of reduction and K-wire fixation of digital fractures under X-ray control.

20 Myxofibrolipomata of the upper limb

Mr J Smith, Dr E Cochrane, Miss S Jivan (Wakefield)

Introduction: Myxofibrolipoma is an uncommon benign soft tissue lesion that contains a mixture of both fibrous and myxoid tissue. Despite the lesion being a benign pathology, their rate of growth, size and location may be mistaken for sarcoma [1]. To the best of our knowledge this is the first case of a patient having two separate myxofibrolipomata on the same extremity.

Case: A fifty-eight year-old right hand dominant man presented with a progressive swelling arising on the volar aspect of the left index finger metacarpal over a three-month period. In 2012 he had a previous mass excised from the ipsilateral forearm with histology confirming a myxofibrolipoma.

On examination a 3 x 3cm round soft tissue swelling could be found on the volar aspect of the left index finger at the level of the distal palmar crease extending dorsally. A MRI scan confirmed a solid lesion closely abutting and mildly pushing on the tendon with no evidence of invasion. In June 2014 the patient underwent a complete excision of the lesion under general anaesthesia with tourniquet control. Histology confirmed a myxofibrolipoma.

Discussion: Myxofibrolipoma is an uncommon benign soft tissue tumour first described by Suster et al. 1998 [1]. The lesion is often misinterpreted as a low-grade sarcoma. Distinct features of this benign pathology include an absence of atypical adipocytes and lipoblasts, presence of a capsule, absence of invasion and CD34 positivity[3]. Complete excision appears to be the treatment of choice in the literature with no evidence of local recurrence.

21 Utility of the virtual clinic in the management of hand trauma in plastic surgery

Dr M Joy, Mr K Y Chin, Mr A Lowrie (Dundee)

Introduction: The 'Virtual Clinic' (VC) concept has gained popularity in orthopaedics as a method of improving efficiency in managing non-urgent trauma. We have audited its effectiveness in managing hand trauma in plastic surgery.

Design: Evidence based hand trauma referral guidelines were disseminated to A&E departments in the trust. VC involved an hour long morning clinic for consultant led review of notes, X-rays and management planning.

Method: Prospective data of referrals and clinical outcomes were collected over consecutive thirty-day periods before and after the introduction of the VC.

Results: Eighty-three patients were referred before introduction of VC. 100% of referrals underwent bedside assessment in hospital. 50% (n=42) were managed conservatively. Fifteen of 41 (36.6%) did not undergo surgery on the day of admission.

After introduction of VC, seventy-four patients were referred with an average delay to review of 1.51 days (SD 0.89). 51% (n=38) were followed up by hand therapists. 43% (n=32) were brought to trauma clinic for further assessment and 21.6% (n=16) then admitted to the ward for operative management. 4% were discharged from VC without further follow-up and 2% redirected to orthopaedics.

Conclusions: Use of a virtual clinic is time efficient and has clear cost benefits as it prevents unnecessary hospital attendances. It allows for effective utilisation of hand therapy resources. This in turn eases pressure on the surgical team and ensures adequate patient follow-up.

22 A simple and effective method to remove a titanium wedding ring

Mr A Salibi, Mr A Morritt (Sheffield)

Introduction: Titanium rings are becoming popular because of their strength, durability, low weight and hypoallergenicity. Ring constriction is a relatively common presentation, which can result in necrosis of the affected digit if not relieved. Rings made of gold or silver are easily removed with basic ring cutters, in contrast, titanium rings require specialist cutting equipment such as dental saws, drills or diamond tipped saws. These techniques can take up to fifteen minutes to divide the ring, can burn the underlying skin, require an assistant to provide irrigation, and may not be available within all hospitals at all times.

Case Report: We describe in pictures a simple and quick method to remove a titanium ring in a patient who presented to the Emergency Department (ED) with a painful, swollen left ring finger following prolonged bathing in a warm spa six hours earlier. Attempts to remove the ring in ED using traditional methods such as elevation, finger lubrication, finger binding and a manual ring cutter failed. The fire service also failed despite using specialised cutting equipment. The patient was then admitted under plastic surgery for hand elevation and further attempts eight hours later with blunted two manual ring cutters. An attempt was then made to cut the ring with a pair of large bolt cutters obtained from theatre and this was successful. Once the ring had been split it was then pulled apart by lateral traction on a pair of large paper clips. The patient made an uneventful recovery.

Conclusion: Our method used simple equipment that is readily available in most hospitals at all times of the day. In contrast to the other methods our technique was performed in less than thirty seconds and could be performed by a sole operator without damage to the underlying finger.

23 Wagner approach for first carpometacarpal joint denervation

Mr A Salibi, Mr J Arenas-Prat (Sheffield)

Introduction and Aims: First carpometacarpal (1st CMCJ) denervation is usually carried out through either a single longitudinal dorsal incision or two smaller incisions at the dorsal and volar aspects. We describe a technique that utilises Wagner approach, to allow wider access to the volar and ulnar aspects of the first CMCJ including the trapezium and metacarpal base, usually the most painful areas and generally the least addressed with classic denervation techniques.

Technique: A radial incision at the level of the first metacarpal (1st MC) is performed. Trapezium and metacarpal base are identified. Dorsal subcutaneous blunt dissection is performed dividing the articular sensory rami from the dorsal nerves and those from the lateral antebrachial cutaneous nerve using bipolar diathermy. Reflection of the thenar muscles from their insertion is performed throughout the whole ulnar aspect and as close as possible to the outer surface of

the articular capsule to divide the sensory rami of the thenar and the palmar branches of the median nerve. The insertion of the abductor pollicis longus tendon at the base of the first MC is cauterised in order to divide the branch of Cruveilhier that runs under the first extensor compartment and very close to that tendon. After complete denervation is achieved, closure in layers is performed.

Results: Sixteen patients (18 hands) underwent denervation using this technique over a period of 15 months. Although no statistical or formal pain assessment was performed, fourteen patients (16 hands) were satisfied or very satisfied with the results of the procedure and would have it again.

Conclusion: The Wagner approach allows a satisfactory joint denervation. Its main advantage is at the volar and ulnar regions where it offers a better exposure and more reliable denervation.

24 A case report of methemoglobinemia following a supraclavicular prilocaine nerve block for ulnar nerve decompression

Miss J Street, Dr S Clements, Dr C Eickmann, Mr P Jesudason (Bangor)

We present a case of desaturation post prilocaine supraclavicular block for ulnar nerve transposition.

A forty-two year old female was admitted for an elective ulnar nerve transposition. Prior to her operative procedure, she was given a supraclavicular brachial plexus block under ultrasound guidance. This consisted of 1% lignocaine and 1% prilocaine. The surgery was undertaken uneventfully.

Intra-operatively, her oxygen pulse oximetry saturations (SpO2) were initially 95 to 97%, but had fallen to 90 to 92% by the end of the procedure. No change was noted with oxygen therapy or after encouraging vital capacity breaths.

A diagnosis of methaemoglobinemia secondary to prilocaine was made. 60mg of methylene blue in 600ml saline was administered intravenously. She was admitted overnight for observation and discharged home the next day, with oxygen saturations of 95% on room air.

Methaemoglobinemia is a recognised phenomenon following prilocaine administration. However, it is uncommon for this to become clinically apparent within recommended dosages (Scott, 1964). Most case reports documenting this effect have been following urological and dental procedures (Kara, 1998; Odemis, 2004).

Acquired methemoglobinemia (levels exceeding 1%) occurs when exogenous oxidising agents overwhelm or inhibit red cell oxidative-stress enzyme defence systems (Kara, 1998). Toxic effects become manifest when the methemoglobin concentration exceeds 20%.

The standard first line treatment is administration of the oxidant methylene blue (Rehman, 2001) but ascorbic acid can also be used in patients with renal impairment or glucose-6-phosphate dehydrogenase (G6PD) deficiency (Topal, 2013).

Registration

Important notice: Doctors or scientists engaged in research AND presenting a paper will not be charged a registration fee for the day they are presenting if they can confirm in writing that they have no access to study leave expenses. They must, however, pay £60 per day, which is the day delegate rate charged to the Society by the venue for each individual attending.

Exemption from payment of registration fees is not available to those who have access to study leave funding. If all funding for the year has been utilised, full registration fees must be paid.

Online registration will remain open throughout the meeting. The registration fees for online registration during the meeting remain unchanged. However, should you wish to pay by credit card at the registration desk, a £30 late registration supplement in addition to the standard rate is payable.

Registration Fees

BSSH Full Members and Associates who are Consultants	£320 Whole meeting £160 One day
BSSH Associates who are Trainees, Companion Members	£195 Whole meeting £100 One day
BSSH Honorary and Senior Members	£120 per day £60 One day
Trainee Non-Members	£245 Whole meeting £125 One day
Other Non-Members	£420 Whole meeting £210 One day
Medical Students	£120 Whole meeting £60 One day
Speakers who are Research Doctors or Scientists	£60 per day

On-site registration does not include a ticket to the Society Dinner.

Registration and Enquiry Desk

The Registration and Enquiry desk (situated in the 2nd Floor Foyer) will be open at the following times:

Thursday: 09:00–17:30
Friday: 08:15–14:15

The telephone number of the Registration and Enquiry desk during the meeting is: 07930 509 646 (BSSH mobile).

MEETING INFORMATION

Honorary and Senior Members
Honorary and Senior Members will not pay a registration fee. A charge of £60 will be made for refreshments and luncheon each day. This is the delegate rate charged to us by the venue for each delegate.

Venue of the Scientific Meeting
The meeting will be held in the Telford Theatre.

Car Parking
The nearest car parks provided by Q-Park are located in Abingdon Street and on the South side of Trafalgar Square. Limited meter parking is available in and around adjacent streets.

Congestion Charging
The venue lies within the charging area.

Accommodation
One Great George Street is in partnership with The Corporate Team to offer conference delegates discounted rates at a range of local hotels ranging from 3* to 5*. For further information please visit: www.onegreatgeorgestreet.com/corporate-conference-venue/hotels.

Luncheon and Refreshments
Luncheon and refreshments will be served in the Great Hall.

Contributors Information
There will be projection facilities for PowerPoint and Keynote presentations. To avoid delays and ensure the smooth running of the sessions, the use of presenters' laptops will not be allowed.

Speakers are asked to keep strictly to the time allocated for their presentations.

e-Posters will be located in the 2nd floor foyer.

Continuing Medical Education
The following number of points have been awarded for each day:

Thursday:	6.5
Friday:	5.5
Total:	12.0

Society Dinner
Thursday 15 October 2015 at 19:15 for 20:00
Shakespeare's Globe Theatre
Dress code: Business attire

The Society Dinner is open to Honorary, Senior and Full Members and Associates of BSSH, all of whom may invite guests. One ticket was included in the registration fee for those who pre-registered for the whole meeting.

Prizes

Journal of Hand Surgery Prize

A prize consisting of book vouchers to the value of £500 is awarded for the best paper presented at the meeting.

Poster Prize

A prize consisting of book vouchers to the value of £250 will be awarded to the best poster presented at the meeting.

Keynote Lectures

Thursday 15th October

11:30 Douglas Lamb Lecture: Understanding the distal radioulnar joint
17:00 Examination of mechanical disorders of the forearm

Friday 16th October

08:45 Anatomy/physiology of nerve injury
09:30 Specialised service development as a new consultant
10:25 Strategies for nerve repair
13:45 Paradigm shifts in nerve surgery

Symposia

Thursday 15th October

14:35 Managing complex disorders of the forearm
16:00 Deformities of the fingers in inflammatory arthritis

Friday 16th October

15:30 How I do it

Meetings

The BSSH Annual General Meeting will be held on Thursday15th October at 17:30 in the Palmer Room (open to Members and Associates only)

BSSH Meetings in 2016

28–29 April: Royal College of Surgeons, London
13–14 October: Mercure Hotel, Cardiff

MEDICAL AND TECHNICAL EXHIBITIORS

Firms supplying instruments, appliances, materials and books will be exhibiting throughout the two days in the Great Hall, where refreshments and luncheon will be served. It is hoped that everyone will support this exhibition.

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Contact: Mr U Vakharia

Sobi is an international specialty healthcare company dedicated to rare diseases. Our mission is to develop and deliver innovative therapies and services to improve the lives of patients. The product portfolio is primarily focused on Haemophilia, Inflammation and Genetic diseases. We also market a portfolio of specialty and rare disease products for partner companies across Europe, the Middle East, North Africa and Russia.

VBS DIRECT LTD **STAND S13**
1 Mill View Close, Bulkeley, Cheshire SY14 8DB
Telephone: 0845 528 0336, Fax: 0845 528 0358, Email: stephen@vbsdirect.co.uk
Contact: Mr S Barabas

VBS Direct is a British company bringing innovative technology to doctors, plastic surgeons, manual therapists and veterinary surgeons. K-Laser is the global leading Class IV therapeutic laser for rehabilitation and pain management for medical and post-surgical cases. Working closely with private and NHS hospitals, VBS Direct is proud of their association with St. Thomas and Guy's Diabetic Foot Health and Plastic Hand Therapy unit.

Recent double-blind, research and publications on post-surgical cruciate injury rehabilitation, post-surgical cancer removal wounds, chronic diabetic and immune-mediated vasculitis wound healing; continuing research and future publications within plastic surgical rehabilitation units are studying the effects of K-Laser therapy on non-displaced hand fractures, De Quervain's, Trigger fingers, Carpal Tunnel and chronic regional pain syndromes. VBS Direct ensures all members of staff using the K-Laser are trained to the level of the Core of Knowledge with long-term warranty and clinical support.

VBS Direct sells a Class IV advanced surgical CO2 laser, Aesculight. This flexible waveguide laser allows precise surgery, as well as soft tissue growth/tumour removal with ablation of the tumour bed and coagulation properties. The surgical cutting ability reduces pain, inflammation and reduces blood loss making the field of operation clearer and simpler for the surgeon.

VERTEC SCIENTIFIC LTD **STAND S3**

Unit 44, Easter Park, Benyon Road, Silchester RG7 2PQ
Telephone: 0118 970 2100, Fax: 0118 970 1861, Email: sales@vertec.co.uk
Contact: Mr K Lakin

Vertec Scientific is a leading distributor of world class imaging and radiotherapy systems and radiotherapy consumables in the UK.

Vertec offerings include bone mineral densitometry from Hologic, virtual colonoscopy/cardiology from Viatronix, a revolutionary contrast injection device from Transflux, point of care ultrasound by Terason.

Vertec are also leading suppliers of radiotherapy devices and consumables such as patient immobilisation systems, mould room thermoplastics and radiotherapy accessories, patient location monitoring, fiduciary markers and radiation protection.

Featured at the meeting is the UK's leading x-ray mini C-arm intraoperative system, the Hologic Fluoroscan InSight FD.

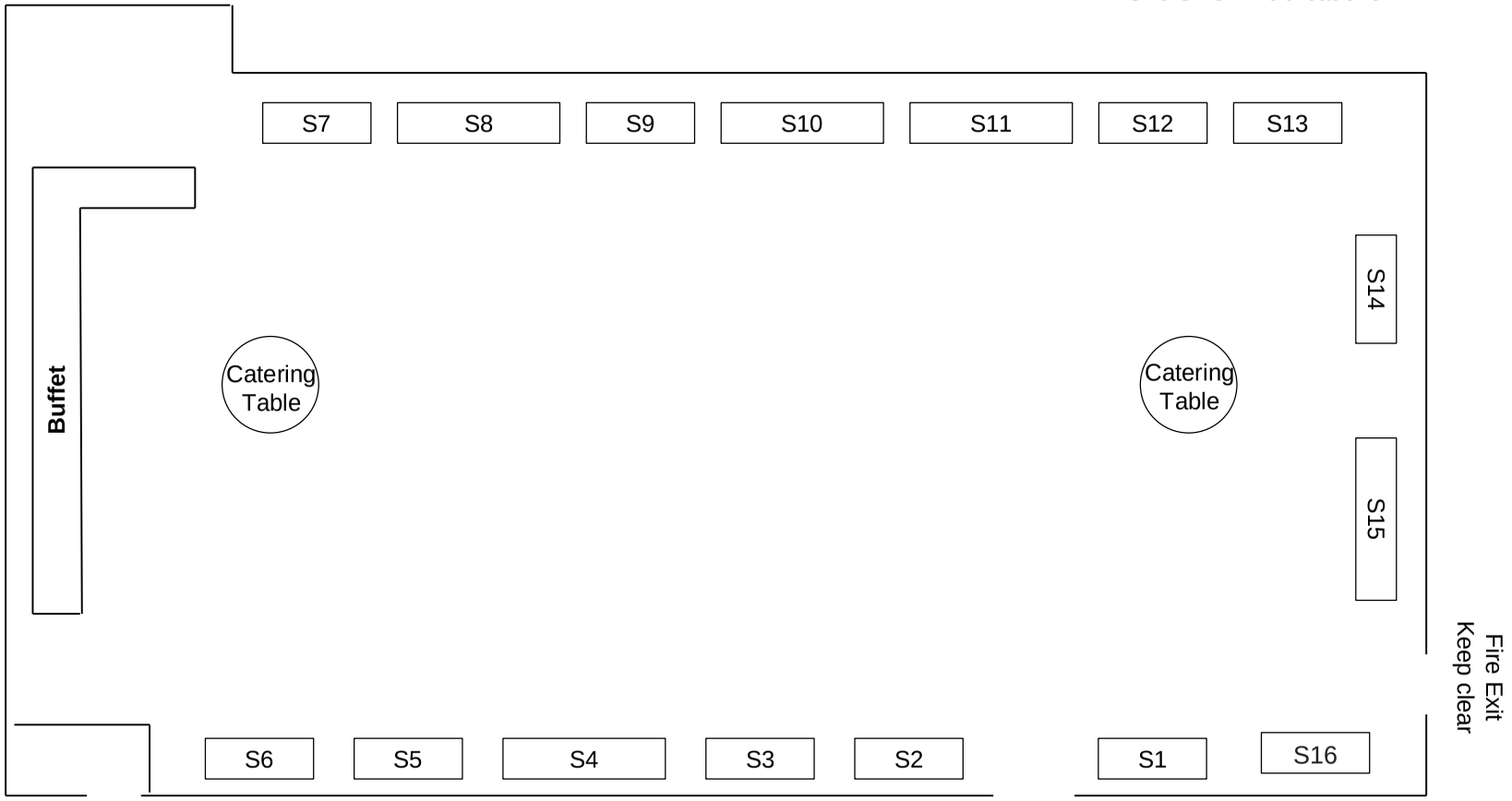
The next generation of Mini C-arm Imaging with Flat Detector Technology, Insight FD has been designed with the surgeon in mind. It features an ergonomic flat detector design with ease of positioning for patient/operator access. To cover all extremities, it has an extensive range of motion and a forward tube source design offers greater C-arm depth with automatic imaging with dose optimisation. Superb image quality is delivered by flat detector technology with 75 micron array and 2k x 1.5k resolution complemented by new image processing algorithms for distortion-free images. Large anatomy penetration is routine without extra dose and for ease of use, Insight has adjustment-free imaging with automatic motion and metal detection, touch-screen interface with easy-to-understand controls - swivel and tilt capability and customisable imaging parameters.

Finally, so that the surgeon can operate the system without any outside assistance, Vertec offer full IR(M)ER training as part of the package.

Exhibition Floor Plan
Great Hall (not to scale)

S1 Jewel Management Ltd T/A General Medical
S2 Lavender Medical Ltd
S3 Vertec Scientific Ltd
S4 Medartis Limited
S5 Leda Orthopaedics Ltd
S6 Mercian Surgical Supply Co Ltd
S7 Hospital Innovations

S8 Osteotec Ltd
S9 Lockdown Medical Limited
S10 Swedish Orphan Biovitrum Ltd
S11 Sovereign Medical Ltd
S12 Acumed Ltd
S13 VBS Direct Ltd
S14 Biovation UK Ltd
S15 DP Medical Systems Ltd
S16 SAGE Publications



BSSH

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