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2021-Sept-01	<p>THE INFLUENCE OF GENDER ON OPERATIVE AUTONOMY IN SURGICAL TRAINING (GOAST) - REGIONAL PILOT STUDY J. Cherry, S. Downie, TORRCo Authors*, T. Harding, S. Gill and S. Johnson Ninewells Hospital, Dundee DD1 9SY Email: jennifer.cherry@nhs.scot</p> <p>Global surgical literature suggests that female trainees have less operative autonomy than their male counterparts. This pilot study had the primary objective to identify difference in autonomy by gender, and to power a national study to carry out further quantitative and qualitative research on this.</p> <p>This was a retrospective, cross-sectional study utilising eLogbook data for all orthopaedic trainees (ST2-8) and consultants with CCT date 2016-2021 in a single Scottish deanery. The primary outcome measure was percentage of procedures undertaken as lead surgeon. 15 trainees and four recent consultants participated, of which 12 (63%) were male (mean grade 5.2), and 7 (37%) were female (mean grade 4.3). Trainees were lead surgeon on 64% of procedures (17595/27558), with autonomy rising with grade (37% ST1 to 85% ST8, OR 9.4). Operative autonomy was higher in male vs female trainees (66.5% and 61.4% respectively, $p < 0.0001$), with female trainees more likely to operate with a supervisor present (STU/S vs P/T, f 48%:13%, m 45%:20%).</p> <p>This pilot study found that there was a significant difference in operative autonomy between male and female trainees, however this may be explained by differences in mean grade of male vs female trainees. Five trainees took time OOT, 4/5 of whom were female. Extension to a national multi-centre study should repeat the quantitative method of this study with additional qualitative analysis including assessing effect of time OOT to explore the reason for any gender discrepancies seen across different deaneries in the UK.</p> <p>*Tayside Orthopaedic Registrar Research Collaborative (TORRCo) Authors: Graeme Nicol, Michael Reidy, Craig Tinning, Alasdair MacInnes, Peter Davies, Joseph Littlechild, Alastair Faulkner, Peter Hutchison, Rebecca Lewis, Ewan Semple, Jennifer Dunn, Iuliana Kanya, Christopher Donoghue, Katie Hoban, Samuel MacKenzie & Elizabeth Lindsay</p>
2021-Sept-03	<p>IMPACT-GLOBAL: PREVALENCE, CLINICAL PREDICTORS AND MORTALITY ASSOCIATED WITH COVID-19 IN HIP FRACTURE PATIENTS. AN INTERNATIONAL MULTICENTRE STUDY OF 7,090 PATIENTS A.J. Hall, N.D. Clement, Impact-Global Study Group, C. Ojeda-Thies, A.M.J. Maclullich, G. Toro, A. Johansen, T.O. White, A.D. Duckworth IMPACT Group, c/o Department of Orthopaedics & Trauma, University of Edinburgh, 50 Little France Crescent, Edinburgh, EH16 4SA, UK Email: Andrew.Hall@ed.ac.uk</p> <p>This international multicentre retrospective cohort study aimed to assess: 1) prevalence of COVID-19 in hip fracture patients, 2) effect on mortality, and 3) clinical factors associated mortality among COVID-19-positive patients.</p> <p>A collaboration among 112 centres in 14 nations collected data on all patients with a hip fracture between 1st March-31st May 2020. Patient, injury and surgical factors were recorded, and outcome measures included admission duration, COVID-19 and 30-day mortality status.</p> <p>There were 7090 patients and 651 (9.2%) were COVID-19-positive. COVID-19 was independently associated with male sex ($p=0.001$), residential care ($p<0.001$), inpatient fall ($p=0.003$), cancer ($p=0.009$), ASA grade 4-5 ($p=0.008$; $p<0.001$), and longer admission ($p<0.001$). Patients with COVID-19 had a significantly lower chance of 30-day survival versus those without (72.7% versus 92.6%, $p<0.001$), and COVID-19 was independently associated with increased 30-day mortality risk ($p<0.001$). Increasing age ($p=0.028$), male sex ($p<0.001$), renal ($p=0.017$) and pulmonary disease ($p=0.039$) were independently associated with higher 30-day mortality risk in patients with COVID-19 when adjusting for confounders.</p> <p>The prevalence of COVID-19 in hip fracture patients was 9% and was independently associated with a three-fold increased 30-day mortality risk. Clinical factors associated with mortality among COVID-19-positive hip fracture patients were identified for the first time. This is the largest study, and the only global cohort, reporting on the effect of COVID-19 in hip fracture patients. The findings provide a benchmark against which to determine vaccine efficacy in this vulnerable population and are especially important in the context of incomplete vaccination programmes and the emergence of vaccine-resistant strains.</p>

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<p style="writing-mode: vertical-rl; transform: rotate(180deg);">2021-Sept-09</p>	<p>USE OF PRE-OPERATIVE EUROQOL FIVE-DIMENSION (EQ-5D) SCORES TO PRIORITISE PATIENTS FOR ELECTIVE HIP AND KNEE ARTHROPLASTY IN THE AFTERMATH OF THE COVID-19 PANDEMIC L. Farrow, J. Redmore, P.Talukdar G.P. Ashcroft Woodend Hospital, Eday Road, Aberdeen, Scotland AB15 6XS Email: luke.farrow@abdn.ac.uk</p> <p>One potential approach to addressing the current hip and knee arthroplasty backlog is via adoption of surgical prioritisation methods, such as use of pre-operative health related quality of life (HRQOL) assessment. We set out to determine whether dichotomization using a previously identified bimodal EuroQol Five-Dimension (EQ-5D) distribution could be used to triage waiting lists.</p> <p>516 patients had data collected regarding demographics, perioperative variables and patient reported outcome measures (pre-operative & 1-year post-operative EQ-5D-3L and Oxford Hip and Knee Scores (OHS/OKS). Patients were split into two equal groups based on pre-operative EQ-5D Time Trade-Off (TTO) scores and compared (Group1 [worse HRQOL] = -0.239 to 0.487; Group2 [better HRQOL] = 0.516 to 1 (best)). The EQ5D TTO is a widely used and validated HRQOL measure that generates single values for different combinations of health-states based upon how individuals compare x years of healthy living to x years of illness.</p> <p>We identified that those in Group1 had significantly greater improvement in post-operative EQ-5D TTO scores compared to Group2 (Median 0.67vs.0.19; $p<0.0001$ respectively), as well as greater improvement in OHS/OKS (Mean 22.4vs16.4; $p<0.0001$ respectively). Those in Group2 were significantly less likely to achieve EQ-5D MCID attainment (OR 0.13, 95%CI 0.07-0.23; $p<0.0001$) with a trend towards lower OHS/OKS MCID attainment (OR 0.66, 95%CI 0.37-1.19; $p=0.168$). There was no statistically significant difference in adverse events.</p> <p>These finding suggest that a pre-operative EQ-5D cut-off of ≤ 0.487 for hip and knee arthroplasty prioritisation may help to maximise clinical utility and cost-effectiveness in a limited resource setting post COVID-19.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">2021-Sept-11</p>	<p>DELAYED ACJ RECONSTRUCTION DOES NOT INCREASE THE RISK OF FIXATION FAILURE OR MAJOR COMPLICATIONS H. Pleasant, P. Robinson, C.M. Robinson and J.A. Nicholson Email: s1611910@ed.ac.uk Department of Trauma and Orthopaedics, Royal Infirmary Edinburgh, EH16 4SA, UK</p> <p>Management of highly displaced acromioclavicular joint (ACJ) injuries remain contentious. It is unclear if delayed versus acute reconstruction has an increased risk of fixation failure and complications. The primary aim of this was to compare complications of early versus delayed reconstruction. The secondary aim was to determine modes of failure of ACJ reconstruction requiring revision surgery.</p> <p>A retrospective study was performed of all patients who underwent operative reconstruction of ACJ injuries over a 10-year period (Rockwood III-V). Reconstruction was classed as early (<12 weeks from injury) or delayed (≥ 12 weeks). Patient demographics, fixation method and post-operative complications were noted, with one-year follow-up a minimum requirement for inclusion. Fixation failure was defined as loss of reduction requiring revision surgery.</p> <p>104 patients were analysed (n=60 early and n=44 delayed). Mean age was 42.0 (SD 11.2, 17-70 years), 84.6% male and 16/104 were smokers. No difference was observed between fixation failure ($p=0.39$) or deep infection ($p=0.13$) with regards to acute versus delayed reconstruction. No patient demographic or timing of surgery was predictive of fixation failure on regression modelling. Overall, eleven patients underwent revision surgery for loss of reduction and implant failure (n=5 suture fatigue, n=2 endo-button escape, n=2 coracoid stress fracture and n=2 deep infection).</p> <p>This study suggests that delayed ACJ reconstruction does not have a higher incidence of fixation failure or major complications compared to acute reconstruction. For those patients with ongoing pain and instability following a trial of non-operative treatment, delayed reconstruction would appear to be a safe treatment approach.</p>

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2021-Sept-12	<p>OPERATIVELY MANAGED DISTAL RADIUS FRACTURES: COMPLICATIONS AND RE-INTERVENTION RATE FROM A SINGLE CENTRE K.R. Bell, J. Balfour, W.M. Oliver, T.O. White, S.G. Molyneux, N.D. Clement, A.D. Duckworth. Email: katrinabell@doctors.org.uk Royal Infirmary of Edinburgh, Edinburgh, EH16 4SA, UK.</p> <p>The primary aim was to determine the rate of complications and re-intervention rate in a consecutive series of operatively managed distal radius fractures.</p> <p>Data was retrospectively collected on 304 adult distal radius fractures treated at our institution in a year. Acute unstable displaced distal radius fractures surgically managed within 28 days of injury were included. Demographic and injury data, as well as details of complications and their subsequent management were recorded.</p> <p>There were 304 fractures in 302 patients. The mean age was 57yrs and 74% were female. Most patients were managed with open reduction and internal fixation (ORIF) (n=278, 91%), with 6% (n=17) managed with manipulation and Kirschner wires and 3% (n=9) with bridging external fixation. Twenty-seven percent (n=81) encountered a post-operative complication. Complex regional pain syndrome was most common (5%, n=14), followed by loss of reduction (4%). Ten patients (3%) had a superficial wound infection managed with oral antibiotics. Deep infection occurred in one patient. Fourteen percent (n=42) required re-operation. The most common indication was removal of metalwork (n=27), followed by carpal tunnel decompression (n=4) and revision ORIF (n=4). Increasing age (p=0.02), female gender (p=0.02) and high energy mechanism of injury (p<0.001) were associated with developing a complication. High energy mechanism was the only factor associated with re-operation (p<0.001).</p> <p>This study has documented the complication and re-intervention rates following distal radius fracture fixation. Given the increased risk of complications and the positive outcomes reported in the literature, non-operative management of displaced fractures should be considered in older patients.</p>
2021-Sept-15	<p>THE ABERDEEN OUTPATIENT DEDICATED PERCUTANEOUS NEEDLE FASCIOTOMY CLINIC FOR THE TREATMENT OF DUPUYTREN'S DISEASE. A VALUABLE RESOURCE IN THE RE-ESTABLISHMENT OF ORTHOPAEDIC SERVICE FOLLOWING THE CORONAVIRUS PANDEMIC. Y. Khan, K. Hamlin, C. Miller, D. Lawrie Email: yasmeen.khan@nhs.scot The Aberdeen Royal Infirmary, NHS Grampian, Foresterhill Health Campus, Aberdeen, AB252ZN</p> <p>Reconfiguration of elective orthopaedic surgery presents challenges and opportunities to develop outpatient pathways to reduce surgical waiting times. Dupuytren's disease (DD) is a benign progressive fibroproliferative disorder of the fascia in the hand, which can be disabling. Percutaneous-needle-fasciotomy (PNF) can be performed successfully in the outpatient clinic.</p> <p>The Aberdeen hand-service has over 10 years' experience running dedicated PNF clinics. NHS Grampian covers a vast area of Scotland receiving over 11749 referrals to the orthopaedic unit yearly. 250 patients undergone PNF in the outpatient department annually. 100 patients who underwent PNF in outpatients (Jan2019-Jan2020).</p> <p>79M, 21F. Average age 66 years range (29-87). 95 patients were right hand dominant. DD risk factors: 6 patients were diabetic, 2 epileptic, 87 patients drank alcohol. 76 patients had a family history of DD. Disease severity, single digit 20 patients, one hand multiple digits in 15 patients, bilateral hands in 65 patients of which 5 suffered form ectopic manifestation suggestive of Dupuytren's diasthesis. Using Tubiana Total flexion deformity score pre and post fasciotomy. Type 1 total flexion deformity (TFD) between 0-45 degrees pre PNF n=60 post N= 85, Type 2 TFD 45-90 degrees pre PNF n=18 post N=9, Type 3 TFD 90-135 pre PNF n=15 post N= 5, Type 4 TFD >135 pre PNF n=1 post PNF N=1. Using Chi-square statistical test, a significant difference was found at the p<0.05 between the pre and post PNF TFD. Complication: 8 recurrence, 1 skin tear. No patients sustained digital nerve injury.</p> <p>Outpatients PNF clinics are a valuable resource.</p>

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2021-Sept-17	<p>PROPHYLACTIC PINNING IN SLIPPED UPPER FEMORAL EPIPHYSIS – A CLOSED LOOP AUDIT OF 25 YEARS PRACTICE E.A. Semple, A. Bakhiet, S. Dalgleish, D.M. Campbell, J.G.B. MacLean Department of Trauma & Orthopaedics, NHS Tayside, Ninewells Hospital, James Arrott Drive, Dundee, DD2 1SG, UK. abdel.bakhiet@nhs.scot</p> <p>Prophylactic pinning of the contralateral hip in unilateral Slipped Upper Femoral Epiphysis (SUFE) persists as a source of debate with the majority of surgeons selecting this option in a proportion of patients whom they regard as at increased risk of a subsequent slip.</p> <p>Universal prophylactic pinning was introduced in our region in 2005 after an audit of ten years local practice identified 25% of unilateral cases presented with a subsequent slip. This study reports our experience between 2005 and 2020.</p> <p>In this prospective study, 44 patients presented with 55 affected hips compared with 60 patients with 67 affected hips in the original study. Two patients were excluded as their initial slip had not been treated in our unit. Of the 42 hips seven were bilateral, 34 of the 35 unilateral hips underwent prophylactic pinning. The one exception subsequently underwent prophylactic pinning due to developing pain.</p> <p>Consistent with our original series, at a minimum follow up of 13 months there have been no complications of infection, fracture, chondrolysis or avascular necrosis subsequent to prophylactic pinning.</p> <p>Over 25 years 70 patients have undergone prophylactic pinning without complication. On the premise that 25% of our unpinned hips presented with subsequent slips before instituting our policy we estimate that we have prevented 17 subsequent slips over 25 years including the consequences which can be significant. We continue to advocate universal prophylactic pinning as an effective and safe practice in the management of SUFE.</p>
2021-Sept-18	<p>FEMORAL INTRA-MEDULLARY NAILING: WHAT'S GOING TO FAIL? A RETROSPECTIVE, MULTI-CENTRE, COHORT STUDY M. McLean, M. Kennedy, E. Wright, K. Lee, C. Toh, E. Fraser, S. Gill, S. Bell Queen Elizabeth University Hospital, Glasgow G51 4TF, United Kingdom. Email: michael.mclean@ggc.scot.nhs.uk</p> <p>Femoral antegrade intra-medullary nailing (FAIMN) is an increasingly common, widely utilised procedure used for proximal femoral and femoral shaft fractures. We sought to identify patient, fracture morphological, implant, fixation and reduction factors associated with treatment failure for fracture related FAIMN.</p> <p>We carried out a retrospective, multi-centre, cohort study, comparing selected risk factors in a control and treatment failure cohort. The control cohort (n=73) included all consecutive patients undergoing a FAIMN for fracture within a 12-month period. The treatment failure cohort (n=52) included all patients undergoing revision surgery following a failed FAIMN for fracture within the last 10 years. Patients were excluded for incorrect procedure coding, non-fracture pathology requiring intra-medullary nailing, removal of metalwork for dynamization or symptomatic hardware and control patients with subsequent treatment failure.</p> <p>The risk of treatment failure was significantly higher with high-energy injuries, AO-32B fracture type, inadequate cortical reduction, use of less than 2 distal locking screws and the absence of ancillary cerclage wire/cable fixation. The most common means of failure were non-union, followed by nail fracture and proximal screw cut out. Patients requiring revision surgery required 2.45 total procedures, waited 1.58 years for revision surgery and 2.26 years for discharge from outpatient follow up.</p> <p>These results would suggest that high energy and AO-32B fractures represent higher risk injury groups. Treatment should involve near anatomical cortical reduction, with open ancillary fixation where required with 3 point proximal and dual screw distal fixation to reduce the risk of failure.</p>

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<p style="text-align: center;">2021-Sept-19</p>	<p>OXFORD UNICOMPARTMENTAL KNEE ARTHROPLASTY VERSUS TOTAL KNEE ARTHROPLASTY - LONG TERM (TEN YEAR) OUTCOMES AND SURVIVAL ANALYSIS E. Lindsay, J. Lim, B. Clift, G. Cousins, D. Ridley. Department of Trauma and Orthopaedics, Ninewells Hospital, Dundee DD2 1SG, UK. Email: Elizabeth.lindsay4@nhs.scot</p> <p>Unicompartmental knee osteoarthritis can be treated with either Total Knee Arthroplasty (TKA) or Unicompartmental Knee Arthroplasty (UKA) and controversy remains as to which treatment is best. UKA has been reported to offer a variety of advantages, however many still see it as a temporary procedure with higher revision rates.</p> <p>We aimed to clarify the role of UKA and evaluate the long-term and revision outcomes. We retrospectively reviewed the pain, function and total Knee Society Score (KSS) for 602 UKA and 602 TKA in age and gender matched patients over ten years.</p> <p>The total pre-operative KSS scores were not significantly different between UKA and TKA (42.67 vs 40.54 $P=0.021$). KSS (pain) was significantly better in the TKA group (44.39 vs 41.38 $P= 0.007$) at one year and at five years post-operatively (45.33 vs 43.12 $P=0.004$). There was no statistically significant difference for KSS (total) in TKA and UKA during the study period. 16.3% of UKA and 20.1% of TKA had a documented complication. 79 UKA (13%) and 36 TKA (6%) required revision surgery. Despite the higher revision rate, pre-operative KSS (total) before revision was not significantly different between UKA and TKA (42.94 vs 42.43 $P=0.84$). Performance for UKAs was inferior to TKAs in Kaplan-Meier cumulative survival analysis at 10 years ($P<0.001$).</p> <p>Both UKA and TKA are viable treatment options for unicompartmental knee osteoarthritis, each with their own merits. UKA is associated with fewer complications whereas TKA provides better initial pain relief and is more durable and less likely to require revision.</p>
<p style="text-align: center;">2021-Sept-24</p>	<p>THE OUTCOME OF TEMPERATURE MONITORING SPINAL BRACE WEAR IN ADOLESCENT IDIOPATHIC SCOLIOSIS: A COMPARISON WITH A SYSTEMATIC REVIEW M. Scott-Watson, S.F. Adams, M. Dixon, S. Garcia-Martinez, M. Crawford, C.I. Adams Royal Hospital for Children, Orthotics Department, Glasgow, G51 4TF, UK. Email: christopher.adams@spinesurgeons.scot</p> <p>Success treating adolescent idiopathic scoliosis (AIS) with bracing is thought to be related to the time worn. Temperature monitors are one method of identifying when patients are wearing their brace. Temperature data from the start of first brace treatment was reviewed between 2014 and 2020 with this available for 18 patients.</p> <p>The current NHS recommendation is brace wear for 20 hours per day. On average, patients complied with this recommendation 27.8% of the time. There were five patients who averaged more than 20 hours.</p> <p>We used the measure of success from the Bracing in Adolescent Idiopathic Scoliosis Trial (BrAIST), of less than 50 degrees Cobb angle. Success at the end of temperature collection was achieved for 14 (78%) of our patients. However, using the same time cohorts our group with 12.9-17.6 hours brace wear per day had a lower success rate at 67%. We still noted that increased brace wear of more than 17.7 hours per day had a higher likelihood of success than wearing it less than 6 hours per day.</p> <p>Temperature monitors allowed an analysis of when patients were achieving their brace wear. When comparing daywear (8am-8pm) versus nightwear (8pm-8am), patients wore the brace for an average of 7.3 hours and 9.1 hours, respectively.</p> <p>We conclude the minority of our patients comply with wear time advice. The success of brace treatment is likely related to the time the brace is worn. More brace wear is achieved at night, compared to daywear for our patients.</p>

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2021-Sept-26	<p>ACUTE CORRECTION OF SEVERE COMPLEX ADOLESCENT LATE-ONSET TIBIA VARA BY MINIMALLY INVASIVE OSTEOTOMY AND SIMPLE CIRCULAR FIXATION. A CASE SERIES WITH 2-YEAR MINIMUM FOLLOW-UP</p> <p>A.B. Zein, A. S. Elhalawany, M. Ali, G.R. Cousins Department of Orthopaedic Surgery, Faculty of Medicine, Cairo University, Kasr Al Ainy St. Cairo 11562, Egypt. Email: ahmed.elhalawany@nhs.scot</p> <p>Despite multiple published reviews, the optimum method of correction and stabilisation of Blount’s disease remains controversial. The purpose of this study is to evaluate the clinical and radiological outcomes of acute correction of late-onset tibial vara by percutaneous proximal tibial osteotomy with circular external fixation using two simple rings. This technique was developed to minimise cost in a context of limited resources.</p> <p>This study was conducted between 2016 and 2020. We retrospectively reviewed the clinical notes and radiographs of 30 patients (32tibiae) who had correction of late-onset tibia by proximal tibial osteotomy and Ilizarov external fixator. All cases were followed up to 2 years.</p> <p>The mean proximal tibial angle was 65.7° (±7.8) preoperatively and 89.8° (±1.7) postoperatively. The mean mechanical axis deviation improved from 56.2 (±8.3) preoperatively to 2.8 (±1.6) mm postoperatively. The mean femoral-tibial shaft angle was changed from - 34.3° (±6.7) preoperatively to 5.7° (±2.8) after correction. Complications included overcorrection (9%) and pin tract infection (25%). At final follow up, all patients had full knee range of motion and normal function. All cases progressed to union and there were no cases of recurrence of deformity.</p> <p>This simple procedure provides secure fixation allowing early weight bearing and early return to function. It can be used in the context of health care systems with limited resources. It has a relatively low complication rate. Our results suggest that acute correction and simple circular frame fixation is an excellent treatment choice for cases of late-onset tibia vara, especially in severe deformities.</p>
2021-Sept-28	<p>THE OLYMPIA ANATOMIC POLISHED CEMENTED STEM IS ASSOCIATED WITH A HIGH SURVIVORSHIP, EXCELLENT HIP SPECIFIC FUNCTIONAL OUTCOME, AND HIGH SATISFACTION LEVELS: FOLLOW-UP OF 239 CONSECUTIVE PATIENTS BEYOND 15-YEARS.</p> <p>G.S Turnbull, J.A Nicholson, C.Marshall, D.J Macdonald, S.J Breusch and N.D Clement. Department of Trauma and Orthopaedics, The Royal Infirmary of Edinburgh, EH16 4SA. Email: gsturnbull@live.com</p> <p>The Olympia femoral stem is a stainless steel, anatomically shaped, polished and three-dimensionally tapered implant designed for use in cemented total hip arthroplasty (THA). The primary aim of this study was to determine the long-term survivorship, radiographic outcome, and patient reported outcome measures (PROMs) of the Olympia stem.</p> <p>Between May 2003 and December 2005, 239 patients (264 THAs) underwent a THA with an Olympia stem in our institution. PROMs were assessed using the Oxford Hip Score (OHS), EuroQol-5 dimensions (EQ-5D) score and patient satisfaction at mean 10-years following THA. Patient records and radiographs were then reviewed at a mean of 16.5 years (SD 0.7, 15.3 to 17.8) following THA to identify occurrence of complications or revision surgery for any cause.</p> <p>Mean patient age at surgery was 68.0 years (SD 10.9, 31-93 years). There were 156 women (65%, 176 THAs). Osteoarthritis was the indication for THA in 204 patients (85%). Stem survivorship at 10 years was 99.2% (95 % confidence interval [CI], 97.9%-100%) and at 15 years was 97.5% (94.6%–100%). The 15-year stem survival for aseptic loosening was 100%. Only one occurrence of peri-prosthetic fracture was identified, with no episodes of dislocation found. At a mean of 10 (SD 0.8, 8.7 -11.3) years follow-up, mean OHS was 39 (SD 10.3, range 7 - 48) and 94% of patients reported being very satisfied or satisfied.</p> <p>The Olympia stem demonstrated excellent 10-year PROMs, very high rates of stem survivorship and negligible peri-prosthetic fracture and dislocation rate at final follow-up beyond 15 years.</p>