



SAOA 2026 Oral presentation abstract book

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P1. Psychological Morbidity and Referral Patterns Following Musculoskeletal Trauma in South Africa: A Cross-Sectional Study

Charl Bosman (University of Witwatersrand), Mohamed Bhamjee (University of Witwatersrand)

Musculoskeletal trauma is a major contributor to global disability, carrying a disproportionate burden in low- and middle-income countries. Depression, anxiety, and PTSD are highly prevalent following injury, profoundly influencing rehabilitation and recovery. Their presence predicts poorer functional outcomes, greater pain, higher opioid use, and increased complication and re-operation rates. Despite this, the true extent of psychological distress and mental health referral in South African orthopaedic trauma care remains uncharacterised. To our knowledge this is the first South African study to characterise both psychological morbidity prevalence and referral rates.

A cross-sectional study was conducted at a high-volume public orthopaedic trauma unit. Adults attending follow-up six to twelve weeks after musculoskeletal injury completed four validated instruments: the PHQ-9 (depression), GAD-7 (anxiety), PCL-5 (PTSD), and Generalised Self-Efficacy Scale (GSE). Mental health referral was independently documented. Multivariable logistic regression identified independent predictors of each psychological outcome.

Of 220 participants, 56.8% screened positive for at least one disorder and 20.9% screened positive on all three simultaneously. Prevalence was 45.5% for probable depression, 35.9% for probable anxiety, and 35.9% for probable PTSD. Despite this burden, only 7.2% of those screening positive were referred for mental health care. Referral was almost entirely predicted by a pre-existing psychiatric diagnosis (risk difference 86.5 percentage points; $p < 0.001$) rather than current screening results. Higher GSE scores were independently protective against depression, anxiety, and any positive screen. Injury-related job loss conferred a fivefold increase in the odds of probable PTSD (OR 5.13; 95% CI 1.28–23.4).

Psychological morbidity following musculoskeletal trauma is prevalent, frequently co-occurring, and critically under-referred. In current practice, referral is driven by prior diagnosis rather than active symptom recognition. Integrating brief validated screening tools with a defined referral pathway into routine orthopaedic care is a practical, high-impact intervention to close this gap and deliver holistic trauma care.

P2. Filling the void: Three-dimensional glenoid anatomy and predictive modelling of premorbid morphology in the South African population

Jeandre Kotze (University of Cape Town), Cameron Anley (University of Stellenbosch), Cornel Breedts (University of Stellenbosch), Dorian Marx (Craniotech), Sven Delpont (Craniotech), Mikail Amod (University of Cape Town), Ntambue Kauta (University of Cape Town)

This study aimed to characterise three-dimensional (3D) glenoid anatomy in a South African cohort, quantify bilateral differences to assess the reliability of contralateral templating in shoulder arthroplasty, and to develop and evaluate a computed tomography (CT)-based 3D statistical shape model (SSM) for predicting premorbid glenoid morphology in this population.

A cross-sectional CT-based imaging study was performed in skeletally mature adults with bilateral premorbid scapulae. Following 3D reconstruction, anatomical landmarks were manually placed and glenoid version, inclination, height, width, depth and lateral offset were measured. Paired differences were analysed. Intra- and inter-observer reliability were assessed using intraclass correlation coefficients (ICCs). A subset was used to construct sex- and side-specific SSMs. Model performance was evaluated by comparing SSM-predicted morphology from simulated defects with actual premorbid measurements.

A total of 159 individual (85 female, 74 male) and 71 paired scapulae (38 female, 33 male) were analysed. The median age was 36.0 years (IQR 28.0–45.0). Bilateral comparison demonstrated statistically significant differences in glenoid inclination in both females ($p = 0.034$) and males ($p = 0.004$); however, all differences were $< 2^\circ$, below minimal detectable change thresholds and clinically negligible. No statistically significant differences were observed for other parameters. Measurement reliability was excellent (ICC 0.92–0.99). SSM reconstruction

demonstrated small but statistically significant differences in selected linear parameters (height, width and depth); however, all differences were ≤ 0.8 mm, below predefined minimal detectable change thresholds and substantially smaller than reported surgical error margins.

In this South African cohort, premorbid glenoid morphology demonstrates a high degree of bilateral symmetry, supporting the use of contralateral templating in appropriately selected patients. SSM achieved clinically acceptable reconstruction accuracy and may serve as a useful adjunct in preoperative planning, particularly in cases of bilateral pathology or complex glenoid bone loss.

P3. PRIORITI-SA (PRIoritisation of ORthopaedic Resources and Interventions in Trauma In South Africa): A National Delphi Consensus Study

Jeandre Kotze (University of Cape Town), Mikail Amod (University of Cape Town), Cornel Breedts (University of Stellenbosch), Cameron Anley (University of Stellenbosch), Dane Maimin (Mitchells Plain Hospital), Nando Ferreira (University of Stellenbosch), Marc Nortje (University of Cape Town)

Orthopaedic trauma places a major burden on South Africa's resource-constrained public healthcare system. High trauma volumes, limited theatre capacity, and inequitable resource distribution contribute to delays and suboptimal outcomes. The absence of a standardised prioritisation framework for operative fracture management results in inconsistent and potentially inequitable care allocation. This study aimed to establish national expert consensus on patient- and injury-specific factors that most strongly influence prioritisation in orthopaedic trauma care.

A three-round, qualitative Delphi study was conducted using electronic surveys. Orthopaedic surgeons across South Africa were invited to participate. Round 1 generated prioritisation domains using open-ended responses. Round 2 employed Likert-scale ratings to assess factor importance, weighting, red-flag management, and tie-breaker logic. Round 3 refined definitions and consensus thresholds. Consensus was defined as $\geq 75\%$ agreement.

Sixty-seven participants contributed to Round 1, 58 to Round 2, and 67 to Round 3. Seven patient-related factors were retained and reached consensus: pre-injury mobility (98.5%), physiological reserve (98.5%), alcohol/illicit drug use (98.5%), psychosis (97%), diabetes mellitus (95.5%), age (94%) and nutritional status (94%). Five injury-related factors were retained: soft-tissue status, neurovascular status (excluding threatened limb), anatomical site, fracture type/pattern, and time to theatre. Injury-related factors were preferentially weighted over patient-related factors (53.5% vs 14.3%). Vascular compromise (95.5%) and compartment syndrome (91%) were identified as overriding indications for urgent intervention. Evolving sepsis (65.7%) and septic arthritis (59.7%) were also supported as overriding indications, while irreducible major joint fracture-dislocation (67.2%) was identified as a strong upweighting factor. Additional domains influencing surgical delay and tie-breaker decision-making were defined.

This national Delphi consensus establishes a context-specific framework for prioritising orthopaedic trauma surgery in South Africa. These findings provide the foundation for developing a validated, practical prioritisation scoring system to improve equity, transparency, and outcomes in South-Africa and other resource-limited settings.

P4. The influence of surgeon experience on the accuracy of patient-specific vs. conventional instrumentation in glenoid guide pin placement: a 3D printed model study in reverse shoulder arthroplasty

Johan Bosch (Frere Hospital, Walter Sisulu University), Douglas Bruce-Brand (Tygerberg Hospital, Stellenbosch University), Niel Bruwer (Life St Dominics Hospital), Stephen Roche (University of Cape Town), Cameron Anley (Tygerberg Hospital, Stellenbosch University), Jonathan Vogel (Life Kingsbury Hospital), Theo Rösch (Netcare Jakaranda Hospital)

Glenoid component positioning in reverse shoulder arthroplasty (RSA) is technically demanding, and malpositioning may contribute to implant failure and suboptimal function. Low-volume surgeons are increasingly encountering patients who may benefit from RSA. Patient-specific instrumentation (PSI) and preoperative 3D planning have been proposed to improve accuracy. This study aimed to determine whether PSI provides a differential accuracy benefit to low-volume compared to high-volume surgeons.

Forty-five surgeons (17 high-volume, ≥ 20 RSAs annually; 28 low-volume, < 20 annually) participated in a cross-sectional study using 3D-printed glenoid models with a silicone shoulder envelope. Preoperative planning was based on a CT scan of a Walch type B3 glenoid. Each surgeon placed a glenoid central guide pin using conventional instrumentation (CI) and PSI on separate models. Outcomes included deviation from the preoperative plan for version, inclination, and starting point, measured using digital image analysis. Gross malposition ($> 10^\circ$ angular or > 4 mm translational error) and safe-zone placement (retroversion $0-10^\circ$, inferior inclination $0-10^\circ$, starting point < 4 mm deviation) were also assessed.

PSI significantly reduced mean deviation compared with CI across all surgeons (version 2.4° vs 11.2° ; inclination 2.5° vs 7.6° ; starting point 1.2 mm vs 4.5 mm; $p < 0.001$). Low-volume surgeons showed greater deviation with CI, while PSI produced significantly greater improvement in this group (method $\times$ volume interaction, $p = 0.006$). Gross malposition occurred in 89% of low-volume and 71% of high-volume cases with CI, but none with PSI. Safe-zone achievement improved from 7% (CI) to 96% (PSI).

PSI improved guide pin accuracy irrespective of experience, with the greatest relative benefit in low-volume surgeons, suggesting a role in improving consistency of glenoid component placement.

P5. Lower Limb Amputation Outcomes of two Orthopaedic Teaching Hospitals in South Africa

Stephen Mattushek (Wits), Oatile Phakathi (Wits), Selma Armas (UCT), Thomas Hilton (UCT)

Lower-limb amputation (LLA) is associated with significant morbidity for the amputee, their family and community. Amputation level, timely rehabilitation, and prosthesis provision are important factors in reducing morbidity, promoting societal reintegration, and potentially enabling a return to work. There is limited data describing outcomes of major-LLA in Low- and Middle-Income Countries (LMICs). We aimed to evaluate the causes of amputation, prosthesis dispensing times and utilisation, and return-to-work rates among patients undergoing major-LLA at two South African teaching hospitals.

We reviewed the records of 54 adult patients and administered the patient-reported Prosthesis Evaluation Questionnaire (PEQ) to consenting patients. Indications for amputation were infection (50.0%, $n = 27$) and sarcoma (44.4%, $n = 24$), most of which (66.7%, $n = 36$) were transfemoral. Prosthetist referral occurred in 53.7% ($n = 29$), with a significant difference between centres (13.6%, $n = 3$ vs 81.3%, $n = 26$, $p < 0.001$), and even fewer (27.8%, $n = 15$) received a prosthesis. The mean time to receiving a prosthesis was 491 days (IQR 132–861). The mean prosthesis use was 7.7 hours/day, and 82.9% ($n = 29$) performed daily activities without a prosthesis. Prosthesis was rejected due to poor fit (20.7%, $n = 6$), residual limb pain (17.2%, $n = 5$), and skin complications (17.2%, $n = 5$). Prosthesis Evaluation Questionnaire (PEQ) data demonstrated poor prosthesis acceptance and satisfaction rates. Paired employment data ($n = 26$) showed that 71.4% ($n = 5$) of previously employed patients returned to work, with 57.1% ($n = 4$) returning to their prior occupation. Among those unemployed pre-amputation, 81.8% ($n = 9$) remained unemployed.

Insufficient amputee rehabilitation (low prosthetist referral rates and prolonged prosthesis dispensing times), compounded by surgical complications (persistent pain and wound complications), led to poor prosthesis utilisation and satisfaction, limiting the ability to return to work. An ill-fitting prosthesis was the leading cause of prosthesis rejection.

Amputee rehabilitation and prosthesis services need to be improved to enhance functional outcomes and reduce the morbidity and fiscal burden of major-LLA.

P6. Audit of Orthopaedic Surgery Patients Referred from Primary Health Care Facilities to a Tertiary Hospital in South Africa

Leonard Muhango (Wits), Shabir Moosa (Wits), Marule Paul Kgagudi (Wits)

Referral pathways from primary health care (PHC) to tertiary orthopaedic services carry implications for resource allocation, diagnostic triage, and timeliness of specialist intervention. Whether these referrals appropriately reflect clinical need remains underexplored in South Africa. We conducted a retrospective clinical audit of 293 new orthopaedic referrals to Chris Hani Baragwanath Academic Hospital Polyclinic (01 June 2023 and 30 June 2024), assessing demographics, diagnostic accuracy, referral appropriateness, and referral letter quality. A validated tool incorporating the Quality Evaluation in Orthopaedic Surgery framework and South African Ideal Clinic standards was used.

Median age was 53 years (IQR 38 – 63), with 54.6% female. Most referrals originated from community health centres (66.9%). Spine pathology was the largest diagnostic category (34.1%), yet only 51.5% of provisional diagnoses proved accurate. Overall referral appropriateness was 63.1%; however, 77.1% of fracture/trauma referrals were inappropriate, suggesting bypass of district/regional hospital pathways. Referral letters achieved good quality ratings in 85.0% of cases, though clinical examination findings were documented in only 29.0%, and referring clinician contact details in 18.4%.

In conclusion, while the administrative elements of referral letters were largely complete, significant deficiencies exist in clinical documentation, diagnostic accuracy, and adherence to referral protocols. Strengthening musculoskeletal competency at the PHC level, coupled with systematic feedback mechanisms, could improve diagnostic accuracy and efficiency of tertiary orthopaedic services. This audit provides quantitative evidence on diagnostic accuracy, referral appropriateness, and letter quality domains previously under-documented locally. Findings inform service planning, clinician training, and quality improvement strategies targeting the PHC-tertiary referral interface.

P7. Non operative management of humeral shaft fractures at a South African District and Tertiary Hospital

D Hugo (Stellenbosch University)

Humeral shaft fractures account for about 5% of fractures in adults, representing a substantial socio-economic and recreational burden. The aim of the study was to investigate radiological outcomes (alignment and union) and investigate possible risk factors for non-union.

A retrospective cohort study was conducted between 2019 and 2024. Adult patients with a humeral shaft fracture who underwent initial non operative treatment with a U slab followed by a functional brace, were included. Patients with vascular injury and severe soft tissue injuries (which warranted fixation) and those who had not followed up until union were excluded. Patient demographic and clinical outcome variables, including alignment, union rate and time to union, were collected. Data are reported descriptively with associations investigated by means of chi-squared or Fisher's exact tests at a significance level of 0.05.

A total of 188 patients (mean age 37.8 ± 14 , 56.1%, n=137 male) were included. Of these, 83.5% (n=157) reached adequate fracture union at a median of 10 (interquartile range, IQR 8 – 12) weeks. A total of 16.5% (n=31) did not achieve adequate fracture union via non operative measures of which 29 were considered non-unions. Non-union was more common ($p < 0.001$) in older patients (45.9 ± 13.9 years) compared to their younger counterparts (36.0 ± 13.1 years). Similarly, non-union was over-represented ($p = 0.007$) in patients who sustained oblique fractures versus other fracture patterns, those who suffered from traffic related injuries ($p = 0.020$), had diabetes ($p = 0.003$), misused alcohol ($p < 0.001$) or were HIV positive ($p < 0.001$). Finally, open fractures ($p = 0.018$) or patients with fracture related infection ($p = 0.001$) were also more likely to result in non-union.

This study affirms that non-operative management in our setting leads to internationally comparable union rates and highlights certain risk factors that should be considered when deciding to initiate or continue non operative management.

P8. One screw, Two screw, Red screw, Blue screw: A survey of the preferred methods of syndesmotic fixation used by South African orthopaedic surgeons

Muhammed Abader (University of the Witwatersrand), Mohamed Bhamjee (University of the Witwatersrand)

Distal tibiofibular syndesmotic injuries account for up to 18% of ankle injuries and, if poorly treated, may result in pain and disability. Although international studies show wide variation in the treatment of syndesmotic injuries, South African practice patterns remain poorly described. This study aimed to describe current treatment practices for syndesmotic ankle fracture injuries in South Africa and determine whether preferences differ by surgeon subgroup, experience, sector, or academic affiliation.

A national cross-sectional survey was conducted among orthopaedic surgeons, registrars, and medical officers with at least 6 months of orthopaedic experience and a minimum of five ankle open reduction and internal fixation procedures performed. An anonymous online questionnaire was distributed through the South African Orthopaedic Association and institutional networks. A total of 184 respondents participated, of whom 84% were male, 44% were aged 30–39 years, and 56% were consultants. Gauteng contributed the largest proportion of respondents (50.5%), and 99% had treated syndesmotic injuries. Screw fixation was preferred by government and earlier-career surgeons, whereas private-sector and senior surgeons often used suture-button or hybrid constructs ($p < 0.001$). Academic-affiliated surgeons more frequently used three-cortex fixation and placed screws through a plate ($p = 0.001$ for both). Fixation was most commonly placed 2–4 cm above the tibial plafond. Routine screw removal was more common among private and experienced surgeons, while government surgeons typically removed hardware only when indicated. Earlier-career and government surgeons were more likely to modify constructs in obese or diabetic patients. In contrast to published literature, few surgeons routinely fixed posterior malleolar fragments smaller than 25%. Nearly all respondents were willing to adjust practice if high-quality evidence became available.

Syndesmotic screw fixation predominates in government and earlier-career practice, while suture-button and hybrid methods are favoured in private and senior practice. Variation persists, highlighting the need for stronger evidence to guide management.

P9. Reliability of Peroneus Longus Autograft & Associated Patient Morbidity in Adults undergoing Knee Ligament Reconstruction, a South African Perspective

Cornel Breedts (Stellenbosch University), Jeandre Kotze (University of Cape Town), David North (Winelands Knee Clinic), Marilize Burger (Stellenbosch University), Gian Du Preez (Stellenbosch University)

The peroneus longus tendon has been proposed as an alternative autograft for knee ligament reconstruction due to favourable biomechanical properties; however, no data exist regarding donor site morbidity and graft characteristics within the South African population. This study aimed to describe donor site morbidity following peroneus longus tendon harvesting in adults undergoing knee ligament reconstruction at 6 months post-operatively, and to characterise graft dimensions and harvest time.

A multicentre prospective observational study included adult patients undergoing knee ligament reconstruction using peroneus longus autografts. Patients with prior foot and ankle pathology were excluded. Intraoperative measurements included graft length, diameter, and harvest time. Outcomes included thigh circumference, kneeling pain, and validated patient-reported outcome measures (PROMs): Karlsson and Peterson Score (KSS), American Orthopaedic Foot and Ankle Society score (AOFAS), and Foot and Ankle Disability Index (FADI). Wounds were graded and presence peroneal nerve injuries recorded. Differences between pre- and 6-month post-operative outcomes were investigated.

This study included 40 patients (62.5% male, 37.5% female) with a mean age of 31.4 ± 10.4 years (range 18–51) and mean body mass index of 28.4 ± 8.6 (range 18.6–57.9). No difference ($p > 0.999$) in thigh circumference pre-

operative (52.1 ± 8.3 cm) and post-operative (52.1 ± 8.0 cm) was observed. Similarly, no differences were observed in the KSS ($p=0.352$), AOFAS ($p=0.241$), FADI ADL ($p=0.103$) or FADI Sport ($p=0.889$) PROMs. Mean graft length was 27.9 ± 3.3 cm (range 20-36), with a median diameter of 8 mm (Interquartile range [IQR] 8-8). Mean harvest time was 7.2 ± 1.8 minutes (range 3.0-12.0). No wound complications or new peroneal nerve injuries occurred.

No significant changes in patient-reported morbidity were observed at 6 months, and grafts of adequate length and diameter to perform knee ligament reconstruction were obtained providing context-specific data supporting its consideration as an autograft option.

P10. Outcomes of Patients with Neck of Femur Fractures Managed with Uncemented Hip Arthroplasty via a Direct Anterior Approach in a Developing Country Tertiary Institution

Kenneth Beck (Tygerberg Hospital), Elsabe Britz (Tygerberg Hospital), Sean Pretorius (Tygerberg Hospital), Marilize Burger (Stellenbosch University)

Outcomes of Patients with Neck of Femur Fractures Managed with Uncemented Hip Arthroplasty via a Direct Anterior Approach in a Developing Country Tertiary Institution.

Fragility neck of femur fractures pose significant morbidity and mortality risks to patients. Cemented arthroplasty, being the current generally accepted treatment option, is contrasted with our unit's common use of uncemented prostheses through a proven direct anterior approach (DAA). The aim of this study was to investigate Patient Reported Outcome Measures (PROMs) and complications occurring within the first 6 weeks using this method.

A retrospective descriptive study included all elderly patients (>60 years of age) NOF fractures managed with an uncemented arthroplasty via a DAA between 2021 and 2025. Demographic and clinical variables, including the 5Q-5D-5L score and the Oxford Hip Score (OHS) PROMs, were collected. Data are reported descriptively using medians (interquartile ranges, IQR) or as frequencies (counts).

A total of 379 patients (mean age 76.1 ± 9.4 years 33.8% male and 66.2% female) were included. Of these, 34.6% ($n=131$) were lost to follow-up. A median 5Q-5D-5L score of 0.622 (IQR 0.250-0.760) and OHS of 32 (IQR 20-39) at 6-weeks was reported. Early complications of the cohort that were successfully followed up ($n=248$) included intra-operative peri-prosthetic fractures (2.42% $n=6$), post-operative peri-prosthetic fractures (1.21% $n=3$), peri-prosthetic joint infection (1.21% $n=3$), lateral femoral cutaneous nerve palsy (2.42% $n=6$), Heterotopic Ossification (HO) (1.21% $n=3$), joint dislocation (2.02% $n=5$) and HO with lateral femoral cutaneous nerve palsy (0.40% $n=1$).

Complications and early PROMs are comparable to international literature which show 5Q-5D-5L scores ranging from 0.59-0.85 and OHS ranging from 35-42. The outcomes show that elderly patients with NOF fractures treated with an uncemented prosthesis through a DAA is an acceptable treatment but requires longer follow-up to ascertain its effectiveness over longer periods.

P11. Assessment of the Orthopaedic Trauma Burden in South African District and Regional Hospitals

Carel Willemse (Steve Biko Academic Hospital), Pududu Rachuene (Steve Biko Academic Hospital), Daniel Montwedi (Kalafong Provincial Tertiary Hospital)

A recent study published in the Lancet has shown that a lack of decentralized specialist services in low- and middle-income countries (LMICs) significantly increases morbidity, mortality, and loss of disability-adjusted life years (DALYs). Within a multi-tiered public health system, the absence of resources at district-level facilities often results in high volumes of patients being referred to tertiary centres, leading to overcrowding and a

breakdown in functionality at higher-level institutions. This study aimed to determine the need for decentralised orthopaedic services at lower-level hospitals by quantifying the trauma-burden and referral patterns in these institutions.

A retrospective observational cross-sectional study was conducted, analysing orthopaedic trauma data over a one-month period at six district and regional facilities. Inclusion criteria encompassed all patients presenting with orthopaedic-related trauma. Injuries were categorized as major or minor and referral patterns were documented.

Of 16,678 total emergency department presentations, 1,309 (7.8%) were orthopaedic cases, including 1,187 adults and 122 paediatric patients. Major trauma accounted for 56.1% (n=734) of the workload, representing a major-to-minor ratio of 1.28:1. A total of 305 patients (23.3%) were referred for higher-level care. Referral patterns varied significantly based on institutional resources; facilities without dedicated orthopaedic support referred up to 50.9% of cases, while those with in-house specialist teams referred as few as 1.8%.

This study showed that orthopaedic trauma constitutes a substantial proportion of the emergency workload at district and regional levels, with over half involving major pathology. The stark disparity in referral rates confirms that tertiary centres are overburdened with cases that could be managed locally with appropriate resources. These findings suggest that the decentralization of specialist services is a fiscally justifiable strategy to mitigate delays in surgical care and improve patient outcomes.

P12. Indications and Appropriate Use of Bioinductive Scaffolds in Rotator Cuff Repair: A Modified Delphi Study.

Archie Rachuene (University of Pretoria Faculty of Health Sciences), Leon Rajah (Private Practice), Will Haynes (Private Practice), Nyiko Chauke (Wits), Sachin Baba (Private Practice), Sham Osman (Private practice), Steve Roche (UCT), Heckroodt Laubscher (Private practice), Craig Grobbelaar (University of Pretoria Faculty of Health Sciences)

Rotator cuff repair failure remains a significant clinical challenge, particularly in high-risk tears. Bionductive scaffold augmentation has emerged as a potential solution; however, its use remains poorly defined, with limited guidance on appropriate indications, especially in resource-constrained setting. The aim of this study was to establish expert consensus on the appropriate, value-based use of biological scaffold augmentation in rotator cuff repair within a South African context.

A modified Delphi study was conducted among experienced shoulder surgeons. Participants rated structured statements using a Likert scale, with predefined consensus thresholds ($\geq 70\%$). Round 1 responses were analysed descriptively and categorised as consensus in, consensus out, or no consensus.

Preliminary round 1 results demonstrate consensus toward a selective, risk-based approach to augmentation. Strong agreement supported its use in revision repairs, large or chronic tears, and poor tendon quality, while there was overwhelming consensus against routine use in small acute tears with good tissue. Reduction in retear rates was identified as the primary benefit, with preference for on lay techniques and the need for formalised training. Isolated comorbidities did not independently justify augmentation, reflecting a shift toward combined structural and biological risk assessment. There was also agreement that augmentation should be restricted to high-risk cases in resource-constrained settings. Areas without consensus included partial tears, individual risk factors, and imaging follow-up strategies.

Expert consensus supports a selective, value-based approach to biological scaffold use, prioritising high-risk cases and rejecting routine application. These findings represent an important step toward developing context-appropriate clinical guidelines for rotator cuff augmentation.

P13. Patient Perceptions and Clinical correlations of Arm and Humeral Lengthening in Reverse Shoulder Arthroplasty: A Radiographic and Outcomes evaluation

Oreeditse Sedumedi (University of Pretoria), Pududu Rachuene (University of Pretoria), Hlabane Sithebe (University of Pretoria)

The optimal humeral and arm lengthening in reverse total shoulder arthroplasty (RTSA) and correlations with function, pain and complications remain literarily unclear. This paper aims to quantify humeral and arm lengthening post RTSA then investigate correlations to patient perceptions and clinical outcomes.

A retrospective, multi-centre cohort study was conducted on 47 patients post RTSA between January 2020 and September 2025 with a minimum follow-up of 3 months. Arm lengthening was quantified clinically, using pre-operative arm measurement or by comparison to contralateral side. Pre- and post-operative acromion to greater tuberosity distance measured on Grashey radiographs was used to quantify humeral lengthening. Outcomes included the American Shoulder and Elbow Surgeons score (ASES), Subjective shoulder Value score (SSV), Visual Analogue Scale (VAS), complications and range of motion (forward flexion and external rotation).

Mean humeral and arm lengthening in the Onlay group were 17.9mm and 13.7mm respectively. Inlay group had insufficient data for analysis and comparison. Increasing humeral lengthening demonstrated a weak negative correlation ($r=-0.18$) with VAS scores, moderately negative correlation ($r=-0.36$) with forward flexion and a strong negative correlation ($r=-0.68$) with external rotation. Patient reported functional outcomes scores revealed contrasting results with a moderately positive correlation ($r=-0.43$) and strong negative ($r=-0.72$) correlation with SSV and ASES respectively. The strong positive correlation ($r=-0.99$) between lengthening and complications should be interpreted with caution given the limited sample size. A negative regression coefficient was noted with forward flexion ($\beta=-10.17$, $p=0.12$) and external rotation ($\beta=-5.84$, $p=0.13$), VAS ($\beta=-0.13$, $p=0.73$), ASES ($\beta=-1.74$, $p=0.56$) and SSV ($\beta=-1.02$, $p=0.72$), none statistically significant.

Study limitations include its retrospective nature, small sample size, potential radiographic measurement variability and limited inlay subgroup data.

Increasing humeral lengthening post RTSA may be associated with poorer functional outcomes, reduced shoulder range of motion and increased complications. Larger prospective studies are essential to validate these results.

P14. Scoping Review of Biologic Scaffold in Rotator Cuff Repair Augmentation: Evidence-based recommendations for Low-to-Middle Income Countries

Archie Rachuene (University of Pretoria Faculty of Health Sciences), Ryan Maroun (University of Pretoria Faculty of Health Sciences), Adelaide Makamu (University of Pretoria Faculty of Health Sciences), Will Haynes (Private Practice), Sham Osman (Private practice), Sachin Baba (Private practice), Nyiko Chauke (Wits), Steve Roche (UCT), Leon Rajah (Private), Heckroodt Laubscher (Private)

Rotator cuff repair augmentation has been increasingly adopted to improve structural healing in moderate-to-large tears and biologically compromised tendon. Techniques vary widely, including dermal allografts, xenografts, bioinductive collagen scaffolds, and synthetic matrices applied using different placement and fixation strategies. Despite growing utilisation, uncertainty persists regarding structural durability, functional benefit, complication profile, and optimal indications for augmentation.

A scoping review of comparative studies, randomised controlled trials, and case series evaluating rotator cuff repair augmentation was conducted. Online bibliographic databases and reference lists were systematically searched. Extracted data included perioperative technique, imaging protocols, structural healing rates, patient-reported outcome measures (PROMs), complications, revision burden, and follow-up duration. Emphasis was placed on comparing augmentation with standard repair where available.

Structural healing rates in augmented cohorts frequently exceeded 85–90%, compared with 65–75% in non-augmented repairs in comparative studies. Retear rates were generally lower in augmented groups. However, PROMs improved substantially in both groups, Imaging protocols and definitions of healing were heterogeneous, limiting cross-study comparability. Complication rates were low, with rare graft-related adverse events and

infrequent revision or conversion to arthroplasty. Structural failure was more strongly associated with tear size and fatty infiltration than with demographic variables.

Rotator cuff repair with biologic scaffold augments demonstrates a consistent structural healing advantage with a favourable safety profile; however, clear functional superiority over standard repair remains unproven in short- to mid-term follow-up. High-quality, adequately powered trials with standardised structural definitions and long-term follow-up are required to define optimal indications and determine whether improved healing translates into durable clinical benefit.

P15. Prevalence and Outcomes of Zone 2 Proximal Humerus Fractures Treated with Plate Osteosynthesis: A Single Center Study at a Tertiary Hospital in Pretoria

Dorcas Olayemi Bodunrin (University of Pretoria), Pududu Archie Rachuene (Univeristy of Pretoria)'

Fractures at the proximal humerus-diaphyseal junction remain an under-recognised entity, poorly defined by existing classification systems despite demonstrating consistent clinical and biomechanical patterns. This study aimed to determine the prevalence of these "Zone 2" fractures among all humeral fractures and to evaluate their demographic profile, mechanisms of injury, and surgical outcomes.

A retrospective cohort study was conducted of adult patients presenting with humeral fractures between 2024 and 2026. After exclusion of incomplete records, eligible cases were analysed to identify Zone 2 fractures as a proportion of the overall cohort. Demographic variables and mechanisms of injury were recorded. All identified cases underwent surgical management, predominantly with helical plate fixation, with one patient treated using intramedullary nailing. Radiological union was assessed using the Radiographic Union Score for Humerus (RUSHU), and functional outcomes were evaluated using Disabilities of the Arm, Shoulder and Hand (DASH) and Constant-Murley scores.

A total of 123 patients were included for analysis. Zone 2 fractures were identified in 24 patients, representing a prevalence of 19.5%. The mean age was 48 years with a slight male predominance. Injury mechanisms demonstrated a bimodal pattern, with low-energy fragility fractures in older patients and high-energy trauma in younger individuals. At a mean follow-up of 3 months, 21 patients had complete clinical and radiographic data. Radiological union was achieved in all patients with available follow-up (21/21), while three patients were lost to follow-up. Functional outcomes demonstrated acceptable recovery, with mean scores indicating mild residual disability and fair-to-good shoulder function, although variability was observed.

Zone 2 proximal humerus fractures represent a distinct and clinically relevant subset of injuries with a measurable prevalence and characteristic injury profile. Surgical fixation, particularly with helical plating constructs, results in reliable early union. These findings highlight the need for refined classification systems and context-specific treatment strategies.

P16. Surgical Management and Functional Outcomes of Acute Traumatic Posterior Shoulder Dislocations: A Retrospective Case Series

Lee Lebu Skosana (University of Pretoria), Pududu Archie Rachuene (University of Pretoria), Hlabane Sithebe (University of Pretoria)

Posterior shoulder dislocation can occur as a simple capsulo-labral dislocation or locked posterior shoulder dislocation with an impression fracture-Reverse Hill Sach's lesion (RHSL) or fracture dislocation. Treatment choice for engaging lesions is guided by size of the RHSL. The aim of the study was to report on functional outcomes of surgical management of acute posterior dislocations to guide decision making.

A retrospective analysis was performed for 12 consecutive cases of acute posterior shoulder dislocations between 2022 and 2025. Patient Reported Outcomes Measures (PROMs) and function were captured postoperative, clinical assessment included Range of motion (ROM), Rowe score, Subjective Shoulder score,

America Shoulder and Elbow Score (ASES) and Visual Analogue Score (VAS).

In 12 cases (11 males, 1 females) and 14 shoulders, two cases bilateral, aetiology was falls in 6 patients, seizure in 5, and 1 case of electrocution. RHSL range from 20%-50%, the average age at time of operation was 38.9years (19-54), the mean time to operation was 10.0 days. Surgical procedures comprised of Mclaughlin procedures 7, Mclaughlin procedures 2, Arthroscopic procedures 3, Open reduction and Internal fixation (ORIF) plus modified Mclaughlin, 1 ORIF plus Mclaughlin. The mean follow-up period was 9.5 months (6-24months), assessment showed SSV 72.3 ± 14.1 , VAS 2.3 ± 0.8 , Rowe 73.7 ± 13.5 and ASES 76.1 ± 14.9 . Nine patients experienced mild pain (1-2), four had moderate pain (3-4) and no cases of severe pain. Complications were shoulder stiffness in two patients.

Short term follow-up of surgical management of acute posterior shoulder dislocation with RHSL of 20-50% showed good functional outcomes without redislocation. PROMs for joint preserving surgery; Mclaughlin procedure and Neer's modification show good to excellent results. Clinical instability, size of the humeral defect, and associated injuries are pertinent indications for surgical intervention.

P17. Research priorities in multiligament knee injury: establishing an agenda aligned with international consensus

Martinique Vella-Baldacchino (Oxford), Waldo Scheepers (Wits), Michael Held (UCT), Puyeipawa Kafita (UCT), Knee Dislocation Study Group (International)

Multiligament knee injury (MLKI) and knee dislocation remain among the most complex conditions in orthopaedic sports trauma. Current literature is heterogeneous, largely retrospective, and lacks standardised outcome reporting. A recent consensus study identified major global research gaps, but priorities relevant to resource-constrained settings remain undefined. This study aimed to present an evidence-based framework of research priorities for knee dislocations, informed by recent international consensus and local clinical realities. A modified Delphi consensus study was conducted using invited members of an international study group comprising surgeons and clinicians with expertise in MLKI management. In the first round, participants submitted important unanswered research questions in multiligament knee injury (MLKI), structured using the PICO framework. Responses were collated into thematic statements by a steering committee and scored on a 5-point Likert scale (1 = low priority, 5 = high priority), with questions achieving a mean score ≥ 3 progressing to the second round. In subsequent rounds, participants anonymously rated each statement on a 9-point Likert scale (1 = lowest importance, 9 = highest importance). In accordance with the RAND/UCLA appropriateness method, statements with a median score ≥ 7 progressed between rounds and were included in the final prioritised list. Final statements were ranked according to median scores to generate a Top 10 research priority list.

High-priority themes included optimal timing of surgery, repair versus reconstruction strategies, rehabilitation pathways, and management of vascular and peroneal nerve injuries. Additional priorities included predictors of return to sport and work, standardised reporting of outcomes, patient-reported outcome measures, and the value of specialist referral pathways and multicentre registries.

This study provides a formal international research agenda for MLKI and knee dislocation. The findings highlight key clinical and system-level gaps and offer a framework to guide future collaborative research and registry development in resource-constrained settings.

P18. Kinematic coupling in an anterior closing-wedge high tibial osteotomies: A computational proof-of-concept for multi-planar corrections

Michael Held (University of Cape Town), Dorian Marx (Craniotech)

Anterior closing-wedge high tibial osteotomy (HTO) is increasingly utilised to reduce posterior tibial slope (PTS)

in patients requiring anterior cruciate ligament (ACL) reconstruction or revision surgery. However, sagittal plane corrections may simultaneously alter coronal alignment, with the extent of this coupling depending on the orientation of the osteotomy hinge axis. The purpose of this study was to define the mathematical relationship between hinge axis orientation and the resulting simultaneous sagittal and coronal plane corrections using a three-dimensional (3D) computational model.

A computational modelling study was performed using 19 high-resolution virtual 3D tibial models representing male, female, left, and right tibiae. All models were standardised within a common coordinate system. A virtual anterior closing-wedge osteotomy was performed with a fixed hinge point positioned 15 mm distal to the articular surface. Simulations were performed across a 180° anterior arc in 10° increments using a constant 9 mm wedge size. Resulting changes in posterior tibial slope and coronal alignment were measured for each hinge axis orientation.

The simulations demonstrated that the ratio of sagittal to coronal correction was primarily determined by hinge axis orientation. As the hinge axis rotated from medial to lateral, the corrective effect progressively shifted between the sagittal and coronal planes in a predictable trigonometric relationship. The absolute magnitude of correction for a fixed wedge size was additionally influenced by the anatomical location of the hinge point. Deviations from an idealised geometric model were consistently related to local variations in proximal tibial morphology, as the distance from the osteotomy plane to the hinge changed according to the approach angle. These findings demonstrate that multi-planar corrections produced during anterior closing-wedge HTO are predictable and governed by hinge axis orientation, hinge point location, and patient-specific tibial anatomy. This computational proof-of-concept provides a framework for more precise multi-planar preoperative planning during slope-reducing osteotomy procedures.

P19. Open Tibia Fractures: Incidence And Outcomes At A Level 2 Trauma Centre

Mikail Amod (Frere Hospital), Kabelo Molatedi (Independent Medical Practitioner), Jeandre Kotze (Groote Schuur Hospital), Marc Nortje (Groote Schuur Hospital), Dane Maimin (Mitchells Plain Hospital)

Open tibia fractures are time-critical and carry high risks of infection and non-union. In resource-limited systems, constrained theatre capacity may delay debridement and fixation, potentially worsening outcomes. We quantified operative workload, timing to surgery, procedure mix and early outcomes of open tibia fractures managed over 12 months at a district-level trauma centre. All operatively managed open tibia fractures were included. Theatre logbooks, operative notes and electronic clinical patient data were reviewed. Variables included demographics, mechanism of injury, procedure type, admission-to-surgery interval and operative duration. Outcomes at 3 months were surgical-site infection (SSI), delayed union, reoperation and amputation; descriptive statistics were used.

Sixty-four patients underwent 76 procedures, accounting for 8% of all operative orthopaedic cases. The cohort was 78% male with a mean age of 32 years. Road-traffic collisions caused 45% of injuries and interpersonal violence 39%, including 15 firearm-related fractures. Intramedullary nailing comprised 47% of procedures, irrigation and debridement (I&D) 28% and external fixation 16%. Median time to first surgery was 2 days; 33% were operated within 24 hours, 39% within 2–3 days and 28% after 4 days or more. All procedures occurred during daytime operating hours; 15% were performed on weekends or public holidays and none after 16:00. Total operative time was approximately 180 daytime theatre hours in a 12 month period. SSI occurred in 7 patients (11%); only one underwent surgery within 24 hours of admission. Delayed union occurred in 5 patients (8%), 22% were lost to follow-up and no post-discharge amputations were recorded.

Open tibia fractures impose a substantial daytime theatre burden and are associated with important early complications. These data support protected trauma theatre access, strengthened infection-prevention pathways and improved follow-up systems, and provide a baseline benchmark for evaluating service changes.

P20. Mseleni Joint Disease revisited: unlocking an old mystery with new technology

Marc Nortje (University of Cape Town), Elizabeth Dinkele (University of Cape), Cecilia Commas (University of Cape Town), Raj Ramesar (University of Cape Town), Ferdinand Oompie (University of Cape Town), Stewart Dix Peek (University of Cape Town)

Mseleni Joint Disease (MJD) is a degenerative arthropathy of unknown aetiology that is geographically endemic to a rural region in KwaZulu-Natal, South Africa. Clinically, the disease is characterised by early onset in adolescence, joint stiffness and pain, and severe disability in early adulthood. The disease is most severely localised to the hip and is characterised by bilateral hip involvement. Diagnosis remains exclusionary, requiring the elimination of conditions such as osteonecrosis, gout, reactive arthritis and rheumatoid arthritis. A key limitation of prior work is the treatment of Mseleni Joint Disease as a single, homogeneous entity, typically using dichotomous case-control classifications. This study aimed to characterise disease phenotypes by integrating radiological and molecular data. A Delphi-style radiological review was conducted to identify features most consistently observed in affected individuals, and to support phenotypic stratification. In parallel, next generation DNA sequencing was performed in a pilot cohort (n=14) to detect variants across multiple candidate genes. Initial analyses did not reveal a unifying genetic signal when cases were considered as a single group. Preliminary findings support substantial heterogeneity within Mseleni Joint Disease, with evidence for multiple sub-phenotypes rather than a single disease process. The convergence of radiological subtypes with differing molecular profiles suggests that previous attempts at gene discovery may have been limited by phenotypic misclassification. These findings challenge the prevailing conceptualisation of the disease and highlight the limitations of relying on radiographic, clinical, or genetic data in isolation. Improved phenotypic resolution has the potential to enhance diagnostic accuracy, reduce delays in diagnosis, and inform future investigations into aetiology and targeted management. More broadly, this work demonstrates the value of multimodal data integration in resolving complex, heterogeneous musculoskeletal disorders.

P22. Posterior plate fixation- A functional outcomes review at least one year after treatment for posterior malleolus ankle fractures at four hospitals in South Africa

Loren Benjamin (Tygerberg Hospital), Etienne Joubert (Tygerberg Hospital), Marilize Burger (Tygerberg Hospital), Tinus Basson (Tygerberg Hospital), Halima Olday (Tygerberg Hospital), James Warren (Khayelitsha Hospital)

Direct visualization and fixation of posterior malleolus fractures has become the favoured method of repair for these devastating ankle injuries. Due to reported outcome inconsistencies, small sample sizes and brief follow-up periods documented in international literature, there remains controversy about whether anatomical reduction with posterior plating results in satisfactory long-term functional outcomes. Therefore, the aim of this study is to investigate the functional outcomes of patients with posterior malleolus ankle fractures.

A multi-center cross-sectional study including adult patients who received posterior malleolus plate fixation as part of their trimalleolar ankle fracture management between 2018 and 2025, was conducted. Patients were excluded if they had ipsilateral leg injuries, open fractures, temporary external fixators before definitive surgery and complications or reoperations. Patient demographics as well as functional outcomes scores including 1) the Olerud and Molander Ankle Score (OMAS) out of 100 and 2) the modified (patient reported) version of the American Orthopaedic Foot and Ankle Society Hindfoot Score (MAOFASHS) out of 60. Data were analysed descriptively. Relationships between continuous variables were investigated by means of Spearman rank correlations. An alpha-level of 0.05 was considered significant.

A total of 102 patients (mean age 40.2 ± 13.7 years, 81.3% female) waited a median of 9.5 (interquartile range, IQR 6.0-14.0) days before surgery. Patients were interviewed a median of 2.6 (IQR 1.4 – 4.4) years after surgery. The median OMAS was 62.5 (IQR 40.0 – 95.0) and MAOFASHS was 43.0 (IQR 31.0 – 58.0). No relationships between age and OMAS or MAOFASHS ($p=-0.118$ and -0.082 , respectively) or time to surgery and OMAS or MAOFASHS ($p=-0.066$ and -0.090 , respectively) was observed.

Direct visualization and fixation of posterior malleolus fractures in trimalleolar ankle fractures provides favourable outcomes independent of age, follow-up duration and operative timing.

P23. Total TALAR Replacements long term outcomes

Wybrand de Kock (Groote Schuur / University of Cape Town), Graham McCollum (Groote Schuur / University of Cape Town)

Total talus replacement has emerged as a motion-preserving alternative to arthrodesis for complex end-stage talar pathology, yet long-term data remain limited. This retrospective case series reports the long-term outcomes in patients who underwent total talus replacement surgery between July 2014 and April 2018. Eight consecutive patients were reviewed at a mean follow up of 109 months. Functional outcomes were assessed using the American Orthopaedic Foot and Ankle Society hindfoot score and the Short Form-36, alongside clinical evaluation of gait, range of motion, and radiographic parameters. At final follow-up, the mean American Orthopaedic Foot and Ankle Society score was 76.9 compared with 79.3 at short-term follow-up, showing no statistically significant difference or deterioration ($p = 0.391$). Three patients achieved good results, three satisfactory, and one poor. The mean Short Form-36 score was 84.7 versus 83.3 at short-term follow-up ($p = 0.391$). No infection, implant loosening, or amputation was observed. Functional preservation and pain relief achieved after total talus replacement were maintained at nearly ten years.

We conclude that Total talus replacements are an alternative long-term option in the treatment and supporting its role as a viable motion-preserving option in appropriately selected patients.

P24. Clinical profile and outcome of patients with knee dislocation at a tertiary academic hospital

Dineo Maloisane (SMU), Bongani Socutshana (UP)

Knee dislocation is a complete loss of tibiofemoral articulation that is radiologically confirmed. It is a rare orthopaedic emergency, with potentially limb-threatening injuries and devastating outcomes. Considering a lack of adequate theatre time availability in South Africa, we needed a relevant context of this injury in our setting. The purpose of this study was to evaluate the clinical profile and outcome of patients with knee dislocation at a tertiary academic hospital.

We retrospectively reviewed 26 medical records of adult patients with knee dislocation during the periods of 01/01/2022 to 31/12/2024. We evaluated patients' demographics, various mechanisms of injury, associated injuries and the severity thereof, and patient-reported outcomes using the Knee Injury and Osteoarthritis Outcome (KOOS) score at 6 to 12 months after injury together with factors influencing those outcomes.

Patients' management included a two-stage ligamentous reconstruction after 6 weeks of immobilisation. The mean age was 37.48 (± 10.75) years. Many of the patients were female (76.92%) and the mean Body Mass Index (BMI) was 34.6 (± 9.39) kg/m². There was an association between a BMI > 30 and vascular injury ($p = 0.018$). We also noted an associated vascular injury of 38.46% and peroneal nerve injury of 53.85%, with a sensory fallout being most affected (42.86%).

Patients with a peroneal nerve injury had an overall poorer functional outcome ($p = 0.031$), with the worst performance in sports/recreation ($p = 0.017$) and knee-related quality of life ($p = 0.023$). Patients had an overall mean KOOS score of 57% (± 15) despite which stage/mode of treatment they received after 6 weeks of immobilisation.

Our study demonstrates that knee dislocation has a life changing impact on patient functional outcomes with a significant incidence of neurovascular injuries. It also probes our focus towards adequate resource allocation for early (within 3 weeks) ligamentous reconstructive surgery to improve patients' functional outcomes.

P25. Use of theatre time in elective orthopaedic surgery in an academic hospital in Soweto, South Africa

Bulelwa Andiswa Klaas (University of the Witwatersrand), Maxwell Jingo (University of the Witwatersrand), Collen Sandile Nkosi (University of the Witwatersrand)

Background Chris Hani Baragwanath Academic Hospital (CHBAH) is one of the world's largest healthcare facilities facing significant surgical backlog; some orthopaedic waiting lists extend to five years. Improving theatre efficiency is essential to manage this burden exacerbated by the COVID-19 pandemic and local infrastructure challenges. The study aims to evaluate the theatre utilisation time at CHBAH and to identify improvement areas for the utilisation of theatre time.

Methods This prospective study evaluated theatre time utilization in three elective orthopaedic theatres at CHBAH during weekdays from 07h00 to 16h00. Data was collected over a six-month period, focusing on procedure types, time utilization, and reasons for cancellation.

Results The study found a major discrepancy between scheduling and reality, with a median procedure duration of 125minutes compared to a median predicted time of only 28-minutes. Daily theatre efficiency varied from a peak of 94.9% on Mondays to 68.6% on Wednesdays. The overall cancellation rate was 17%, with time-related factors being the primary cause, accounting for 73.7% to 90.9% of all cancellations. Early finishes were identified as the leading source of inefficiency, peaking at 4,220 minutes of lost time on Wednesdays due to academic half-days. Significant time was also consumed during non-surgical intervals, such as pre-incision anaesthesia (median 25–35minutes) and post-closure theatre exit (median 20–30minutes).

Conclusion This study of theatre time utilization at CHBAH revealed variations in efficiency and highlights critical bottlenecks within the workflow. Scheduling workflow is the primary bottleneck preventing higher patient throughput. To address the growing surgical backlog, we suggest the hospital move toward more realistic scheduling models including a closer prediction of the operating time, those that account for academic participation and those that better utilize the concentrated unused capacity found especially during early finish windows to enhancing theatre efficiency and improving patient access to elective care.

P27. Retrospective review of occlusive human hand bite injuries at a tertiary hand surgery unit

Schalk Van der Merwe (Groote Schuur Hospital), Duncan McGuire (Groote Schuur Hospital)

Human hand bite (HHB) injuries are common and potentially devastating. While “fight bite” injuries are well described, limited data exist on occlusive bite injuries.

This study aimed to characterise these injuries and identify factors associated with poor outcomes.

A retrospective review was conducted of 133 adult patients with occlusive HHB injuries managed at a tertiary unit over a 5-year period. Patients under 12 and those with “fight bite injuries” were excluded. Demographic, clinical, and outcome data were analysed.

Sepsis occurred in 69.1% of patients overall. Ninety-one percent of patients who did not receive antibiotics immediately post injury developed sepsis, as opposed to only 14% of those who did (95% CI 75–97%, $p < 0.001$). Delay in presentation was significantly associated with sepsis. Patients presenting within 2 days of sustaining the injury had a sepsis rate of 32.6%, compared to 89.5% in those presenting at 2–7 days and 93.9% in those presenting after 7 days ($p < 0.001$).

The overall finger amputation rate was 36.8%. Late presentation (>7 days) was associated with higher amputation rates ($p = 0.012$). On multivariate analysis, osteitis was the strongest independent predictor of amputation (OR 8.35, $p < 0.001$).

We found no relationship between HIV (OR 1.11 (95% CI 0.47 to 2.6, $p=0.829$) or smoking status (OR 0.80 (95% CI 0.27 to 2.39, $p=0.785$) and rate of amputation.

Diabetes was associated with a higher rate of amputation (OR 2.79), however, this was not statistically significant ($p = 0.17$).

Primary amputation was associated with a shorter median treatment duration compared to delayed amputation

(18 vs 28 days), although this was not statistically significant ($p = 0.226$).

Occlusive HHB injuries are associated with prolonged treatment, high sepsis rates and amputation. Early antibiotics and presentation are associated with improved outcomes. Osteitis and delayed presentation are key predictors of amputation.

P28. Ten Years of a Specialist Hand and Wrist Virtual Fracture Clinic: Sustained Safety, Rapid Access and High Patient Satisfaction in a Major Trauma Centre

Harry Costello (Imperial College Healthcare NHS Trust), Hamzah Raza (Imperial College), Samuel Turner (Imperial College), Vijay Badial (Oxford University Hospitals NHS Trust), George Lee (Imperial College Healthcare NHS Trust), Max Little (Imperial College Healthcare NHS Trust), Mark Sykes (Imperial College Healthcare NHS Trust), Raymond Anakwe (Imperial College Healthcare NHS Trust)

We established a specialist Hand & Wrist Virtual Fracture Clinic (VFC) in 2016 to address rising referral volumes, increasing presentations from urgent care and primary care settings, and concerns regarding variability in quality and timeliness of care for hand and wrist injuries. The objective was to introduce early consultant-led subspecialist decision-making within a scalable trauma pathway.

Early implementation demonstrated safety and high patient satisfaction. Ten years on, we report service evolution and contemporary outcome data to evaluate durability of benefit.

Between March 2024 and March 2025, 3,148 patients were reviewed virtually, representing a 48% increase in referrals compared with initial implementation. The mean age was 46.4 years (SD 17.7); 61.5% were female. The cohort reflected a broad socioeconomic profile (mean IMD decile 5.9). Following consultant virtual assessment, patients are directed to a specialist face-to-face consultant clinic, specialist hand therapy, a new advanced hand therapist clinic, or self-care with education and advice, according to clinical need.

The 30-day unplanned re-attendance rate was 2.0%, with no identified safety concerns. Patient experience remained strong, with a mean satisfaction score of 7.3/10 (SD 1.9) and mean PSQ-18 score of 80.6/90 (SD 3.7). Since introduction of the VFC, mean time to specialist review reduced from 10 days under the traditional fracture clinic model to 1.2 days.

Over a decade of increasing demand, the service has maintained low reattendance rates, high satisfaction, and rapid specialist access without expansion of outpatient clinic capacity.

A consultant-led specialist VFC for hand and wrist injuries provides a durable, safe and scalable model of care. It delivers consistent subspecialist decision-making in a high-volume trauma system and in environments where injuries may be assessed by junior or non-specialist teams. This virtual model offers a resilient solution to ongoing service pressures. There is an ongoing need to educate and support referring teams.

P29. Keynote: Outside-in vs inside-out hip arthroscopy in 30–50-year-olds: medium-term THR conversion and outcomes

Immanuel De Wilde (Dr. de Wilde Inc.)

Outside-in vs inside-out hip arthroscopy in 30–50-year-olds: medium-term THR conversion and outcomes

Hip arthroscopy is an established intervention for femoroacetabular impingement (FAI), labral pathology and early hip osteoarthritis. Despite wide adoption of both inside-out (central-compartment-first) and outside-in (peripheral-compartment-first) access strategies, robust comparative medium-term data informing technique selection remain limited.

This retrospective cohort study encompassed 117 primary hip arthroscopies performed by a single surgeon at a private hospital in the Gauteng area, between 1 February 2014 and 30 November 2024, with a minimum follow-up of 24 months (mean 63 months). Eligible patients were adults aged 30–50 years with a mean age at surgery of 41.5 years (SD 6.02); 87 patients (74.6%) were female and 30 (25.6%) were male. A total of 556 arthroscopies

were done during this time, of which 213 were excluded due to age and 226 were lost to follow up. Only patients presenting with FAI, labral pathology or early hip osteoarthritis (Tönnis grade 1–2) were included. No patients in the analysed cohort had BMI >35. The primary outcome was time to total hip replacement (THR) estimation, using Kaplan–Meier survival analysis and a prespecified parsimonious Cox proportional-hazards model. Secondary outcomes were the Forgotten Joint Score-12 (FJS-12) and International Hip Outcome Tool-12 (iHOT-12).

We conclude that the outside-in and inside-out approaches demonstrated comparable medium-term joint preservation, with an adjusted hazard ratio for THR of 0.87 (95% CI 0.32–2.34; $p = 0.78$). Patient-reported outcomes at latest follow-up, showed no meaningful differences between access techniques. However, baseline history of hip pain emerged as an important predictor of subsequent THR (HR 0.15; 95% CI 0.04–0.52; $p = 0.003$). This warrants careful consideration in preoperative assessment and future studies.

The author's preference due to experience, is the outside-in (peripheral-compartment-first) access strategy, which reduces time and cost of the procedure.

P30. Perioperative pain management at a tertiary hospital sarcoma unit - A descriptive study

Selma N Armas (University of cape town), Alma De Vaal (university of cape town), Thomas Hilton (university of cape town)

Orthopedic tumor surgery is associated with severe, multifactorial pain that hinders early mobilization and recovery. Perioperative analgesic practices and outcomes are poorly described in many resource-constrained settings.

We conducted a retrospective descriptive study of malignant tumors surgeries (resection, limb salvage, ablation surgery) performed between 1 May 2021 and 31 December 2025 at our institution. Data was extracted from pain team data sheet, medical records and the local orthopedic registry. This data included anaesthetic and analgesic techniques, opioid consumption, pain scores and rehabilitation activity over the first 72 hours postoperatively.

Fifty-three (53) patients made up the cohort of which 51% had Osteosarcoma. The age ranged from 11 to 78 years at time of surgery. A multimodal approach of general anaesthesia with neuroaxial anaesthesia and/or peripheral nerve block were used as anaesthetic technique. Nerve blocks were placed under ultrasound guidance or directly via a nerve catheter. Local wound infiltrations were performed when a nerve block was not thought to be of sufficient benefit. Post operatively patients were admitted to high care for 24 hours and received intravenous paracetamol, morphine and adjuncts like ketamine. Day 1, morphine and ketamine patient-controlled analgesia pumps with multimodal oral analgesia (paracetamol, anti-inflammatories, tramadol) were added. In collaboration with the pain team, adjuncts such as pregabalin, clonidine and ampyriptiline were introduced when central sensitization and neuropathic pain were present. Pain was consistently well controlled over 3 days. Using the visual analogue scores, no pain at rest was reported on day 1 by 75.5%, and by 83% on day 3. None/mild pain with movement was reported by 77% of patients on day 1 and 75.5% on day 3.

A multimodal approach to pain in this vulnerable group shows beneficial outcomes. The presence of a dedicated pain team plays a significant role in maintaining these good outcomes.

P31. Epidemiology of metastatic bone tumours at a tumour unit in South Africa

Sujith Philip (WITS University), Marule Paul Kgagudi (WITS University), Maxwell Jingo (WITS Univeristy)

Cancer remains a leading cause of mortality worldwide, with an increasing global incidence. The skeletal system is the third most common site of metastasis after the lung and liver, and bone involvement may be the first manifestation of malignancy in up to 30% of cases. Metastatic bone disease is associated with significant morbidity, including pain, pathological fractures, and neurological complications. Despite South Africa's diverse

population, local epidemiological data on metastatic bone tumours remain limited.

A retrospective observational study was conducted at an Orthopaedic Tumour and Sepsis Unit in South Africa to analyse the epidemiology of metastatic bone tumours. Clinical records of patients aged ≥ 18 years presenting with metastatic bone disease between 01 January 2017 and 31 December 2022 were reviewed. Demographic, clinical, and histopathological data were analysed using Stata 18.1. Summary statistics and cross-tabulation were performed, with significance set at $p < 0.05$.

Fifty-six patients were included (36 females, 20 males) with a median age of 56 years (IQR 49 – 62). Breast cancer (26.8%) was the most common primary tumour, followed by lung (16.1%) and thyroid (12.5%). Tumour distribution differed significantly by sex ($p = 0.003$). The femur was the most frequently involved skeletal site (64.3%), followed by the humerus (35.7%) and polyostotic disease (37.5%). No significant sex-based differences in metastatic site distribution were observed.

Breast and lung cancers were the leading sources of skeletal metastases, with the femur most commonly affected. Thyroid carcinoma demonstrated a notable proportion of polyostotic disease. Although tumour types varied by sex, metastatic site patterns did not. Despite limitations inherent to the retrospective design and referral bias, this study provides important local epidemiological data and highlights the need for larger prospective studies

P32. Temporary Joint-Spanning Internal Fixation Using a Spinal Rod System Following Multiligament Knee Reconstruction in Morbidly Obese Patients: A Report of Two Cases

Robin Moreels (UCT), Kaylin Williams (UCT), Michael Held (UCT)

Knee dislocations with multiligament injury present significant challenges, particularly in morbidly obese patients where postoperative bracing and external fixation may be impractical. We report two cases of traumatic knee dislocation in patients with body mass index ≥ 57 who underwent multiligament knee reconstruction augmented with temporary joint-spanning internal fixation (INFIX).

Both patients sustained complete disruption of multiple knee ligaments; one case was complicated by popliteal artery injury requiring stenting, and both demonstrated common peroneal nerve dysfunction. In each case, conventional postoperative immobilisation was not feasible because of extreme soft-tissue bulk and limb morphology. A subcutaneous lateral tibiofemoral INFIX construct using pedicle screws and a contoured spinal rod was applied to protect ligament reconstructions, maintain alignment, and prevent posterior tibial sag during early healing. INFIX removal was performed at 4–6 weeks postoperatively, followed by gradual mobilisation. At early follow-up, both patients demonstrated stable knees with preserved limb perfusion and acceptable early range of motion, avoiding pin-related complications known with external fixation devices.

Temporary internal joint-spanning fixation may represent a useful alternative to external fixation or bracing in select morbidly obese patients undergoing multiligament knee reconstruction.

P33. Patient Specific Instrumentation improves accuracy in High Tibial Osteotomy: A systematic review and meta-analysis

Branavan Rudran (Oxford University), Olivia Dunseath (Oxford University Hospitals NHS Foundation trust), Alex Shearman (Oxford University Hospitals NHS Foundation trust), Nicholas Colyvas (UCSF), Andrew Price (Oxford University)

Background: PSI (Patient-Specific Instrumentation) has emerged as an alternative method to conventional free hand (FH) techniques for performing angular bony corrections during medial open wedge high tibial osteotomy (MOWHTO). Although FH remains the standard technique, it is susceptible to variability and technical errors. Evidence regarding the effect of PSI on correction accuracy, complications, and patient-reported outcomes remains limited and inconsistent.

Purpose/Hypothesis: This study aimed to determine whether PSI improves correctional accuracy compared with conventional FH techniques in MOWHTO.

Study Design: Systematic review and meta-analysis; Level of evidence, 4.

Methods: Medline, Embase, and Cochrane Library were searched in May 2026 for studies using PSI for MOWHTO in medial compartment knee osteoarthritis. The primary outcome was the mean error in MOWHTO, defined as the procedure's accuracy. Secondary outcomes were complications and patient-related outcome measures (PROMs). The methodological quality of each study was assessed using the ROBINS-I v2 tool for non-randomised studies and RoB 2 tool for randomised studies. All statistical analyses were performed using R version 4.3.1.

Results: Of the 1505 articles reviewed, thirty studies met the inclusion criteria (1659 patients, 1668 HTO). Mean age was 52.2 years. The pooled difference in mean error was 1.36 ° in favour of PSI over FH for MOWHTO accuracy (95% CI: 0.8° to 1.86°, $p < 0.0001$; GRADE Very low). 24 studies reported moderate risk of bias and 3 reported severe risk of bias. The PSI group demonstrated a lower average complication rate of 2.86% (range: 0%-10%) versus 3.6% (range: 0%-21.1%) in the FH group. PROMs demonstrated significant improvement in functional PROMs following PSI-assisted MOWHTO.

Conclusion: PSI was associated with greater correctional accuracy than FH in MOWHTO relative to the planned corrections in the coronal plane, sagittal plane, and mechanical axis. Furthermore, PSI demonstrates low complication rates and favourable patient-reported outcomes.

P34. Challenges and Barriers to Musculoskeletal Injury Research in Sub-Saharan Africa: A Modified Delphi Study

Robyn Waters (University of Cape Town), Maritz Laubscher (University of Cape Town), Sithombo Maqungo (University of Cape Town), Linda Chokotho (Malawi University of Science and Technology), Nyengo Mkandawire (Kamuzu University of Health Sciences), Billy Haonga (Muhimbili University of Health and Allied Sciences), George Njambilo (Muhimbili University of Health and Allied Sciences), Matthew Costa (University of Oxford), Simon Graham (University of Oxford), National Institute for Health Global Health Research Group o (University of Oxford)

Musculoskeletal (MSK) injuries are a major cause of morbidity and mortality worldwide. However, research into MSK injuries is hampered by significant challenges and barriers, particularly in low-and middle-income countries (LMICs). Our aim was to identify the most important challenges and barriers to MSK injury care research across Malawi, South Africa and Tanzania.

We conducted a three-stage modified Delphi study. In Stage 1, healthcare professionals and researchers involved in MSK injury care listed challenges and barriers to conducting MSK injury research, which were consolidated in 25 themes. In Stage 2, participants rated each theme on a 5-point Likert scale. In Stage 3, to drive consensus, participants re-rated the themes after viewing group and country-specific feedback from the previous stage. Challenges and barriers were ranked by mean score. Consensus was defined as $\geq 75\%$ of respondents rating a theme as 4 or 5 ("important" and "most important" on the Likert Scale).

Three hundred and ninety-six participants completed Stage 1, 424 completed Stage 2 and 434 completed Stage 3. Across all participants, consensus ($\geq 75\%$) was reached on nine key challenges and barriers to MSK injury research, including: lack of funding, high clinical workloads, limited training and mentorship, poor-quality data collection practices, healthcare facility resource constraints, patient loss to follow-up, limited research opportunities outside academic institutions, poverty and financial barriers, and healthcare delays. At the country level, the challenges of lack of funding, high clinical workload, and inconsistent data collection practices consistently achieved consensus in Malawi, South Africa and Tanzania.

MSK injuries impose a substantial burden in Sub-Saharan Africa, yet research remains limited by funding shortages, high clinical workloads, and inconsistent data collection practices. These challenges, consistently identified across Malawi, South Africa, and Tanzania, highlight the need for targeted investment and regional collaboration to strengthen research capacity and improve patient outcomes.

P35. Musculoskeletal injury research in Sub-Saharan Africa: A 10-year bibliometric analysis of research outputs from Malawi, South Africa and Tanzania

Robyn Waters (University of Cape Town), Shahd Osman (Federal Ministry of Health), Maritz Laubscher (University of Cape Town), Sithombo Maqungo (University of Cape Town), Linda Chokotho (Malawi University of Science and Technology), Nyengo Mkandawire (Kamuzu University of Health Sciences), Billy Haonga (Muhimbili University of Health and Allied Sciences), George Njambilo (Muhimbili University of Health and Allied Sciences), Matthew Costa (University of Oxford), Simon Graham (University of Oxford), NIHR Global Injury Group (University of Oxford)

Musculoskeletal (MSK) injuries pose a significant health burden across Sub-Saharan Africa (SSA). Despite this, regional research output is limited, constrained by insufficient infrastructure, limited funding, and underdeveloped research capacity. This bibliometric analysis examined research outputs and collaboration patterns in MSK injury research across three SSA countries, representing a spectrum of income levels- low, lower-middle, and upper-middle income.

MSK injury research articles from Malawi (MLW), South Africa (SA), and Tanzania (TZN), published between January 2014 and April 2024, were identified using Web of Science and Scopus databases, and cross-referenced with ResearchGate. Data were analysed descriptively in Excel and institutional co-authorship and collaboration networks were mapped using VOSviewer.

A total of 329 articles were published across MLW (n=98), SA (n=141), and TZN (n=90) between January 2014 and April 2024. We report a steady increase in the number of publications from 2014, with a research focus on fracture management, outcomes, and lower limb injuries. Majority of research was published in partnership with high-income countries (HICs) (SA: 51%, MLW: 98%, TZN: 87%), with HIC institutions dominating first and last authorship in MLW (68 and 61%) and TZN (59 and 69%) publications. Most studies were descriptive and based on secondary records. Institutional networks showed strong regional collaboration in SA, international focus in MLW, and limited connectivity in TZN.

MSK injury research is increasing across MLW, SA, and TZN, but remains largely HIC-led and descriptive, particularly in lower income countries. Strengthening local leadership, regional collaboration, and research capacity is essential for more sustainable and context-specific evidence generation.

P36. Injury patterns of pedestrian vehicle accidents in the paediatric population of a specific tertiary hospital and surrounding areas – an observational study

Armand Uys (Personal)

Paediatric pedestrian vehicle accidents is a common cause of morbidity and mortality in many South African communities. With many children walking to and from school as well as playing in the streets during non-school hours. The socioeconomic limitations of these communities also directly result in less after-school care of children.

The study aimed to assess the injury patterns in paediatric PVAs and identify seasonal variations regarding school holidays, seen in a specific tertiary hospital that has a high trauma load.

This is a retrospective observational study (cross sectional study) done between 01/08/2023 and 31/03/2024 using data from the orthopaedic departments data capture sheets. Patient involved in PVAs between 0 and 15 years of age were identified and used in the study. The injuries were categorised into body regions and the dates

of injuries correlated to school holidays. Data management and analysis was done using Stata statistical software, version 18.0. and descriptive statistics was used to summarize the type of injuries. Categorical variables were described using frequencies and proportions and was compared using the Fisher's exact test and Chi-square test as appropriate.

94 patients were identified. Most commonly injured body region from most to least was, leg (n=30, 31.9%), foot (n=20, 21.3%), thigh (n=12, 12.8%), ankle (n=9, 9.6%), forearm (n=6, 6.4%), arm (n=4, 4.26%), shoulder (n=4, 4.3%), knee (n=3, 3.2%), followed by ankle and knee combined (n=2, 2.1%), elbow (n=2, 2.1%), hand (n=1, 1.1%) and pelvis (n=1, 1.1%).

There was a statistically significant decrease in paediatric PVAs during school holidays with a chi-square p value of 0.007. This is hypothesised to be due to people moving to different provinces during school holidays.

P37. A CT angiographic study of proximal femoral vascular and bony anatomy to establish a safe zone for proximal locking screw placement during retrograde femoral nailing in the South African setting

Lone Bogwasi (Stellenbosch University), Sean Pretoria's (Stellenbosch University), Marilize Burger (Stellenbosch University), Gian Du Preez (Stellenbosch University), Jayesh Haribai (Stellenbosch University)

Proximal locking during retrograde femur nail (RFN) fixation is performed with a free-hand percutaneous technique. Given the proximity of the lateral circumflex femoral artery (LCFA) branches, the free-hand technique poses a risk of vascular injury. We aimed to evaluate the pattern of LCFA branches course on the proximal femur in the South African population.

One hundred three-dimensional computerised tomography angiographies, performed between July 2019 and May 2022 at a level 1 trauma centre, were retrospectively reviewed. Left and right proximal femurs were assessed, identifying where a LCFA branch is found using a zoning method. Zone 1 measures proximal to the lesser trochanter, zone 2 along the length of the lesser trochanter, measured from the superior margin and zone 3 on the subtrochanteric region. Data was analysed; described as means and standard deviations. Subsequently, the identified "danger zones" were extrapolated, to guide RFN placement for safe proximal locking.

The mean age of included patients was 32.7 ± 10.2 years (81.0% male). LCFA branches were identified anteriorly on Zones 1, 2 and 3 in 61%, 76% and 67% of the patients, respectively. The mean distance to LCFA branch in zone 1 was 14.8 ± 7.7 mm and 15.4 ± 8.4 mm on the right and left, respectively; zone 2 was 10.4 ± 6.5 mm and 12.7 ± 8.3 mm on the right and left, respectively, and zone 3 was 24.4 ± 13.2 mm and 22 ± 14.6 mm on the right and left, respectively. Posteriorly, LCFA branches were identified in zone 3 only in 75% of all patients; the mean distance to a branch was 33.6 ± 12.6 and 33.7 ± 9.7 on the right and left, respectively.

The suggested safe areas for RFN proximal locking are <7 mm and >24 mm in zone 1; >21 mm on zone 2 and <11 mm and >38 mm on zone 3. Our proposed dual-locking configuration guides the placement of RFNs in the respective zones, which may reduce the risk of LCFA injury.

P38. A Prospective Case Series assessing the safety and efficacy of the Swemac Hansson Superior Lock Nail system; A long cephalomedullary nail with intermediate 'jig guided' shaft locking screw fixation.

Ruan van Staden (George Regional Hospital Orthopaedics), Gerry Cappaert (George Regional Hospital Orthopaedics HOD)

A Prospective Case Series assessing the safety and efficacy of the Swemac Hansson Superior Lock Nail system; A long cephalomedullary nail with intermediate 'jig guided' shaft locking screw fixation.

Existing literature supports biomechanical superiority of long versus short cephalomedullary nails. Long cephalomedullary nails which are distally locked relate to longer operative times, increased operative blood loss

as well as increased intraoperative fluoroscopy exposure in comparison to short nails. The Hansson Superior Lock Cephalomedullary device, is a long cephalomedullary nail with intermediate 'jig guided' interlocking shaft screw placement relating to decreased operative time and intra operative fluoroscopy exposure as well as offering unique biomechanical properties and surgical applications.

The aim of this study was to evaluate the safety and efficacy of the Hansson Superior lock cephalomedullary nail in the treatment of proximal femur fractures particularly assessing for hardware failure as well as radiographic confirmation of fracture union.

A prospective case series including patients with intertrochanteric or subtrochanteric proximal femur fractures treated with a Hansson Superior lock cephalomedullary nail from January 2025 to June 2026 were included. Demographic, clinical and outcome data was collected. Hardware failure in terms of nail breakage, lag screw cut out/cut through and interlocking screw breakage was assessed. Fracture union was assessed by using the Radiographic Union Score for Hip(RUSH) scoring system.

This series of 40 cases suggests that the Hansson Superior lock nail system offers stable fixation as no cases of hardware failure were observed and fracture union was confirmed in all cases adequately followed up. Operative theatre time was reduced and no periprosthetic distal femur fractures were observed. One case required surgical debridement after wound breakdown.

P39. Clinical-effectiveness and cost-effectiveness of circular external fixation Vs internal locking plate fixation for a closed C3 pilon fracture: ACTIVE, International randomised control trial.

Hemant Sharma (Hull University Teaching Hospitals), Stephen Brealy (Yorl Trial Unit), Matthew Costa (NDORMS), Lydia Flett (York Trial Unit), Emma Turner (York Trial Unit), Debbie Sykes (York Trial Unit), Alex Mitchell (York Trial Unit), Qian Zhao (York Trial Unit), Joy Adamson (York Trial Unit), Sam Adie (UNSW), Zsolt Balogh (University of Newcastle), Elizabeth Barron (Hull University Teaching Hospitals), Nikos Giotakis (Liverpool University Hospital), Ian Harris (UNSW), Catherine Hewitt (York Trial Centre), Ada Keding (York Trial Centre), Maritz Laubscher (University of Cape Town), Matthew Northgraves (HYMS), Grace Catherine O'Carroll (York Trial Centre), Adwoa Parker (York Trial Centre), Catriona McDaid (Yorl Trial Centre) [B Tshayinca](#)

Total articular pilon fractures are life-changing injuries, and there is no clear evidence to support the superiority of internal fixation (IF) or circular external fixation (CEF). The ACTIVE trial is an international, randomised controlled trial conducted across 43 hospitals in the United Kingdom, South Africa, and Australia.

Adults with closed total articular AO/OTA 43-C3 pilon fractures were randomly assigned to treatment with either circular external fixation or internal locking plate fixation. The primary outcome was the Disability Rating Index (DRI) at 12 months. Secondary outcomes included cost-effectiveness, Olerud and Molander Ankle Score (OMAS), complications, bone healing (non-union, malunion, and secondary osteoarthritis), and secondary interventions. Outcomes were summarised descriptively and analysed using a covariance-pattern mixed-effects linear regression model at 3, 6 and 12 months.

A total of 255 patients were randomised: 126 to CEF and 129 to IF. The mean DRI score at 12 months was 32.1 (SD 22.9) in the CEF group and 35.6 (SD 25.4) in the IF group (adjusted mean difference -4.6; 95% CI -10.4 to 1.1; $p = 0.12$). The IF group experienced a higher number of complications, while the CEF group had more unplanned frame adjustments. CEF was associated with higher costs (£2,745; 95% CI -£2,329 to £7,820) and a small increase in quality-adjusted life-years (0.012; 95% CI -0.098 to 0.122) compared with IF.

There was no difference in disability between treatment groups at 12 months. Neither surgical strategy was superior in terms of patient-reported outcomes at any time point. Circular external fixation was associated with higher costs, whereas internal fixation was associated with a higher complication rate.

P40. Osseointegration limb replacement surgery: Early outcomes from a South African cohort

Tara Venter (Institute of Orthopaedics and Rheumatology), Franz Birkholtz (Division of Orthopaedic Surgery, Stellenbosch University and Institute of Orthopaedics and Rheumatology)

Osseointegration (OI) is emerging globally as an alternative to socket-based prosthetic rehabilitation for amputees with poor socket tolerance, soft tissue complications, and limited mobility. Through direct skeletal fixation, OI may improve prosthetic control, comfort, and functional outcomes. Access to OI remains limited in low- and middle-income countries. This series reports early outcomes from a newly established South African osseointegration unit, evaluating feasibility and clinical impact.

Eight implant segments were performed in a prospective cohort of patients (n=7; mean age (SD): 56.2 years (10.5)) with transfemoral and transtibial amputations. Detailed evaluation was conducted at baseline, 6 months, and 1 year post-operatively. At time of retrospective audit, patients had an average follow-up of 8 months (5-12).

Clinical and functional outcomes assessed included K-level classification, Amputee Mobility Predictor (AMPPRO & AMPnoPRO), Timed Up and Go (TUG), and 2-minute walk test. Prosthetic use was evaluated by time and independence of donning and doffing, need for assistive devices, and frequency of daily use. Patient-reported outcomes included ABIS, BDI, EQ-5D, SF-36, and TAPES-R. Complications were recorded prospectively.

Functional improvement was observed across the cohort, with mean K-level improving from K2 pre-operatively to K4 post-operatively. Mean AMP scores increased from ~31 to ~42, TUG improved from ~16 to ~13 seconds, and 2-minute walk distance from ~137m to ~160m. Donning and doffing times decreased substantially (from >80 seconds to ~10 seconds), with reduced reliance on assistive devices and improved independence. Patient-reported outcomes demonstrated improved quality of life, body image, and satisfaction. No patients suffered early complications with a conspicuous absence of infection and peri-prosthetic fractures.

This study suggest that early outcomes after osseointegration in a low- and middle-income country are promising with objective improvements in functional outcomes, efficiency of prosthetic use and patient satisfaction.

P41. A Comparative Laboratory Study of Wire Tension Maintenance: The Role of High Bolt-Tightening Torque and Fixation Bolt Geometry in Two Commercial Ilizarov External Fixator Brands

Claudia van der Westhuizen (Stellenbosch University), Wayne Swart (Stellenbosch University), Rudolph Venter (Stellenbosch University), Gerhard Venter (Stellenbosch University)

The purpose of the observational laboratory study was to measure and compare the loss of tension in Kirschner wires after 450 cycles (0 to 800 N) between two commercial clinically representative circular external fixation frames fixed around a surrogate bone model in a uniaxial test machine.

Two circular external fixation device brands were assembled using four 180 mm rings and eight 1.8 mm Kirschner wires secured to a PVC bone surrogate. Clinical relevance was maintained through a 60° wire-crossing angle between the transverse and oblique wire, and a realistic slightly anterior positioned bone. Wires were pretensioned to 1275 N (130 kg) and secured with a bolt-tightening torque of 18 Nm. The constructs were subjected to 450 cycles of axial loading (0 to 800 N). Primary outcomes included wire pretension loss, wire slippage, axial stiffness, and evidence of plastic deformation.

No measurable pretension loss occurred during the initial clamping or tensioning process. During cyclic loading, the average pretension decreased by 10.9 % (range 8.7 % to 14.6 %). Brand A (grooved bolts) demonstrated higher stability with a mean slippage of 1.3 mm, and only recorded one slip event, whereas Brand B (smooth bolts) exhibited a mean slippage of 0.23 mm across multiple events. Average axial stiffness was 78.0 N/mm for Brand A and 82.9 N/mm for Brand B. Visual inspection confirmed localised plastic deformation, including wire-

induced grooves on the rings and wire elongation at the bolt interface.

These findings provide new insights into tension loss mechanisms by demonstrating that a high bolt-tightening torque of 18 Nm significantly improves tension retention compared to previously reported lower torque values in literature. Clinically, these results suggest that surgeons can enhance frame stability by utilising grooved fixation hardware and higher tightening torques, which effectively minimise mechanical settling during weight-bearing.

P42. The 'sleeper ring' frame construct for Ilizarov circular fixator bone transport: A pilot study

Adrian Jansen van Rensburg (Stellenbosch University), Nando Ferreira (Stellenbosch University), Ed Fuzy (Stellenbosch University), Rudolph Venter (Stellenbosch University), Karolina Siwicka (Paley European Institute)

The methods for reconstructing segmental bone defects remains the holy grail in orthopaedics. The challenge in management of critical bone defects is generating new bone whilst maintain alignment and limb length. Multiple studies have highlighted the concern of instability in the transport segment leading to poor regenerate formation. This study proposes a new surgical technique in order to improve stability of the transport segment.

Traditional Ilizarov circular fixator was defined as the standard surgical technique use for application of tensioned fine wire Ilizarov frame for a single-level, proximal-to-distal bone transport. 'Sleeper ring' Ilizarov circular fixator was defined as the newly described technique proposed in this study. This technique follows the same surgical principles of a traditional Ilizarov frame, however a 'sleeper ring' is added for stability.

In this study, 40 patients were identified with large segmental bone defect as a result of trauma, infection or malignancy. Among the cohort of 40 patients, 24/40 (60.0%) patients were treated with traditional Ilizarov frame, whereas 16/40 (40.0%) patients were treated with the newly described 'sleeper ring' technique. The mean size large bone defect in this study was 48.05mm $\pm$ 15.51mm (95% CI 43.09 – 53.01 mm). There was no statistical significant difference in defect size ($p = 0.22$), union rate ($p = 1.0$), time to union ($p = 0.508$), equal limb length ($p = 0.833$), follow-up period ($p = 0.15$), as well as fixator index ($p = 0.079$). However, there was a statistical significant difference in regenerate healing index (days/cm) between the two management techniques ($p = 0.04$).

Instability in the Ilizarov circular fixator during bone transport can result in complications affecting the newly formed regenerate bone. Future research is needed to gain valuable insight in the understanding of the precise relationship between the risk factors and instability.

P43. Torque Variability in Ilizarov External Fixation Frame Assembly: A Multi-Surgeon Study Using an Instrumented Measurement Device

Claudia van der Westhuizen (Stellenbosch University), Gerhard Venter (Stellenbosch University), Wayne Swart (Stellenbosch University), Rudolph Venter (Stellenbosch University)

Accurate and consistent bolt tightening is essential for the biomechanical stability of Ilizarov external fixation frames. Inconsistent torque on the fixation bolts could compromise the fixation stability and efficiency, however, no bolt-tightening torque standard exists. The purpose of this prospective laboratory study is to quantify inter- and intra-surgeon variability in torque applied to Ilizarov frame bolts using a torque-measuring clinical spanner, and to determine whether surgical experience influences tightening consistency.

This is a prospective, controlled, experimental study. Orthopaedic surgeons and trainees will be recruited across experience levels, categorised as trainees/registrars, fellows, and specialists. Participants with no prior knowledge of the Ilizarov frame assembly are excluded from the study. Each participant will tighten all sixteen bolts of a standard Ilizarov external fixator using a custom-designed instrumented spanner capable of

continuous torque measurement. No target torque value will be provided to replicate real-world clinical practice. The measurement device is a clinical spanner equipped with sensors to measure torque during frame assembly. Torque values will be recorded for each bolt and analysed using descriptive statistics, intraclass correlation coefficients (ICC) for repeatability, and independent samples t-tests to compare values across experience groups.

Initial observations indicate meaningful inter- and intra-surgeon variability in bolt torque measurements, with trends suggesting clinically relevant differences.

These findings suggest that Ilizarov frame assembly is subject to considerable differences in tightening torque, which may have direct implications for construct stability and patient outcomes. This work provides a foundation for the development of bolt-tightening torque guidelines and the potential for using a feedback tool for surgeons or surgical training. Standardising bolt-tightening could reduce mechanical instability and the risk of failure in external fixation devices.

P44. Recalcitrant non-union of humeral shaft fractures: case series of a novel fixation technique

Brad Johnson (Western Cape Department of Health, Helderberg Hospital, Corner Lourensford and Hospital Rd, Somerset West), Tara Venter (Institute of Orthopaedics and Rheumatology, Mediclinic Winelands Orthopaedic Hospital, Stellenbosch), Maaïke Eken (Institute of Orthopaedics and Rheumatology, Mediclinic Winelands Orthopaedic Hospital, Stellenbosch), Franz Birkholtz (Institute of Orthopaedics and Rheumatology, Mediclinic Winelands Orthopaedic Hospital, Stellenbosch)

Persistent humeral shaft non-union remains a challenging clinical problem, particularly in patients who have undergone multiple failed operative interventions. These procedures are often performed as stand-alone techniques, including internal fixation, intramedullary nailing or external fixation. Despite best efforts, some cases remain resistant to standard treatment. This case series describes the application and outcomes of a novel single-stage, multi-component surgical technique combining external fixation with internal plating to address persistent humeral shaft non-unions.

The surgical technique was performed at a specialised limb reconstruction unit. In case patients presented with existing implants, these were removed, followed by debridement of non-viable bone and fibrotic tissue until healthy bleeding bone was encountered at the non-union site. Longitudinal and interfragmentary compression were achieved through rigid plate fixation and interfragmentary screw placement respectively, optimising coaptation for autologous bone grafting. As a final step, the limb segment was stabilised using external fixation. Six patients (M/F: n=3/3; mean age (SD): 62 yr (15)) presented to the specialised limb reconstruction unit with established humeral shaft non-union. All patients had multiple failed reconstruction attempts (number of prior surgeries: range [2 – 12]). Following the multi-component procedure, union was achieved in all cases (Radiographic Union Score for HUmeral Fractures (RUSHU) score: [8-10]). At final follow-up (mean (SD): 5.2 yr (2.5)), patients demonstrated American Shoulder and Elbow Scores (ASES) between 51.7–56.7 and Quick Disabilities of the Arm, Shoulder and Hand (QuickDASH) scores between 22.7–54.5, with high levels of satisfaction (10/10). All patients returned to previous occupational activities, and ongoing pain medication use was limited.

This case series demonstrates that this novel combination of external fixation, plating and bone grafting provides a reliable limb salvage option to treat persistent humeral shaft non-unions, achieving stable fracture fixation and favourable functional outcomes.

P45. Management outcomes of tibial non-unions: A retrospective evaluation of a comprehensive treatment algorithm

Anadi Bulaya (Stellenbosch University), Elsabe Britz (Stellenbosch University), Marilize Burger (Stellenbosch

University), Nando Ferreira (Stellenbosch University)

The definition of nonunion remains lacking with no single no one definition truly capturing nonunion as an entity. Whilst no gold standard approach to the treatment of tibial nonunion exists, a dedicated method, utilising external fixation, has been proposed in 2016. The aim of this study was to evaluate the management outcomes of patients with aseptic tibia nonunion, treated at two hospitals between January 2016 to December 2023.

All patients with aseptic tibia non-union were considered for inclusion with those lost to follow-up being excluded. Demographic and clinical data were collected, including clinical and radiological imaging. Outcomes of interest included the rate of re-operation, time to union and union rate. Data were analysed descriptively. The final study population consisted of 49 male and 21 female with a mean age of 42 years.

Seventy patients (mean age 41.8 ± 11.9 ; 70.0% (n=49) male) were included. Open fractures were the majority of the cases (n=42). Risk factors for nonunion development were identified in 68/70 patients. Each patient had at least one risk factor, or missing information

The majority of non-union were classified as stiff hypertrophic (45.7%, n=32) Fifty-one non-union (72.9%) were classified at type A2.2 fixed deformity non-union by means of the Paley classification. Bony union was achieved after the initial surgery in 94.4% (n=64) tibias whilst six patients required >1 operation to union. The median time to union across all patients was 74.1 (interquartile range, IQR 55.5 – 118.3) weeks.

The proposed tibial non-union treatment algorithm produces high union rates (94.4%) across a diverse group of tibial non-unions. Tibial non-union however remains a complex process with outcomes influenced by multiple intrinsic and extrinsic factors.

Keywords: Circular external fixator; Non-union; Tibia.

P46. Tibial distraction osteogenesis: Association between comminution at the osteotomy site and time to bone healing

Anna Kuijpers (Department of Trauma Surgery, Erasmus Medical Centre, Rotterdam & Institute of Orthopaedics and Rheumatology, Mediclinic), Sebastiano Dos Santos (Department of Surgery, New Somerset Hospital, Portwood Road, Cape Town, 8005), Philippe de Rooij (Department of Trauma Surgery, Erasmus Medical Centre, Rotterdam), Esther van Lieshout (Department of Trauma Surgery, Erasmus Medical Centre, Rotterdam), Franz Birkholtz (Institute of Orthopaedics and Rheumatology, Mediclinic Winelands Orthopaedic Hospital, Stellenbosch & Division of Orthop)

Tibial distraction osteogenesis (DO) is an established surgical technique used to treat conditions such as limb length discrepancy, complex deformities, and fracture non-union. However, whether the osteotomy comminution during tibial DO influences bone healing has not yet been investigated. While fragmentation could create a mechanical strain environment good for regenerate formation, it could also impair vascular supply and disrupt the biological microenvironment essential for early bone regeneration. This study aimed to investigate whether there is an association between comminution caused by the osteotomy and bone healing in tibial DO. This retrospective cohort study included adult patients treated with tibial DO using a circular external fixator between January 2006 and December 2024. Comminution was graded on early postoperative radiographs using a predefined algorithm. Healing was defined as Pixel Value Ratio (PVR) ≥ 0.94 per cortex and as 3 out of 4 cortices with a modified Radiographic Union Scale in Tibia (mRUST) score of 3. Multivariable models were adjusted for age, sex, and distraction length. Thirty-nine tibiae osteotomies were included, 24 comminuted and 15 non-comminuted. Comminution was predominantly located posteriorly (80%). Initial PVR values were higher in the comminution group. Kaplan–Meier analysis showed no significant overall differences between groups. The multivariable Cox analysis showed that comminution was independently associated with faster posterior cortical healing ($p=0.045$), but not with healing of the medial, lateral, anterior cortices or overall mRUST healing. Greater distraction length was independently associated with prolonged healing at the medial, anterior posterior cortex and overall healing. Comminution at the osteotomy site does not seem to reduce healing rate in tibial distraction osteogenesis and may be associated with accelerated posterior cortical consolidation. However, future research

is recommended to include larger cohorts and longitudinal monitoring to better understand the effect of osteotomy comminution on cortical and overall bone healing.

P47. Treatment outcomes in patients receiving oral antibiotics versus those receiving intravenous antibiotics for low velocity gunshot fractures

Bongani Mcolisi Sifundza (University of Witwatersrand)

In the available literature, there are no universal treatment protocols for the management of low velocity gunshot fractures with regards to intravenous or oral antibiotics. In this study, we were seeking to ascertain whether there was a difference between treatment outcomes and complications in patients receiving oral versus those receiving intravenous antibiotics for low velocity gunshot fractures.

This was a retrospective study involving 91 patients who presented with gunshot injuries to Leratong hospital during the period from 01 January 2021 to 30 June 2024. An audit of the available records from the orthopaedic wards, clinic, outpatient and emergency department was undertaken. Patients that sustained low velocity gunshot fractures were divided into two groups, those who had received oral antibiotics and those who had received intravenous antibiotics (IV). Treatment outcomes were recorded for each group during follow up for a period of at least six months.

Only six patients developed infection (five from the IV group and one from the oral group) and further six patients from the IV group had features, which were suggestive of infection compared to one from the oral group. There was no statistical significance in the infection rates between the two groups (p-value 1.000).

We concluded that there was no difference in the infection rates between those who receive oral and those who received IV antibiotics in the treatment of low velocity gunshot fractures.

P48. The use of LODOX scans to predict femoral intramedullary implant sizes in patients sustaining acute femur fractures

Joshua Ward (Groote Schuur Hospital - Orthopaedics), Maritz Laubscher (Groote Schuur Hospital - Orthopaedics), Leila Wagener (Groote Schuur Hospital), Michael Boyd (Groote Schuur Hospital), Melissa Jones (Groote Schuur Hospital)

In regions with high trauma burdens, accurate preoperative determination of intramedullary implant sizes can assist with efficient surgical management of femoral shaft fractures yet calibrated long-bone imaging is often impractical or impossible in unstable polytraumatised patients. The Lodox Statscan (LS) full-body digital radiography machine offers rapid, low-dose imaging with minimised magnification artifacts – due to its collimated scanning fan-beam design. It is available in many South African and international trauma centers. This study aimed to determine whether femoral intramedullary nail sizes could be accurately predicted using pre-operative measurements from LS radiographs.

A retrospective review evaluated patients who sustained acute traumatic injuries to a single femur and underwent LS imaging prior to receiving a standard locking femoral nail via either antegrade or retrograde approach. Pre-operative measurements of the uninjured femur were taken by multiple independent researchers on the LS radiograph. to predict ideal nail length and canal diameter at the isthmus. These were compared against the actual implanted sizes recorded in clinical and theatre records. Accurate length prediction was defined as a predicted length within 20mm of the actual length, and accurate canal prediction was defined as a predicted diameter equal to or greater than the actual implant diameter.

The findings of this study demonstrate that LS digital radiography can provide reliable measurements for predicting femoral intramedullary implant sizes in the clinical trauma scenario without any special positioning of patients or calibration markers. This technique serves as a valuable, time-efficient tool for pre-operative planning in acute trauma scenarios, potentially reducing intra-operative delays caused by incorrect implant

availability and optimizing implant inventory management. This study also highlights the potential to take other clinically relevant measurements from these radiographs for the estimation of plate lengths or other implant sizes or assist with retrospective reviews about fracture position and subsequent implant function.

P49. Inter-and Intra-Reliability Among Orthopaedic Surgeons in Assessment of Low Energy Civilian Gunshot Injuries to the Neck of Femur, A Comparison of Low and High-Income Settings

Nicola Weels (University of Cape Town), Sithombo Maqungo (University of Cape Town), Felix Klingebiel (University of Cape Town), Kirsty Berry (University of Cape Town), Maritz Laubscher (University of Cape Town)

Gunshot injuries to the neck of femur (NOF) are rare, devastating and complex injuries. Most NOF fracture classifications are based on fragility fractures. Our study aims to assess the AO classification and management for gunshot injuries in NOF among orthopaedic surgeons in low- and high-income settings. Primary objective was to assess the inter-observer and intra-observer reliability of the AO/OTA classification system when applied to NOF fractures secondary to low-velocity civilian gunshot wounds (GSWs) in South Africa (SA) and the United States (US) and to test the reliability in guiding their management.

An inter- and intra-observational study among the US and SA orthopaedic surgeons was performed. A survey was e-mailed to 37 orthopaedic surgeons with varying levels of experience. 19 participants in SA and 18 US. Each participant received a set of 25 multiple choice questions. Each question had X-rays and / or CT scans of NOF fractures secondary to civilian gunshot injuries. Each observers had to use the AO/OTA classification system to classify each fracture and then choose from a given list of treatment options their management.

The Fleiss kappa values for intra-observer reliability among all raters indicate fair agreement for classification and treatment. The inter-observer reliability between SA and US indicated slight agreement for classification and treatment. The inter-observer reliability in SA and the US separately indicate unreliability for classification and poor agreement for treatment.

The use of the AO/OTA classification showed fair, slight or unreliability in classification of gunshot fractures of the femur neck and fair, slight or poor reliability in guiding surgical treatment.

We cannot apply the AO classification system reliably in GSW to the neck of femur.

P50. Impact of Increased Body Mass Index on Functional Recovery After Operative Treatment of Lower Limb Fractures: A Systematic Review

Puseletso Khetsi (UKZN), Phakamane Mthethwa (UKZN), Vuyisa Mdingi (UKZN)

Obesity is increasingly common and poses specific challenges not only in orthopaedic trauma care but also in the healthcare system. We conducted a systematic review to examine the impact of increased body mass index (BMI) on functional recovery after operative treatment of lower-limb fractures.

Following PRISMA guidelines and PROSPERO registration (CRD 539821), we searched PubMed, MEDLINE, Scopus, ScienceDirect, and the Cochrane Library for studies reporting functional outcomes after surgical management of lower extremity fractures in patients with elevated BMI. Study quality and risk of bias were assessed using the Newcastle–Ottawa Scale. Outcomes of interest included validated functional scores (e.g. Lysholm, Knee Society Score, MOXFQ, Lower Extremity Functional Scale), walking distance/time, time to independence in self-care, length of stay, and complication rates.

The review included 9 studies comprising a total of 18 210, patients; one study did not specify the number of patients. Outcome measures and follow-up intervals were heterogeneous across studies. Several studies demonstrated that increased BMI was associated with lower validated functional scores, delayed attainment of rehabilitation milestones (including later independence in ambulation and self-care), and prolonged hospital stays. Higher BMI was also linked to increased rates of postoperative complications in multiple reports. The

magnitude and statistical significance of these associations varied between studies, and residual confounding and methodological heterogeneity limited comparability.

Available evidence suggests that elevated BMI is associated with delayed functional recovery and greater healthcare resource use following operative treatment of lower limb fractures. High-quality prospective studies using standardised, validated functional outcome measures, consistent follow-up intervals, and robust adjustment for confounders are needed to better define the relationship and to inform perioperative care and rehabilitation strategies for this patient group.

P51. A practical guide to prepare human articular chondrocyte culture for ex vivo manipulation in the sub-Saharan African setting.

Mario Rankin (UKZN)

Autologous chondrocyte implantation using isolated chondrocytes is an evolving area in regenerative medicine which is being developed outside of sub-Saharan Africa, and tailoring approaches to sub-Saharan Africa may require chondrocyte isolation to be developed locally. In vitro, chondrocytes must survive and expand in cell culture. Here, we describe our experience isolating and culturing human articular chondrocytes in the sub-Saharan African setting.

Informed consent was obtained from participants enrolled in a prospective cohort study approved by the Biomedical Research Ethics Committee at the University of KwaZulu-Natal (reference BREC/00005351/2023). Matched blood and hyaline cartilage tissue was obtained from participants undergoing clinically indicated surgeries.

We achieved a 78% success rate (21/27 cultures) in obtaining confluent chondrocyte cultures. The study group consisted of 68% males. Nine of the participants were HIV positive. The surgical procedures performed included 82% arthroplasties, 11% arthrodeses and 7% amputations. Indications for surgery included 64% non-reconstructable trauma, 21% for osteoarthritis, 11% for developmental deformities, and 1 case for finger osteitis. No significant associations were found between culture success rate and patient demographics or comorbidities.

We present a practical protocol to prepare human articular chondrocyte culture for ex vivo manipulation that can be successfully implemented in a resource limited setting. This work provides a foundational technique for advancing orthopaedic research and future cell-based therapies on the African continent.

P52. A descriptive cross-sectional study on the average years of working experience medical officers have before becoming an orthopaedic registrar in South Africa

Alvin Drabile (University of Pretoria), Cuma Mancotywa (University of Pretoria), Tiego Moropane (University of Pretoria), Pududu Archie Rachuene (University of Pretoria)

There is a widespread belief that junior doctors are required to accumulate more years of working experience before being accepted into Orthopaedic registrar training posts, however no evidence has been documented to confirm or disprove this perception. This study aims to address this literature gap by investigating the average years of working experience medical officers have before becoming orthopaedic registrars in South Africa and identifying factors that may influence this interval.

A descriptive cross-sectional study design was used. Data was collected via a digital questionnaire distributed to consultants and current registrars identified from a national professional database, with snowball sampling used to increase reach. South African orthopaedic surgery consultants and registrars who have specialised or are currently specialising locally were included. Non-South African surgeons and those who trained through supernumerary posts were excluded.

A total of 72 participants consented to the study. 64 eligible participants arising from 8 different tertiary

institutions were included. 13 participants were female and 51 were male. The primary outcome was the total number of years worked as a medical officer before entering registrar training: 0% had less than 6 months; 3% had 6 months to 1 year; 11% had 1-2 years; 29% had 2-3 years; 19% had 3-4 years; 19% had 4-5 years and 19% had over 5 years. Additional factors such as postgraduate examinations, certificates, diplomas and research activity were also explored: 89% had Basic Surgical Skills; 91% had ATLS; 97% had CMSA Primary; 66% had CMSA Intermediate and 53% had completed research. Outcomes were compared across tertiary institutions, generational cohort groups and sex.

By providing evidence-based insight into the working experience required and the additional factors that have an influence, this study may assist future medical students, young doctors and policy makers with career and workforce planning.

P53. Does the MMed matter? A Bibliometric analysis of early research output of South African orthopaedic surgeons

Michael Sanoto (University of KwaZulu-Natal), Megan O'Connor (University of KwaZulu-Natal)

The Master of Medicine (MMed) degree was introduced as a mandatory requirement for orthopaedic specialist registration in South Africa in 2011, with the intention of standardising registration requirements and strengthening research understanding and capacity among specialists. However, its impact on early scholarly productivity remains uncertain. This study aimed to evaluate publication output in relation to MMed completion.

A retrospective cross-sectional bibliometric analysis was conducted of all orthopaedic surgeons registered with the Health Professions Council of South Africa between 2001 and 2020, encompassing ten years before and ten years after introduction of the MMed requirement. Publication data were obtained from Scopus and SciELO. To enable fair comparison between individuals, publication output was assessed within predefined time windows, including a five-year period from the year of specialist registration. Statistical analyses were performed to compare publication metrics between surgeons registered before and after implementation of the MMed requirement, and between those with and without a recorded MMed qualification.

A total of 604 orthopaedic surgeons were identified, of whom 42% were registered before 2011 and 58% thereafter. Overall, 39% of specialists had a recorded MMed qualification, comprising 37% of the pre-2011 group and 40% of the post-2011 group; this difference was not statistically significant. Forty-six percent of specialists had at least one scholarly publication, with publication rates significantly higher in the post-2011 group compared with the pre-2011 group (52% vs 37%). Surgeons registered after introduction of the MMed requirement were 1.87 times more likely to have scholarly output than their pre-2011 counterparts.

These findings suggest that the MMed may facilitate research engagement for some trainees, although publication output remains heterogeneous. Ongoing institutional support may be required to optimise the academic impact of mandatory research training.

P54. Orthopaedic surgeons using 3D printed models to prepare for surgery: a qualitative investigation

Rudolph Venter (Stellenbosch University), Michelle Visser (Stellenbosch University), Stephan Rabie (University of Cape Town), Lodewyk Vogel (Stellenbosch University)

Many orthopaedic surgeons have taken up 3DP for pre-operative planning and rehearsal. The aim was to label and categorize perceived benefits of using 3DP in preparation for surgery. We employed qualitative explorative design using a phenomenological approach. In-depth, semi-structured interviews with 10 orthopaedic surgeons were transcribed and imported into ATLAS.ti for analysis. We used a deductive coding approach.

Two main themes emerged: perceived benefits and surgeon attitudes. Three subthemes included: pre-operative

planning benefits, intra-operative benefits and benefits to the health system and training. All the surgeons reported that having 3DP models of patient imaging positively influenced preparation. Most described the models as an adjunct to image interpretation. Some participants reported rehearsing a procedure more than once to test out strategies and implants. Intra-operative benefits included increased confidence in theatre and a sense of 'déjà vu'. Frequently mentioned benefits were perceived increase in surgeon skill and being a valuable training tool. Several surgeons mentioned perceived decrease in theatre times and a perceived increase in surgical accuracy. Other ideas that occurred were that 3DP is not essential for all cases, but that it was going to become essential for some.

Publications about the use of 3DP in healthcare have risen dramatically and pre-operative planning is a major theme. However, most studies focus on more objective outcomes like operative time, blood loss, fluoroscopic usage and surgical accuracy. There was very often an overlap in the discussion of 3DP for surgeon training and for experienced surgeons preparing for something new and complex, which underscored the concept of surgical practice being a continuous embodied process. Future directions for research might investigate how perceived benefits link with existing models of cognitive load and fatigue accumulation in theatre, being more measurable outcomes.

P55. The quality of Systematic Reviews published in leading Orthopaedic Surgery journals

Marilize Burger (Stellenbosch University), Jacques Van Niekerk (Private), Nando Ferreira (Stellenbosch University), Michael McCaul (Stellenbosch University)

Systematic reviews as a source of evidence have become increasingly important in decision-making processes across healthcare disciplines. The aim of this study was to determine the quality of systematic reviews published in the field of Orthopaedic surgery between 2019 and 2023, and to explore the domains of poor quality as potential targets for improvement.

A cross-sectional meta-epidemiological design was used, with purposive sampling to identify the top five orthopaedic journals from the 2022 Scimago Journal Rank. Eligible studies were systematic reviews - quantitative, qualitative or mixed-methods - addressing an Orthopaedic surgery related topic and published between January 2019 and December 2023. Exclusion criteria included big picture reviews (scoping reviews, evidence gap maps), animal-only studies, and basic science systematic reviews. After screening, a stratified, weighted sample of systematic reviews published between January 2019 and December 2023 was included. Methodological quality was appraised using the AMSTAR-2 tool.

After screening 1,481 studies, a final random sample of 200 records, stratified and weighted by journal, was included. The primary focus of reviews were mostly arthroplasty (30.5%, n=61) followed by studies focusing on lower limb investigations (28.5%, n=57), upper limb (16.5%, n=33), hip (9.0%, n=18), sport-related investigations (5.5%, n=11) or other investigations (10.0%, n=20). Most reviews lacked prospective registration (70%, n=140), and only 7.5% (n=15) used GRADE to estimate certainty. Overall methodological rigor was poor: 91.5% (n=183) were rated as critically low on AMSTAR-2, while only two reviews (1%) achieved a high-quality rating.

P56. The effect of pre-operative simulation with 3D printed models on the cognitive load of orthopaedic surgeons: a clinical simulation study

Rudolph Venter (Stellenbosch University), Nando Ferreira (Stellenbosch University), Adrian Jansen van Rensburg (Stellenbosch University), Gary Allen (Stellenbosch University)

3DP technology have become more user-friendly, and this has created new possibilities for training. We aimed to study the influence that pre-operative planning with patient specific 3DP models have on the cognitive load of surgeons in a simulated procedure.

We developed a Slipped Capital Femoral Epiphysis (SCFE) simulator using 3DP. Simulations were performed in a clinically representative lab. Participants were both consultants and trainees. Strain on working memory was measured by monitoring a secondary task and completing the NASA Task Load Index (NASA-TLX). Participants performed the simulated procedure in a control session (with normal x-rays for planning) and a test session (with x-rays and a 3DP planning model).

Twenty participants included 5 consultants (group 1), 5 trainees with experience (group 2) and 10 trainees with no experience (group 3). The procedure time was 180.56sec (3.01min) faster with a 3DP model ($p=0.028$). Group 3 gained most benefit with a decrease of 260.67sec (4.34min). For the secondary task, mean response times decreased from 1.30sec to 1.17sec, suggesting decreased cognitive load but not statistically significant ($p=0.56$). Group 3 was the only group to show a decrease in response times (1.63sec to 1.09sec) but also not statistically significant ($p=0.17$). Completing the NASA-TLX, overall workload decreased from 59.03 to 43.90 ($p=0.01$). Performance sub-score decreased from 130.75 to 77 ($p=0.02$) and frustration sub-score decreased from 168 to 54.75 ($p=0.01$) but the other components showed no difference.

A 3DP model had the effect of decreasing procedure time, decreasing overall workload, feeling less frustrated and more satisfied with performance. However they still reported it as effortful and mentally demanding. Experience influenced how 3DP models were used and the effect they had on cognitive load.

P57. A Custom Multi-Platform Digital Ecosystem for Orthopaedic Surgical Waiting List Management: A Tertiary Hospital Quality-Improvement Intervention

Kayla Liedemann (Victoria Mxenge Hospital)

Surgical waiting lists in resource-constrained settings are often managed through fragmented systems, such as paper records and isolated spreadsheets, generating input errors, administrative delays, poor transparency, and inefficient theatre utilisation. Within our orthopaedic department at a tertiary hospital in South Africa, the elective waiting list lacked visibility of theatre capacity and competing trauma workloads, resulting in inequitable booking practices and frequent day-of-admission cancellations.

We conducted a quality-improvement intervention in which we designed, implemented, and evaluated a cloud-based, automated elective orthopaedic surgical waiting list using a bespoke digital ecosystem integrating Google Forms, Sheets, Apps Script, and Calendar. The system centralised data entry, automated booking, and provided real-time visualisation of waiting list metrics. Key features included mandatory data fields, automated patient tracking, and live-updating dashboards monitoring waiting times, booking status, cancellations, and surgical flow. The primary outcome was data integrity, with secondary outcomes of system visibility, scheduling efficiency, and responsiveness.

At baseline, 82.6% of records were incomplete, 19.6% contained duplicate entries, and patients were frequently miscategorised across subspecialty lists. Transparency was non-existent, resulting in entirely “blind” scheduling. Post-intervention, data integrity improved to 100% with zero duplicates or incomplete records, and system latency decreased to under five seconds. Full transparency allowed identification of previously “unbooked” patients and quantification of the “hidden” backlog. Cancellations are now systematically categorised as either “trauma overflow” or “patient unfit,” enabling predictive scheduling and reducing unnecessary elective admissions. Future work will focus on longitudinal evaluation of cancellation rates, waiting times, and theatre throughput, and on adapting the system for additional departments and sites.

Our digital solution is a low-cost, impactful method for improving data quality, optimising workflows, and enhancing clinical governance. It serves as a scalable template readily adoptable by other surgical subspecialties and hospital networks, offering a sustainable framework for managing surgical backlogs across the national healthcare sector.

P58. Challenges to fracture service availability and readiness; a national survey across South Africa

Anya Burton (University of Bristol), James Masters (University of Oxford), Fundile Habana (University of KwaZulu-Natal), Hannah Wilson (University of Bristol), Farhanah Paruk (University of KwaZulu-Natal), Yoliswa Madela (University of KwaZulu-Natal), Sam Hawley (University of Bristol), Mkhululi Lukhele (University of Witwatersrand), Kate Ward (University of Southampton/MRC Unit The Gambia), Matt Costa (University of Oxford), Celia Gregson (University of Bristol/Biomedical Research and Training Institute), Bilkish Cassim (University of KwaZulu-Natal)

With increasing longevity in South Africa, age-related health conditions such as fragility fractures are becoming more common. A detailed understanding of the current fracture service provision will help enable health service planning.

A modified WHO Service Availability & Readiness Assessment survey, with a focus on hip fracture availability and readiness, was conducted between March 2022 and 2024 in a random sample of facilities (public/private, community health centres (CHC) through to central hospitals) across South Africa.

Of 147 facilities that participated; 34 were CHCs and 49 district/rural, 35 regional/provincial, 5 central, and 24 private hospitals. The highest participation was in Kwa-Zulu Natal (n=43, 39.4% of all facilities) and the lowest in North West (n=1, 1.3%) province.

Provision of basic fracture care, opioids and radiography were limited in CHCs (30.3% could provide lower limb traction, 57.6% plaster of Paris, 63.6% splints, 69.7% slings, 35.7% morphine, 37.9% codeine, 46.9% radiography). These were available in >90% of other facility types. While 81.7% of facilities could provide surgical services, only 49.3% could provide treatment for hip fractures, with 90.3% of these providing surgical treatment (all central and private, 93.9% regional, 44.4% district hospitals).

Of those that could treat a hip fracture surgically, 76.9% public and 23.1% private did not allow patients to weight bear within 24 hours of surgery. 30.4% public and 26.6% private facilities would assess for osteoporosis via dual X-ray absorptiometry prior to discharge, and had a scanner available and functional. 50.0% public and 10.5% private would prescribe bisphosphonates at discharge to treat osteoporosis.

Surgical treatment for hip fractures is widely available at regional level and above, but limited in district hospitals. There is low uptake of secondary preventative measures following hip fracture.

P59. Socioeconomic Deprivation Influences Failure to Attend Arranged Orthopaedic Outpatient Appointments as Well as Access to and Engagement With Health Care

Vijay Badial (Imperial College Healthcare NHS Trust), Samuel Turner (Imperial College Healthcare NHS Trust), Hamish Jeffrey (Imperial College Healthcare NHS Trust), Reece Barter (Imperial College Healthcare NHS Trust), Edward Hayter (Imperial College Healthcare NHS Trust), Raymond Anakwe (Imperial College Healthcare NHS Trust)

We undertook this study to examine the “did-not-attend” (DNA) rate for the orthopaedic outpatient clinic at a large tertiary center, to understand the influencing factors and reasons from the patient perspective and to determine the impact of socioeconomic deprivation.

We reviewed all scheduled outpatient attendances to our trauma and orthopaedic surgery service over a 12-month period and demographic information for each patient, including the Index of Multiple Deprivation. We studied the rate and predictors for nonattendance in the outpatient clinic and the influence of socioeconomic deprivation. We undertook a secondary study to evaluate the reasons patients gave for nonattendance, their perception of the accessibility, usefulness, and format of the outpatient model and any relationship with socioeconomic deprivation 18,033 patients attended 58,396 outpatient appointments over the 12-month study period.

2060 patients “did not attend” at least one arranged orthopaedic outpatient appointment over the 12 months of the study period. Men and more socioeconomically deprived patients were more likely to not attend. The

most common reasons given for not attending were that patients did not feel that the appointment was useful for them. Patients from socioeconomically deprived groups were more likely to reference transport difficulties as a reason for not attending ($p < 0.001$). Socioeconomically deprived and disadvantaged patients reported poorer satisfaction scores regarding how able they felt to access orthopaedic help and services when they needed to and how able they felt to access orthopaedic help and services in a way that suits them. Socioeconomic deprivation affects health and access to health care. Patients who are more socioeconomically deprived are more likely to not attend, and they report poorer satisfaction with access to orthopaedic outpatient care. DNA rates may reflect underlying health disparities.

P60. Unadjusted Unplanned 30-Day Hospital Readmission Rates are Not a Useful Quality Measure for Planned or Urgent Orthopaedic Inpatient Care

Samuel Turner (Imperial College Healthcare NHS Trust), Vijay Badial (Imperial College Healthcare NHS Trust), Reece Barter (Imperial College Healthcare NHS Trust), Edward Hayter (Imperial College Healthcare NHS Trust), Raymond Anakwe (Imperial College Healthcare NHS Trust)

We examined the number of patients who experienced an unplanned hospital readmission following an episode of inpatient care in a tertiary level trauma and orthopaedic service, the reasons for readmission and whether these reasons related to lapses in care, care and service delivery problems, and missed healthcare intervention opportunities and whether they were or should have been prevented and anticipated. We hypothesized that most 30-day readmissions would be unrelated to the original complaint and admission, and the reasons for readmission would not be truly avoidable or attributable to the index hospital admission. We further hypothesized that socioeconomic factors would be predictive of the likelihood of unplanned hospital readmission within 30 days of hospital discharge.

Over 5-years we identified all adult patients discharged from our unit and those who had an unplanned readmission within 30 days of discharge. We evaluated the reasons for readmission and assessed the impact of socioeconomic deprivation and social determinants of health on the likelihood of unplanned 30-day readmission using multivariable logistic regression. 15,313 patients were discharged from our unit over the study period. 690 patients (4.5%) were readmitted within 30 days of discharge as an unplanned episode of care. 58.4% of unplanned readmissions were directly related to the index admission, but only 9% of readmissions were preventable. The single most frequent reason for readmission was an unrelated noninfective medical complaint, 244 patients (35.4%). Social determinants of health influenced the risk of an unplanned readmission, particularly the Index of Multiple Deprivation and the subdomains related to housing, the living environment, social services, and support.

The 30-day readmission rate as a marker of quality is not useful as an unadjusted metric and can be misleading. Adjusting for socioeconomic influences, preventability of readmissions, and missed opportunities to improve whole health may improve its usefulness.

P61. Talonavicular dislocation: Mechanism, management and outcomes in three cases

Nondumiso Zondi (UKZN), Duduzile Sigodi (SAOA)

Talonavicular dislocation is a rare Chopart joint injury, often associated with high-energy trauma and occult fractures. Delayed diagnosis and avascular necrosis of the talar head are recognised complications. Literature on management and outcomes remains limited.

We retrospectively reviewed three patients treated for talonavicular dislocation at a single centre from 2021 to 2026. All underwent plain radiographs and CT scan for diagnosis and pre-operative planning. Data included demographics, mechanism, associated injuries, treatment, and complications. Functional outcome was assessed using the AOFAS Midfoot Score. Minimum follow-up was 6 weeks. Ethical approval was obtained.

Three male patients aged 34 to 50 years presented following a fall from height, gunshot injury, and motor vehicle

accident. CT confirmed isolated medial talonavicular dislocation in one case and identified associated cuboid and navicular fractures in two cases. One closed dislocation was managed with closed reduction under sedation and below-knee cast for 6 weeks. Two cases required open reduction due to talar head buttonholing through the dorsal talonavicular ligaments; these were stabilised with 3.5 mm cannulated screws across the talonavicular joint. The gunshot case had a Gustilo-Anderson grade II medial wound requiring debridement. At final follow-up [range 6 weeks to 2 years], mean AOFAS score was 79 (range 62-92). No avascular necrosis was noted on follow-up radiographs. One patient had residual midfoot stiffness. All returned to activities of daily living. CT is essential to identify associated fractures in talonavicular dislocation. Prompt closed reduction is successful for isolated injuries, but open reduction and screw fixation are required for irreducible dislocations. Short to mid-term outcomes are acceptable, though stiffness may persist.

P62. Retrospective Analysis of the BOAT Osteotomy for Hallux Valgus Correction

Heinrich Hesse (WITS), Ziyaad Mayet (WITS), Sebastian Magobotha (WITS)

Anecdotally, many other Orthopaedic surgeons also incorporate the Best Of All Technique (BOAT) into their HV management. However, very little data exists on its outcomes.

The study aims to assess radiographical and patient-reported outcomes of the BOAT technique and to assess if it is a viable alternative to the current options available in the surgical management of Hallux Valgus.

A Retrospective Analysis of the BOAT Osteotomy for Hallux Valgus Correction was performed from January 2014 to December 2019.

Inclusion criteria were patients who underwent the BOAT procedure for correction of Hallux Valgus deformity, with a minimum of 3 months postoperative radiographs, and skeletally mature patients, as evidenced by closed growth plates. Patients with Preceding Infection or a lack of sufficient data for interpretation were excluded.

Radiographical parameters (HVA, DMAA and IMA) were assessed pre- and post-operatively and classified according to the HV severity index. Additionally, patient-reported outcomes were analysed pre- and post-operatively using the Visual Analogue Scale and the American Orthopaedic Foot and Ankle Scoring system.

The data analysis plan involves using STATA 18 software to analyse data from subjects undergoing BOAT surgery for hallux valgus repair. Data cleaning will be conducted using STATA's capabilities to identify and handle missing data, ensuring data integrity through consistency checks and outlier detection. Descriptive analysis will include calculating statistics for pre- and post-operative radiographical parameters and patient-reported outcomes. Inferential analysis will employ paired t-tests or Wilcoxon signed-rank tests for comparing pre- and post-operative measures within subjects, and independent t-tests, Mann-Whitney U tests, or chi-square tests/Fisher's exact tests for comparing outcomes between BOAT and other osteotomy techniques. Data standardisation or normalisation using z-scores or transformations will ensure comparability where necessary.

The study is in the data analysis phase and will be completed for presentation at the congress.

P63. Impact of Standardized Care Protocols on Hip Fracture Outcomes: Mitigating Socioeconomic and Racial Disparities in a Universal Healthcare System

Vijay Badial (Oxford University Hospitals NHS Trust), Samuel Turner (Imperial College), Harry Hodgson (Imperial College Healthcare NHS Trust), Reece Barter (Imperial College Healthcare NHS Trust), George Lee (Imperial College Healthcare NHS Trust), Thomas Mackinnon (Imperial College Healthcare NHS Trust), Edward Hayter (Oxford University Hospitals NHS Trust), Raymond Anakwe (Imperial College Healthcare NHS Trust)

Socioeconomic deprivation and race and ethnic background are established predictors of poorer health outcomes and mortality after a hip fracture. The extent to which standardized, evidence-based treatment protocols can address these disparities remains unclear.

We analyzed data from 637 patients treated for hip fractures at a level 1 trauma center over 5 years. All patients received care according to a standardized protocol aligned with national best practice standards.

Four hundred eleven (65%) patients underwent surgery within 36 hours of diagnosis. The mortality was 34.7% over 5 years. Factors significantly associated with mortality included delayed surgery ($p < 0.05$), American Society of Anesthesiologists grade ($p = 0.003$), and frailty ($p = 0.001$). Ethnicity ($p = 0.381$) and socioeconomic class ($p = 0.678$) were not significant predictors of mortality. There was no difference in the pattern of hip fractures, the treatment given, the timeliness of surgery, or patient mortality when patients of different ethnic background and socioeconomic status were compared.

Standardised, evidence-based protocols and treatment pathways within healthcare systems have the potential to enhance clinical outcomes and minimise the influence of socioeconomic and racial disparities on postoperative mortality. These findings highlight the crucial role of equitable access to care and the implementation of structured treatment protocols and standards in addressing health inequities.

In a protocol-driven, audited hip fracture pathway, socioeconomic and racial disparities in mortality were eliminated. These findings suggest that structured, evidence-based systems of care—combined with equitable access—can mitigate health inequities in major trauma. Standardization is not only a quality intervention but an equity intervention.

P64. Management of sacral fragility fractures leading to spinopelvic dissociation: A scoping review

Tasneem Pope (Trauma and Orthopaedics Department, Imperial College Healthcare NHS Trust, London, United Kingdom), Esther Wright (Trauma and Orthopaedics Department, Imperial College Healthcare NHS Trust, London, United Kingdom), Douglas Evans (Exeter Hip Unit, Princess Elizabeth Orthopaedic Centre, Royal Devon University Healthcare NHS Foundation Trust, Exeter,), Peter Tayloir (Trauma and Orthopaedics Department, Austin Health, Austin Hospital Tower, 145 Studley Rd, Heidelberg VIC 3084, Australia), Jasvinder Daurka (Trauma and Orthopaedics Department, Imperial College Healthcare NHS Trust, London, United Kingdom)

Fragility fractures affecting the sacrum present an increasing challenge to orthopaedic practice due to limited comparative data and the absence of consensus on optimal management. Despite a low energy mechanism of injury, U-Type and Rommens Type IVb fractures specifically may result in spinopelvic dissociation with associated neurological deficit. This scoping review aims to summarise the current principles of care for these low-energy bilateral posterior sacral fractures (BPSFs), indications for surgery, and outcomes of operative versus non-operative treatment.

This scoping review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR). A systematic search of electronic databases was performed to identify studies including ten or more patients with BPSFs comparing operative and non-operative approaches. Two reviewers independently screened titles, abstracts, and full texts against predefined inclusion and exclusion criteria, with disagreements resolved by consensus. Data were extracted using a standardised form and summarised narratively with reference to mobility, quality of life, and patient-reported outcome measures. Of 421 studies screened, eight met the inclusion criteria.

Operative management was indicated secondary to failure of non-operative care in most cases. Percutaneous screw fixation was the most common surgical technique utilised. Although one study reported improved outcomes with early fixation, considerable heterogeneity in surgical approach and timing was observed, alongside a similar lack of consensus regarding non-operative regimes and their threshold for failure.

Operative management may enhance pain relief, mobility, and function in selected patients with BPSFs, though with notable implant-related risks. Careful patient selection remains key, and further prospective studies are needed to establish optimal non-operative management protocols and identify patients who would benefit from early operative intervention.

P65. Risk factors for hip fractures in Zimbabwe and the Gambia: A case control study

Anya Burton (University of Bristol), Kate Ward (University of Southampton/MRC Unit The Gambia), Tafadzwa

Madanhire (University of Bristol/Biomedical Research and Training Institute), Hannah Wilson (University of Bristol), Momodou K-Jallow (MRC Unit The Gambia), Tadios Manyanga (Biomedical Research and Training Institute), Lucy Gates (University of Southampton), Camille Pearce (University of Southampton), Anthony Muchai Manyara (University of Bristol), Kebba Marenah (Edward Francis Small Teaching Hospital), Prudence Mushayavanh (Sally Mugabe Central Hospital), Munyaradzi Ndekwere (Sally Mugabe Central Hospital/Midlands State University), Chris Grundy (London School of Hygiene and Tropical Medicine), Matt Costa (University of Oxford), Bilkish Cassim (University of KwaZulu-Natal), Rashida Ferrand (Biomedical Research and Training Institute/London School of Hygiene and Tropical Medicine), Celia Gregson (University of Bristol/Biomedical Research and Training Institute)

With increasing longevity across Africa, age-associated fractures are increasingly seen yet context-specific risk factors are poorly understood. We assessed clinical risk factors (CRFs) for hip fracture in two African countries. This case-control study of adults aged ≥ 40 years residing in The Gambia and Zimbabwe included prospectively-identified incident hip fracture cases, age-band and sex frequency matched (1:3) to general population controls. Data were collected using researcher-administered questionnaires and physical measurements. Mid-upper arm circumference (MUAC) was included as a proxy for body mass index as immobility post-fracture prevented measurement. Multivariate models assessed associations between traditional and contextual CRFs and hip fracture.

There were 327 hip fracture cases and 936 controls, mean age 70 years, $n=655$ (51.9%) female. Considering traditional CRFs other than the matching factors age and sex (underweight, previous fracture, parental hip fracture, smoking, glucocorticoids, secondary osteoporosis, >3 units alcohol a week), only 'underweight' MUAC (OR 3.36 [95%CI 2.23-5.06] vs. 'normal weight' MUAC) and previous fracture (OR 3.00 [1.48-6.10]) were associated with increased hip fracture risk (AUC=0.70). The context-specific model additionally identified dementia (OR 5.02 [1.74-14.5]), poor balance (OR 3.00 [1.65-5.42]) and HIV (OR 2.08 [1.18-3.68]) as independent risk factors (AUC=0.71). Due to its high prevalence (24.6% cases vs. 6.3% controls) and relatively large effect estimate, MUAC alone identified 77% of cases correctly (AUC 0.69).

Undernutrition is an important predictor of hip fracture in this context. Additional risk factors beyond those traditionally included in fracture prediction models should be considered when evaluating fracture risk in African populations (e.g. dementia, balance, HIV). Further work to develop an African-centred fracture risk prediction tool is needed.

Funding: Wellcome (ref:217135/Z/19/Z).

P66. Management of Fragility Fractures. A Survey From a Single Orthopaedic Department in South Africa

Serenna Dehaloo (University of the Witwatersrand), Oatile Phakathi (University of the Witwatersrand), Sophie Davies-van Es (University of Cape Town)

Osteoporosis is a metabolic condition that frequently presents to orthopaedic surgeons as fragility fractures and is associated with increased mortality, morbidity, and healthcare expenditure. This healthcare burden necessitates the recognition of osteoporosis and initiation of anti-osteoporosis medications to prevent secondary fractures. We aimed to evaluate the knowledge and attitudes of orthopaedic surgeons and trainees regarding fragility fractures by conducting a cross-sectional online survey of the orthopaedic surgery division at a single teaching hospital. Data were analysed descriptively, with chi-square and binomial tests used to assess response distributions.

Eighty-two participants completed the questionnaire, of whom 85.3% were registrars and 14.6% were specialists. All (100%) respondents regarded osteoporosis care as "very important", 98.8% reported feeling "very responsible" for initiating osteoporosis treatment in fragility fracture patients. Despite this, a minority (39%) believed their current osteoporosis management was adequate. Most cited reasons for inadequate care were a "knowledge gap" (83.3%, $p<.001$) and discomfort with anti-osteoporosis

pharmacotherapy (91.8%, $p<.001$). Perceived time constraints and viewing osteoporosis treatment as outside their scope were less common. Subgroup analysis using Fisher's exact tests found no significant association between training level and the self-reported "knowledge gap." DEXA scans were "sometimes" ordered by 55.7% of respondents, 46.8% "usually" recommended calcium and vitamin D supplementation and 46.8% "usually" referred patients to a metabolic disease unit. Significantly, 54.4% "never" ordered vitamin D levels, and 45.6% "never" prescribed anti-resorptive medications, such as bisphosphonates. However, they reported greater comfort providing advice on diet, exercise, fall prevention and future fracture risk than in prescribing and monitoring pharmacotherapy.

These findings reveal gaps in knowledge and care for osteoporotic patients presenting with fragility fractures to orthopaedic surgeons. Increased education on osteoporosis pharmacotherapy, the establishment of treatment guidelines, and multidisciplinary fragility fracture care teams are essential to reduce mortality and morbidity and to prevent secondary osteoporotic fractures.

P67. Reluctant Knee: Understanding and Managing Stiffness After Total Knee Arthroplasty

Sakeena Hosanee (Wits University), Nnena Elebo (Wits), Nkhodiseni Sikhauli (Wits), Jurek Pietrzak (Wits)

Post-total knee arthroplasty (TKA) stiffness remains a clinically important cause of pain, limited range of motion (ROM), functional impairment, and reintervention despite the overall success of modern knee arthroplasty. Its reported incidence varies because the literature continues to use inconsistent definitions of stiffness, fibrosis, and arthrofibrosis, but contemporary data suggest that acquired idiopathic stiffness occurs in approximately 3.6% to 4.0% of TKAs and that manipulation under anaesthesia (MUA) is required in roughly 2.6% to 3.6% of cases. This narrative review synthesises current evidence on the pathophysiology, evaluation, and staged management of post-TKA stiffness, with particular emphasis on the role of MUA.

The available literature supports a diagnosis-of-exclusion approach in which infection, component malposition, instability, and other secondary causes are excluded before arthrofibrosis is diagnosed. MUA remains the principal first-line procedural intervention once early conservative measures fail, and current evidence suggests that earlier intervention, generally within 6 to 12 weeks of index TKA, is associated with greater ROM gain and lower complication and revision risk than delayed manipulation. However, outcomes remain influenced by baseline ROM severity, patient selection, and the quality of post-manipulation rehabilitation. When MUA fails, escalation to arthrolysis or revision TKA should be individualised and guided by identification of persistent soft-tissue fibrosis versus correctable mechanical pathology. Important gaps remain in standardised definitions, biomarker development, prospective comparative studies, and context-specific data from South Africa and other resource-constrained settings.

P68. Younger patients (< 60 years) face a higher 10 year revision rate following primary total knee arthroplasty for osteoarthritis: a systematic review of revision rates, complication rates and patient reported outcomes

Branavan Rudran (Oxford University), Christopher Little (Oxford university), Simon Abram (Oxford University), Shiraz Sabah (Oxford University), Andrew Judge (Oxford University), Abtin Alvand (Oxford University), Antony Palmer (Oxford University), Andrew Price (Oxford University)

Total knee arthroplasties (TKA) are projected to increase significantly, particularly among younger patients who may place greater demands on these prostheses than older patients. This study will assess the implant survivorship by assessing the revision rate of primary TKA for patients aged 60 years or younger (≤ 60), diagnosed with osteoarthritis of the knee.

This systematic review was performed according to PRISMA guidelines. Studies were included if they reported

at least one outcome of interest following primary TKA for osteoarthritis in patients 16 to ≤ 60 years of age. The primary outcome was implant survivorship at 10 years. Revision was defined as exchange of any component and/or subsequent patella resurfacing. The secondary outcomes were revision rates by alternative definitions, PROMs and complication rates. All statistical analysis was performed using Stata Version 15 (STATA corp). 1868 articles were reviewed, with 32 studies included. The 10 year revision rate was 7.3% (95% CI 4.9 - 9.7%). for patients ≤ 60 years of age (0.73% per annum: 95% CI 0.49 - 0.97%). The 10 year revision rate was 31.4% (95% CI 21.7-41.2%) for patients ≤ 40 years of age: 3.14% per annum (95% CI 2.17-4.12%). The most reported complication was DVT, ranging from 0.9-40% at 1 - 15.5 years follow-up. Twenty-nine studies reported at least one PROM, only 3 used a validated, knee-specific PROM (OKS). At 6–12 months, the weighted mean change was 13.4 points for Oxford Knee Score (range 6.1–19.0)

Conclusion

In conclusion, 10 year revision rate was 7.3% for patients ≤ 60 years of age. 10-year revision rates were significantly higher in patients < 40 years. Further research is required to understand why younger patients have a higher 10-year revision rate following primary TKR. This research will guide shared decision making between the patient and surgeon.

P69. Primary Total Knee Arthroplasty in South Africa: The First Analysis of the South African Orthopaedic Registry

Rohit Raghavendran (Imperial College school of Medicine), Martinique Vella-Baldacchino (Imperial College London - MSK Lab), Edgar Majirija (University of Cape Town), Marc Nortje (University of Cape Town), Michael Held (University of Cape Town)

Joint arthroplasty registries have proven vital in monitoring implant performance and guiding clinical improvements. In a South African context, an arthroplasty registry can provide valuable insights into local patient care different from existing international registries. This study presents the first analysis of the South African Orthopaedic Registry for primary total knee arthroplasty (TKA).

Data from all primary TKAs recorded up until January 1st 2024, were analysed. Patient demographics, hospital distribution, and surgeon participation were evaluated. Hospitals were categorised by province and sector (private vs. public academic vs public non-academic), and high-volume centres were identified. Data analysis was conducted using Microsoft Excel.

A total of 16,939 TKAs were recorded. Most patients were elderly females with high rates of obesity. Primary osteoarthritis was the predominant indication. Procedural volumes peaked in 2018 but declined sharply in 2020 due to the COVID-19 pandemic, before rebounding by 2023. Of 88 hospitals contributing data, 85.2% were private; 70.1% of procedures occurred in private institutions. Gauteng, Western Cape, and KwaZulu-Natal accounted for most recorded surgeries. Surgeon participation peaked in 2018, with 87 active contributors.

This inaugural analysis of South Africa's joint registry highlights demographic trends, geographic and sectorial disparities, with the dominance of private sector care in TKA delivery. Ongoing data collection is essential to guide policy, enhance equitable access, and improve surgical outcomes across the country.

P70. The Global Incidence Over Time for Primary Total Hip Replacements - A Multi Registry Review

Branavan Rudran (Oxford University), Luca Ignatius (Oxford university), Bhavi Patel (Oxford University), Abtin Alvand (Oxford University), Andrew Judge (Oxford University), Andrew Price (Oxford University), Antony Palmer (Oxford University)

Primary total hip arthroplasties (THA) are projected to increase significantly over the next 10-20 years, with a particular increase in younger patients less than 55 years. National joint registries across the Western world

continue to present their data annually and this review compares trends in THA globally.

All national joint registries with >6 years of data were reviewed, which were reported in English. The countries included were: Australia, Finland, Switzerland, Sweden, New Zealand, and the United Kingdom. All available annual registry reports from 2010-2023 were analysed. The total number of primary THA per country per year was extracted. For patients less than 55, 55-65, and >65 years, the rate per 100,000 was calculated using government reported population data to compare rates of THA.

Across all registries, the cumulative incidence of primary THA increased in all countries from 2010-2023. Primary osteoarthritis remains the predominant indication for primary THA. From available data, the incidence of hip replacements per 100,000 population increased in all countries: United Kingdom (112.9 to 171.8), Australia (114.9 to 177.9), Finland (139.0 to 175.7), Switzerland (210.0 to 273.5), Sweden (169.4 to 262.8) and New Zealand (164.2 to 200.4). The incidence per 100,000 of hip replacement in patients <55 years-old increased in the United Kingdom (15.7 to 20.1), Australia (20.0 to 28.6), Finland (27.2 to 29.9), Switzerland (36.8 to 40.1) and Sweden (25.9 to 26.9). Following the impact of Covid-19, there has been varying impacts on the total number of joint replacements delivered with a noticeable decrease in incidence in 2020.

The demand for total hip replacements continues to rise in the western world. This is across all age demographics including younger patients. Further understanding of the registry data is required to understand the impact of the increasing number of primary THA on younger patients.

P71. The Number of Hip and Knee Arthroplasties Performed in South Africa in 2024

Antoine Dymond (JointCare), Allan Van Zyl (Mediclinic Bloemfontein), Jacobus Jordaan (Busamed Paardevlei Private Hospital), Frans Moolman (JointCare), Aashish Diayar (JointCare)

South Africa lacks accurate annual volume estimates for hip and knee arthroplasty. This ongoing study aims to estimate the number of total hip arthroplasties (THAs), total knee arthroplasties (TKAs), unicompartmental knee arthroplasties (UKAs), and robot-assisted arthroplasties performed nationally during 2024.

A retrospective, multi-source observational study was conducted. Data were requested from implant distributors, medical schemes, private hospital groups, and academic institutions. Overlapping sources enabled improved accuracy using cross-validation. A trusted data processor was used to aggregate inputs to protect the commercial sensitivity of data contributions. Missing data were imputed using probability distributions based on Dirichlet models, with priors informed by publicly and previously available information. Sensitivity analyses were performed across prior strengths.

At time of abstract submission, data were available from prosthesis suppliers representing approximately 48% of the private healthcare sector, medical schemes representing 48%, and hospital groups representing 39%. With moderate prior strength (100), estimated private-sector procedure volumes were 17,351 THAs (95% credible interval [CrI] 8,601-23,449), 12,197 TKAs (CrI 10,348-13,571), and 1,549 UKAs (CrI 1,137-1,645). The implied total volume across these procedures was approximately 31,097 arthroplasties. Sensitivity analyses estimated total private-sector arthroplasty volumes between 23,264 and 35,474, depending on prior strength. Robot-assisted arthroplasty estimates were limited by incomplete and inconsistent reporting. Data from four government-sector institutions, collectively servicing approximately 27% of the country's population, were available. Estimated national government-sector totals based on these available data were 3,488 THAs, 2,588 TKAs and 83 UKAs.

These preliminary estimates suggest that, in 2024, South Africa likely performed 29,424-41,633 hip and knee arthroplasties. These estimates inform healthcare planning, registry development, and national arthroplasty research priorities. As this study progresses, uncertainty originating from incomplete data provision should decrease. Key limitations include partial participation from data providers, reliance on estimated market shares and modelling assumptions for imputation, potential non-response and reporting biases, and incomplete capture/standardisation.

P72. Outcomes and complications of simultaneous bilateral total knee arthroplasty: A retrospective cohort study

Michael Held (UCT), Marc Nortje (UCT), Bradley Bonner (UCT), Kudzai Chironga (UCT), Edgar Majirija (UCT), Puyeipawa Kafita (UCT)

Total knee arthroplasty (TKA) is widely used to treat degenerative joint disease, which frequently affects both knees. Simultaneous bilateral TKA offers potential advantages in efficiency and recovery but remains controversial due to concerns regarding perioperative risk. This study aimed to compare outcomes and complications of simultaneous bilateral TKA with unilateral TKA.

A retrospective cohort review was performed using a prospectively maintained database of procedures performed between October 2017 and April 2025. All simultaneous bilateral TKA cases were identified and matched to unilateral cases based on patient age and surgeon. Primary outcomes included surgical time, intraoperative blood loss, and hospital length of stay (LOS). Secondary outcomes included postoperative complications, high care and intensive care unit (ICU) admission, thromboembolic events, and 30-day mortality. The bilateral group included 10 patients (20 knees), and the unilateral group included 32 knees. Mean hospital stay was 7.1 days for bilateral TKA (3.55 days per knee) compared to 5.1 days for unilateral TKA. When analysed per knee, bilateral TKA demonstrated reduced surgical time (89 minutes versus 97 minutes) and blood loss (185 mL versus 241 mL). All patients were admitted to high care postoperatively as per protocol. No ICU admissions, thromboembolic events, or 30-day mortalities were observed in either group.

Simultaneous bilateral TKA in selected patients appears to be safe and may reduce operative time, blood loss, and hospital stay per knee without increasing early complications or mortality. These findings support its consideration in appropriately selected patients.

P73. The association between post-operative medial knee laxity and aseptic revision risk in total knee arthroplasty – a registry cohort and radiographic study

Dioné Meiring (JointCare), Aashish Diayar (JointCare), Antoine Dymond (JointCare), Frans Moolman (JointCare)

Instability remains a leading cause of revision after total knee arthroplasty (TKA), and medial knee laxity may contribute to suboptimal outcomes. This study assessed the association between post-operative medial laxity and aseptic revision following primary TKA, and explored clinically relevant thresholds.

A retrospective cohort study was conducted using primary TKAs recorded in the JointCare registry between January 2020 and March 2026. Medial laxity was measured radiographically, in degrees, using the joint line convergence angle (JLCA). Cases with septic revision, trauma-related revision, unrelated re-operation, or non-osteoarthritis indications were excluded. Cox proportional hazards regression assessed the association between medial laxity and revision risk, adjusting for age, sex, BMI, ASA grade, implant characteristics, alignment strategy, year of surgery, and radiographic positioning. Restricted cubic spline and exploratory threshold analyses assessed non-linearity.

Included were 8,861 TKAs, with 49 revisions, including 9 for instability. Greater medial opening increased revision hazards overall (adjusted hazard ratio [HR] 1.49 per degree JLCA; 95% CI 1.11-2.00; $p=0.009$). The association was stronger in medially lax knees (JLCA $>0^\circ$; adjusted HR 1.67 per degree; 95% CI 1.46-1.92; $p<0.001$), especially on erect radiographs (adjusted HR 2.18 per degree; 95% CI 1.74-2.73; $p<0.001$). Instability-specific revision showed a stronger association (adjusted HR 2.23 per degree; 95% CI 1.81-2.73; $p<0.001$), although events were sparse. Threshold analyses suggested increased revision risk above 1.0° overall (HR 3.71; 95% CI 1.78-7.70; $p<0.001$), 0.99° in medially lax knees (HR 4.05; 95% CI 1.68-9.77; $p=0.002$), 0.35° on erect radiographs (HR 3.85; 95% CI 1.43-10.40; $p=0.008$), and 0.35° in erect medial-laxity cases (HR 6.13; 95% CI 1.40-26.76; $p=0.016$). No consistent supine threshold was identified.

Post-operative medial knee laxity was independently associated with increased revision risk after TKA, particularly on erect radiographs. Medial opening may represent a clinically relevant radiographic marker of soft-tissue imbalance and help identify patients at increased risk of failure.

P74. Preoperative glycaemic screening and periprosthetic joint infection risk: A systematic review of five biomarkers across thirty studies and over one million patients

Samuel Turner (Imperial College), Vijay Badial (Imperial College Healthcare NHS Trust), Yaman Mhissen (Imperial College), Harry Costello (Imperial College Healthcare NHS Trust), Hamzah Raza (Imperial College), Harry Hodgson (Imperial College Healthcare NHS Trust), Russell De Sa (Imperial College Healthcare NHS Trust), Raymond Anakwe (Imperial College healthcare NHS Trust)

Periprosthetic joint infection (PJI) is among the most serious complications of total joint arthroplasty (TJA). Diabetes mellitus is a well-recognised and potentially modifiable risk factor, yet the optimal glycaemic screening strategy before TJA remains poorly defined. Despite near-universal preoperative measurement of glycated haemoglobin (HbA1c), multiple large studies have failed to demonstrate its independent predictive validity for PJI. This study was prospectively registered on PROSPERO and conducted in accordance with PRISMA 2020 guidelines. Structured searches of MEDLINE, EMBASE, and the Cochrane Library identified thirty studies encompassing over one million patients. All five clinically available preoperative glycaemic biomarkers were evaluated: HbA1c, fructosamine, fasting blood glucose, glycated albumin, and 1,5-anhydroglucitol (1,5-AG). HbA1c demonstrated a consistent but heterogeneous association with infection risk and limited standalone discriminatory performance. In de novo random-effects meta-analysis, elevated HbA1c was associated with postoperative deep infection (pooled OR 2.13; 95% CI 1.40–3.22; $I^2=70.5\%$), whereas the widely adopted 7.0% threshold was non-significant as an independent PJI predictor in multiple large studies. Fructosamine, reflecting short-term glycaemic control over two to three weeks, showed substantially larger effect sizes. Pooled analysis of three qualifying prospective studies demonstrated an association with PJI of pooled adjusted OR 6.97 (95% CI 3.05–15.94; $I^2=0\%$), with 61% of at-risk patients not previously recognised as dysglycaemic through routine diabetes history.

The widely applied 7.0% HbA1c threshold lacks independent predictive validity. The Centre for Perioperative Care pragmatic target of HbA1c below 8.5% better reflects the current evidence base. Universal preoperative glycaemic screening irrespective of known diabetes status is supported. The combination of HbA1c with fructosamine in selected higher-risk patients offers a strategy grounded in current evidence to identify dysglycaemia not captured by HbA1c alone and to guide preoperative optimisation. The available observational evidence does not support binary, threshold-based surgical deferral decisions based on a single biomarker value.

P75. Glucagon-Like Peptide-1 agonists reduce 90 day surgical and medical complications in Total Hip Arthroplasty and Total Knee Arthroplasty: A meta-analysis and systematic review

Branavan Rudran (Oxford University), Christopher Little (Oxford university), Antony Palmer (Oxford University), Alberto Carli (HSS), Andrew Judge (Oxford University), Andrew Price (Oxford University), Abtin Alvand (Oxford University)

Obesity and diabetes are risk factors for developing osteoarthritis, associated with worse outcomes following hip and knee arthroplasty. GLP-1 receptor agonists (GLP-1a) promote weight loss and improve glycaemic control. This study aimed to assess the impact of GLP-1a treatment on 90-day surgical complications following hip and knee arthroplasty.

A systematic review was performed according to PRISMA guidelines. Studies were included if they reported the effect of any GLP-1a on at least one outcome of interest following primary total hip arthroplasty (THA) or total knee arthroplasty (TKA). The primary outcome measure was 90-day surgical complication rate for the combined THA and TKA cohort. Secondary outcomes included 90-day medical complications, 90-day re-admission, all cause revision, healthcare costs, and length of hospital stay (LOHS). Statistical analyses were performed using Stata Version 15.

Seventy-eight articles were reviewed, with ten matched cohort studies (96,356 patients; 30,350 hips and 66,606 knees). Mean age was 61.9 years, 60.3% female. Two studies had serious risk of overall bias and eight a moderate risk. The confidence of evidence as per GRADE was very low for all but one outcome measures (healthcare cost: moderate). The rate of 90-day surgical complications was lower in the GLP-1a group: pooled risk ratio (RR) 0.73 (95% CI: 0.6-0.87) (I² = 58%). GLP1a lowered 90-day medical complications and re-admission rates: RR 0.78 (95% CI: 0.63-0.96) (I² = 88.3%) and RR 0.79 (95% CI: 0.70-0.90) (I² = 61.6%). At 2-years, the revision rate ranged from 1.7-3.3% for the GLP-1a cohort and 1.7-4.5% for control.

GLP-1a treatment prior to THA and TKA reduces 90-day surgical complication, 90-day medical complication and 90-day readmission rates within higher-risk obese populations. In addition to the demonstrated clinical benefit, adoption of this treatment option by healthcare providers could potentially result in significant cost savings across healthcare systems.

P76. AI-Powered Dynamic Curriculum Development in Knee Arthroplasty Training Using Augmented Reality Surgical Interactions

Edgar Majirija (University of Cape Town), Michael Held (University of Cape Town), William Jackson (Oxford Knee Group), Advait Ghandhe (Amodisc Ltd)

Traditional arthroplasty training relies heavily on in-theatre apprenticeship, which limits access, scalability, and the ability to capture expert-trainee dialogue that defines high-level surgical decision-making. Artificial Intelligence (AI) and Augmented Reality (AR) offer an opportunity to transform this process by converting real surgical interactions into structured, reusable educational content. This is especially valuable in a Southern African context with limited resources and volume of arthroplasty training.

As part of a collaboration between a South African and British academic arthroplasty unit, we conducted multiple AR-supported virtual surgical sessions in partial knee and kinematic alignment TKR. These virtual sessions captured real-time video, audio, and intraoperative conversations between the hosting surgeon and visiting surgeon.

Using AI-based processing pipelines, we generated structured video chapters, written educational content, and multiple-choice questions to test participants knowledge retention. The goal was to also to create a dynamic curriculum that reflects authentic and locally relevant expert-fellow discussions and can transform and evolve with future learner input.

Across the initial pilot rounds, AI successfully used raw AR-recorded interactions to generate multi-format learning materials, including automated transcripts, procedural summaries, learning objectives, and item-bank MCQs. Early testing demonstrated strong potential for engagement and knowledge reinforcement, with learners reporting high perceived value in content derived from real intraoperative dialogue. The co-created nature of the material grounded in actual questions fellows ask during surgery, appears to reduce expert blind spots and improve relevance for future trainees.

This project demonstrates the feasibility and early impact of an AI-driven, learner-centred curriculum generated from AR-captured surgical interactions. The approach offers a scalable, cost-effective model for arthroplasty education, particularly suited to resource-limited training environments. By transforming natural surgical conversations into structured, high-quality educational resources, this platform has the potential to redefine how knee arthroplasty knowledge is created, shared, and accessed.

P77. The Weight of Youth: Trends over time in the prevalence of obesity among younger patients undergoing Total Hip Arthroplasty

Branavan Rudran (Oxford University), Abtin Alvand (Oxford university), Simon Abram (Oxford University), Andy Judge (Oxford University), Andrew Price (Oxford University), Antony Palmer (Oxford University) L Ignatius

Obesity is a risk factor for poorer outcomes following Total Hip Arthroplasty (THA), with high risks of revision and periprosthetic joint infection. Over 100,000 THA's are performed annually in the UK, with increasing numbers amongst younger patients. Longitudinal data on obesity by age group remains limited. This aim of the study is to examine obesity trends in THA patients by age using national registry data.

All patients who underwent a THA from 2013-2021 were included from the UK National Joint Registry (NJR). Demographic characteristics, BMI classification, and temporal trends were analysed across both the public and private sectors. Rates were reported as proportions (%) of patients within each BMI category per age group. Only patients with complete BMI data were analysed.

A total of 1,113,576 THA cases were included. After cleaning and excluding missing data, 615,686 patients were analysed. Of these, 117,835 (19%) were under 60 years, 172,696 (28%) aged 60–70, and 325,155 (53%) over 70. The prevalence of obesity in THA recipients has increased substantially over the study period. In patients less than 60 years, there was a higher relative prevalence of obesity, with 81% of patients who underwent a THA having a BMI of overweight or obese. Severe obesity (Obese Class 3) was most prevalent in patients less than 60 (5.2%), compared to 4.2% in those aged 60–70, and 1.9% in patients over 70.

Obesity was highly prevalent in younger THA patients, with 81% of those under 60 classified as overweight or obese. Severe obesity was most prevalent in younger patients. Further research is required to analyse the rising risk of obesity in younger patients on outcomes following TKA.

P78. Patellofemoral Radiographic Measurements and Outcomes After Knee Arthroplasty: A Scoping Review

Aashish Diayar (JointCare), Dioné Meiring (JointCare), Frans Moolman (JointCare)

Patellofemoral complications remain an important cause of pain, dissatisfaction, functional limitation and revision after knee arthroplasty. Lateral and axial radiographs are used to assess patellar height, alignment, tilt and tracking; however, the clinical relevance of these measurements and their thresholds remain uncertain. This scoping review aimed to characterise patella-related radiographic measurements on lateral and axial views, and to summarise their associations with outcomes following primary total knee arthroplasty (TKA) and unicompartmental knee arthroplasty (UKA).

MEDLINE was searched using terms for knee arthroplasty, lateral or axial radiography, patellar height, alignment, displacement and tilt, and clinical outcomes. Supplementary records were identified through targeted searches. Eligible studies reported objective patella-related radiographic measurements or abnormalities on lateral and/or axial radiographs, and their associations with revision, re-operation, pain, dissatisfaction, patient-reported outcome measures (PROMs) or functional outcomes after primary TKA or UKA. Findings were charted descriptively. Meta-analysis was not undertaken because of heterogeneity in imaging protocols, measurement definitions, thresholds and outcomes.

The search yielded 141 records, of which 35 studies were included. Lateral radiographs primarily assessed patellar height using the Insall-Salvati ratio (ISR), Blackburne-Peel index (BPI) or Caton-Deschamps index. Axial radiographs assessed patellar tilt angle (PTA), lateral patellar displacement (LPD), subluxation, congruence and component-patella relationships. Of the 33 studies formally testing measurement-outcome associations, 19 reported at least one statistically significant association, 11 were neutral and three were mixed. Clinically meaningful thresholds identified from the outcome literature included: ISR <0.8 (patella baja), BPI <0.54 (pseudo-patella baja), PTA >5° (excessive lateral tilt), and LPD >5 mm (suboptimal patellar tracking). Exceedances of these thresholds were associated with poorer outcomes, including anterior knee pain, worse PROMs, reduced range of motion, dissatisfaction and revision.

Lateral and axial radiographs provide complementary but distinct information about the patellofemoral joint after knee arthroplasty. Clinically interpretable thresholds exist, but require further validation.

P79. Orthopaedic injuries in 'Zama-Zama' gold miners

Philani Ntombela (Orthopaedic Surgery, University of the Witwatersrand), Qophelo Qwabe (Orthopaedic Surgery, Sefako Makgatho Health Sciences University, Pretoria), Maradona Mncedisi Mashigo (Orthopaedic Surgery, University of the Witwatersrand), Lerato Nhlapo (Orthopaedic Surgery, University of the Witwatersrand), Wofhatwa Ndou (Orthopaedic Surgery, University of the Witwatersrand)

Johannesburg was one of the first sites of gold discovery. Many mines have since been abandoned, contributing to the rise of illegal gold miners ('Zama-Zamas').

Artisanal miners are at higher risk of injury. Reported mechanisms of injury include falls from height, rockfalls and explosions.

Fractures are a common injury type in artisanal miners. Commonly injured regions are the upper limb, followed by lower limb and spine. There is a paucity of literature evaluating orthopaedic injuries in 'Zama-Zamas'.

We evaluated patient demographics, injuries sustained and management thereof in 23 patients seen between January 2024 and May 2025.

The mean age was 28.9 (range 19 - 41). There were 22 males and 1 female. Two patients (9%) were South African, 65% foreign nationals and 6 refused to disclose their nationality.

Mechanisms of injury were rock falls, gunshot wounds, falls from height and assault. Anatomical regions with injuries were lower limb (63%), upper limb (14.8%), pelvis and spine (11.1%). Femur and tibia fractures were the most common with each being sustained by 22% of patients. 80% of the tibia fractures were open injuries. Phalanx fractures, humerus, radius, thoracic spine, calcaneus and metatarsals were present in 6% of the patients. 2 patients sustained an associated vascular injury.

Most patients were managed operatively (61%). 2 patients were transferred to a tertiary facility for further management. 2 patients refused hospital treatment before definitive management. No patients required ICU admission. Median length of hospital stay was 9 days (range 4 - 137 days).

Artisanal miners are at risk of sustaining severe orthopaedic injuries. Majority of artisanal miners are foreign nationals. Multicenter, prospective studies reporting on demographics, injuries sustained and outcomes are needed. This study also highlights the need for targeted interventions to combat illegal mining, to decrease the resultant burden on the healthcare system.

P80. Profile of gunshot injuries at orthopaedic clinic at a tertiary hospital in Gauteng

Mosa Leeuw, (SMU)

Civilian gunshot injuries represent a growing public health and healthcare systems burden in South Africa, particularly within orthopaedic trauma services. Limited institution-specific data exist regarding management strategies and short-term outcomes of gunshot injuries in Gauteng Province.

We analysed the types and patterns of gunshot-related orthopaedic injuries, evaluated their management approaches and short-term clinical outcomes.

A retrospective, cross-sectional descriptive study was conducted over a six-month period at a tertiary academic hospital. Medical records of patients presenting with gunshot-related musculoskeletal injuries managed by the orthopaedic department were reviewed. Data collected included demographic characteristics, injury patterns, imaging, surgical interventions, antibiotic use and complications. Descriptive and inferential statistical analyses were performed using Stata SE 15.0, with a p-value < 0.05 considered statistically significant.

A total of 118 patients were included with a mean age of 33 ± 9.3 years. The lower limb was most frequently affected (71.2%), and fractures were present in 86.4% of patients. The femur was the most commonly fractured bone (45.8%). A significant association was observed between lower-limb injuries and the presence of fractures ($p = 0.009$). Robbery was the leading cause of injury (63.6%), and a statistically significant relationship existed between time of shooting and reason for shooting ($p = 0.041$), with most robberies occurring between 18:01 and 00:00. Surgical management was required in 78.0% of patients, most commonly intramedullary nailing. The implant insertion rate was 61.0%. The median length of hospital stay was 8 days (IQR 5–14). The overall

complication rate was 5.1%.

Orthopaedic gunshot injuries predominantly affect young males and frequently involve lower-limb fractures requiring operative management. Although complication rates were low, the significant associations between anatomical site, fracture occurrence and injury circumstances highlight the substantial clinical and resource burden on tertiary trauma services.

P81. Suprapatellar versus Infrapatellar Intramedullary Tibial Nailing: A Survey by South African Orthopaedic Surgeons

Riven Ragunandan (Witwatersrand)

Tibial shaft fractures are commonly treated with intramedullary nailing. The infrapatellar (IP) approach has traditionally been standard but is associated with anterior knee pain and technical challenges. The suprapatellar (SP) approach may facilitate easier reduction and improved fluoroscopic imaging, though concerns regarding intra-articular injury and knee sepsis remain. The national practice patterns and surgeon perceptions in South Africa are poorly described.

A national cross-sectional survey of South African orthopaedic surgeons assessed demographics, fracture volume, training exposure, preferred technique, factors influencing approach selection, perceived functional outcomes, and comparative perceptions using 5-point Likert scales. Descriptive statistics, chi-square goodness-of-fit test, binomial test, one-sample t-test, independent t-test, Pearson's chi-square test, and Cronbach's alpha were applied.

One hundred surgeons responded. Most treated ≤ 25 tibial fractures annually (68%), and 68% had formal training in both techniques ($p < 0.001$). Routine practice was divided (55% IP versus 45% SP). Fracture location was the dominant determinant (89%, $p < 0.001$). Respondents agreed SP nailing is easier and quicker (mean 3.41, SD = 1.09), improves proximal tibial fracture reduction (mean 4.11, SD = 1.07), and is associated with less anterior knee pain (mean 3.25, SD = 1.02). IP nailing was perceived to cause less patellofemoral damage (mean 3.60, SD = 1.03). These perceptions were more pronounced among the higher-volume surgeons.

South African surgeons report divided practice, with perceptual advantages favouring suprapatellar nailing balanced against patellofemoral concerns. These findings highlight evolving practice trends and support the need for further research in our local settings.

P82. The prevalence of associated pelvic fragility fractures in patients older than 60 years with hip fragility fractures

Kwandiwe Matanda (University of Pretoria), Archie Rachuene (University of Pretoria), Tshepang Phiri (University of Pretoria), Ropo Ogunsakin (University of Pretoria)

Pelvic fragility fractures are associated with significant morbidity, mortality and functional decline, yet concurrent pelvic fractures in elderly patients with hip fragility fractures are poorly documented. This study aimed to determine their prevalence and assess how often these injuries are missed.

A retrospective cross-sectional analysis was conducted on radiographs of patients aged 60 years and older who underwent surgical management for proximal femur fragility fractures between 2024 and 2025. Admission anteroposterior (AP) pelvic radiographs were reviewed using the Picture Archiving and Communication System (PACS) to identify concurrent pelvic fractures. Intertrochanteric fractures were treated with either cephalomedullary nails or dynamic hip screws, while neck of femur (NOF) fractures were managed with hip arthroplasty. Patients with pathological fractures, periprosthetic fractures, or polytrauma were excluded.

A total of 158 patients underwent surgery for proximal femur fractures, including 81 with intertrochanteric fractures and 77 with NOF fractures. The majority of patients were female, with males accounting for 51 cases (32.3%). Fifteen patients had associated pelvic fractures, yielding an overall prevalence of 9.5%. Of these, 14

cases (17.3%) were associated with intertrochanteric fractures, while only one case (1.3%) was associated with NOF fracture. Fracture Patterns in patients with intertrochanteric fractures show Ipsilateral injuries as most common (8/14 – 57%), followed by contralateral (4/14 – 29%) and bilateral injuries (2/14 – 14%). Slightly higher prevalence of associated pelvic fractures was observed in those older than 70 years. Notably, none of the pelvic fractures were noted on admission.

Concurrent pelvic fractures in patients with intertrochanteric fractures are clinically significant and frequently missed. Advanced imaging, particularly computed tomography (CT), may be required to improve detection, especially for posterior pelvic ring injuries.

P83. The value of pre-operative blood tests in orthopaedic trauma patients in a South African hospital

Thanduxolo Thabethe (The University of Witswatersrand)

Traditionally, laboratory tests conducted before surgery have been considered essential in assessing a patient's fitness for anaesthesia and the surgery indicated. However, in recent literature, this practice has been increasingly questioned due to its high cost and limited usefulness, especially in patients who appear healthy. Routine preoperative testing often fails to reveal significant new conditions or influence anaesthetic or surgical management.

This study aims to determine if there is any value in doing basic pre-operative bloods tests FBC and U&E in trauma orthopaedic surgery cases

A retrospective study looking at pre-operative blood tests FBC and U&E was conducted on 140 orthopaedic trauma patients at Leratong Hospital Orthopaedic Department between 01 January 2023 and 31 December 2024. The collection focused on the patients who were done basic bloods before their surgical management in theatre. The data collection sheet also included patient's age, comorbidity, costs of investigations, and associated injuries. Following importing data into Stata version 18, data preparation was commenced.

The study population consisted of 144 orthopaedic trauma patients, with a gender distribution of 64% males. The majority of patients did not have comorbidities, with 65% reporting none, while the remaining had one or more comorbid conditions. Among the comorbidities, hypertension was the most common and seen in 55% of patients. The most frequently conducted procedure was open reduction and internal fixation (ORIF), accounting for 37% cases. Analysis of the basic pre-operative blood tests revealed that most patients had results within normal ranges.

Most trauma orthopaedic patients (especially those without comorbidities) have normal pre-operative FBC and U&E results. Routine testing may be unnecessary in low-risk patients and could be reserved for those with known comorbidities or abnormal clinical findings. Selective testing based on patient risk factors would be more cost-effective and clinically appropriate.

P84. Use of 3D printed models to evaluate acetabular fractures in a resource constrained tertiary hospital

Mukondeleli Muthivhi (SAOA)

Acetabular fractures are complex injuries requiring precise anatomical understanding for optimal management. Conventional imaging, computed tomography (CT), remains limited in conveying the full three-dimensional complexity of fracture patterns. Three-dimensional (3D) printed models offer enhanced spatial visualization and tactile assessment, potentially improving diagnostic accuracy and surgical planning. The study aimed to assess the understanding of Acetabular fractures using 3D Computer tomography in comparison with 3D printed models using the Judet and Letournel classification.

A retrospective descriptive study was conducted from January 2020 to December 2023. A total of 16 Acetabular

fracture cases with CT imaging were included and corresponding 3D printed models were generated. Eight orthopaedic registrars with at least 4 years' experience participated as observers. Each participant assessed fracture cases in two sessions, first using 3D CT and second session using 3D printed models. A structured questionnaire was used to evaluate fracture classification (Judet and Letournel), management decisions, surgical approach, fixation strategy and observer satisfaction.

From the eight orthopaedic registrars that participated, there was 100% familiarity with 3D CT, whereas 3D model familiarity was variable. 3D CT demonstrated higher apparent agreement in fracture classification, with dominant patterns identified in most cases (>75% agreement). In contrast, 3D-printed models revealed greater heterogeneity with observers identifying complex or combined fracture patterns. Operative management decisions and fixation strategies (100% plate and screw) showed near-universal agreement across both modalities. However, 3D models influenced surgical approach selection, promoting more anatomically tailored and occasionally more complex or combined approaches. Observer satisfaction was higher with 3D printed models, indicating improved subjective confidence.

We concluded that 3D printed models do not alter operative indications or fixation strategies but significantly enhances fracture interpretation, surgical planning, and surgeon confidence. It improves anatomical understanding, particularly in complex acetabular fractures, making it a useful adjunct in resource-constrained settings and surgical training.

P85. Prevalence of Depression, Anxiety, and Stress in patients with non-traumatic mechanical chronic low back pain in Two Healthcare Centers based in South Africa

Andrea Asare-Bediako (University of Pretoria), Mthunzi Ngcelwane (University of Pretoria), Elmè Nel (University of Pretoria)

Pain is a complex experience involving sensory, emotional, and behavioural responses triggered by tissue damage. Data on the psychological burden among patients with CLBP in South Africa are limited. We conducted a prospective study of 90 adults with chronic low back pain (CLBP) at local Trauma & Spine Outpatient Clinics. Participants completed validated questionnaires, including the Depression Anxiety Stress Scale-21 (DASS-21), Patient Health Questionnaire-9 (PHQ-9), Generalized Anxiety Disorder-7 (GAD-7), Visual Analog Scale (VAS), and Oswestry Disability Index (ODI), to assess the prevalence of psychological symptoms and their potential association with pain severity and disability.

The median age of participants was 53 years (IQR 45–59), with 66.7% being female. Anxiety stood out as the most common psychological issue, affecting 75.6% of individuals with at least mild symptoms. Depressive symptoms were observed in 54.4%, and similarly, 54.4% experienced elevated stress levels. Nearly half, 53.3%, reported severe pain, while 56.7% showed severe disability according to the ODI score. There was a significant link between anxiety severity and higher pain intensity ($p = 0.010$). Also, disability level correlated strongly with depression ($p < 0.001$), anxiety ($p = 0.001$), and stress ($p < 0.001$). Logistic regression analysis indicated that being a pensioner was associated with lower odds of experiencing clinically significant depression compared to being unemployed (OR 0.12; 95% CI 0.03–0.51; $p = 0.004$).

We conclude that patients with chronic mechanical low back pain experience significant psychological distress, intense pain, and notable functional impairment. Higher levels of psychological distress correlate with poorer clinical outcomes. These findings underscore the importance of regular psychological screening and the adoption of a multidisciplinary, biopsychosocial approach to managing CLBP.

P86. Cervical Spine Tuberculosis Presenting with Aerodigestive Compromise Prior to Neurological Deficit: A Case Report

Stephen Mattushek (Wits), Leonard Muhango (Wits), Morake Tlhabane (Wits), Fred Ukunda (Wits)

Cervical spine tuberculosis is an uncommon but potentially devastating form of extrapulmonary TB, associated with high morbidity due to its proximity to the spinal cord and airway. Retropharyngeal abscess formation may present with dysphagia, voice changes, or respiratory compromise, often preceding neurological deficit and posing a risk of rapid deterioration if not recognised early.

A 37-year-old HIV-negative female presented with a two-month history of progressive neck pain, one month of dysphagia to solids, and acute onset dyspnoea. Examination revealed anterior neck swelling with tracheal deviation but no neurological deficit. Imaging demonstrated extensive vertebral destruction from C3–C7, near-complete collapse of C5, kyphotic deformity, and a massive prevertebral abscess extending from C2–T2 causing laryngeal narrowing and extradural spinal cord compression. Chest imaging showed cavitary pulmonary disease. GeneXpert confirmed rifampicin-resistant tuberculosis.

A staged surgical strategy was employed. Urgent anterior incision, drainage, and biopsy relieved airway compromise and established the diagnosis, allowing prompt initiation of second-line anti-tuberculous therapy. Ongoing instability due to multilevel destruction necessitated posterior stabilisation from C3–C6 after two weeks. The patient developed acute postoperative quadriparesis, requiring emergent posterior decompressive laminectomy, with complete neurological recovery within 24 hours. Dysphagia, dyspnoea, and pain resolved completely.

Cervical TB may present primarily with aerodigestive symptoms in the absence of neurological deficit despite advanced disease. In multilevel subaxial involvement with kyphosis and instability, staged management with early anterior decompression, stabilisation, and a low threshold for decompression is essential. Prompt microbiological diagnosis and tailored therapy, particularly in drug-resistant TB, are critical to prevent catastrophic airway and neurological compromise.

P87. Short segment instrumentation and fusion without burst fragment fixation as a treatment modality for patients suffering from thoracolumbar burst fractures at a tertiary hospital

Christian Makita (Stellenbosch university), Sanesh Miseer (Stellenbosch University), Marlize Burger (Stellenbosch university)

Short -segment posterior instrumentation and fusion (SSPIF), employing a four-screw construct (4S) one level above and below the injured vertebra, is a commonly used technique for the operative management of thoracolumbar burst fractures. The addition of intermediate pedicle screws at the fractured vertebra itself (six-screw construct, 6S) has been shown in literature to improve post-operative sagittal alignment and reduce implant failure. At Tygerberg Hospital, Cape Town, SSPIF without intermediate screw fixation (4S) is standard practice. This study aimed to evaluate postoperative radiographic outcomes and loss of correction in patients with thoracolumbar burst fractures.

A retrospective study included patients who underwent 4S SSPIF for thoracolumbar burst fractures at Tygerberg Hospital between January 2019 and July 2023. Cobb angle measurements and the vertebral body compression ratio (VBCR = anterior vertebral height [AVH] / posterior vertebral height [PVH] × 100%) were assessed at post-operative, 6-week, 3-month, 6-month, >12-month and >24-month intervals. Paired t-tests were used to assess loss of correction between postoperative and follow-up data-points.

Fifty-five patients (54.5%, n=30 male; mean age 34.2± 10.9 years) all with traumatic fractures, were included. The predominant level was L1 (71%, n=39). The majority of patients had a AO classification of A3 (44%, n=24). The mean post-operative Cobb angle was 0.85± 4.84°. Correction loss was +1.86° at 6 weeks (p = 0.050), +1.72° at 3 months (p = 0.001), +2.10° at 6 months (p = 0.008), and +2.13° at greater than one year (p = 0.024). Clinically significant kyphosis (>5°) was present in 30% of patients at 6 months and 25% at greater than one year. Mean post-operative VBCR was 90.36± 6.27% remaining stable across all follow-up intervals at 85–90%.

Despite the absence of intermediate screw fixation, the 4S construct achieved radiographic outcomes comparable to published 6S constructs, supporting its preferential use in thoracolumbar burst fracture management

P88. Spinal Tuberculomas as a Clinical Manifestation of Paradoxical TB-IRIS: A Case Series

Sanesh Miseer (Tygerberg Hospital, Stellenbosch University)

Tuberculosis-immune reconstitution inflammatory syndrome (TB-IRIS) is an abnormal immune reaction to Mycobacterium tuberculosis that can be classified as either paradoxical or unmasking. The paradoxical response is a clinical or radiological deterioration of a pre-existing tuberculous lesion or the development of new lesions in a patient who initially experienced a favourable response to chemotherapy. The unmasking type is less clearly defined and is associated with any deterioration after the initiation of antiretroviral therapy (ART). Paradoxical reactions have been noted in both human immunodeficiency virus (HIV) negative and positive patients, with the clinical spectrum including worsening miliary infiltrates, lymphadenitis and hepatosplenomegaly. The central nervous system (CNS) represents one of the most common sites of paradoxical TB-IRIS with meningitis, intracranial tuberculomas and myeloradiculopathy often reported. Spinal epidural tuberculomas as a paradoxical response to TB chemotherapy have never been previously reported in the literature. We present our experience with four cases which highlight a new entity in the spectrum of paradoxical TB-IRIS.

P89. Management and Outcomes of Neglected, Severe Adolescent Idiopathic Scoliosis: A Single Surgeon Experience

Nomsa Afrika (Tygerberg Hospital, Stellenbosch University), Sanesh Miseer (Tygerberg Hospital, Stellenbosch University)

Severe adolescent idiopathic scoliosis (AIS) is typically defined as a major curve exceeding 80 degrees, with less than 25 degrees of correction on bending films. Severe AIS can lead to complications associated with continued curve progression, including increased back pain, cardiac and respiratory dysfunction, and a higher risk of cor pulmonale. Increased mortality has also been noted in patients with curves exceeding 100 degrees. In adulthood, patients may also experience mental health challenges, reduced marriage rates and limited social participation. The surgical correction of severe deformities is technically demanding and carries significant intraoperative and postoperative risks. Rapid correction of a severe curve can increase the likelihood of neurological compromise. Other potential complications involve the gastrointestinal, urinary, vascular and cardiopulmonary systems. We conducted a retrospective, observational study on all patients with severe, neglected AIS that were operated between 1st January 2015 and 31st June 2025. All patients were under 18-years-of-age and demonstrated curves exceeding 100 degrees. The authors describe their pre and post-operative strategies that allowed an average of 70% correction in all included patients. These strategies provide a novel and clinically pertinent solution to this challenging condition.

P90. Is Time Really Spine? Early versus Delayed Surgical Decompression in Traumatic Spinal Cord Injury: A Systematic Review and Meta-Analysis

Wilhelm Hansen (Independent Researcher, Düsseldorf,), Reaz Moolla (Independent Researcher, Johannesburg), Duval Jugganath (Frere Hospital, East London), Matthew Velcich (Chris Hani Baragwanath Academic Hospital, Johannesburg), Kylene Govender (Chris Hani Baragwanath Academic Hospital, Johannesburg), Kofi Nyarko (Chris Hani Baragwanath Academic Hospital, Johannesburg), Olusegun Ogunbanjo (Thelle Mogoerane Regional

Hospital, Vosloorus), Badar Munir (Helen Joseph Hospital, Johannesburg)

Traumatic spinal cord injury has major consequences for function and independence, yet the optimal timing of surgical decompression remains contested. This systematic review and meta-analysis evaluated whether early decompression improves outcomes compared with delayed surgery in adults with traumatic spinal cord injury. MEDLINE, Scopus, Web of Science, CINAHL, the Cochrane Library and Google Scholar were searched from inception to February 2025. Comparative studies of early versus delayed decompression in adults were included. Three reviewers independently screened studies, extracted data and assessed risk of bias. Random-effects meta-analysis was performed for comparable outcomes, with neurological recovery as the primary outcome. Seventy-one studies involving 29716 participants were included, comprising 10909 in the early group and 18807 in the delayed group. Definitions of early surgery varied, although decompression within 24 hours was the most common threshold. Early decompression was associated with improved neurological recovery at 6 to 12 months. For American Spinal Injury Association Impairment Scale improvement of at least one grade, early surgery increased the likelihood of recovery by 39% (risk ratio 1.39, 95% confidence interval 1.22 to 1.60). For improvement of at least two grades, the association was stronger (risk ratio 2.41, 95% confidence interval 1.83 to 3.16). The effect was most consistent in cervical injury and in studies evaluating shorter time windows, particularly within 8 to 24 hours. Limited pooled evidence also suggested a lower complication risk with early surgery (risk ratio 0.73, 95% confidence interval 0.57 to 0.94).

Early decompression, particularly within 24 hours, appears to improve neurological recovery after traumatic spinal cord injury without a clear increase in complications. These findings support early surgery as a target where feasible and strengthen the case for systems that enable referral, imaging and operative access, while highlighting the need for prospective multicentre studies, standardised outcome reporting and greater representation of resource-constrained settings.