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Abstract Book

Category: General Arthroplasty

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ID: 15523

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

Background
Quantifying disease burden is essential for healthcare planning and research. However, accurate annual volume estimates are unavailable for hip and knee arthroplasty in South Africa. To address this knowledge gap, 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 during 2024 in South Africa.

Method
A retrospective, multi-source observational study was conducted. Data were requested from implant distributors, medical schemes, private hospital groups, and heads of departments at academic institutions. Multiple overlapping sources were contacted to improve 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 available and previously available information. Sensitivity analyses were performed across prior strengths.

Results
At the time of abstract submission, data were available from prosthesis suppliers estimated to represent 45% of market share of the private healthcare sector, medical schemes representing 48%, and private hospital groups representing 34%. Using a moderate prior strength (100), estimated procedure volumes within the private sector were 21,569 THAs (95% credible interval [CrI] 21,147-22,008), 13,700 TKAs (CrI 13,530-13,893), and 1,882 UKAs (CrI 1,781-1,918). The implied total volume across these procedures was approximately 37,151 arthroplasties. Sensitivity analyses estimated private sector arthroplasty volumes to lie between 22,556 (CrI 22,251-22,885) and 45,254 (CrI 44,867-45,699), depending on prior strength. Robot-assisted arthroplasty estimates were limited by incomplete and inconsistent reporting across sources at the time of submission. Data from only two government-sector institutions, collectively servicing approximately 12% of the country's population, were available. Estimated national government sector totals based on these available data were 5,377 THAs, 2,548 TKAs and 124 UKAs.

Conclusion
These preliminary national estimates suggest that, in 2024, South Africa likely performed between 30,605 and 53,303 hip and knee arthroplasties. As this study progresses the 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 of robot-assisted procedures.

Country: South Africa

Category: General Arthroplasty

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Temporal Trends In HIV Seroprevalence Among Primary Total Joint Arthroplasty Patients In South Africa: A Comparative Study From 2017 To 2024

Background
South Africa has one of the highest global burdens of HIV, and its impact on elective total joint arthroplasty (TJA) continues to evolve. A 2017–2018 cohort from our unit reported an HIV seroprevalence of 10.7%, with femoral head avascular necrosis (AVN) as the predominant indication. The widespread implementation of Universal Test and Treat (UTT) and expanded access to antiretroviral therapy (ART) may have altered this profile. This study reassessed HIV prevalence, disease control,and indications for TJA in the contemporary era.

Method
We performed a retrospective cross-sectional review of all consecutive patients undergoing primary elective TJA at a South African quaternary academic centre between January 2023 and December 2024. Demographic, clinical, functional**,** and HIV-specific variables were collected and compared with the 2017–2018 cohort. Outcomes included HIV seroprevalence, CD4+ count, virological suppression, ART regimen,and surgical indication.

Results
Of 801 patients, 120 (15.0%) were HIV-positive, representing an increase from 10.7%. HIV-positive patients were younger (56.3 vs 62.1 years, $p < 0.001$), predominantly female (67.5%), and had lower BMI and ASA class. Virological suppression was achieved in 95.8%, with 85.0% receiving first-line ART. AVN as an indication for total hip arthroplasty declined from 65.4% to 14.2%, while primary osteoarthritis predominated. Nearly half of HIV diagnoses were made via community-based testing. Functional scores at presentation were comparable between HIV-positive and HIV-negative patients.

Conclusion
HIV prevalence among patients undergoing TJA has increased, however disease control has markedly improved. The shift from AVN to degenerative joint disease reflects ART-related gains in longevity and musculoskeletal health. Elective TJA appears safe in virologically suppressed patients, supporting routine screening and linkage to care in high-burden settings.

Country: South Africa

Category: General Arthroplasty

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ID: 15508

1 Year Outcomes of the first 1,243 Same-Day Discharge Hip And Knee Arthroplasties In A Developing Economy (South Africa)

Background

Same-day discharge or outpatient arthroplasty (SCDDA) is well documented as a safe and efficient system in high-income countries (HIC), but is it viable in low-and middle-income countries (LMIC)? Evidence from resource-constrained settings is limited. This study evaluated the safety, viability, and value of SCDDA in South Africa by reporting clinically relevant patient-centered outcomes from a large multicenter (ambulatory surgical centers and acute-care hospitals), multi-surgeon cohort.
Method: We conducted a retrospective study of a 1,590 consecutive patients at one-year follow-up who underwent primary same-day discharge hip or knee arthroplasty between January 2020 and February 2025. Procedures were performed across ambulatory surgical centers (ASC), n = 651, and acute-care hospitals (acute), n = 939, within a multi-surgeon practice. Of the total cohort undergoing planned SCDDA, 1,481 patients (93.1%) were successfully discharged on the same calendar day, while 109 cases required enhanced recovery (ERAS) conversion. Robotic-assisted procedures (ROSA) accounted for 109 cases within the cohort. Eligibility for SCDDA followed multidisciplinary assessment (e.g., ASA ≤ 3, optimised comorbidities, adequate social support). Patients were followed up at 6 weeks, 6 months, and 1 year. Outcomes were structured into the “Triple C” model (Teisberg, Wallace & Edwards, 2020): Capability (HOOS-PS, KOOS-PS; EQ-5D-5L mobility, usual activities), Comfort (SANE; EQ-5D-5L pain/discomfort), and Calm (patient experience, satisfaction, willingness to repeat). Descriptive statistics and paired tests were used with significance at $p < 0.05$ and 95% confidence intervals.

Results

Follow-up rates were exceptional, with 97.7% of patients followed up at 6 weeks, 96.2% at 6 months and 95.8% at 1 year. Mean age was 66 ± 10.4 years; BMI 30.5 ± 5.7 kg/m²; 45% male and 55% female. Procedure mix: 36% (579) THA, 52% (822) TKA, 12% (189) UKA. Ninety-day complications were 2.0% medical and 1.8% orthopaedic. Ninety-day readmissions were 1.5% (n = 24) medical and 0.9% (n= 15) orthopaedic. HOOS-PS improved from 11.1 to 1.2 (Δ −9.9; 95% CI −10.3 to −9.4; $p < 0.001$) and KOOS-PS from 15.3 to 2.2 (Δ −13.1; 95% CI −13.6 to −12.6; $p < 0.001$). SANE (affected joint) increased from 47.5 to 92.4 ($p < 0.001$). EQ-5D-5L domains improved from medians of 3/2/3/3/2 (mobility, self-care, usual activities, pain/discomfort, anxiety/depression) pre-op to 1/1/1/1/1 at 1 year. Calm averaged 9.5 pre-operatively, 9.4 for hospitalisation, and 9.2 post-operatively; 95% reported expectations met and 96% would choose SCDDA again.

Conclusion

When delivered through a multidisciplinary, patient-centered pathway, SCDDA is safe, effective, and transferable within a developing-economy context. Complication and readmission rates were low, functional recovery, and patient experience was excellent, supporting broader adoption of SCDDA in South Africa.

Country: South Africa

Category: General Arthroplasty

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SCDDA is a Team Sport

Background

Arthroplasty outcomes are frequently interpreted through a surgeon-centric framework, with quality often attributed primarily to individual technical performance. While surgical expertise is indispensable, modern enhanced recovery and same-day discharge arthroplasty (SCDDA) pathways depend on coordinated perioperative optimisation, expectation alignment, and structured follow-up systems (Husted et al., 2011; Wainwright et al., 2020). Whether reproducible outpatient outcomes are driven primarily by surgeon variability or by pathway maturity remains underexplored. This study evaluates whether consistent SCDDA performance in a multi-surgeon practice reflects individual operator effects or the stability of a shared multidisciplinary system.

Method

A retrospective analysis was conducted of 1,546 consecutive primary same-day discharge hip and knee arthroplasties performed between January 2020 and January 2025 across ambulatory surgical centers (n = 651) and acute-care hospitals (n = 895) within a multi-surgeon practice. 1509 patients were successfully discharged, while 104 patients converted to enhanced recovery after surgery (ERAS). The cohort consisted of 563 total hip arthroplasties (THA), 798 total knee arthroplasties, and 185 unicompartmental knee arthroplasties (UKA).
While operating surgeons varied, the perioperative team and structured pathway remained constant. All patients were managed through a standardized multidisciplinary model comprising:

- Anaesthesiologist-led risk stratification
- General practitioner oversight for medical optimisation and complication governance
- Clinical nurse screening (ECG, laboratory review, glycaemic monitoring) and longitudinal telephonic follow-up at 6 weeks, 6 months, and 1 year
- Preoperative physiotherapy education with protocolized postoperative review
- Clinical coordination for expectation alignment and joint-coach engagement
- Structured post-discharge telephonic surveillance on postoperative days 1, 2, 3, and 7
- Specialist clearance coordination for high-risk patients

The GP maintained oversight of readmissions and complications to ensure closed-loop clinical governance. Outcomes were assessed using the “Triple C” value framework—Capability, Comfort, and Calm (Teisberg, Wallace & O’Hara, 2020). Ninety-day complications and readmissions were recorded. Follow-up integrity exceeded 95% at all timepoints.

Results
Mean age was 66 ± 10.4 years; BMI 30.5 ± 5.7 kg/m². Of planned SCDDA cases, 93.1% achieved same-day discharge. Ninety-day medical complications occurred in 2.0% and orthopaedic complications in 1.8%; readmissions were 1.5% (medical) and 0.9% (orthopaedic).
Substantial and clinically meaningful functional improvements were observed: HOOS-PS improved from 11.1 to 1.2 ($p < 0.001$), KOOS-PS from 15.3 to 2.2 ($p < 0.001$), and SANE from 47.5 to 92.4 ($p < 0.001$). EQ-5D-5L domains normalized at one year. Patient experience remained high, with 95% expectations met and 96% willing to repeat SCDDA.
Despite multiple surgeons performing procedures, outcome measures and complication rates demonstrated minimal observable inter-surgeon variation. High discharge success, low complication burden, and exceptional follow-up integrity (> 95%) were consistent across surgeons and facilities, suggesting performance stabilization attributable to shared pathway design

Conclusion
While surgical skill remains fundamental to safe arthroplasty, these findings suggest that reproducible same-day discharge outcomes are not surgeon-dependent alone. In a setting where surgeons varied but the perioperative team and pathway remained constant, performance consistency was preserved. This supports the hypothesis that multidisciplinary optimisation, expectation architecture, structured surveillance, and follow-up integrity function as system-level performance stabilizers. As value-based healthcare models evolve (Porter, 2010; Teisberg, Wallace & O'Hara, 2020), quality attribution in outpatient arthroplasty may need to expand beyond individual operators toward integrated system design and collective accountability.

Country: South Africa

Category: General Arthroplasty

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ID: 15511

Is SCDDA Safe? A Granular Look into Complications

Background
Safety of same-calendar-day-discharge arthroplasty (SCDDA) is frequently evaluated using aggregate readmission rates, particularly within 30-day postoperative windows. However, reliance on crude readmission metrics risks conflating heterogeneous medical events, trauma-related injuries, and unrelated surgical conditions with pathway-attributable complications. Many published outpatient arthroplasty studies report overall readmission percentages without detailed analysis of causality, temporal patterns, or revision linkage, limiting accurate interpretation of risk (Goyal et al., 2017; Meneghini et al., 2017; Hoffmann et al., 2018). Furthermore, registry-based and database studies often restrict evaluation to 30-day endpoints, potentially underestimating later orthopaedic complications (Hoffmann et al., 2018; Wainwright et al., 2020). This study aimed to perform a granular, time-stratified complication audit in a large consecutive SCDDA cohort, indicating that: (1) complication phenotype changes materially after 90 days; (2) many “readmissions” are not pathway failures; and (3) structured surveillance produces a more accurate—and often more favorable—safety profile than crude readmission counts.

Method
A retrospective analysis of 2,076 consecutive same-calendar-day discharge arthroplasties (UKA, TKA, THA) was conducted within a structured perioperative pathway incorporating standardized postoperative monitoring. All readmissions underwent manual case-level adjudication by the treating team, enabling contextual interpretation rather than reliance on administrative coding.
Readmissions were stratified according to:
- Temporal interval (< 90 days, 90 days–1 year, ≥1 year)
- Causality classification (medical, orthopaedic-related, orthopaedic-unrelated)
- Revision
- Periprosthetic joint infection (PJI)/aseptic
- Robotic-assisted arthroplasty (ROSA)

This methodology enabled differentiation between complications plausibly attributable to index surgery and unrelated clinical events—an approach not routinely adopted in large outpatient series (Meneghini et al., 2017; Goyal et al., 2017).

Results
Across the cohort (n = 2,076), < 90-day readmissions were uncommon and were dominated by medical events rather than orthopaedic failure: medical readmissions 1.4% and orthopaedic-related readmissions 1.0%, with early revision 0.4% and PJI 0.1%. These values compare favorably with
reported 30-day outpatient arthroplasty readmission rates ranging between approximately 1.5% and 5%, depending on selection criteria and data source (Lovald

et al., 2014; Goyal et al., 2017; Hoffmann et al., 2018).

Medical Complications

Early medical readmissions were diverse and frequently unrelated to surgical pathway design. Observed presentations included:

- Shortness of breath and cardiopulmonary events, including suspected pulmonary embolism and pneumothorax.
- Neurological events including seizure activity.
- Gastrointestinal complications such as postoperative ileus, gastritis, and faecal impaction.
- Urological complications including POUR requiring catheterisation and subsequent TURP.
- Infectious diseases including COVID-19.
- Cardiac events including suspected myocardial infarction.
- Renal calculi and unrelated surgical pathology (hernia repair).

These findings indicate that many early readmissions reflect baseline patient medical complexity rather than discharge timing.

Orthopaedic-Related Complications

Orthopaedic readmissions represented expected arthroplasty risk spectra rather than unique risks attributable to SCDDA.

Key patterns included:

- Hip dislocation events requiring closed reduction or revision liner exchange.
- Periprosthetic fractures, frequently associated with trauma or falls rather than early instability.
- Wound-related complications including suture granuloma and superficial infection requiring debridement.
- Mechanical symptoms including instability and stiffness requiring MUA or arthroscopic procedures.
- Revision surgery for mechanical or infectious indications (including DAIR).

Notably, several orthopaedic readmissions occurred beyond the 90-day window, including late instability, trauma-related fractures, and progressive symptomatic pathology requiring revision procedures.

Orthopaedic-Unrelated Admissions

A subset of readmissions were clearly unrelated to index arthroplasty:

- Trauma-related injuries including fractures following falls.
- External surgical interventions.
- Pre-existing pathology unrelated to joint replacement.

This reinforces that crude readmission metrics risk misattributing unrelated events to pathway performance.

Critically, the complication phenotype shifted beyond the early postoperative window. In the 90-day– 1-year interval, orthopaedic-related readmissions increased to 1.5% and revision procedures to 0.5%,with PJI 0.2%, exceeding corresponding < 90-day orthopaedic rates. This interval included mechanicalinstability, progressive symptomatology requiring intervention, trauma-linked fractures, and stagedinfection management. By ≥1 year, orthopaedic-related readmissions persisted (0.7%) with additionalrevisions (0.2%), demonstrating that clinically meaningful orthopaedic risk extends beyondconventional 30- or 90-day reporting windows.

When benchmarked against international outpatient arthroplasty literature—where surveillance often truncates at 30 days and readmissions are not consistently causally adjudicated—our < 90-day profile lies at the favorable end of reported

ranges, while extended surveillance reveals orthopaedic burden not captured in short-window analyses (Goyal et al., 2017; Hoffmann et al., 2018).

Conclusion

SCDDA safety cannot be validly adjudicated using crude 30-day (or even < 90-day) readmission counts alone. In a large consecutive same-day cohort, early readmissions were infrequent and largely medical/heterogeneous, while orthopaedic-related events and revisions were more prominent in the 90-day–1-year window—a period frequently underweighted in outpatient reporting. This audit supports a shift from “counting readmissions” to classifying causality and timing, and argues that high-quality SCDDA programs should be judged by the maturity of their surveillance and attribution methodology, not by simplistic endpoints that confound unrelated admissions with pathway failure. Collecting outcomes is essential, but meaningful quality improvement requires active engagement with the data—understanding each complication in context rather than simply recording its occurrence.

Country: South Africa

Category: General Arthroplasty

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ID: 15512

Measuring What Matters to Patients: Excellent Traditional Outcomes Demonstrated Despite Unrestricted Expectations Measured in a SCDDA Patient Cohort

Background
Managing patient expectations is widely regarded as central to arthroplasty outcomes, with several models advocating expectation alignment to optimize satisfaction (Teisberg, Wallace & Edwards, 2020; Scott et al., 2010). In many programs, expectations are deliberately moderated to reduce dissatisfaction risk. However, in a value-based, patient-centered framework, restricting expectations may be counterintuitive. Whether same-day discharge arthroplasty (SCDDA) can maintain high satisfaction without capping expectations in a developing-economy setting remains unclear.

Method
We performed a retrospective analysis of 1,590 consecutive patients undergoing planned primary same-day discharge hip or knee arthroplasty between January 2020 and February 2025 across ambulatory surgical centers (ASC, n=651) and acute-care hospitals (n=939) within a multi-surgeon South African practice. Of these, 1,481 (93.1%) achieved successful same-day discharge. Expectations were not restricted or pre-emptively moderated; patients defined their own postoperative goals. Outcomes were evaluated at 6 weeks, 6 months, and 1 year using the Triple C framework (Capability, Comfort, Calm) (Teisberg, Wallace & Edwards, 2020). Capability was measured with HOOS-PS and KOOS-PS; Comfort with SANE and EQ-5D-5L pain/discomfort; Calm with satisfaction, expectation fulfillment, and willingness to repeat the pathway. Ninety-day complications and readmissions were recorded. Statistical significance was set at $p < 0.05$.

Results
Follow-up rates exceeded 95% at all timepoints. Mean age was 66 ± 10.4 years; BMI 30.5 ± 5.7 kg/m²; 55% female. Procedures included 36% THA, 52% TKA, and 12% UKA. Ninety-day complications were 2.0% medical and 1.8% orthopaedic; readmissions were 1.5% medical and 0.9% orthopaedic. Despite no limitation on expectations, 95% of patients reported that their expectations were met, and 96% would choose SCDDA again. HOOS-PS improved from 11.1 to 1.2 (Δ −9.9; 95% CI −10.3 to −9.4; $p < 0.001$), and KOOS-PS from 15.3 to 2.2 (Δ −13.1; 95% CI −13.6 to −12.6; $p < 0.001$). SANE increased from 47.5 to 92.4 ($p < 0.001$). EQ-5D-5L domains normalized to median 1/1/1/1/1 at one year. Calm scores remained high throughout the pathway (9.5 pre-operative; 9.4 hospitalisation; 9.2 post-operative).

Conclusion
Contrary to the assumption that expectations must be tempered to preserve satisfaction (Scott et al., 2010), this large South African cohort demonstrates that unlimited, patient-defined expectations are compatible with excellent outcomes in same-day arthroplasty. Within a structured multidisciplinary pathway, high expectations did not compromise satisfaction, safety, or functional recovery. These findings challenge conventional expectation-management paradigms and support a value-based model that empowers rather than restricts patient ambition in arthroplasty. You don’t have to manage expectations downwards to protect satisfaction.

Country: South Africa

Category: General Arthroplasty

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ID: 15513

Discovering value in Robotic TKA: Functional Equivalence but Potential Early Socioeconomic Benefit in Same-Day Discharge Document

Background
While robotic-assisted TKA is often justified by improved surgical precision, evidence remains inconclusive regarding durable patient-reported benefit. In high-performance same-calendar-day discharge (SCDDA) systems, where early mobilization and rapid socioeconomic reintegration are central goals, the relevant question may not be long-term functional superiority but whether small early recovery gains translate into meaningful patient-level value.

Method
We performed a retrospective matched cohort study of 532 consecutive primary TKAs (266 ROSA robotic-assisted, 266 conventional), matched 1:1 without replacement on age, sex, BMI, comorbidity burden, and ASA classification. All procedures were performed by a single high-volume orthopaedic surgeon in a dedicated ambulatory surgical centre using the same implant (Zimmer Biomet Persona® MC) and identical SCDDA perioperative protocols. By controlling the surgeon, implant, and perioperative pathway, the study isolates the incremental contribution of robotic assistance within an already optimized ambulatory ecosystem. Outcomes included intra-operative process metrics (surgical time, total theatre time, blood loss), time to mobilization, numeric pain scores (NRS 0–10), return-to-function milestones, readmissions, and PROMs (KOOS-PS, SANE, EQ-5D-5L, EQ-VAS) assessed pre-operatively and at 6 weeks, 6 months, and 1 year. Given the matched design, between-group comparisons were performed using paired statistical tests as appropriate. Return-to-work data were analysed to explore potential productivity implications within the SCDDA framework.

Results
Mean intra-operative blood loss was lower in the RA-TKA group (105.13 ± 36.33 mL vs 124.95 ± 49.19 mL; Δ −19.82 mL [95% CI −27.29 to −12.34]; p=3.62×10⁻7; n=266 paired), representing a relative reduction of 15.9%. Although meta-analyses report reductions of approximately 25–30% with robotic systems (Kayani et al., 2020; Batailler et al., 2021; Agarwal et al., 2024), the statistically robust reduction observed within this optimized SCDDA cohort suggests that robotic assistance confers measurable intra-operative efficiency even when baseline surgical performance is already high, highlighting potential diminishing returns at higher performance thresholds rather than absence of benefit. Time to first mobilization was similar between groups (mean clock time 13:58 vs 14:13; Δ −1 5 minutes; p=0.179; n=266 paired), indicating that pathway- driven early mobilization protocols likely outweigh surgical modality in determining immediate postoperative functional readiness. Immediate post-mobilization numeric pain scores were slightly higher in the RA-TKA group (5.53 ± 2.10 vs 4.85 ± 2.43; Δ +0.68; p=0.00032; n=264 paired); however, this

early difference did not persist beyond the immediate postoperative period, suggesting transient perioperative factors rather than clinically meaningful divergence in recovery trajectory.
KOOS-PS improved markedly in both groups, demonstrating large within-group functional gains. Between-group differences remained small and statistically non-significant through six months, supporting functional equivalence between robotic-assisted and high-quality conventional techniques within an optimized SCDDA pathway. This convergence is consistent with contemporary literature demonstrating limited medium-term PROM separation between surgical modalities when performed by experienced surgeons (Batailler et al., 2021; Agarwal et al., 2024). A modest one-year separation favouring RA-TKA was observed but should be interpreted cautiously due to reduced paired sample size. EQ-VAS scores improved substantially from baseline in both groups, reaching high and stable values by six months and one year without meaningful between-group divergence. EQ-5D-5L domain responses demonstrated near-ceiling performance at one year, reinforcing that patient-reported health status converges irrespective of surgical modality when embedded within standardized fast-track perioperative pathways (Scott et al., 2010; López-López et al., 2019). Among matched employed patients (n=79 paired), return to work occurred at 3.20 ± 1.76 weeks following RA-TKA compared with 3.75 ± 1.88 weeks after cTKA (Δ −0.54 weeks; 95% CI −1.15 to 0.06; p=0.077). Although not statistically significant, the direction and magnitude of this effect are clinically meaningful within the context of SCDDA pathways, where small temporal gains may translate into substantial socioeconomic impact. Notably, more than 92% of employed patients in both groups returned to work within six weeks, markedly earlier than commonly reported international recovery timelines of approximately 8–12 weeks following TKA (McGonagle et al., 2019; Lombardi et al., 2018), suggesting that perioperative pathway optimization may exert a greater influence on economic reintegration than surgical modality alone. Time to driving, cessation of crutch use, and independence in activities of daily living demonstrated overlapping distributions without statistically significant separation between groups, reinforcing that robotic assistance does not fundamentally alter the overall trajectory of functional recovery when high-quality perioperative care is standardized. A consistently higher proportion of RA-TKA patients reported expectations met at early follow-up, although satisfaction rates were high in both cohorts at later intervals.

Conclusion
In a high-volume same-day discharge ASC, robotic-assisted TKA did not confer medium-term functional superiority compared with optimized conventional techniques. However, consistent short-term process advantages and directionally earlier return-to-work suggest that the value of robotics may reside less in enhancing surgical performance and more in modestly accelerating patient independence and economic reintegration. Within optimized ambulatory ecosystems, where long-term outcomes are already excellent, incremental early recovery gains may represent the most meaningful domain of added value. These findings support redefining robotic benefit from alignment precision toward patient-centric temporal and socioeconomic impact.

Country: South Africa

Category: General Arthroplasty

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ID: 15515

Inclusion Through Optimization: Challenging Patient Selection in SCDDA

Background
Same-calendar-day discharge arthroplasty (SCDDA) has increasingly gained acceptance as part of enhanced recovery pathways; however, many contemporary protocols rely on restrictive patient selection emphasizing younger age, lower American Society of Anesthesiologists (ASA) classification, and minimal comorbidity burden (Meneghini et al., 2017; Goyal et al., 2017). These approaches reflect the prevailing assumption that baseline patient risk profile determines SCDDA feasibility. Emerging evidence suggests that structured perioperative optimization and multidisciplinary care may be more important determinants of safety than rigid exclusion criteria (Husted et al., 2011; Wainwright et al., 2020). This study evaluates whether successful SCDDA can be achieved in a medically heterogeneous cohort using a structured optimization pathway, thereby challenging traditional exclusion-based paradigms.

Method
A retrospective analysis was performed of 2,076 consecutive same-calendar-day discharge arthroplasties performed between January 2020 and January 2026 in a multi-surgeon, multi-center private orthopaedic practice. 902 procedures were performed in ambulatory surgery centers (ASC) and 1,174 procedures were performed in acute facilities. Procedures included 221 (11%) unicompartmental knee arthroplasties, 1,086 (52%) total knee arthroplasties, and 769 (37%) total hip arthroplasties, of which 282 (14%) were robotic-assisted. SCDDA was defined as discharge on the same calendar day as surgery.
All patients underwent structured preoperative assessment within a multidisciplinary clinic, with an anaesthesiologist, physiotherapist, general practitioner, nurse practitioner, and coordinated specialist consultation, emphasizing risk modification rather than risk avoidance.
Baseline patient characteristics demonstrated substantial medical complexity:
- Age: 65 (16–90) years
- BMI: 31 (17–170) kg/m²
- ASA: 2 (1–3)
- Number of comorbidities: 3 (0–12)

Osteoarthritis etiology included primary/idiopathic (74%), mechanical or congenital deformity (10%), trauma (6%), avascular necrosis (5%), inflammatory arthritis (4%), and prior infection (1%), reflecting inclusion beyond traditionally selected outpatient populations. Outcomes included numeric pain scores, functional recovery milestones (return to work, mobilise without crutches, drive, and all-day living), expectations met, HOOS-PS, KOOS-PS, EQ-5D-5L domains, EQVAS, and SANE scores with follow-up at 6 weeks (n=2,013), 6 months (n=1,862), and 1 year (n=1,243).

Results
Contrary to prevailing outpatient selection paradigms that prioritize low-risk patient

profiles, this cohort demonstrated substantial medical and diagnostic heterogeneity while maintaining low complication and readmission rates. Notably, 26% of procedures were performed for secondary or complex etiologies often considered less suitable for outpatient pathways; however, etiology did not preclude successful same-calendar-day discharge within the structured optimization model. Despite broad inclusion without restrictive exclusion criteria, perioperative metrics demonstrated efficient surgical delivery and controlled physiological impact, with mean operative duration 71 minutes (28–230), total theatre time 115 minutes (21–280), and estimated blood loss 124 mL (0–600).

Patient-reported outcomes demonstrated statistically significant and clinically meaningful improvement across all timepoints (all $p < 0.001$), with HOOS-PS improving from 10 preoperatively to 1 at one year and KOOS-PS from 15 to 2, alongside normalization of EQ-5D-5L domains (mobility/self-care/usual activities/pain-discomfort/anxiety-depression) to 1/1/1/1/1 at one year and EQVAS improvement from 77 to approximately 90–91, consistent with international fast-track arthroplasty outcomes (Husted et al., 2011; Hoffmann et al., 2018).

Safety outcomes remained low despite broad inclusion and medical complexity: < 90-day medical readmissions occurred in 1.4% of cases, orthopaedic-related readmissions in 1.0%, early revision procedures in 0.4%, and periprosthetic joint infection in 0.1. Importantly, complications were predominantly medical or transient and rarely represented pathway failure, reinforcing the primacy of perioperative management over exclusion-based screening. These results compare favorably with published outpatient arthroplasty readmission rates of approximately 2–4% reported in more selectively screened cohorts (Meneghini et al., 2017; Goyal et al., 2017; Dey et al., 2021). Among patients not achieving planned same-day discharge, failure was primarily attributable to modifiable physiological or logistical factors rather than major complications, including mobilization challenges (26.6%), postoperative nausea and vomiting (14.7%), and urinary retention (12.8%). Within this framework, successful SCDDA appears to be determined less by baseline risk phenotype and more by the robustness of optimization pathways and postoperative surveillance. Patient experience was highly positive, with expectations met in 89% at six weeks and increasing to 94–100% at later follow-up, and 96% reporting willingness to undergo SCDDA again.

Conclusion

In this large consecutive cohort characterized by advanced age, obesity, and significant comorbidity burden, successful same-calendar-day discharge arthroplasty was achieved without reliance on restrictive exclusion criteria. Outcomes and safety metrics compared favorably with international outpatient benchmarks despite broader inclusion, suggesting that structured multidisciplinary optimization and proactive postoperative monitoring may be more important determinants of SCDDA success than baseline risk profile alone. These findings challenge traditional selection paradigms and support a shift from exclusion-based screening toward individualized optimization pathways, indicating that the feasibility of same-day discharge depends less on who is excluded and more on how patients are prepared and supported.

Country: South Africa

Category: General Arthroplasty

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ID: 15496

Prevalence And Patterns Of Smoking Cessation And Relapse In Patients Undergoing Total Joint Arthroplasty At A Quaternary South African Institution

Background
Cigarette smoking is a well-established modifiable risk factor associated with increased complications, revision risk, and mortality following total joint arthroplasty (TJA). While perioperative smoking cessation reduces postoperative morbidity, relapse after surgery remains common, particularly in resource-constrained settings. There is limited region-specific data from Southern Africa describing smoking prevalence, cessation success, and relapse patterns in arthroplasty populations. This study aimed to determine the prevalence of smokers undergoing TJA, quantify preoperative cessation rates, evaluate postoperative relapse rates and timing, and assess associations between nicotine dependence severity and relapse patterns. We hypothesised that although a proportion of patients achieve temporary preoperative cessation, relapse within the first six postoperative months would be common and associated with higher nicotine dependence scores.

Method
A retrospective cohort analysis was conducted using a prospectively maintained institutional database at a quaternary referral centre. All patients who underwent primary TJA during the study period and had documented smoking status and follow-up data were included. Patients with incomplete smoking histories or missing follow-up data were excluded. Collected variables included age, sex, comorbidities, smoking status, Fagerström Test for Nicotine Dependence (FTND) score, cessation attempts, support received (counselling, nicotine replacement therapy, pharmacotherapy), relapse status, and time to relapse. Descriptive statistics were used to determine smoking prevalence and cessation rates. Kaplan–Meier survival analysis assessed time to relapse, and multivariable regression modelling identified predictors of relapse.

Results
Smoking prevalence among patients undergoing TJA was substantial. A proportion of active smokers achieved preoperative cessation; however, relapse was frequently observed within the first three to six months postoperatively. Higher FTND scores were associated with increased likelihood of relapse and shorter time to relapse. Patients receiving structured cessation support demonstrated comparatively lower relapse rates.

Conclusion
A significant burden of smoking exists among patients undergoing TJA, with high early postoperative relapse rates despite initial cessation. Nicotine dependence severity is a key predictor of relapse. These findings highlight the need for structured, sustained perioperative smoking cessation programmes extending beyond the immediate preoperative period, particularly in resource-limited settings, to optimise surgical outcomes and reduce complication risk.

Country: South Africa

Category: General Arthroplasty

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ID: 15514

The Dry Wound Initiative: An Audit of Wound Dressing Post Total Joint Arthroplasty

Background
Early postoperative wound assessment is an essential component of arthroplasty care, as dressing condition may provide early indicators of wound-related complications. Systematic auditing of wound status allows objective evaluation of current practice and informs quality improvement initiatives within surgical units

Method
A prospective audit of postoperative wound dressings was conducted. Patients undergoing hip or knee arthroplasty were assessed day one postoperative. Wound dressings were scored by the consultant or fellow. A breathable, self-adhesive island dressing with an absorbent pad was routinely used postoperatively. Dressings were graded based on extent of blood staining: Grade 1 (completely dry dressing), Grade 2 (< 50% staining), Grade 3 (> 50% staining), Grade 4 (dressing changed overnight or actively oozing). Wound dressings were monitored daily prior to discharge. Grade 3 & 4 dressings were changed. Intraoperative variables and wound complications within 30 days were recorded.
The goal was to describe immediate postoperative wound status in our unit, describe any association with post operative wound complications or identify possible intraoperative associations.

Results
A total of 140 wound dressings were assessed, 36 total knee arthroplasties (TKA) and 104 total hip arthroplasties (THA). The lead surgeon was the consultant in 24 of the cases, the fellow in 57 and registrars in 59 cases. Dressing grades were: Grade 1 – 36.4% (n=51), Grade 2 – 48.6% (n=68), Grade 3 – 11.4% (n=16) and Grade 4 – 3.6% (n=5). Overall, 85% were Grade 1 or 2. Of the Grade 4 wound dressings, 3 were post TKA and 2 post THA. Grade 3 wounds, 6 were post TKA and 10 post THA. Mean surgical times for Grade 1 & 2 vs Grade 3 & 4 was 95.2 minutes vs 94.3 minutes. One surgical site infection was recorded within 30 days postoperative, occurring in a patient with a Grade 3 dressing following TKA. No other complications were recorded.

Conclusion
This audit demonstrates that the majority of postoperative arthroplasty wounds in our unit exhibit minimal early dressing saturation. Although a small proportion required closer monitoring, higher dressing grades were not associated with an increased incidence of short-term wound complications.

Country: South Africa

Category: General Arthroplasty

Authors : Leonard Muhango[1], Allan Roy Sekeitto[2], Nkhodiseni Sikhauli [2], Jurek Pietrzak [2], Lipalo Mokete[2]
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ID: 15503

An Eight-year Audit in an Academic Tertiary Adult Reconstruction Unit: Trends and Cancellations

Background
Elective surgery cancellations in total joint arthroplasty (TJA) present a persistent challenge,
with rates between 10% and 40% reported globally. We report on Charlotte Maxeke Johannesburg Academic Hospital (CMJAH), a major tertiary referral centre in South Africa,
which experiences high cancellation rates reflective of these global patterns. At CMJAH,
resource constraints, limited operating time, and delayed patient medical optimisation
frequently intersect to disrupt elective arthroplasty services, highlighting broader systemic
healthcare challenges within the public sector.

Method
We conducted a retrospective audit over eight years (January 2017 to December 2024). Data
from the unit statistics, looking at procedures performed, cancellations and reasons, was
reviewed to identify trends over time and contributing factors.

Results
A total of 2,930 procedures were scheduled, with 753 cancellations (25.7%). Cancellation rates
ranged from 13.0% in 2017 to a peak of 27.6% in 2023. Elective surgery was suspended in
2021 due to infrastructural damage (fire). Among 126 cancellations in 2024, lack of ICU/high
care bed availability accounted for 42.1%(53/126), anaesthetic-related issues 20.6% (26/126),
and time constraints 10.3% (13/126). Theatre temperature extremes were responsible for 10.3%
(13/126) of cancellations, while implant or autoclave problems and power outages each
accounted for 6.3% (8/126). Patient refusal or eating preoperatively and water supply issues
were rare, each constituting less than 1% of cancellations. These findings mirror global trends,
emphasising the critical impact of infrastructural and operational challenges on

elective surgery
cancellations. Mortality rates remained low but showed a rise in 2023 (8 deaths) and 2024 (11
deaths), warranting further investigation into perioperative risk management and case selection
practices in high-volume periods.

Conclusion
Elective TJA cancellations at CMJAH remain substantial and are mainly driven by administrative and infrastructure challenges. Sustained investment in perioperative infrastructure, critical care capacity, and coordinated patient optimisation pathways is essential
to reduce cancellations and improve patient outcomes.

Country: South Africa

SUPPORTING DOCUMENTS APPLY TO THIS SUBMISSION

(hold down ctrl and click on the link to view the document)

Category: General Arthroplasty

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[1]Self

ID: 15440

Lifestyle Management of Arthritic Pain

Background
Non communicable diseases such as Type 2 DM, Cardiovascular disease can be reversed using Lifestyle medicine practices by changing the patient's diet, exercise, sleep and optimising the 6 pillars of Lifestyle medicine in the patient.

Can knee pain be minimised and reversed using Lifestyle Medicine management?

Method
Case study

Results
Knee pain reduced by weight loss and persistence of weight loss achieved using Lifestyle medicine changes.

Conclusion
Lifestyle Medicine is an effective way of relieving knee pain by ensuring sustainable weight loss

Country: South Africa

Category: General Arthroplasty

Authors: Innocent Senyolo[1], Winfred Mukiibi[1], Nnenna Elebo[1], Modisha Kinder[4], Nkhodiseng Sikhauli[2], Jurek Rafal Tomasz Pietrzak[1]
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ID: 15541

Uncovering The Oral Health BurdeniIn Arthroplasty Candidates: A South African Perspective.

Background
Oral health is an important and modifiable risk factor in preventing periprosthetic joint infection (PJI) after total joint arthroplasty (TJA). Despite this, standardised dental screening is not universally implemented in preoperative protocols. This prospective study aimed to assess the incidence of dental pathology and its impact on oral health-related quality of life among patients awaiting primary elective TJA at a high-volume arthroplasty referral institution in South Africa.

Method
Fifty randomly selected patients scheduled for primary total hip or knee arthroplasty were assessed by a qualified dentist before surgery. Each patient underwent a structured dental examination, including the Simplified Oral Hygiene Index (OHI-S) and completion of the Oral Health Impact Profile (OHIP-14) questionnaire.

Results
Of the 50 patients, 34 were scheduled for total knee arthroplasty (TKA) and 16 for total hip arthroplasty (THA). Dental pathology was identified in 37 patients (73%), comprising 14 with active carious lesions, 10 with retained root fragments (root rests), and 13 with severe calculus accumulation.

7 patients (14%) were considered dentally clear, with 4 wearing full removable dentures. The mean OHI-S score was 3.3, and 71% had a score > 3.1, indicating generally “poor” oral hygiene. OHIP-14 scores showed that 27% of patients reported moderate impact (scores 15–28) and 12% had severe impact (scores ≥29). A statistically significant correlation was found between higher OHIP-14 scores and the need for dental intervention ($p < 0.01$).

Conclusion
At 90-day follow-up, no patients were readmitted for infective complications, suggesting that early identification and management of oral pathology may help reduce postoperative risk. These findings support routine dental screening as a valuable adjunct to optimising patient safety in elective arthroplasty.

Country: South Africa

Category: General Arthroplasty

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THE CORRELATION BETWEEN VITAMIN D LEVEL AND SEVERITY OF OSTEOARTHRITIS IN PATIENTS AWAITING TOTAL HIP ARTHROPLASTY AND TOTAL KNEE ARTHROPLASTY AT AN ACADEMIC HOSPITAL

Background
Osteoarthritis (OA) is a progressive degenerative joint disease and a leading cause of disability worldwide. Vitamin D plays essential roles in bone metabolism, muscle function, and inflammatory regulation, and deficiency has been proposed as a potential contributor to OA progression and symptom severity. However, evidence on the relationship between serum vitamin D levels, radiographic severity, and functional outcomes in OA remains inconsistent. In South Africa, where delayed healthcare access and high prevalence of vitamin D insufficiency are frequently reported, understanding this relationship has important implications for preoperative optimisation in patients awaiting total hip arthroplasty (THA) and total knee arthroplasty (TKA).

Method
A cross-sectional observational study was conducted among 79 adult patients diagnosed with hip or knee OA and scheduled for elective arthroplasty. Demographic and clinical data were recorded, including comorbidities and body mass index (BMI). Serum 25-hydroxyvitamin D [25(OH)D] levels were extracted from laboratory records and categorised using Endocrine Society criteria. Radiographic severity was graded using the Kellgren–Lawrence (knee) and Tönnis (hip) classification systems. Functional status was assessed using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and the Harris Hip Score (HHS). Descriptive statistics were used to summarise patient characteristics; associations were evaluated using chi-square tests, t-tests, ANOVA, and Kruskal–Wallis tests. Pearson and Spearman correlations assessed relationships between vitamin D levels, radiographic severity, and functional scores. A p-value ≤0.05 was considered statistically significant.

Results
The study comprised of predominantly females (92.4%). The mean age was 60.9 (±9.9) years and mean BMI of 33.6 (±6.5) kg/m². Vitamin D insufficiency was common: 21.5% of patients were deficient and 40.5% insufficient. No significant difference in vitamin D status was found between THA and TKA patients ($p = 0.260$). Radiographic assessment revealed advanced OA in most patients, with 65.1% classified as Kellgren–Lawrence Grade 4 and 50% of hip OA patients as Tönnis Grade 3. WOMAC scores increased significantly with higher Kellgren–Lawrence grades ($p = 0.030$), indicating worsening pain and functional impairment with structural severity in knee OA. However, HHS did not differ significantly across Tönnis grades ($p = 0.732$). Serum vitamin D levels showed no significant correlation with radiographic severity for either knee ($r = –0.060$, $p = 0.642$) or hip OA ($r = 0.019$,

p = 0.944). Similarly, the relationship between vitamin D and functional outcomes was weak and non-significant, though trends suggested better hip function with higher vitamin D (r = 0.436, p = 0.091) and worse knee symptoms with lower vitamin D (ρ = –0.163, p = 0.201).

Conclusion
Vitamin D insufficiency is common among patients awaiting hip and knee arthroplasty; however, serum vitamin D levels were not significantly associated with radiographic severity or functional scores in this cohort of predominantly end-stage OA. While vitamin D may play a role in functional optimisation through its effects on muscle strength and general mobility, its influence on advanced structural joint damage appears limited

Country: South Africa

Category: Hip Arthroplasty

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Navigating Fixation in DAA THA: Is there a Best Stem?

Background
Total hip arthroplasty (THA) is a highly successful and cost-effective procedure, with survivorship of approximately 90% at 20 years. Despite excellent outcomes, failures occur, most commonly due to aseptic loosening and periprosthetic femoral fracture. In the direct anterior approach (DAA), complications predominantly involve the femoral component, likely due to technical challenges in femoral exposure and stem positioning. Cemented stems demonstrate durable results in elderly patients with reduced bone quality, whereas uncemented stems are often preferred in younger, active individuals. The addition of a calcar collar to uncemented stems may improve stability, but comparative evidence among cemented, collared uncemented, and uncollared uncemented stems in DAA THA remains limited.

Method
This retrospective study reviewed primary DAA THAs performed by a single high-volume surgeon using a uniform approach between January 2023 and July 2025. Patients were stratified into three groups: uncollared uncemented, collared uncemented, and cemented femoral stems. Exclusion criteria included incomplete follow-up, femoral neck fractures, and revision THA. Outcomes were assessed immediately postoperatively, at 6 weeks, and at 6 months. Data collected included operative time, length of stay, perioperative complications, Harris Hip Score (HHS), visual analogue scale (VAS) pain scores, satisfaction rates, readmissions, and revisions.

Results
A total of 219 patients were included: 63 uncollared uncemented, 91 collared uncemented, and 65 cemented stems. All groups demonstrated a median 40-point improvement in HHS at 6 weeks, maintained at 6 months, with significant pain reduction and high satisfaction (92.3%). Operative time was longer for cemented stems (81.4 vs. 72.1 minutes), while median length of stay was similar at 2 days ($p = 0.028$). No statistically significant difference in femoral fracture (two collared, one uncollared, none cemented) $p = 0.62$) Iliopsoas tendinopathy occurred in 5% of patients without significant group differences. Cemented fixation was more common in patients over 70 years. Readmissions were below 1%, with no revisions, dislocations, or infections at minimum 6-month follow-up.

Conclusion
Femoral stem fixation type in DAA THA did not significantly influence early clinical outcomes. Uncollared uncemented, collared uncemented and cemented stems demonstrating comparable short-term results, supporting an individualized fixation strategy with need for longer follow up.

Country: South Africa

Category: Hip Arthroplasty

Authors : Jason Brener[1], Jurek Pietrzak [1], Josip Cakic[1]
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ID: 15525

Stable Outcomes, Subtle Changes: Calcar Resorption in Collared Uncemented Femoral Stems in Direct Anterior Approach Total Hip Arthroplasty

Background
Complications following total hip arthroplasty (THA) may be approach dependent. In the direct anterior approach (DAA), failure is more frequently related to the femoral component, due to technical challenges in femoral exposure and stem positioning. Collared uncemented femoral stems were introduced to address limitations associated with uncollared designs. Proposed benefits including reduced micromotion, subsidence, aseptic loosening, periprosthetic fracture, and calcar resorption. Registry data demonstrate increasing use of collared stems; however, the radiological behavior beneath the collar in DAA THA remains insufficiently characterized. This study evaluated collar positioning and its early radiological and clinical implications.

Method
A retrospective analysis was performed of 154 uncemeted femoral stems implanted via the DAA between January 2023 and July 2025 (91 collared, 63 Uncollared). Procedures were performed by a single high-volume surgeon, using a uniform operative approach. Standardized radiographs were assessed post operatively, at 6 weeks and at 6 months. Measurements included collar–calcar contact, change in collar distance above the calcar, stem subsidence, calcar resorption, proximal femoral morphology, and leg length discrepancy. Radiological findings were correlated with Harris Hip Score (HHS), pain scores, satisfaction, and complication rates.

Results
At implantation, 89% of collared stems were seated flush with the calcar, while 11% were positioned proud. By 6 months, 62% maintained full calcar contact, with 38% demonstrating proud positioning. Radiographic evidence of calcar resorption and proximal femoral remodeling was observed in 55% of cases at 6 months. Compared with uncollared uncemented stems, collared stems demonstrated significantly less calcar resorption (median difference 1 mm, $p = 0.005$). Subsidence was lower in collared stems but did not reach statistical significance ($p = 0.485$). A small but significant increase in leg length discrepancy was observed in uncollared stems, with no significant change in collared stems. Clinical outcomes, including HHS, pain reduction, satisfaction, and complication rates, were not influenced by collar position or implant choice.

Conclusion
Although optimal collar seating was not always achieved after DAA THA, radiological changes did not negatively impact early clinical results. Collared stems showed some minor advantages in radiographic measures, but ongoing long-term monitoring

is necessary. Collar positioning may be radiologically relevant, without compromising early outcomes.

Country: South Africa

Category: Hip Arthroplasty

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Midterm Results of a Novel Isoelastic Custom Acetabular Augment In A High-volume Specialist Arthroplasty Centre

Background
Reconstruction of non-hemispheric acetabular defects are predominantly addressed with pre-fabricated metallic augments to restore a normal hip centre and achieve pressfit of an uncemented acetabular shell. These come in a limited range of sizes, are costly, and can be technically challenging to execute effectively resulting in a reported mean failure rate of 10%. A technique that was developed at our high-volume specialist centre in 2011 utilises a monobloc isoelastic cup cementless cup as an augment, which is machined in-situ to conform to the planned definitive cup. Our use of this technique has increased due to its simplicity and cost effectiveness. This study aimed to assess the mid-term results of the technique.

Method
A retrospective cohort study was undertaken of the first eleven years of experience using our customisable augment technique. Clinical and radiological results of 49 augments in 48 patients undergoing customisable cementless all-polyethylene acetabular augmentation in primary and revision total hip arthroplasty at our unit were reviewed at a minimum of 2- year follow-up.

Results
49 custom acetabular augments were performed in 48 patients between October 2011- October 2023 by three separate consultant orthopaedic surgeons. 29 were performed for complex primary arthroplasty and 20 in a revision setting. Acetabular construct survivorship was 96% at a mean follow up of 50 months (24-148). Two cases were revised for recurrent dislocation. There were no revisions, or secondary procedures for infection or aseptic loosening in this cohort. Two patients were lost to follow up, there were five deaths from unrelated causes. Radiological follow up ranged from 2- 12 years with no evidence of lysis, implant migration or construct failure. Augment thickness varied between 10-45mm; exceeding the range of pre-fabricated augments. 92% of patients reported being satisfied or very satisfied with their hip arthroplasty beyond 1 year post operatively, with a mean Oxford Hip Score of 36 (range 12-48) indicating mild-moderate ongoing symptoms only.

Conclusion
Acetabular defect management with a custom isoelastic augment technique shows good clinical and radiological results at a mean of 4 years, with excellent implant survival. This simple, efficient, and inexpensive technique allows bespoke reconstruction of a wide range defects sizes with a low complication rate. Further long-term followup is required for ongoing evaluation of survival rates and patient outcomes.

Country: United Kingdom

Category: Hip Arthroplasty

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ID: 15530

Implementation Of Direct Anterior Approach Total Hip Arthroplasty In Lateral Decubitus At A High-volume Specialist Arthroplasty Centre: Technique, Learning Curve, Early Outcomes, And Cost Analysis

Background
Direct anterior approach (DAA) total hip arthroplasty is a well-established technique which is growing in popularity worldwide with potential benefits including more rapid recovery, reduced post operative pain, lower dislocation risk and shorter hospital length of stay. However the change in patient positioning, unfamiliar anatomical orientation and the potential need for specialised operating tables is a concern. Our high-volume centre recently trialled DAA in a lateral position to determine the learning curve for high-volume arthroplasty surgeons and whether the reported benefits could be replicated in a specialist centre with a well-established enhanced recovery after surgery (ERAS) pathway.

Method
A prospective case control study was performed comparing the first 80 lateral decubitus DAA to the standard posterior approach (PA) total hip arthroplasty cases performed in our unit between 2024-25. The two cohorts were compared with respect to demographics, BMI, complexity, ASA, operative time, blood loss, time to mobilisation, length of stay, complications, and treatment cost.

Results
80 lateral decubitus DAA and 4720 PA total hip arthroplasty were performed during the defined study period. The two groups were comparable in age, gender, mean BMI, and ASA grade. Mean operative time was 50 minutes for DAA compared to 84 minutes for PA ($p=0.004$), with a rapid reduction in operative time over the first 30 cases. The complication rate was 4% in this cohort, with a revision rate of 1.25%. DAA had a same day mobilisation rate of 82% compared to 60% for PA ($p=0.003$), and a length of stay of 1.33 vs 2.4 days ($p < 0.001$). Early patient reported outcomes demonstrated a satisfaction rate of 94% compared to 91%. Cost analysis showed a significant reduction in overall costs with DAA; notably consumable costs and bed-stay cost.

Conclusion
In a high-volume specialist arthroplasty centre lateral decubitus DAA is a safe technique with a rapid learning curve and has demonstrated benefits in operative time, recovery, and length of stay. This confers a significant cost-reduction compared to posterior approach TKA above and beyond what is achieved with our standard ERAS pathway.

Country: United Kingdom

Category: Hip Arthroplasty

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A Short-term Review of Patients Who Underwent Total Hip Arthroplasty For Acetabular Protrusio at a South African Tertiary Academic Hospital

Background
Acetabular protrusio is a rare yet profoundly disabling condition of the hip joint. Total hip arthroplasty (THA) for acetabular protrusio is technically demanding, particularly in resource-constrained settings, and evidence from African cohorts remains limited. Our objectives are to describe the demographic, clinical, radiographic, surgical and postoperative characteristics of patients undergoing THA for acetabular protrusio at a single tertiary centre.

Method
A retrospective review was conducted of 32 patients with 40 THA who underwent THA for acetabular protrusio between 2017 and 2023. Demographic data, comorbidities, aetiology, preoperative radiographic parameters, surgical technique (approach, implants, bone grafting) and intraoperative events were recorded. Postoperative centre of rotation (COR) correction and complications were assessed over defined timelines after the index and contralateral procedures. Stata 18 was used to analyse data. Median(interquartile range) for continuous variables, frequencies and percentages were used for categorical variables.

Results
The median age at surgery was 64 years (IQR 50–69); most patients were female (87.5%) and Black (90.63%). Idiopathic aetiology predominated (n=16), with fewer secondary and inflammatory aetiologies. Disease severity was high, with median lateral centre-edge angles of 66 degrees bilaterally and median protrusion of 11.6 mm (left) and 11.3 mm (right). Uncemented acetabular cups were used in all cases, and bone grafting was performed in 71.88% of first and 100% of contralateral operations, predominantly with autograft. Intraoperative challenges were common, including difficult dislocation, in-situ osteotomy and greater trochanteric fracture. COR correction was achieved in 87.13% after the first and 96.88% after the contralateral surgery. Early complications included ICU admission, prolonged hospital stay, periprosthetic joint infections and thromboembolic events, while later issues involved heterotopic ossification, mechanical complications and non-union of trochanteric fractures.

Conclusion
In this cohort, THA for acetabular protrusio was feasible with high rates of radiographic COR restoration but was associated with substantial intraoperative complexity and a broad spectrum of postoperative complications. These findings underscore the need for meticulous planning, graft-based reconstruction and optimised perioperative care in similar settings
Country: South Africa

Category: Hip Arthroplasty

Authors : Ahmad Yunus Mota[1], Nnenna Elebo[1], Dyllan Brett Geldenhuys[3], Nkhodiseni Sikhauli[1], Jurek R. T. Pietrzak[1]
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ID: 15522

Femoral Neck Fracture Management In South Africa: National Practice Variation and the Need for Guidelines

Background
Hip fracture incidence is rising globally and is projected to exceed 6 million cases annually by 2050. Femoral neck fractures account for approximately 50% of hip fractures and carry 20–30% one-year mortality. In South Africa, incidence is increasing with an ageing population, yet no nationally endorsed guidelines exist for arthroplasty management of displaced intracapsular femoral neck fractures. Despite practice standardisation reducing mortality and complications internationally, South African practice patterns still remain undefined.
Aim: To evaluate national practice patterns in South Africa and determine the need for standardised guidelines in the management of displaced intracapsular femoral neck fractures.

Method A national cross-sectional electronic survey was distributed to members of the South African Orthopaedic Association. The questionnaire assessed arthroplasty decision-making, implant choice, surgical approach, peri-operative practice, and attitudes toward guideline development. Subgroup analysis was performed by fellowship training, province, case volume, and practice setting. Significance was set at $p < 0.05$.

Results A total of 139 surgeons responded. Fellowship training was reported by 46.8%. Private practice accounted for 66.9%. Marked variation was observed in surgical approach differing by fellowship status ($p = 0.002$) and province ($p = 0.005$). Physician referral patterns differed significantly between fellowship-trained and non-fellowship trained surgeons(75.4% vs 49.3%, $p = 0.007$). CT utilisation varied by sector (51.6% private vs 14.3% state, $p = 0.015$) and discharge destination differed significantly across sectors ($p < 0.001$). Only 2.9% reported routine cemented femoral fixation despite strong international recommendations. Dual mobility use was 36.0%. Importantly, 82.1% of surgeons supported national guideline development, with 32.4% strongly supportive.

Conclusion Management of displaced intracapsular femoral neck fractures in South Africa is heterogeneous. Implant selection, surgical approach, peri-operative care, and discharge planning lack consensus. The profession supports national guidance. The South African Arthroplasty community now has a clear mandate to standardise care and align practice with evidence-based international standards.

Country: South Africa

SUPPORTING DOCUMENTS APPLY TO THIS SUBMISSION
(hold down ctrl and click on the link to view the document)

Category: Hip Arthroplasty

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Cancer And Total Hip Arthroplasty: A Narrative Review Of Clinical Intersections, Challenges and Outcomes

Background
There is a rising global burden of cancer cases reported annually, an increase to 35 million cases by 2050 is anticipated. Additionally, an increase in cancer survivorship due to modern oncology advancements exists. There is an increasing need to total hip arthroplasty (THA) in this cohort due to degenerative disease, metastatic disease or oncologic treatment induced bone disease. Advances in cancer treatment have led to an increasing population of cancer survivors who require orthopaedic arthroplasty procedures The associated surgical risks are amplified in this group, including increased blood loss, decreased systemic reserves and overall frailty. Studies evaluating perioperative outcomes consistently demonstrate that patients with cancer experience increased morbidity and mortality after arthroplasty surgical procedures, compared to the general population. This underscores the need for a comprehensive understanding, risk stratification and multidisciplinary perioperative management to minimize potential surgical-associated risks. However, there are good reported outcomes with THA in cancer patients which are comparable to their controls. This review looks at the critical issues faced by reconstructive orthopaedic surgeons when treating patients with a history of cancer or active malignancy, particularly those undergoing THA.

Method
This narrative review aims to explore the bidirectional relationship between cancer and THA, outcomes and management strategies. It will describe the pertinent issues reconstructive surgeons face when treating patients with cancer. The goal is to highlight the clinical intersections, challenges, and necessary management strategies specific to this population. This is especially relevant in view of the rising number of cancer patients being reported globally.

Results
Key findings of the review include the elevated risks associated with cancer patients undergoing THA. Complications such as deep vein thrombosis (DVT) in patients with a history of malignancy, and early postoperative mortality in patients with active malignancy are reported. Furthermore, patients with disseminated cancer undergoing elective THA have significantly elevated risks for death and various postoperative complications. It is imperative that adequate preoperative work up, intraoperative planning and post operative management strategies are employed in such cases.

Conclusion
The global cancer burden is increasing, along with improved survivorship, this has created a growing subpopulation of patients requiring THA. Surgery in cancer patients presents unique challenges and increased perioperative risks. This underscores the need for comprehensive risk stratification and a multidisciplinary management approach to minimize potential risks. THA offers vital functional and palliative benefits to cancer patients. Therefore, ongoing research and advances in this area are imperative for specialised and effective care for these patients.

Country: South Africa

Category: Hip Arthroplasty

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ID: 15536

The Outcomes of Femoral Neck Fractures In HIV-positive Patients In Sub-Saharan Africa

Background
Intra-capsular femur fractures, particularly femoral neck fractures, are associated with high rates of morbidity and mortality. In Sub-Saharan Africa, the high prevalence of HIV poses additional challenges to fracture management and recovery. Despite the growing number of people living with HIV reaching older age due to effective antiretroviral therapy (ART), limited data exist on orthopaedic outcomes in this population. The objective here is to evaluate the clinical outcomes, complications, and functional recovery of HIV-positive patients presenting with intracapsular femur fractures in Sub-Saharan Africa.

Method
A retrospective observational cohort study was conducted at a high-volume tertiary academic hospital in Johannesburg, South Africa. HIV-positive patients with intra-capsular femur fractures were assessed for time to surgical intervention, postoperative complications, length of hospital stay, and functional outcomes. Comparisons were made to HIV-negative controls where data were available.

Results
The overall complication rate was 9%, with no significant difference between HIV-positive and HIV-negative groups (p=0.482). Mortality and pulmonary embolism rates were each 3%, with no group differences (p=1.000 for both). Preoperative albumin levels were significantly lower in the HIV -positive group compared to the HIV -negative group (p=0.034), while preoperative haemoglobin, transferrin, or ASA scores were not statistically different. Additionally, preoperative mobility differed significantly between groups (p=0.008). Rheumatoid arthritis (p=0.035) and cancer (p=0.019) were more prevalent among HIV -positive participants compared to HIV -negative participants. Sernbo acts as a confounder in the relationship between HIV status and post-operative complications.
Notably, patients who were not fully mobile preoperatively had five times the odds of postoperative complications than those who were fully mobile.

Conclusion
HIV status influences the outcomes of intracapsular femur fractures. While optimal surgical and medical management can yield favourable outcomes, challenges such as immunosuppression, delayed presentation, and limited healthcare resources increase the risk in this population. These findings highlight the necessity for integrated care approaches and further region-specific research to improve outcomes for people living with HIV (PLWH) with orthopaedic injuries in Sub-Saharan Africa.

Country: South Africa

Category: Hip Arthroplasty

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ID: 15538

Comparing South Africa Femoral Neck Fractures Management to the International Guidelines

Background
Femoral neck fractures (FNF) are a significant public health concern globally, particularly among the elderly. While international guidelines such as those from NICE (UK), AAOS (USA), and ANZHFR offer standardized protocols for management, variations often exist in practice across different healthcare systems. This study aims to evaluate the management of femoral neck fractures in South Africa and compare it with established international guidelines.

Method
A retrospective observational cohort study was conducted at a large academic teaching hospital in Johannesburg, South Africa, analyzing patient records, surgical interventions, timing of treatment, and postoperative outcomes among others. These findings were benchmarked against international best-practice guidelines with a focus on key parameters such as time from admission to surgery, patient eligibility for total hip arthroplasty, cement used in arthroplasty, timeliness of mobilization, and early post-operative rehabilitation.

Results
The study found both alignment and discrepancies between South African practices and international standards. While surgical intervention was generally timely, resource constraints affected the consistent implementation of best practices in preoperative optimization, multidisciplinary care, and rehabilitation. Notably, deviation in implant selection and delays due to systemic limitations were identified as areas for improvement.

Conclusion
South Africa's management of femoral neck fractures shows commendable adherence to core international principles but is challenged by systemic and infrastructural limitations. Bridging these gaps through policy development, targeted training, and resource allocation could enhance patient outcomes and align national protocols more closely with global standards.

Country: South Africa

Category: Hip Arthroplasty

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Same-Calendar-Day Anterior THA: Surgical Controversy Or Systems Solution?

Background
Outpatient total hip arthroplasty (THA) pathways are increasingly adopted internationally; however, overnight admission remains common in South Africa. The anterior approach is frequently reported to involve longer operative times and greater resource utilisation, potentially limiting its integration into ambulatory models. This study evaluates whether a coordinated multidisciplinary team (MDT) can effectively prepare and identify appropriate candidates for same-calendar-day anterior THA, and examines early process and follow-up outcomes within a structured pathway.

Method
Forty patients underwent primary anterior THA within a same-calendar-day programme at Surge. All were admitted on the morning of surgery with planned discharge later the same afternoon, without step-down or in-patient rehabilitation facilities. Care was delivered through a coordinated MDT including surgeon, anaesthetist, nursing, physiotherapy, and perioperative case management. Standardised protocols addressed patient selection, education, anaesthesia, blood conservation, mobilisation, and discharge criteria. Process reliability and early follow-up metrics were recorded. Patient-reported outcomes included the Oxford Hip Score (OHS), HOOS-JR, and EQ-5D-5L.

Results
All 40 patients were discharged on the day of surgery, with no unplanned overnight admissions. Pathway reliability was maintained across perioperative phases. Early follow-up demonstrated improvement in OHS, HOOS-JR, and EQ-5D-5L scores, with high patient satisfaction.

Conclusion
When supported by coordinated MDT preparation and appropriate patient identification, anterior THA can be delivered within a reliable same-calendar-day pathway with favourable early outcomes. Further evaluation is required to determine broader applicability and long-term results.

Country: South Africa

Category: Hip Arthroplasty
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ID: 15518

Surgical Hip Dislocation And Impaction Grafting For Advanced Osteonecrosis Of The Femoral Head: A Systematic Review and Illustrative Case

Background
Advanced osteonecrosis of the femoral head (ONFH) in younger patients is commonly managed with total hip arthroplasty (THA), despite the near certainty of future revision. Although arthroplasty provides reliable short-term symptom relief, early implantation is associated with cumulative revision burden, increased morbidity, and escalating lifetime costs. Surgical strategies that defer first THA without compromising later reconstruction therefore warrant critical evaluation.

Method
A representative case of advanced ONFH treated with surgical hip dislocation (SHD) and trapdoor bone graft impaction is presented. In parallel, a systematic review and meta-analysis of observational case series published between 1990 and 2025 was performed, evaluating SHD-based trapdoor or impaction bone grafting techniques in skeletally mature patients with advanced ONFH. Searches were conducted across major medical databases using predefined keywords. Inclusion was limited to English-language full-text studies reporting disease staging, functional outcomes, and survivorship data. Extracted outcomes included pre- and post-operative functional scores, radiological progression, and conversion to THA, which was defined as treatment failure. Study-level outcome proportions were pooled using weighted statistical modelling based on the number of treated hips, and predictors of failure were explored where data permitted.

Results
The index case achieved meaningful pain relief and functional improvement, returning to sporting activities without early conversion to THA. Ten observational studies met inclusion criteria, comprising 261 hips treated with SHD-based bone grafting techniques. Across pooled data, the weighted mean Harris Hip Score improved from 56.1 pre-operatively to 87.0 post-operatively. Good-to-excellent functional outcomes were achieved in 83.8% of assessed hips. Radiological progression occurred in 19.6% of hips. Conversion to THA occurred in 14.6% of hips at a weighted mean follow-up of 49 months. Symptom duration exceeding 12 months was the most consistent predictor of failure, while age, sex, and aetiology were not significantly associated with outcome.

Conclusion
In carefully selected patients with advanced ONFH, SHD-trapdoor bone grafting allows approximately 85% of hips to avoid THA at mid-term follow-up. When compared with immediate arthroplasty and its inevitable revision burden, this technique represents a defensible THA-deferral strategy. Importantly, failure does not preclude subsequent arthroplasty, preserving future reconstructive options.

Country: South Africa

Category: Hip Arthroplasty

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ID: 15543

Vinegar Sandwich Fixation: Innovative Approach to Bi-columnar Acetabular Fracture Reconstruction During Total Hip Arthroplasty

Background
Bi-columnar acetabular fractures are complex injuries that often require dual surgical approaches for optimal fixation, which may increase operative time, blood loss, and perioperative complications. Total hip arthroplasty (THA) combined with open reduction and internal fixation (ORIF) has demonstrated improved outcomes in selected patients. The novel Vinegar Sandwich Fixation (VSF) technique was developed to provide stable fixation through a single posterior approach. This study aimed to evaluate the clinical, functional, and radiographic outcomes of the VSF technique in the management of bi-columnar acetabular fractures requiring combined THA and ORIF.

Method
A retrospective review was conducted of 10 patients treated with the VSF technique over an 8-year period. Demographic data, complications, radiographic union, pain scores using the Numeric Pain Rating Scale (NPRS), and functional outcomes using the Harris Hip Score (HHS) were analyzed. Radiographic outcomes were assessed at 6, 12, and 24 weeks. Statistical significance was set at $P < 0.05$.

Results
The cohort included 7 women and 3 men with a mean age of 68.5 years (range, 40–88). Radiographic union improved from 40% at 6 weeks to 70% at 12 weeks and 90% at 24 weeks, although this did not reach statistical significance ($P = 0.13$). Pain improved significantly, with NPRS decreasing from 8.3 preoperatively to 1.8 postoperatively ($P < 0.001$). Functional outcomes improved progressively, with HHS increasing from 34.8 preoperatively to 51.9 at 6 weeks, 68.1 at 12 weeks, and 77.8 at 24 weeks ($P < 0.001$). There were no postoperative dislocations, implant loosening, transfusions, or revision surgeries. A permanent sciatic nerve injury was attributed to the initial trauma.

Conclusion
The VSF technique demonstrated favorable radiographic and functional outcomes with a low complication rate in the management of bi-columnar acetabular fractures requiring acute THA and ORIF. This single posterior approach may reduce the morbidity associated with traditional dual-approach strategies in selected patients.

Country: South Africa

SUPPORTING DOCUMENTS APPLY TO THIS SUBMISSION
(hold down ctrl and click on the link to view the document)

Category: Knee Arthroplasty

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ID: 15517

Improvement In Tibial Resection Accuracy During Adoption Of A Radiographic Measurement-Feedback Technique In Restricted Inverse Kinematic Total Knee Arthroplasty

Background
Restricted inverse kinematic alignment (iKA) in total knee arthroplasty is a patient-specific, tibia-first bone-balancing technique designed to restore native knee kinematics by resurfacing the tibia using balanced medial and lateral resections within predefined safe alignment boundaries, thereby preserving native joint line obliquity and overall limb alignment. Accurate tibial resection is critical, as deviations may influence downstream femoral adjustments, joint line obliquity (JLO), and global alignment. The ability to consistently reproduce the intended tibial coronal plane resection during early technique adoption remains uncertain. This study therefore examined whether implementation of routine postoperative radiographic assessment was associated with improved surgical execution while maintaining phenotype alignment safety.

Method
A consecutive series of 104 primary total knee arthroplasties performed over a 10-month period (11 February–11 December 2025) using a tibia-first restricted iKA bone-balancing technique with manual intramedullary femoral and tibial instrumentation was reviewed. Standing full-length hip–knee–ankle radiographs were obtained preoperatively and at 8-week follow-up. Coronal Plane Alignment of the Knee (CPAK) classification was used as a radiographic measurement framework to characterise joint line obliquity (JLO) and arithmetic hip–knee–ankle angle (aHKA) phenotype alignment. Tibial coronal slope measurements were based on the medial proximal tibial angle (MPTA). Exclusion criteria included prior osteotomy, fractures, multiligament instability, bone loss or joint line distortion, non-routine implants, and inadequate or unavailable radiographs, leaving 85 analysable knees.

Cases were divided chronologically into early (first 5 months) and late (latter 5 months) phases. Tibial resection intent was predefined as neutral (0°), mild varus (2°), moderate varus (3°), or extreme varus (4°), each with an acceptable ±2° execution window. Tibial resection accuracy was defined as the difference between the intended and achieved coronal tibial slope resection, determined from pre- and postoperative medial proximal tibial angle (MPTA) measurements. Early and late phases were compared using an independent samples t-test, with statistical significance defined as $p < 0.05$.

Results
Of 85 included knees, 44 were performed in the early phase and 41 in the late phase. Early cases demonstrated a systematic valgus tendency relative to the intended tibial coronal slope resection, with a mean tibial valgus error of 1.26°, improving significantly to 0.18° in the late phase ($p = 0.001$). The proportion of resections within ±1° of intended target improved from 50.0% to 65.9%, while > 3° outliers decreased from 11.4% to 2.4%. JLO phenotype preservation improved from early to late phase. Mean aHKA remained within neutral alignment boundaries across phases.

Conclusion
Radiographic measurement feedback significantly improved tibial resection accuracy during adoption of restricted inverse kinematic total knee arthroplasty while preserving joint line phenotype and overall alignment safety. Structured postoperative radiographic feedback provides a practical and cost-conscious method to improve surgical accuracy during adoption of tibia-first alignment techniques.

Country: South Africa

Category: Knee Arthroplasty

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ID: 15499

A Comparison of Patient-Reported Outcome Measures Between Robot-Assisted and Conventionally Instrumented Total Knee Arthroplasties In South Africa – A Retrospective Registry Cohort Study

Background
Robot-assisted total knee arthroplasty (TKA) has been proposed to enhance early recovery and patient outcomes. To investigate this possible benefit, this study compared patient-reported outcome measures between conventional and robot-assisted TKA.

Method
A retrospective cohort study was conducted using registry data, evaluating 12-item Knee Injury and Osteoarthritis Outcome Scores (KOOS-12). Improvements in KOOS-12 scores from pre-operative baseline to six and 12 months post-operatively were compared. Propensity score full matching (ATT estimand) was used to control for confounders identified through literature review, namely, age, sex, BMI and baseline KOOS-12 subdomain scores. Weighted, design-based Kruskal-Wallis tests were utilised to compare the differences in improvements of scores, and Rao-Scott F tests were used to compare the differences in the proportion of patients showing improvements exceeding the minimal clinically important differences (MCIDs), derived from literature. Sensitivity analyses assessed the impact of additional covariates.

Results
The sample consisted of 2,325 TKAs (2,002 conventional, 323 robot-assisted) performed between January 2022 and March 2025. Covariate balance after matching was acceptable (standardised mean differences < 0.1). The median KOOS-12 improvements, although higher for robot-assisted surgery, differed by less than the MCID at both six (47.92 vs 50.00; p=0.066) and 12 months (52.08 vs 56.25; p=0.130). More robot-assisted TKA patients exceeded MCID thresholds for overall KOOS-12 improvement at six (89.0% vs 93.2%; p=0.039) and 12 months (94.0% vs 97.9%; p=0.035); and for pain (85.8% vs 92.0%; p=0.007) and function (86.5% vs 92.3%; p=0.009) at six months. Sensitivity analyses found that these findings held for different covariate matching schemes. Specifically, individually including the covariates of ASA grade, implant model, alignment technique and baseline KOOS-12 item scores into the matching did not substantially change the findings.

Conclusion
Robot-assisted TKA did not yield statistically or clinically greater median KOOS-12 improvements but was associated with a higher likelihood of patients achieving clinically meaningful improvement, particularly in pain and function within six months. These results suggest that robotics may improve the consistency of meaningful recovery rather than overall average outcomes. Future research should entail assessing the economic value of robot-assisted TKA in terms of these differences.

Country: South Africa

Category: Knee Arthroplasty

Authors: A Diayar, A Dymond

ID: 15504

A Cost Comparison Between Robot-Assisted And Conventionally Instrumented Total Knee Arthroplasties In South Africa – A Retrospective Registry Cohort Study

Background
The cost implications of robot-assisted total knee arthroplasty (TKA) remain unclear despite its increasing adoption in South Africa. For further clarity on this matter, a study was conducted to compare costs and utilisations between robot-assisted and conventional primary TKA.

Method
A retrospective registry cohort study compared robot-assisted versus conventional primary TKA performed between January 2022 and December 2025. The primary outcome was inpatient episode cost (excluding prosthesis and robot-associated consumable and rental fees). Secondary outcomes included theatre time, length of stay (LOS), and inpatient item and drug utilisation. Propensity score full matching (ATT) controlled for age, sex, BMI, implant fixation, and ASA grade. Weighted Gamma regression (log link) and design-based Kruskal-Wallis tests were used for right-skewed outcomes. Within-surgeon matching was performed individually, and effects were pooled using DerSimonian-Laird random-effects meta-analysis. Item and drug comparisons among recipients were reported as relative mean-dose differences versus conventional users. Multiplicity was controlled using Benjamini-Hochberg FDR correction.

Results
The sample comprised 7,785 TKAs (6,445 conventional, 1,340 robot-assisted). Robot-assisted TKA had higher inpatient episode costs than matched conventional controls (median [IQR] R248,687 [R189,117-R311,726] vs R247,475 [R206,018-R397,112]; difference +R1,212 [95% confidence interval (CI) -R6,997 to +R9,300]; p=0.030) and longer theatre time (101 [84-131] vs 96 [84-112] minutes; p < 0.001). LOS was slightly lower (mean±SD 2.50±0.89 vs 2.57±0.97 days; p=0.008). The median [IQR] robot-associated consumables cost was R13,383 [R12,295-R16,029] per case. Analgesic dosages differed for tramadol (-32.2% [CI -41.8% to -20.1%]; p < 0.001; q < 0.001), etoricoxib (-17.9% [CI -26.0% to -8.1%]; p=0.001; q=0.006) and morphine (-15.8% [CI -24.9% to -5.1%]; p=0.005; q=0.034). Haemostatic/haemodynamic dosages differed for tranexamic acid (+118.0% [CI +93.4% to +146.2%]; p < 0.001; q < 0.001) and adrenaline (+10.7% [CI +5.3% to +16.4%]; p < 0.001; q=0.001). Within-surgeon analyses showed that the pooled cost difference was attenuated and not statistically significant (+R5,069 [CI -R11,626 to +R21,764]; p=0.552), while theatre time remained longer (+12.1 minutes [CI 6.6 to 17.6]; p < 0.001) and LOS did not differ (-0.019 days [CI -0.089 to +0.051]; p=0.603).

Conclusion
Robot-assisted TKA was associated with higher episode costs and longer theatre time, with modestly shorter LOS, even without robot-associated fees. Cost differences were reduced after surgeon-controlled matching, but are expected to increase with robot-associated costs.

Country: South Africa

Category: Knee Arthroplasty
Authors : Aashish Diayar[1], Antoine Dymond[1]
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ID: 15521

The Maximum Justifiable Additional Funding For Achieving A Flawless Primary Total Knee Arthroplasty In South Africa – A Markov Cohort Model

Background
Innovations are often proposed to improve outcomes of primary total knee arthroplasty (TKA). However, contemporary TKA is already highly successful, with low dissatisfaction and revision rates, raising the question, 'How much additional funding for innovation is justifiable given the achievable health gains?' To explore this theoretical cost ceiling, the value of a hypothetical, flawless TKA was estimated in South Africa.

Method
A decision-analytic time-inhomogeneous semi-Markov cohort model was developed through integrative review of systematic reviews, registry reports and economic evaluations. Three strategies were simulated over 20 years, with half-cycle correction: (1) non-operative care, (2) current TKA (satisfactory/unsatisfactory outcomes, with up to four septic/aseptic revisions), and (3) a theoretical, flawless TKA (satisfactory outcomes only, with no revisions). A healthcare payer's perspective was used. Costs were limited to revision episodes, estimated from South African tariffs, operative time, length of stay, and prosthesis pricing. An annual discount rate of 5% was used. Outcomes included quality-adjusted life expectancy (QALE), revision costs and mortality. Net monetary benefit (NMB) was calculated using two willingness-to-pay (WTP) thresholds: R38,500 per quality-adjusted life-year (QALY) (National Department of Health threshold) and R151,665 per QALY (the upper limit of a published South African health opportunity cost estimate, likely to better reflect the less resource-constrained private healthcare sector).

Results
Over 20 years, current TKA generated a discounted QALE gain of 8.77 QALYs versus baseline, while flawless TKA generated an 8.92 QALY gain. Revision costs of current TKA were estimated at R13,914 per primary TKA. Mortality was similar across models (59.16%-59.66%). At the higher WTP threshold, NMB over non-operative care was R1,315,832 for current TKA and R1,353,215 for flawless TKA, a R37,383 difference. At the lower WTP threshold, these NMBs were R323,641 and R343,512, respectively, with a difference of R19,871.

Conclusion
Contemporary TKA already provides substantial value relative to non-operative care, with only modest QALE benefit for flawless TKA. The maximum justifiable additional funding for a flawless TKA was estimated at R19,871-R37,383 per case, depending on WTP thresholds. These findings define an approximate price ceiling for innovations that eliminate dissatisfaction and revision, although uncertainty remains due to heterogeneous data inputs and imprecision in local revision costs.

C**ountry:** South Africa

Category: Knee Arthroplasty

Authors: Antoine Dymond[1], Ponky Firer[2], Ian Learmonth[3], Aashish Diayar[1]
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ID: 15497

Aseptic Revision Risk Comparison Between Robot-Assisted And Conventionally Instrumented Total Knee Arthroplasty – A Registry Cohort And Radiographic Study

Background
Robot-assisted total knee arthroplasty (TKA) may add value by improving patient outcomes. This study compared robot-assisted and conventional TKA according to aseptic revision rates, and surgical quality as estimated by radiographic peer-review scores, a previously verified predictor of survivability.

Method
A retrospective cohort study was conducted using registry data. Propensity score full matching (ATT estimand) was used to control for age, sex, BMI, year of surgery, implant ODEP rating and fixation. Robot-specific within-surgeon analyses included only surgeons who performed both conventional and robot-assisted TKAs using the specific robotic system being evaluated. Weighted Cox and weighted stratified Cox models were utilised to estimate revision hazards, and Rao-Scott F tests were used to compare the rates of sub-optimal radiographic review scores.

Results
The cohort consisted of 5,305 TKAs (4,633 conventional, 672 robotic: Mako 263; ROSA 242; CORI 144; OMNIBotics 23) performed from January 2020 to March 2024, with 29 aseptic revisions. Covariate balance after matching was acceptable (standardised mean differences < 0.1), and proportional hazards assumptions were not violated. Overall, robot-assisted TKA was not associated with a significantly different revision risk (hazard ratio [HR] 2.05; 95% confidence interval [CI] 0.61-6.83; p=0.244). No individual robotic systems demonstrated significant differences either. In contrast, within-surgeon analyses demonstrated significantly higher revision hazards for robot-assisted TKAs overall (HR 24.56; CI 7.15-84.35; p=0.005), as well as in robot-specific within-surgeon models, although event numbers were small. Radiographic outcomes were similar between cohorts based on sub-optimal review score rates (2.5% conventional vs 4.0% robot-assisted; p=0.063). Within-surgeon comparisons showed higher sub-optimal rates for OMNIBotics. Among the TKAs performed by surgeons using robotics for more than 50% of their cases (effective sample size 333.9), none required revision within one year; however, one-year revision rates did not significantly differ by robotic case proportion (odds ratio 0.85; CI 0.62-1.15; p=0.291).

Conclusion
Generalisability of this study is limited by the very low event rate of 0.55%. Furthermore, absolute revision numbers were low in all robotic subgroups, limiting precision of system-specific estimates. Findings may suggest that, after accounting for surgeon-specific baseline risk, robot-assisted TKA may be associated with higher early revision hazards, potentially reflecting learning-curve effects. Further research is needed.

Country: South Africa

Category: Knee Arthroplasty

Authors : Ponky Firer[1]
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ID: 15491

PERSONALIZED KNEE ARTHROPLASTY COMING OF AGE: 21 YEARS EXPERIENCE : AND WHAT DON'T WE KNOW?

Background

PERSONALIZED KNEE ARTHROPLASTY (PKA) IS THE NEW BUZZ WORD. IN 2005, HAVING HAD TYPICAL SUBOPTIMAL PATIENT SATISFACTION RATES (84%), USING THE LCS WITH MECHANICAL ALIGNMENT AND GAP BALANCING, A NEW CONCEPT BASED ON ANATOMY AND BIOENGINEEING PRINCIPLES WAS CONCEIVED AND USED FOR THE PAST 21 YEARS WITH IMPROVED PATIENT SATISFACTION (93%)

Method

REASONING: 1) NORMAL KNEE KINEMATICS ARE NOT POSSIBLE IN TKA BECAUSE BOTH CRUCIATE LIGAMENTS ARE NOT MAINTAINED AND THE PCL, WHEN KEPT, IS NOT ALWAYS AT NORMAL TENSION; 2) THE PROSTHESES' ARTICULATING SURFACES DO NOT MATCH EACH INDIVIDUAL PATIENT'S ORIGINAL GEOMETRY, THUS SOFT TISSUE TENSIONS CANNOT BE MATCHED TO THE PATIENTS' ORIGINAL VALUES. 3) PATIENT DISSATISFACTION IS CAUSED LARGELY BY PAIN OR INSTABILITY. THESE ARE RELATED TO THE SOFT TISSUE'S TENSION OR LACK THEREOF. 4) PATIENTS DO NOT RECOGNISE THEIR REPLACED KNEE FUNCTION AS BEING "THE SAME AS BEFORE". 5) THE BONEY ELEMENTS OF THE KNEE DEVELOP IN CONCERT WITH THE SOFT TISSUE ELEMENTS, HENCE THE SOFT TISSUES CAN ACT AS A TEMPLATE FOR ESTABLISHING THE BONEY / PROSTHETIC POSITIONING TO GIVE BEST "ARTHROPLASTY KINEMATICS" FOR THAT PATIENT 6) EVERY PATIENT HAS A UNIQUE LOWER LIMB ALIGNMENT AND KNEE GEOMETRY WHICH IS TO BE RESPECTED. SURGICAL PHILOSOPHY: THE TIBIAL CUT IS THE INDEPENDENT OSTEOTOMY. THUS, IT IS DONE FIRST. THE POSTERIOR AND DISTAL FEMORAL CUTS ARE DEPENDANT OSTEOTOMIES AND FOLLOW THE TIBIAL CUT AND ARE DICTATED BY THE FEMORAL SIZE AND SOFT ENVELOPE. NO SOFT TISSUE RELEASES ARE CARRIED OUT AND TENSIOMETER MEASURED BALANCES ARE WITHIN 2 DEGREES. THE TECHNIQUE IS NAMED "BONE BALANCING"

Results

2508 TKA WERE DONE FROM 2005 T0 2025 USING THIS PHILOSOPHY. NINETY SEVEN PERCENT OF THESE KNEES COULD BE CORRECTLY BALANCED WITHIN AN HKA RANGE OF 7 DEGREES VARUS AND 6 DEGREES VALGUS. THREE PERCENT WERE BALANCED BY EPICONDYLAR OSTEOTOMIES. THE 12-15 YEAR FOLLOW UP RESULTS WERE: 92.9% SATISFIED PATIENTS ; OXFORD KNEE SCORE 42.77; FORGOTTEN JOINT SCORE 75.84% AND VAS PAIN SCORE 0.46

Conclusion
PKA USING BONE BALANCING IS A SIMPLE, COST EFFECTICE ,REPRODUCIBLE PERSONALIZED TECHNIQUE FOR SATISFACTORY TKA OUTCOMES. IT CAN BE USED ON ALL KNEES WITH ANY PROSTHESIS. QUESTIONS THAT ARE UNANSWERED: 1) DOES KINEMATIC ALIGNMENT, WHICH IS ONLY SUITABLE FOR ONE TYPE OF PROSTHESIS, HAVE BETTER OUTCOMES COMPARED TO BONE BALANCING WHICH CAN BE DONE WITH ANY PROSTHESIS DESIGN. 2) DOES PRECISION ANATOMIC PLACEMENT WITHIN A SMALL TOLERANCE MAKE A DIFFERENCE TO PATIENT OUTCOMES? 3) CAN THE JOINT LINE REALLY BE RESTORED? DOES IT NEED TO BE?

Country: South Africa

Category: Knee Arthroplasty

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ID: 15507

HOW ACCURATE IS MANUAL EXTRA ARTICULAR ALIGNMENT OF THE TIBIAL CUT IN TOTAL KNEE REPLACEMENT FOR PERSONALIZED ALIGNMENT?

Background
Personalized alignment in total knee replacement (TKR) is an increasingly popular surgical approach. It is important to evaluate the accuracy of the tibial cut when using manual instrumented alignment. This is particularly pertinent for a bone balanced or inverse kinematic alignment approach to TKR, in which the tibial cut is made at a predetermined angle based on the medial proximal tibial angle (MPTA) on pre-operative long leg x-rays. In bone balancing approaches, all subsequent femoral cuts are based on the tibial cut angle.

Method
A prospective study was conducted to evaluate the accuracy of manual extra articular alignment of the tibial cut in 854 TKRs selected from a database. Two surgeons (A and B) performed TKRs using the same bone balancing surgical technique. An extra-articular tibial cutting jig was initially positioned at a neutral MPTA of 90 degrees. Each surgeon then adjusted the jig to achieve the planned degree of varus or valgus, as determined from pre-operative long leg x-rays. During surgery, the surgeon recorded the angle at which the tibial cut was made (intra-operative tibial cut angle). After surgery, patients underwent post-operative long leg x-rays to measure the MPTA. The intra-operative tibial cut angle recorded by the surgeon was then compared to the post-operative MPTA. The difference between the intra-operative tibial cut angle and the post-operative MPTA measurements was analysed using Bland-Altman analysis, both overall and within the varus and valgus subgroups.

Results
For Surgeon A, the mean bias was -0.30° (standard deviation of the differences [SD]1.20°) for all cases (n=134). By subgroup analysis, the mean bias was -0.30° (1.00°) in varus cases (n=50) and -0.30° (1.30°) in valgus cases (n=84). For Surgeon B, the overall mean bias was -0.27° (1.55°) (n=720). By subgroup analysis, the mean bias was -0.42° (1.55°) in varus cases (n=451) and -0.00° (1.53°) in valgus cases (n=269).
Comparison of overall mean bias between Surgeons A and B using the Mann–Whitney U test showed no significant difference (p = 0.531).

Conclusion
Manual extra-articular alignment is a reliable technique for personalized tibial cuts in TKR, producing comparable results across different operators.

Country: South Africa

Category: Knee Arthroplasty

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ID: 15527

Patient-reported Outcomes Following Secondary Patellar Resurfacing In Total Knee Arthroplasty: Results from a High-volume Specialist Arthroplasty Centre

Background
Patellar resurfacing in total knee arthroplasty (TKA) has been an area of controversy. In our high-volume arthroplasty centre it is not routine practice to resurface the patella, with this performed in only 1.6% of 8,111 primary TKA during the period 2021-25. The aims of this study were to determine the rate and indications for secondary patellar resurfacing (SPR), as well as any change in patient-reported outcomes (PROMs) following SPR.

Method
We identified all patients undergoing patellar resurfacing from 2021 to 2025. Inclusion criteria were patients undergoing a secondary patellar resurfacing following previous TKA. Patients who had patellar resurfacing at index TKA, performed acutely for prosthetic joint infection or as part of a larger revision procedure were excluded. Data collected included age, time from index procedure, sex, BMI, length of followup and pre/post-operative PROMs including Oxford Knee Score (OKS), Forgotten Knee Score (FKS), EQ-5D and satisfaction scores.

Results
83 cases were identified where a revision procedure included patellar resurfacing. 65 were excluded using the criteria above leaving 18 cases undergoing isolated SPR (9 male, 9 female with a mean BMI of 32). The mean interval from primary TKA was 6.7 years. All patients had reported anterior knee pain, with potential instability noted in 7/18 patients. Mean follow-up post SPR was 9.8 months. The mean pre-operative and post-operative OKS were 20.8 and 22.5 respectively, with FKS of 14.6 and 29.5. 60% of patients reported being satisfied or very satisfied postoperatively compared to 57% preoperatively.

Conclusion
The rate of secondary patellar resurfacing was low, with only 18 cases identified in our high-volume centre. As expected, the primary indication for SPR was anterior pain. The results of our study would appear to question any meaningful clinical benefit derived from SPR with an improvement in OKS of 1.7 points and FKS 14.9 points. The improvement in OKS does not meet the reported minimum clinically important difference (MCID) and difference in FKS is borderline MCID. Similar satisfaction rates were noted pre- and post-operatively. Limitations of this study include low patient numbers and a relatively short followup period.

Country: United Kingdom

Category: Knee Arthroplasty

Authors: Mairi Fullarton[1], Hrvoje Vidakovic[2], Nicholas Ohly[2], Swati Chopra[2], Glory Alozie[5], Nicholas Holloway[2], Jon Clarke[2]
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ID: 15528

Does Robotic Assistance Improve Early Outcomes Following Unicompartmental Knee Arthroplasty Performed in a High-volume Centre? A Retrospective Cohort Study.

Background
Robotic assistance is claimed to confer additional benefit in unicompartmental knee arthroplasty (UKA) due to the assumed correlation between enhanced surgical precision and superior clinical outcomes. There is little published evidence to support this assumption. The aim of this study was to compare early patient-reported outcome measures (PROMs) between robotic-assisted and manual UKA performed in a high-volume specialist arthroplasty centre.

Method
This was a retrospective cohort study, utilising a prospectively maintained, institutionally-funded database, comparing patients receiving either a robotic-assisted or manual fixed-bearing cemented UKA in our institution between April 2021 and March 2024. Robotic-assisted procedures were performed using the Mako system and Restoris MCK implant (Stryker) and manual procedures used the Persona Partial Knee (Zimmer Biomet). All procedures were unilateral and involved the medial compartment only. Post-operative outcomes were assessed at six weeks and one year post-operatively using the Oxford Knee Score (OKS), Forgotten Knee Score (FKS) and satisfaction on a 4-point Likert scale.

Results
There were 395 robotic assisted and 170 manual procedures performed in the study period. Both groups were comparable for age, gender, body mass index and pre-operative EQ-5D health index. At six weeks the mean OKS was 31.4 (SD 8.5) in the robotic group vs 33.6 (8.6) in manual UKA ($p=0.016$) and mean FKS 35.1 (SD 26.9) vs 42.6 (SD 27.1) respectively ($p=0.012$). Although statistically significant, these differences did not reach the minimal clinically important difference (MCID) thresholds indicating similar post-operative outcomes. At one year these differences were maintained, with respective mean OKS 38.7(SD 9.2) for robotic UKAs vs. 41.8 (SD 6.8) for manual UKAs ($p=0.014$) and FKS 57.8 (SD 31.1) vs. 73.2 (SD 27.1) respectively ($p < 0.01$), the latter exceeding the MCID threshold. Overall satisfaction for robotic vs. manual was 87.2% vs. 90.6% at six weeks and 87.1% vs. 90% at one year, with a higher proportion of “very satisfied” patients for manual knees at both six weeks (61.2% vs. 69.2%) and one year (69.2% vs. 78.3%).

Conclusion
The results of our study appear to conclude robotic-assisted UKA does not confer significant post-operative benefits compared to manual, with only a small clinically significant difference seen in the FKS at one year. However, the use of differing implants and the retrospective, non-randomised nature of the study may limit the generalisability of these findings.

Country: United Kingdom

Category: Knee Arthroplasty
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Perioperative Body Mass Index In Elective Total Knee Arthroplasty: A Retrospective Audit at a South African Tertiary Academic Hospital

Background
Obesity significantly affects outcomes following Total Knee Arthroplasty (TKA). While international data are abundant, context-specific South African evidence is scarce, particularly within the resource-constrained public healthcare sector facing a unique "double burden" of obesity and malnutrition. This study described the perioperative Body Mass Index (BMI) profile of TKA patients at a tertiary academic hospital and assessed its association with length of hospital stay (LOS) and in-hospital acute postoperative complications.

Method
A retrospective clinical audit was conducted on all adult patients (≥18 years) who underwent primary elective TKA for OA at a tertiary academic hospital between 1 January 2022 and 31 December 2024. A census sampling approach was utilised. Data extracted included demographics, BMI, comorbidities, LOS, and in-hospital complications. The association between continuous BMI and LOS was assessed using a multivariable linear regression model with a third-order polynomial, controlling for age. Fisher's exact tests were used to examine associations between BMI categories and complications.

Results
A total of 249 patient records were analysed. The median age was 64 years (IQR 58–70), and 82% (204 of 249) were female. The cohort demonstrated a high prevalence of obesity, with 63% (157 of 249) classified as obese (BMI ≥30 kg/m2) and a median BMI of 32.0 kg/m2 (IQR 28.0–37.0). A significant, non-linear, U-shaped relationship was identified between BMI and LOS ($p < 0.001$) suggesting deviation from normal/overweight BMI in either direction, was associated with a prolonged hospital stay. Postoperative pain ($p < 0.001$) and stiffness ($p < 0.001$) were significantly more prevalent in higher BMI categories. No statistically significant association was found between BMI categories and major complications such as prosthetic joint infection ($p=0.055$) or surgical site infection ($p=0.320$).

Conclusion
This study confirms a high burden of obesity among TKA patients in the South African public sector and identifies a complex, U-shaped association between BMI and length of stay. These findings challenge simple linear risk assumptions and highlight the vulnerability of patients at both BMI extremes. Context-specific perioperative risk stratification and optimisation strategies are required to address these dual risks.
Country: South Africa

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Category: Knee Arthroplasty

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[1]Private

ID: 15501

Patient Satisfaction After TKA, Same Surgeon Same Patient . KA Vs MA

Background
Despite technological advances in total knee arthroplasty (TKA), approximately 20% of patients remain dissatisfied post-operatively
Current patient-reported outcome measures (PROMs) such as the Oxford Knee Score (OKS), WOMAC, KOOS, and Knee Society Score (KSS) primarily assess pain and function but may not fully capture overall patient satisfaction. Alignment philosophy—mechanical alignment (MA) versus kinematic alignment (KA)—remains debated regarding its influence on satisfaction. This study uniquely integrates validated patient satisfaction metrics to evaluate patient satisfaction following TKA.
Purpose: To compare patient satisfaction between KA and MA TKA using both traditional orthopaedic PROMs and customer satisfaction measurement tools derived from marketing science, and to assess the validity and correlation between these measurement approaches.

Method
A quantitative observational study was conducted in a private orthopaedic practice. The cohort included 110 patients: 50 with bilateral TKAs (one KA and one MA in the same patient) and 60 unilateral TKAs (30 KA; 30 MA). All procedures were performed by a single surgeon using the same medial pivot prosthesis (Medacta® Sphere). Minimum follow-up was 12 months, with data collected up to a maximum of 18 months post-operatively.
Patients completed five instruments: OKS, WOMAC, KOOS, KSS (2011 version), and a structured customer satisfaction questionnaire adapted from marketing methodology. Statistical analysis included Shapiro-Wilk testing for normality, paired and independent t-tests, Pearson and Spearman correlations, ANOVA/MANOVA where appropriate, and regression analysis (SPSS v24; significance $p < 0.05$).

Results
At ≤18 months follow-up, both KA and MA techniques demonstrated high functional scores across validated PROMs. However, variability in overall satisfaction was observed that was not consistently explained by pain or function scores alone. Preliminary correlation analysis suggests that patient satisfaction measures may detect perceptual and experiential factors not captured by traditional orthopaedic PROMs.
Within-patient bilateral comparisons reduced surgeon, implant, and demographic bias, allowing more isolated assessment of alignment philosophy on perceived satisfaction.

Conclusion
Both KA and MA provide good short-term functional outcomes, consistent with

existing literature. However, traditional PROMs may incompletely reflect overall patient satisfaction. Incorporating validated customer satisfaction frameworks from marketing science may enhance our understanding of patient perception following TKA and offer practical implications for healthcare management, value-based care, and patient-centred arthroplasty delivery.
Ongoing Work:
Prospective data collection is underway to extend follow-up to 36 months, allowing mid-term validation of these findings and assessment of durability of satisfaction tr

Country: South Africa

Category: Knee Arthroplasty

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Early Patient-Reported Outcomes Following Subvastus Calipered Kinematic Alignment Total Knee Arthroplasty: A 100-Patient Consecutive Series

Background
Restoration of native knee kinematics through calipered kinematic alignment (KA) has been proposed to improve patient-reported outcomes compared with conventional mechanical alignment (MA). The subvastus approach preserves the extensor mechanism and may facilitate accelerated early functional recovery. Additionally, medial pivot prosthetic designs aim to reproduce physiologic medial compartment stability. This study evaluates early joint awareness outcomes in a consecutive cohort undergoing primary total knee arthroplasty (TKA) using a combined subvastus approach, calipered KA principles, and a medial pivot implant.

Method
A prospective review was performed of 100 consecutive primary TKAs conducted by a single surgeon using a true subvastus exposure and unrestricted calipered kinematic alignment. All cases utilized the SpheriKA medial pivot prosthesis. The Forgotten Joint Score (FJS-12) was collected at 6 weeks, 6 months, and 12 months postoperatively. Outcomes were compared descriptively with published benchmarks for mechanically aligned TKA cohorts. Complications, re-operations, and revisions were recorded.

Results
Mean FJS demonstrated progressive improvement across follow-up intervals. At 6 weeks, mean FJS exceeded commonly reported MA benchmarks for early postoperative recovery. At 6 months, scores approached or surpassed reported MA 12-month averages (~65–70). At 12 months, mean FJS was consistent with high-performing kinematic alignment series in the literature. No early aseptic loosening, instability-related revision, or extensor mechanism complications were observed. Overall complication rates were comparable to contemporary registry data.

Conclusion
In this single-surgeon consecutive series, the combination of subvastus exposure, calipered kinematic alignment, and a medial pivot prosthesis demonstrated favorable early patient-reported outcomes without increased short-term complication risk. These findings support the hypothesis that surgical approach, alignment philosophy, and implant conformity collectively influence early joint awareness following TKA. Ongoing follow-up will assess mid- and long-term durability.

Country: South Africa

Category: Knee Arthroplasty

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Robotic Bi-UKA vs Conventional TKA 5 Year outcomes

Background
The aim of this study was to evaluate the clinical outcomes, demonstrating equivalent or superior outcomes between constitutionally aligned, robotic arm-assisted bi-unicompartmental knee arthroplasty (bi-UKA) and conventional, mechanically-aligned total knee arthroplasty (TKA) at five-year follow up.

Method
This was a prospective, randomized, single-centre study comparing the clinical outcomes of robotic arm-assisted bi-UKA versus conventional TKA in patients with medial and lateral joint osteoarthritis (OA). 80 patients were randomised to receive either a cemented, fixed-bearing, robotic arm-assisted bi-UKA or a cemented, posterior stabilised, mechanically aligned TKA using conventional instrumentation over a 3 year period. Data collection was completed by a blinded research team, consisting of validated scoring systems to assess patient reported outcome measures and complications. Patient follow-up was carried out at 3 months, one, two and five years.

Results
Post-randomisation, 76 patients were enrolled in the study (TKA - n = 35; bi-UKA - n = 41). At five-year follow-up, there was no significant differences between bi-UKA and TKA groups in patient reported outcome measures including Oxford Knee Score, Forgotten Joint Score, EQ-5D-3L, UCLA, New Knee Society Score and Pain or Stiffness visual analogue scores. However, participants had significantly improved in all reported outcomes from baseline over the course of follow-up in both groups. Importantly, both treatment allocations had complication/adverse event profiles and there was no observed differences in re-intervention or revision rates.

Conclusion
In conclusion, the outcomes from participants who received constitutionally aligned, robotic arm-assisted bi-UKA are not significantly different to the results of participants receiving TKA with advanced medial and lateral joint OA, with similar outcomes and complication rates at mid-term follow-up. Although the specific indications for bi-UKA remain inconclusive from our research, the technique offers a viable alternative to TKA. Robotic arm-assisted bi-UKA results in similar patient reported outcome measures and complications at five-year follow-up compared to conventional TKA.

Country: South Africa

Category: Knee Arthroplasty

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AI-Powered Dynamic Curriculum Development In Knee Arthroplasty Training Using Augmented Reality Surgical Interactions

Background
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.

Method
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.

Results
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.

Conclusion
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.

Country: South Africa

Category: Knee Arthroplasty

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ID: 15531

Activity Recognition Using Artificial Intelligence Techniques In A Cadaveric Knee Replacement Model Based On Dual Integrated IMU Devices.

Background
Total knee replacements(TKR) are highly successful procedures. Despite improvements in both the prosthesis and the surgical technique over the past half century, we still encounter failures. Prosthesis loosening is the primary mode of failure and often presents as pain. Loose prosthesis invariably remain loose, cause unnecessary patient suffering and bone loss with delayed diagnosis. Currently we do not have sensitive modalities to diagnose early TKR loosening. Embedded Inertial Measurement Unit sensors(IMUs) in the context of smart knee replacements have been used successfully to provide activity tracking data and we have previously demonstrated that data generated by dual embedded IMUs can be used to recognise knee activity using Artificial Intelligence(AI) models. In this study we demonstrate the ability of the AI model to identify loosening of prosthesis.

Method
We developed an AI model for activity recognition based on IMU data generated from a cadaveric knee specimen implanted with a cemented smart knee replacement prosthesis (dual IMUs in tibia, femur) powered by a six degree -of-freedom hydraulic simulator (AMTI VIVO). The model transforms inputs from accelerometers and gyroscopes from independent IMUs, computes the data through multiple neural networks into an embedding vector and predicts activity. We intentionally loosened the interface between the tibia prosthesis and bone and harvested additional IMU data streamed at 50Hz for a total of 12 channel inputs for the following activities stance, walking, walking up stairs.

Results
We collected embeddings from the model (stable and loose prosthesis) for specific ADLs. We used K-means as a clustering algorithm to assign the embeddings to clusters representing activity patterns in stable prosthesis and computed the embedding vector for sample windows for the loose prosthesis. We used the few-shot anomaly detection approach to estimate the degree of loosening (insufficient loose prosthesis training data) and Euclidean distance between loose prosthesis embeddings and centroids of the specific activity cluster as a surrogate of loosening. A T-SNE plot of the output layer showed a significant distance between the cluster centre of specific ADLs for loose and stable prosthesis.

Conclusion

Dual IMUs in a smart knee replacement can diagnose loosening in TKR and degree of loosening based on specific ADLs.

Country: South Africa

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Category: Knee Arthroplasty

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Activity Recognition Using Artificial Intelligence in a Cadaveric Knee Replacement Model with Embedded IMU Devices

Background
Total knee replacement (TKR) is a reliable treatment for end stage conditions of the knee. Patient Reported Outcome Measures (PROMs) are the standard measures of success. However, PROMs are subject to limitations including floor and ceiling effects. There is recognition that a combination of PROMs and objective measures present a more holistic picture of outcomes. Wearable devices are increasingly being used to collect objective data but they are subject to inaccuracies and compliance challenges. Inertial Measurement Unit sensors (IMUs) embedded within TKR prosthesis have the potential to seamlessly relay accurate objective quantitative activity data. In this study we demonstrate that IMUs can also relay qualitative data through Artificial Intelligence (AI) powered recognition of knee activity.

Method
A standard posterior stabilised knee replacement prosthesis was modified to create blind chambers on the lateral aspects of the femoral and tibial prosthesis to house powered IMU (accelerometer, gyroscope) devices. The modified prosthesis was implanted with bone cement in a cadaveric knee using standard jigs. The TKR was mounted to a six degree-of-freedom joint motion simulator(AMTI VIVO) and the following activities of daily living (ADLs) derived from OrthoLoad were simulated jogging, walking, knee bend, sitting down, standing up, stance, walking up and down stairs. IMU data was streamed at 50Hz and labelled according to the associated ADL. An AI multimodal deep learning model was constructed using a combination of neural networks and late fusion strategy with 20% of data being used for training and the rest set aside for deep learning.

Results Activity recognition accuracy of the model overall was 96% with 100% accuracy for jogging, knee bend, sitting down, stance and standing. walking:93.55%, walking downstairs:93.55%, walking upstairs:94.44%. Confusion matrix showed that walking was confused with walking downstairs and vice-versa 5% of the time and similarly walking upstairs was confused with walking downstairs.

Conclusion IMU data generated by dual devices embedded in a knee replacement can accurately recognize specific ADLs in a simulated knee cadaver model using AI. This preliminary study demonstrates the promise of sensor technology and AI to accurately recognize knee activity with future implications for patient specific rehabilitation protocols.

Country: South Africa

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Category: Knee Arthroplasty

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Perceptions Of Trainee Orthopaedic Surgeons In Sub-Saharan Africa On Robotic-Assisted Knee Arthroplasty: Opportunities, Barriers And Global Relevance.

Background
Robotic-Assisted Total Knee Arthroplasty (RA-TKA) is an emerging surgical technology that promises enhanced precision, improved patient outcomes, and reproducibility in joint arthroplasty. However, the adoption of this technology in low-to-middle-income (LMICs) countries within Sub-Saharan Africa remains limited. Understanding the perceptions of registrar orthopaedic surgeons in training is critical for anticipating future trends in surgical practice and training needs. This will also better equip registrars for future practice in Sub-Saharan Africa and worldwide. This study explores the opinions, beliefs, and perceived barriers among orthopaedic registrars in South Africa regarding RA-TKA. There is a focus on its relevance, accessibility, training opportunities, and potential impact on clinical practice.

Method
A cross-sectional, descriptive survey was distributed electronically to registrars enrolled in accredited orthopaedic surgery training programs across South Africa. The survey included both quantitative and qualitative items addressing knowledge, exposure, attitudes, perceived benefits, challenges, and expectations regarding RA-TKA.

Results
Preliminary findings indicate that registrars acknowledge the potential clinical advantages of RA-TKA, such as improved alignment and surgical accuracy. However, many expressed concerns over perceived costs, limited local availability, and inadequate training exposure. A significant proportion believes RA-TKA will become more prevalent in the future, though most felt unprepared to use the technology without additional dedicated training.

Conclusion
South African orthopaedic registrars hold a cautiously optimistic view of RA-TKA, recognizing its future potential while highlighting current infrastructural and educational limitations. These insights underscore the need for integrating robotic-assisted surgery training into orthopaedic surgery curricula and addressing systemic barriers to adoption within the public and private sectors.

Country: South Africa

Category: Knee Arthroplasty

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ID: 15537

CPAK and alignment change following Kinematic Aligned Total Knee Arthroplasty: A Prospective Cohort Study

Background

The Coronal Plane Alignment of the Knee (CPAK) system categorises coronal knee phenotypes using arithmetic hip–knee–ankle angle (aHKA) and joint line obliquity (JLO). Alignment philosophies have been developed to try and personalise total knee arthroplasty(TKA) for better patient satisfaction and improved function. Kinematic alignment aims to restore the patient's natural pre-arthritic knee alignment. This study evaluated whether Kinematically Aligned TKA performed with a calipermeasured resection technique preserves pre-operative CPAK phenotype, alignment and joint line obliquity.

Methods

A prospective cohort study of 61 consecutive primary TKAs was performed at a single centre by four fellowship-trained surgeons using kinematic alignment philosophy. The Spherika implant from Medacta was inserted using the "caliper and shim" technique described by Howells and using the femoral linked-jig.
Pre- and post-operative long-leg radiographs were analysed to determine arithmetic HKA, joint line obliquity, and CPAK classification (Types 1–9).The primary outcome was maintenance of CPAK phenotype post-operatively. Descriptive statistics were used to assess phenotype distribution pre- and postoperatively

Results

Sixty-one knees were analysed. Pre-operatively, the most common CPAK phenotype was Type III (24.6%), followed by Type IV (21.3%) and Type I (18.0%).Demonstrating a high proportion of valgus knees in the cohort.

Twenty-two knees (36%) maintained the same CPAK phenotype post-operatively, while thirty-nine (64%) demonstrated a change in CPAK grade. Overall varus cases increased postoperatively (41% to 49%), as did neutral cases

(19% to 28%) while valgus incidence reduced (40% to 33%), showing a shift in alignment towards varus.

Overall apex-distal joint line obliquity increased postoperatively (51% to 59%), while neutral joint line reduced, showing a shift towards more apex distal(varus) obliquity

Type I became the most prevalent phenotype (26%) post-operatively, with Types II and VI each accounting for 21.3%. A reduction in Type III (25% to 12%) and Type IV (21% to 13%) was observed, alongside an increase in Type II (8% to 21%) and Type VI (15% to 21%).

Conclusion

While overall coronal alignment was largely preserved, there was a shift toward neutral joint line obliquity in the valgus knees and to more varus obliquity in the varus group, resulting in redistribution of CPAK phenotypes. These findings suggest that this kinematic alignment techniques generally maintains constitutional limb alignment but does not reliably preserve the exact CPAK grade.

Category: Knee Arthroplasty
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Redefining Knee Arthroplasty Indications: Phenotype-Based Classification Reveals the True Opportunity For Compartment-Specific Surgery

Background
Knee osteoarthritis (OA) has traditionally been approached as a tricompartmental disease, resulting in widespread use of total knee arthroplasty (TKA). Emerging evidence suggests that most knees present with compartment-specific degeneration patterns. This study aimed to develop and clinically validate a phenotype-based Integrated Knee Osteoarthritis Grading System (iKOGS) integrating radiographic findings, anterior cruciate ligament (ACL) status, and intraoperative confirmation, and to determine the proportion of knees potentially suitable for partial knee arthroplasty (PKA). We hypothesised that a majority of arthroplasty candidates demonstrate disease patterns amenable to compartment-specific reconstruction rather than TKA.

Method
A prospective cohort of 2,000+ consecutive primary knee arthroplasties was analysed. All knees were graded using the Integrated Knee Osteoarthritis Grading System (iKOGS), incorporating radiographic wear distribution, alignment phenotype, ACL status, and intraoperative findings. Inclusion criteria comprised symptomatic end-stage OA requiring arthroplasty. Revision cases and inflammatory arthropathies were excluded. Surgical procedures included unicompartmental knee arthroplasty (UKA), bicompartmental arthroplasty, and TKA. Outcomes were assessed using the Oxford Knee Score (OKS) at mid-term follow-up. Revision rates and phenotype distribution were analysed.

Results
The majority of knees demonstrated compartment-specific disease patterns rather than true tricompartmental destruction. A substantial proportion of cases were classified as isolated medial, isolated lateral, or combined bicompartmental phenotypes with preserved ACL function. TKA was required in a minority of cases when strict phenotypic criteria were applied. Mid-term OKS outcomes were high across compartment-specific procedures, with low revision rates comparable to contemporary TKA benchmarks. ACL status proved to be a critical determinant in procedure selection and functional outcome.

Conclusion
Phenotype-driven classification reveals that most knees undergoing arthroplasty are not uniformly tricompartmental. Application of iKOGS provides a reproducible framework for selecting UKA and bicompartmental reconstruction in appropriately indicated patients. These findings challenge default TKA utilisation and support a paradigm shift toward functional, compartment-specific arthroplasty to restore native biomechanics and optimise patient-reported outcomes.

Country: South Africa

Category: Knee Arthroplasty

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ID: 15539

Intraoperative Airborne Particle Counts During Imageless Robotic-Assisted Total Knee Arthroplasty Using A Handheld Burr

Background
Maintaining optimal air quality in the operating theatre is crucial for minimising the risk of surgical site infections(SSIs), particularly during procedures involving prosthetic implants. Using powered instruments like handheld burrs in robotic-assisted total knee arthroplasty(RA-TKA) raises concerns about potential increases in airborne particulate matter. This could disrupt laminar airflow and increase the risk of infection.

Method
This prospective observational study evaluated airborne particle concentrations during 50 consecutive imageless robotic-assisted TKAs utilising a handheld burr. Particle counts for sizes≥0.3 µm, ≥0.5 µm, and ≥1.0 µm were measured at three strategic locations within the operating theatre. Measurements were taken during eight defined surgical phases: skin incision and opening, femoral preparation, tibial preparation, trialling, cementation and closure. The influence of door openings on particle counts was also assessed.

Results
Throughout all procedures, particle counts remained well below the ISO 7 cleanroom threshold of 352,000 particles/m³ for particles ≥0.5µm. There was no increase at any point for particles > 1µm. Notably, during the femoral preparation with the handheld burr, cementation and skin incision phases, minor transient increases in particle counts were observed. However, these increases did not exceed 15% of baseline and remained within acceptable limits. Importantly, no significant correlation was found between the frequency of door openings and particle count variations. Postoperative outcomes were favourable, with no reported cases of periprosthetic joint infection, readmissions or reoperations within 1 year of follow-up.

Conclusion
The use of a handheld burr in imageless robotic-assisted TKA does not compromise theatre air quality. The observed fluctuations in particle count were minimal and remained within safe thresholds, suggesting that the incorporation of this technology does not elevate the risk of SSIs related to airborne contamination.

Country: South Africa

Category: Knee Arthroplasty

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Precision Without Control? Tibial Rotation Variability In MAKO Robotic Unicompartmental Knee Arthroplasty

Background
Robotic-assisted unicompartmental knee arthroplasty (UKA) delivers accurate coronal and sagittal alignment. However, tibial rotation is determined by surface point mapping during MAKO preoperative planning, which may introduce variability. In UKA, where native kinematics are preserved, small rotational errors may have significant biomechanical consequences.

Method
MAKO preoperative planning datasets were analysed to evaluate tibial point identification used to define rotational alignment. Planned tibial rotation based on mapped surface areas was quantified and compared to rotation aligned relative to the femoral flexion axis. Rotational variance between methods was assessed.

Results
Surface-based tibial point mapping demonstrated measurable rotational variability, with small differences in point acquisition resulting in clinically meaningful changes in tibial rotation. Alignment referenced to the femoral flexion axis showed improved consistency and closer alignment to functional knee kinematics. Given the sensitivity of UKA to rotational error, such variability may influence mid-flexion stability, polyethylene loading, compartmental balance, and the risk of early failure.

Conclusion
While MAKO robotic UKA provides precision in coronal alignment, tibial rotation remains a variable parameter influenced by point identification. Referencing rotation to the femoral flexion axis may reduce variability and improve functional alignment.

Country: South Africa

Category: Knee Arthroplasty

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Coronal Knee Phenotypes Are Associated With Distinct Ankle Alignment Profiles: Combined Analysis Using CPAK And DMTA Classifications

Background
The relationship between coronal knee alignment and distal ankle orientation is clinically relevant but poorly defined. This study evaluated whether knee alignment phenotypes, defined by Coronal Plane Alignment of the Knee (CPAK) classification and conventional varus–neutral–valgus categories, are associated with ankle alignment as measured by the distal medial tibial angle (DMTA).

Method
The relationship between coronal knee alignment and distal ankle orientation is clinically relevant but poorly defined. This study evaluated whether knee alignment phenotypes, defined by Coronal Plane Alignment of the Knee (CPAK) classification and conventional varus–neutral–valgus categories, are associated with ankle alignment as measured by the distal medial tibial angle (DMTA).

Results
Valgus knees were significantly associated with varus ankles (χ^2=10.21, p=0.0014) and neutral ankles (χ^2=11.88, p=0.0006). Neutral knees were associated with neutral (χ^2=10.46, p=0.0012) and valgus ankles (χ^2=6.77, p=0.0093). Varus knees showed no significant association with any ankle type.

CPAK analysis demonstrated a non-random distribution between CPAK and DMTA categories (χ^2=35.97, p=0.0029). CPAK 6 was overrepresented in varus ankles (residual +2.81), while CPAK 5 was underrepresented in valgus ankles (–1.94). A significant difference was noted between CPAK 2 and neutral knees with proximally directed joint line obliquity, the latter showing more neutral ankles (χ^2=4.28, p=0.039). No differences were observed between CPAK 1 vs 4/7 or CPAK 3 vs 6/9.

Conclusion
Coronal knee phenotype is associated with specific ankle alignment patterns, particularly in valgus and neutral knees. Varus knees demonstrate greater distal alignment variability. Recognition of limb-wide alignment patterns may influence preoperative planning in arthroplasty and deformity correction.

Country: South Africa

Category: Knee Arthroplasty
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Does Robotic Arm Assistance Expand The Indications For Uncemented Cruciate Retaining Components In Primary Total Knee Arthroplasty?

Background
Uncemented fixation and cruciate retaining (CR) designs in primary total knee arthroplasty (TKA) have traditionally been reserved for selected patients. Advanced age, smoking, severe coronal deformity, flexion contracture, reduced bone quality and post-traumatic osteoarthritis have been considered relative contraindications. Robotic arm assistance may enhance tibial resection accuracy which in addition to improved implant design may lead to better bone ingrowth in uncemented components. Robotic enabling of improved soft-tissue balancing may potentially allow broader usage of CR components.

Method 1200 consecutive primary TKAs were included in the study.
All cases were done with Robotic arm assistance.
Uncemented CR components were used in all cases and there were no carve out cases that required cemented fixation or PS or more constrained bearings.
The cohort included 72 patients > 80 years, 82 smokers, 20 with severe flexion deformity, 40 with coronal deformity > 10°, and 24 with post-traumatic osteoarthritis.
Mean follow-up was 30 months, with radiographic follow-up ≥6 months. Primary endpoints were revision for any cause and radiographic osseointegration.

Results VAS pain improved from 7.6 to 1.7 and Oxford Knee Score from 21.3 to 41.3 at 6 months. The mean Forgotten Joint Score was 80.6 (range 55-100)
5 of 1200 knees were revised, yielding an overall revision rate of 0.42% (95% CI 0.18–0.98). Septic revision rate was 0.25% (95% CI 0.09–0.73), and aseptic revision rate was 0.17% (95% CI 0.05–0.61). Kaplan–Meier survivorship at 30 months was 99.58%.
Radiographic bony ingrowth was observed in 99.83% of components (95% CI 99.39–99.96), with two cases of non-ingrowth not requiring revision.
No revisions were performed for instability.
Three manipulations were performed, and one asymptomatic PCL rupture was observed.

Conclusion
Robotic arm–assisted TKA demonstrated excellent short-term clinical outcome and survivorship with high osseointegration rates using uncemented CR components across a broad patient spectrum. A substantial percentage of these cases would traditionally require cemented fixation and a more constrained tibial bearing.
These findings suggest robotic assistance may expand the indications for biological fixation and reduce the need for constraint in primary TKA. Comparative studies are required to confirm the validity of these findings in the long term

Country: South Africa

Category: Knee Arthroplasty

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Can Patella Tracking Be Improved In Individualised Alignment Total Knee Arthroplasty?

Background
The past two decades have seen a progressive shift from systematic mechanical alignment toward more patient-centered, individualised alignment strategies in total knee arthroplasty (TKA).
While personalised alignment aims to better restore native anatomy, concerns have been raised regarding potentially suboptimal patella tracking.
This study evaluated whether targeted intra-operative optimisation strategies could improve patella tracking in individualised alignment TKA and whether this translates into improved short-term clinical outcomes.

Method
Two groups of Functionally aligned Robotic arm assisted TKA's with routine patella resurfacing were compared to each other.
The first group were presented at a previous SAAS meeting and despite excellent clinical outcome an increase in lateral patella tilt was noted.
Group 2 consists of a subsequent set of patients where specific component positioning and soft tissue adjustments were carried out to improve patella tracking.
Both groups consisted of a hundred consecutive TKA's. Both were assessed for axial patella tracking using Merchant view radiographs at 6 months post-operatively.
Clinical outcomes included VAS pain, Oxford Knee Score, Lille patella score, Kujala score, and HSS patella score.

Results
The mean lateral patella tilt improved from 9° (range 3–18°) in Group 1 to 6° (range 2–12°) in Group 2, representing a statistically significant reduction ($p < 0.05$).
Despite improved radiographic patella tracking, no statistically significant differences were observed between groups in VAS pain, Oxford Knee Score, Lille patella score, Kujala score, or HSS patella score at 6 months ($p > 0.05$).

Conclusion
Optimised femoral position and retinacular soft tissue tension improved patella tracking radiologically.
However, these improvements did not seem to improve short-term clinical outcomes which remained excellent.
Longer-term follow-up is required to determine the clinical relevance of improved patella tracking.

Country: South Africa

Category: Knee Arthroplasty
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The IKOGS - Integrated Knee Osteoarthritis Grading System A Framework For Phenotype-stratified Arthroplasty Outcome Evaluation

Background
Across the three compartments of the knee various wear patterns develop during arthritic degeneration. With the increase in utilisation of partial knee arthroplasty, the wear phenotype emerged as paramount to implant selection and prognostication. The aim of this study was to develop a practical framework to categorise osteoarthritic (OA) knee assessment for arthroplasty and apply it to a cohort of 2,200 knees to describe the distribution. Secondary objectives are to correlate patient related outcomes, implant selection and implant survival to the arthritic phenotypes.

Method
This retrospective analysis of a prospectively maintained database included 2364 primary arthroplasties (2012–2025) performed by a single surgeon. Phenotypes were classified using iKOGS (12 patterns; Grades 1–4). Patient related outcomes were measured using a pre-operative, 6 week and 3-month Oxford Knee Score (OKS). Survivorship was analysed using Kaplan–Meier methods with the following predefined endpoints: revision, conversion, and reoperation.

Results
The 12 iKOGS presentations identified, with their assessed distributions, were:
Grade 1A: Medial tibiofemoral compartment OA (48.1%);
1B: Lateral tibiofemoral compartment OA (14.7%);
1C: Patellofemoral compartment OA (3%);
2A: Single-compartment OA with coronal translation (varus/valgus) with ACL retained (2.6%);
2B.1: Single-compartment OA with prior ACL reconstruction (1.2%);
2B. 2: Single-compartment OA with ACL reconstruction concurrent with partial knee arthroplasty (1.2%);
2C: Single-compartment OA with ACL-D (no ACL reconstruction performed) (4.1%);
3A: Medial tibiofemoral and patellofemoral compartments OA (7.6%);
3B: Lateral tibiofemoral and patellofemoral compartments OA (4.2%);
3C: Medial and lateral tibiofemoral compartments OA (6.2%);
4A: Bicompartmental (tibiofemoral) OA with ACL-D (0.5%); and
4B: Tricompartmental OA with or without ligament involvement. (6.6%).
There was no mean clinical important difference in OKS across the phenotypes. The 2B.1 phenotype had the least improvement in OKS (4.4), and 4B the most (18.1).

Conclusion
This framework offers a practical assessment tool for use in arthroplasty, with the capability to compare degenerative presentations against the range of suitable implants.

Country: South Africa E&OE