

joint arthroplasty. Their study was designed to establish if registry-derived data were capable of improving practice across a healthcare system.⁷ The study team started by collating data for 1872 total joint arthroplasty cases and, paying particular attention to the AABB transfusion guidelines, presented the guidelines at monthly orthopaedic service line meetings halfway through the study period. The authors noted a significant improvement in adherence to the nationally agreed guidelines, with inappropriate (Hb > 8 g/dL) transfusion falling from 6.5% to 1.3%. The authors noted that there were no observed increases in complications during the study period, and that their use of a regional registry to drive practice change through the audit cycle had been successful. The thorny issue of registries is one that will continue to raise its head. Here at 360 we are delighted to see good use made of what are essentially large audits such as this.

Death rates higher in readmission to other hospitals

x-ref Research, Knee

■ Hospital readmissions are common after major surgery, including a variety of orthopaedic procedures. It is, however, still unknown whether the particular hospital to which patients are readmitted is of import. Does readmission to the index institution improve or hinder outcomes? In a major study published in *The Lancet*, epidemiologists from **Salt Lake City (USA)** used the Medicare insurance dataset over a ten-year period to examine the location of readmission and its effect on outcomes in major orthopaedic, abdominal and cardiac surgery. Patients were included in the study if they had undergone readmission to any medical institution within a 30-day window of the index procedure. The study included a whopping 9 440 503 patients, and is to our knowledge the largest

epidemiological study involving orthopaedic patients in existence.⁸ The results are quite extraordinary. Readmission rates to the initial treating institution varied markedly, from 66% (for coronary artery bypass surgery) to 83% for colectomy patients. The most startling finding here was the significantly lower mortality rate in patients who were readmitted to their index hospital – 26% lower at 90 days, to be precise. This really is a crucial finding for planning health care. Facilities undertaking major procedures such as hip and knee arthroplasty must have 24/7 readmission facilities to reduce this burden in excess mortality on patients.

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Knee

For other Roundups in this issue that cross-reference with *Knee* see:

[Hip Roundup 1, 2, 3, 4, 7, 8, 9;](#)
[Research Roundup 1, 2, 3, 4, 7.](#)

Allergy and outcome in arthroplasty

x-ref Hip

■ Allergy is clearly a spectrum of disease, with some patients suffering genuine life-threatening anaphylaxis to everyday allergens, and others laying all of their healthcare problems at the door of a perceived minor food intolerance. In a very interesting and thought-provoking paper, surgeons in **New York (USA)** set out to establish if there was a link between reported allergies and outcomes. This study evaluated the number of patient-reported allergies in just over 500 patients undergoing primary hip or knee arthroplasty, and specifically

measured their satisfaction levels post-operatively and equated these to the patient-reported allergies.¹ These researchers have established that for each additional patient-reported allergy, there was an increase of between 37% and 62% in the odds of reporting poorer satisfaction ratings based on the satisfaction domain queried, and the type of joint arthroplasty performed. While it's difficult to state what constitutes a 'true allergy', as formal allergy testing was not performed in this study, this study evaluates a surrogate for potential patient dissatisfaction. Perhaps surgeons should be wary of setting high expectations in patients that present with a long list of allergies. Certainly the patients' perceptions of their outcomes may not be as good as other individuals who undergo total joint arthroplasty.

Physiotherapy and drains not such a bad combination?

■ Retransfusion drains have been thoroughly examined in a range of randomised controlled trials, and they seem to be safe and associated with lower rates of post-operative transfusion. The message from the combined wisdom of these studies appears to be that if you are going to use a drain in knee arthroplasty, then a retransfusion drain is probably the best variety to use. That said, patients often do not like undergoing physiotherapy with drains *in situ*, making these a potential bar to early discharge programmes. However, anaemia is also a bar to early mobilisation, with plenty of data to suggest that anaemic patients don't mobilise as quickly as non-anaemic patients. Although not a randomised controlled trial, our interest was caught

by this paper from **Victoria (Australia)** describing the outcomes of 303 primary total knee arthroplasties performed with one of three drain strategies – retransfusion drain, closed suction drainage (either deep or superficial) or no drain. As this was a retrospective study, there is likely to be significant selection bias in the groups, however the results of this single-surgeon series are still very interesting. Although the retransfusion drain was not associated with a lower rate of post-operative transfusion, it was associated with a lower haemoglobin drop, and also a significantly shorter interval to sitting out of bed and discharge home when compared with the other strategies.² This study serves to remind us that interventions such as arthroplasty are complex procedures and there is often more to them than

meets the eye. Although in most corners of the world the perception is that it's hard to get patients to do much rehabilitation with a drain *in situ*, perhaps here the higher post-operative Hb's have offset that effect.

Another nail in the coffin for arthroscopists?

■ There is a desperate need for appropriately designed, randomised controlled trials to demonstrate the benefits of arthroscopic debridement in older patients with certain types of knee arthritis, or we as a profession should stop undertaking the procedure altogether. As is demonstrated by this meta-analysis from **Odense (Denmark)**, the current volume of evidence does not reflect current practice in many centres. The results, or rather the interpretation of these results, was sensational enough to warrant mention in the British newspapers suggesting knee arthroscopy carries no benefits, and risks death! The study team selected nine trials, all assessing the benefit of knee arthroscopy for patients experiencing pain with signs of degenerate disease. While the study did demonstrate an overall improved outcome, the effect size was tiny (0.14), representing just 2.4 mm of improvement on a 100 mm VAS scale. A more careful, time-based analysis demonstrated improvements of up to 5% in pain perception lasting up to six months, but no noticeable benefit at 24 months. The authors conclude that the benefits are "small and inconsequential", but cite in their abstracts harms, including death.³ Mechanical symptoms were not on the list of inclusion criteria so these patients likely represent 'washout' for early osteoarthritis, a procedure that most would agree has limited benefit as reflected in this meta-analysis. However, politicians, insurance companies and even some healthcare providers are generalising these studies to apply to all patients over middle age with knee symptoms, including mechanical ones. The arthroscopic knee community needs some good news soon

– perhaps a sensibly designed RCT evaluating the benefit of arthroscopy in those patients with mechanical symptoms is in order?

Graft pre-conditioning hocus pocus

■ If the aim of ACL reconstruction is to eliminate instability, surely it stands to reason that 'pre-conditioning' of the graft is a useful thing to do? Generations of knee surgeons have stretched all manner of grafts, from hamstring to Achilles tendon, reassuring themselves that they are somehow improving the outcome for their patients. An ingenious group in **Los Angeles (USA)** devised an experiment to test the benefit (or otherwise) of graft pre-conditioning. Their cadaveric study revolved around a robotic system which could be connected to a cadaveric knee. The system was essentially devised to produce a calibrated Lachman's test. The study team chose to test the full range of potential grafts (hamstring, patellar tendon, Achilles tendon and tibialis tendon) and a full range of pre-tensioning options (tension board, *in situ*, a combination and no tension). Each graft was implanted into a cadaveric knee and tested over 250 cycles, with the outcome being an increase in translation over the test cycles.⁴ In what is one of the most rigorous biomechanical tests of this variety, the study team were able to establish that although there is an increase of around 1.1 mm in translation during the testing cycle, this was independent of pre-tensioning protocol.

Extended dose steroids in knee arthritis?

■ It is a well known fact that injected steroids relieve pain from osteoarthritis of the knee, but that they come with some drawbacks. There is evidence of increasing rates of infection if administered too close to arthroplasty, in addition to the potential for local and systemic side effects (such as osteoporosis, diabetes, etc.) which are offputting for patient and clinician alike. Perhaps

most concerning is the evidence that repetitive injection of steroidal drugs can lead to joint destruction. A clinical team from **Burlington (USA)** have set out to establish if FX006, a long-acting version of triamcinolone, is safe and efficacious. Their study is a phase 2 randomised, controlled double-blinded study involving 228 patients, all presenting with moderate to severe knee arthritis. The patients were treated with a single injection containing either one of a range of doses of FX006, or standard triamcinolone acetonide. Outcomes were assessed at 12 weeks and pain scores taken as the primary outcome measure. Essentially the study team established that a 10 mg dose of FX006 provides the equivalent anal-



gesic effect of standard triamcinolone over the 12-week period, and a 40 mg dose provided superior analgesia to the standard of care intervention.⁵ This efficacy study demonstrates analgesia to be superior in the longer-lasting steroid. Here at 360, we wonder if the authors have any idea regarding the positioning of treatment by FX006 among other treatments on osteoarthritic knees, and how the longer immunosuppressive effect will impact on infection rates in subsequent arthroplasties.

Indolent peri-prosthetic infection

x-ref Hip

■ The sensitivity (if not specificity) of serological markers of infection in

the diagnosis of peri-prosthetic joint infection is well established. Clinicians worldwide use CRP and ESR to 'rule out' infection. With sensitivities of over 90% in all recent studies, this does not seem an unreasonable strategy. However, revision surgeons in the **Mayo Clinic in Rochester (USA)** asked, not unreasonably, what about the others? They designed a retrospective paper with the intention of investigating the outcomes of 'seronegative' revision arthroplasty. They report that 4% of their series of 952 septic revisions of total knee and hip prostheses were seronegative, a cohort of 21 TKA and 17 THA. As is the case with these retrospective series, not all patients were treated the same, but the majority of TKAs (n = 17/21) and around half of the THAs (n = 11/17) underwent pre-operative aspiration which, when combined with intra-operative sampling, was diagnostic the vast majority of the time. In these difficult to diagnose cases, the surgical team undertook two-stage revision in all but three cases and achieved a 92% cure rate at five years of mean follow-up.⁷ This paper demonstrates that when treated aggressively, similar outcomes can be achieved for patients presenting with negative inflammatory markers to the more common 'seropositive' cultures.

Computer modelling and medial knee arthritis

x-ref Research

■ Health economic analysis is a bit of a dark art – and rarely done well. The simplest papers are basically a counting and multiplication game based on averaged costs and accepted normal values. These studies have huge drawbacks and the more complex health utility analyses and quality-of-life-based assessments are, for the most part, now standard. More complex analysis however, such as those presented by health economists in **Boston (USA)** who used computer models to evaluate the cost benefits or otherwise of different treatments, are

far more useful. The research team used a probabilistic state transition computer model to establish the cost effectiveness of high tibial osteotomy (HTO) and unicompartmental knee arthroplasty (UKA) as possible alternatives to total knee arthroplasty (TKA).⁸ The model took into account pain, complications and likelihood of revision surgery to evaluate a cost-based assessment of the three options in patients aged 50 to 60 years. In short, the study concluded that in this age group, HTO was the most cost-effective treatment, with HTO achieving cost effectiveness 57% of the time, UKA 24% of the time and

TKA 19% of the time. This study takes into consideration the complexities of revision surgery and the likely outcomes of such revisions. Definitely a thumbs up for HTO as a surgical option from a health economic perspective.

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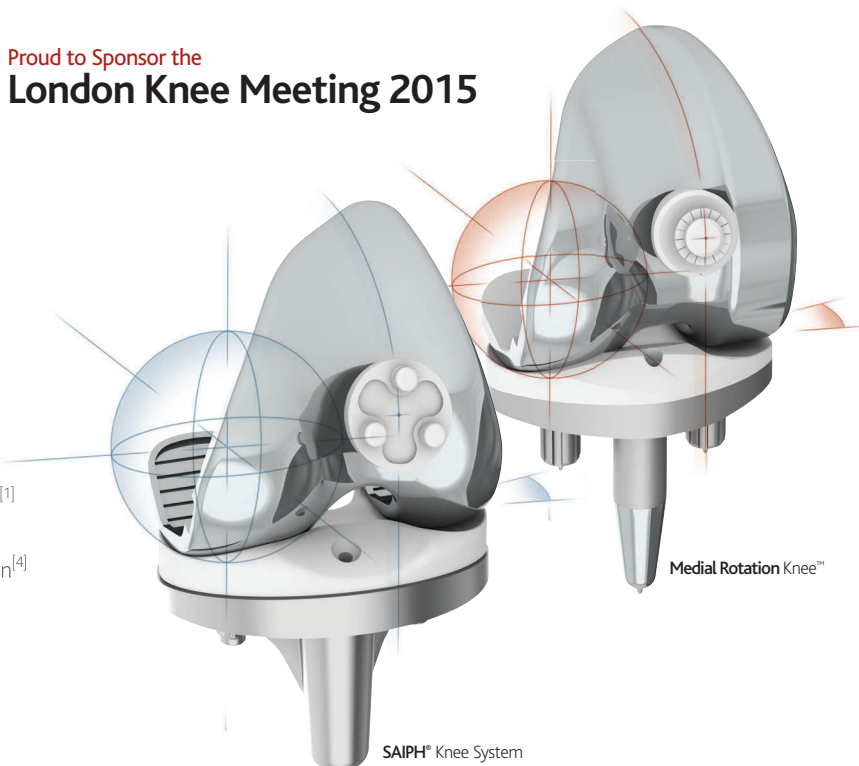
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