

success is early, quick surgery and that ARIF itself may actually be a confounder. It is almost impossible to reliably make that sort of conclusion with a small group and multiple factors; however it certainly seems that if patients do require fixation of a tibial eminence fracture, in these patients at least, the use of open surgery is more reliable.

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Research

X-ref For other Roundups in this issue that cross-reference with **Research see: Hip & Pelvis Roundup 4; Shoulder & Elbow Roundups 5 & 6; Spine Roundup 4; Trauma Roundup 5.**

In-theatre diagnostic tests for periprosthetic infection X-ref

■ There has been a lot of industry-driven pressure towards the use of expensive assays, and one in particular, anti-defensin alpha-1, to establish the presence or absence of infection intra-operatively during joint revision surgery. Despite the tantalising nature of a bedside instant diagnostic test, uptake has been far from 100% — in part due to the limited (and mostly commercially sponsored) research on its use and partly due to the competing test leukocyte esterase, which is essentially just a standard ‘cheap-as-chips’ urine dipstick. Recognising the current dichotomy in practice, a review team in **Bristol (UK)** have undertaken a well conceived systematic review and meta-analysis to enlighten us all as to what exactly the evidence is for each approach.¹ The study team’s stated aim in the abstract of their paper was to “synthesize the evidence on the accuracy of the alpha-defensin immunoassay and leukocyte esterase colorimetric strip test for the diagnosis of PJI compared with the Musculoskeletal Infection Society diagnostic criteria”. Their extremely extensive literature review yielded just 11 studies evaluating the accuracy of one or more of these two diagnostic tests. The study team undertook a

data-pooling approach to evaluate the sensitivity, specificity and receiver-operator characteristic (ROC) curve for both diagnostic tools. In short, there was no statistically discernible difference between the two, both showing superb sensitivity and specificity with a ROC area under the curve of 0.99 for the alpha-defensin assay and 0.97 for the leukocyte esterase dipsticks. Both were equally impressive from a diagnostic accuracy perspective, however, given the massive cost difference, the feeling around the editorial desks at *360 HQ* is that — for the moment at least — the leukocyte esterase tests win out drastically on cost savings alone. This meta-analysis suggests that using a simple urine dipstick is equally as accurate and is a fraction of the cost.

Orthopaedic replicas X-ref

■ I would strongly recommend all orthopaedic surgeons with an interest in arthroplasty to read this annotation from **London (UK)**, published in a recent issue of *The Bone & Joint Journal*.² Excellent outcomes with long-term follow-up continue to be reported in the literature for lower limb arthroplasty. Not only can patients expect a successful outcome in terms of pain relief and function, but the results are also durable in the long term. It is also widely reported that with an ageing population, the demand for lower limb arthroplasty is expected to rise. Increasingly, the cost of performing a total hip or knee arthroplasty has come under close scrutiny with

efforts to reduce patients’ length of stay in hospital and increase theatre productivity. An additional focus has been on the cost of the implants we use, particularly with a number of the well-established implants coming off patent. Are these implants, however, really ‘good enough’? The two most publicised disasters in orthopaedic arthroplasty implants is the Capital Hip System (3M; St Paul, Minnesota) — a copy of the Charnley — and the articular surface replacement (ASR), a copy of the Birmingham hip. Neither of these lightly modified implants appeared terribly different even to the educated consumer, however, both were significant disasters. The authors of this important article highlight the difficulty in identifying the true costs of manufacturing an implant due to the lack of transparency. Estimates have suggested that the actual manufacturing of the implant represents approximately 30% of the final cost, while the sales and marketing represent 40%. Similar to the drug industry, as patents expire, generic ‘copies’ of well established implants are starting to appear on the market. However, there is very little regulation of how these copies are manufactured, nor how they are monitored once they are on the market. We would thoroughly commend this annotation to *360* readers.

How long do hands stay ‘scrubbed’?

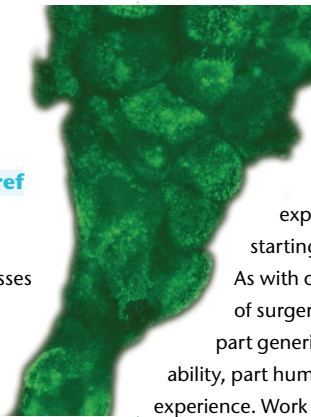
■ There is plenty of evidence that longer operations have a higher infection rate. There are a number

of possible reasons for this — clearly the longer the operation, the higher the risk of inadvertent contamination or seeding of an open wound with bacteria. There is also the likelihood that longer operations are more complex, or the operating surgeon less experienced, or sometimes both. An interesting potential contributing factor to this phenomenon is investigated by a study team based in **San Diego, California (USA)**. These investigators hypothesised that the surgical scrub becomes less effective the longer the time interval between scrubbing and the operation, and, as such, surgeons may then end up with contaminated hands.³ The study team undertook a prospective clinical study with 20 cases, all spinal procedures, each the first case of the day and all lasting longer than three hours. In all cases, the surgical team scrubbed with chlorhexidine gluconate 1% solution and ethyl alcohol 61% prior to the procedure. Cases were excluded if glove changing occurred or post-scrubbing cultures were positive. The study team undertook swabs and culture to calculate the colony-forming units (CFU) per ml when the swab tips were mixed with 5 ml pre-buffered saline. The swabs were undertaken pre-scrub, post-scrub and immediately post-surgery. Perhaps unsurprisingly, the main finding of this study was that with gloved hands there was a recolonisation effect, with more CFUs cultured with each unit time. Analysis with receiver-operating

characteristic curves suggested that by five hours the hands had all but completely recolonised to the pre-scrub level. Clearly some consideration should be given to this. An interesting addendum to this study would be to ask for changes of surgical gloves at specific time points since the start of surgery, and to identify the number of CFUs at that stage.

Steroid as good as hyaluronic acid X-ref

■ The non-operative treatment of knee osteoarthritis encompasses everything from physiotherapy to offloading braces, steroid and hyaluronic acid injection, analgesia and weight loss. While there is plenty of evidence for each intervention, there is very little in terms of head-to-head comparisons in a randomised study setting with which to form an opinion on efficacy. We were delighted here at 360 to come across the report of this double-blind randomised controlled trial from **Khlong Nueng (Thailand)** comparing steroid and hyaluronic acid injections.⁴ The authors report a well conducted double-blinded randomised controlled trial pitting a single-shot, intra-articular injection of either 6 ml of hylan G-F 20 or 6 ml of 40 mg triamcinolone acetonide and 5 ml of 1% lidocaine with epinephrine. Outcomes of the 99 patients, all with symptomatic knee osteoarthritis, were reported at regular intervals and final follow-up at six months. Outcomes were measured using the visual analogue pain scale (VAS) and the Western Ontario and McMaster Universities Arthritis index (WOMAC). The two interventions were comparable in terms of



improvement in function and pain, although the triamcinolone group reported earlier improved functional outcomes.

3D computer gaming helpful in arthroscopic surgery X-ref

■ As surgical exposure is falling during training and accountability is increasing, there is a perceived widening of the gap in skills and experience in trainees starting as consultants. As with other branches of surgery, arthroscopy is part generic skill, part innate ability, part human factors and part experience. Work with arthroscopic simulators and other types of surgical simulation can improve surgical skills across a wide variety of surgical disciplines. This interesting paper from **Zürich (Switzerland)** examines whether other generic skills (in this case proficiency with, and exposure to, 2D and 3D video gaming) can have an effect on surgical simulation.⁵ Their cross-sectional study of 30 volunteers without arthroscopy experience involved performance of three different validated arthroscopic knee surgery tasks on a surgical simulator. The participants recorded their video game experience via questionnaire and through evaluation of performance on five different 2D and 3D games. The study demonstrated statistically significant correlations between video game and simulator performances. The video game performances were reflective of different arthroscopic tasks with the 2D tile most strongly predictive of abilities with simple arthroscopic tasks, and the 3D sports and first person shooter games correlating best with the more complex games.

The authors here suggest experience and ability with 3D games make for better arthroscopists, at least as measured by a simulator. We can't help thinking, however, that this kind of paper focuses purely on the one aspect of surgical ability — a specific simulated technical skill — where there are so many other factors involved in achieving a successful operation. The authors make an interesting point that video game ability helps with the knee simulator, but we aren't certain it will help with the non-technical skills side of surgical training.

Detecting cartilage damage with T1ρ MRI sequences X-ref

■ Cam femoroacetabular impingement (FAI) occurs in between 14% and 18% of an asymptomatic population. However, it can be associated with symptomatic lesions and cartilage damage. The difficulty of course is in knowing on which population groups to operate. This very interesting paper from **Ottawa, Ontario (Canada)** sets out to establish if T1ρ MRI is a sequence that was designed to return signal in response to cartilage proteoglycan content.⁶ If the T1ρ sequence is able to distinguish between asymptomatic cam lesions and those with chondral damage, it would aid in decision making and help greatly in the clinical setting where there is difficulty in establishing the source of pathology. The authors report their study of 1.5 Tesla T1ρ MRI performed on 36 hips (20 asymptomatic hips with a cam deformity and 16 controls). There was a difference in mean signal across the whole of the acetabulum, and significant differences in the anterolateral and posteromedial quadrants between the cam deformity and control groups. The authors

conclude that cartilaginous damage is seen in hips with cam deformities, although there is no clear evidence from this study that patients can be selected for surgery based on these findings alone, just that the MRI findings in the cartilage reflect the radiographic findings. We would like to see more studies into this promising technique. A longitudinal cohort study of patients with asymptomatic cam lesions would rapidly yield some very interesting results, both in terms of insight into the pathophysiology of cam lesions, and when to intervene in patients who will ultimately become asymptomatic.

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