

just 20% (n = 63) returning the outcome measures which were the DASH score, DASH work and sports modules, and the Modified Mayo Wrist Score (MMWS) at a mean of 6.3 years from injury. In what is a bit of a mixed bag of patients, 39 presented with an acute fracture, with six requiring surgery. Of the 24 who presented with nonunion, 20 were treated surgically and all patients in both groups healed. Multivariate analysis demonstrated that chronic fracture presentation and osteonecrosis were independent predictors of a poorer outcome and that surgical treatment itself did not appear to influence outcome. This

is a relatively common injury in the paediatric population and despite the major limitation of low rate of recall, this is an interesting paper for general orthopaedic practice. The authors have demonstrated, with some caveats, that outcome in this age group is influenced by nonunion and osteonecrosis, as would be expected in an adult population. There is no difference in outcomes between casting and surgery, and, as such, if casting can be used then it should be used. However, surgeons should not be afraid to fix those scaphoid fractures where surgery is indicated, even in the paediatric population.

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Research

X-ref For other Roundups in this issue that cross-reference with *Research see: Hip Roundup 1, 3, 4, 7; Knee Roundup 1, 3, 4, 5, 7; Children's Orthopaedics Roundup 2; Trauma Roundup 2; Shoulder Roundup 3; Ankle Roundup 3.*

Antifungals in cement? X-ref

■ Treatment of fungal-associated infections can be a complicated business. Often difficult to culture and even more difficult to eradicate, fungal-associated periprosthetic infections don't benefit from the same research focus as the more common bacterial infections, although they can be far harder to remove. A mainstay of revision arthroplasty is the use of antibiotic elution in cement – plenty of research abounds to guide the antibiotic mix to maximise elution properties, and ensure thermal stability without compromising on the mechanical properties in the cement. Where there is a distinct evidence gap is in the use of antifungals in cement mixing. Researchers in **Rochester (USA)** have plugged one of the evidence gaps with their simple but important paper on the use of amphotericin B in cement.¹ Previous research has been a little ambiguous with conflicting reports

as to the likely efficacy of amphotericin B, mainly due to concerns about its elution characteristics. In a simple science experiment using a flow chamber, the research team manufactured custom polymethyl methacrylate beads with a high concentration (7.5%) of amphotericin B. Following polymerisation, measurements suggested that over 3.3% of the loaded amphotericin was detectable, suggesting potential efficacy. Use of the flow chamber gave a combined overall elution of 0.33 µg/mL during the first eight hours of the experiment, and over the first 24-hour period 2.79 µg/mL/h was eluted; an efficacious dose, and representing 0.2% of the available amphotericin B. In short, high-dose preparation of bone cement with amphotericin B can be expected to elute therapeutic doses of the antifungal when used in cement spacers and custom beads.

The mini C-arm: more radiation than a radiograph? X-ref

■ The mini C-arm is often the imaging device of choice in the paediatric and hand surgical worlds. This decision is usually twofold. The lack of requirement for a radiographer,

combined with the perceived lower radiation levels make it an attractive option. This said, there is little literature surrounding the radiation doses when this modality is used in paediatric fracture surgery. Researchers in **Hershey (USA)** set out to establish if the radiation exposure using mini C-arm for the reduction of paediatric fractures really is as low as we believe it to be.² In a prospective study, the research team recorded the kilovolts, milliamps, and exposure time required to reduce the upper extremity fractures of 86 consecutive paediatric patients. They then used this information to estimate the radiation exposure (mR) that each received. In their centre, the closed reduction and casting in the emergency department was performed by a surgeon in training (PGY2/3), using mini C-arm and post-reduction, in cast, anteroposterior and lateral images were routinely saved. The average exposure (mR) for distal radial fractures was 63; forearm 109; elbow 53; and hand 69 mR. Perhaps not surprisingly, the radiation exposure was operator-dependent and the less experienced (PGY2) residents had a higher exposure per reduction. Conventional anteroposterior/lateral

forearm radiographs were estimated by the authors to require 20 mR. There is a tacit assumption that the mini C-arm uses less radiation than a conventional source and this is often used as a driver to acquire portable radiograph equipment. The authors of this study demonstrate an unexpected contrary finding and recommend that residents receive appropriate training. It is clear that, in the case of manipulations of paediatric fractures if the C-arm is not required to effect the reduction, surgeons would be doing their patients a favour by using simple plain films after reduction and plaster.

Beating infection one step at a time X-ref

■ The pages of 360 wouldn't be complete without a paper describing the problems associated with, or a method aimed at, reducing the incidence of periprosthetic joint infection (PJI). After all is said and done, it is perhaps the most disastrous complication of any orthopaedic surgery. This fascinating paper from **Philadelphia (USA)** crossed the editorial desks at 360 this month, describing the progress this unit has made to advance their fight against PJI.³ It details the stepwise manner

they took to achieve a lower infection rate. Their approach involved setting up an infection control committee, initially consisting of two surgeons, a microbiologist and infectious disease doctor, along with an anaesthetist and infection control nurse. The committee examined all parts of the pathway and compared local data with nationally collated outcomes in an attempt to improve practice in a stepwise manner. Impressively, the authors were able to improve the PJI rates from 1% in 2008 to 0.4% in 2010. Their pathway improvements included introducing infection screening and the use of tranexamic acid. There is much of value that can be learned from this paper.

Urinary retention after arthroplasty: a preventable problem X-ref

■ There has been a concerted effort to reduce lengths of stay using so-called ‘enhanced recovery’ protocols which appear to improve patient experience (possibly) and surgical outcomes, and to shorten hospital length of stay. One of the difficulties associated with these protocols has been that the avoidance of urinary catheterisation, while helping for the most part to reduce length of stay, can result in urinary retention. The causes for this are probably multifactorial, however, noting that anaesthetists like to add opioids to their spinal anaesthesia as it helps the spinal work better and longer, investigators in **Philadelphia (USA)** set out to establish if this has a detrimental impact on urinary retention rates.⁴ The team report the outcomes of 824 consecutive patients undergoing various types of lower limb arthroplasty over a two-year period, all treated with an opioid-free spinal. In their cohort, just 9% of patients (n = 79) developed urinary retention following their arthroplasty. The authors also identified that patients with risk factors such as prostatism, longer operative times and renal disease were more likely to go into retention. The difficulty with papers like this is that although it does have

some face validity, and there are certainly a number of easy-to-see attractions to blaming the anaesthetist for post-operative urinary retention, without any comparator group it is impossible to say that the two are causally related. It is equally likely, for example, that the low rates of urinary retention may be due to aggressive post-operative mobilisation or an uncommonly young male population in the cohort.

Effective closure for knee arthroplasty X-ref

■ There is some clinical evidence that patients do better with suture closure rather than clips in the hip fracture population, and the evidence is strong enough for several meta-analyses to have concluded that the clip-related infection rate is higher. However, clips have always found a home around the knee. In an excellent study from **Rochester (USA)**, the investigators randomised patients undergoing total knee arthroplasty to either running subcuticular or vertical mattress sutures or clips.⁵ This innovative randomised study focused on wound perfusion as their outcome measure, using laser-assisted indocyanine green angiography (LA-ICGA). The study describes the outcomes of 45 patients randomised to one of these closure methods. The perfusion was measured at closure and the wounds followed up for around six months. The investigators quite clearly showed that the use of a continuous subcuticular suture was associated with better wound perfusion. Although subcuticular sutures may provide better blood supply to the skin, there is some concern that as the knee wound is flexed, the tension in the suture changes. Nevertheless, despite these concerns, the single subcuticular suture demonstrated

better perfusion, and no difference in long-term healing.

Showering safely after surgery

■ Cleanliness and maintaining an uninfected wound following surgery is often a question of personal preference for surgeons, with each offering their own advice about changing dressings, when it's safe to shower and how to deal with any minor complications. Although the majority of surgeons are happy for their patients to shower after a few days, there is little in the way of evidence to support this approach. We were delighted to see this randomised study from **Taipei (Taiwan)** examining the safety of showering following surgery.⁶ Their study included patients from all branches of surgery and 222 patients were randomised to either showering or keeping the wound dry until healing. Patients were randomised at 48 hours following surgery and the primary outcome measure assessed was wound infection rate, with secondary outcomes of pain, satisfaction and cost. To cut a long story short, there were no differences in infection rates between the two groups with regard to infection rates or pain scores.

However, patients in the ‘shower’ group had lower overall healthcare costs and higher satisfaction levels. The evidence, it would seem, supports the concept of early showering following surgical intervention.

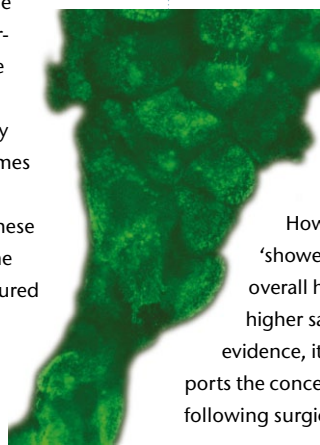
Dramatic changes to quantity and quality of life research X-ref

■ At the back of every strategy decision in modern health care is the fear that the ageing population will continue to live longer and longer, placing more strain on the health-care system as the proportion of taxpayers to pensioners falls. Although the ageing population is a real phenomenon, due to the difficulties in

measuring the changing health status of the population, surprisingly little is known other than that people are living longer. A superb population study from the **Medical Research Council Cognitive Function and Ageing Collaboration (UK)** sets out to describe the changes in quantity as well as quality of life associated with an increasingly healthy population.⁷ Using baseline data collected as part of the MRC Cognitive Function and Ageing Studies population cohorts, the research team set out to establish what the changes were in life expectancy, cognitive function and disability. The results of this population study were fascinating. The authors established that in practice, the life expectancy of the UK population has risen by 4.5 years for men and 3.5 years for women over the 20 years of the study. In addition, the burden of cognitive impairment has dropped, with more years spent in relative health and without impairment. Minor disability had increased (and the authors make some suggestions about lifestyle changes and, in particular, the obesity epidemic as possible causes) but severe disability decreased. In planning for our services then, we can expect not only to have to plan for a longer-living population, but for a healthier and less mentally impaired population hampered by minor disabilities such as arthritis. Despite the squeeze of austerity, it seems that musculoskeletal surgery is set to need significant investments in the coming decades.

Rheumatoid arthritis and wound healing issues

■ Rheumatoid arthritis is in itself immunomodulatory and, in addition, patients are now taking significant disease-modifying agents that can have a profound impact on the immune system and health status. A study team in **Okayama (Japan)** set out to establish if there are any discrete factors associated with wound healing problems in patients with rheumatoid arthritis.⁸ They studied the records of over 1000 rheumatoid patients undergoing orthopaedic surgery to establish what,



if any, were the risk factors for wound complications. While the study team was not able to find any association between the use of immunosuppressive drugs and wound complications, the incidence of infection was around 1%, and we do wonder if the study was somewhat underpowered. However, the research team were able to comment that patients with a longer history of rheumatoid arthritis and those undergoing foot and ankle surgery or knee arthroplasty were at greater risk of infection in their series. This is an ideal topic for a 'big data' study and it would be interesting to see if these findings stand up to inspection with such a study.

Coffee in brief

■ The 'team coffee' is a ritual in many hospitals, as is the use of the

occasional black coffee to perk up the flagging registrar towards the end of the night shift. Our interest was piqued by this unusual study from **St. Gallen (Switzerland)** into the coffee purchasing habits of doctors in their institution (from electronic payment records).⁹ A staggering 70 772 coffees were purchased by 766 qualified doctors during the period of the study with a definite hierarchy in consumption. More senior doctors consumed more coffee and purchased more rounds than their junior colleagues, and surgeons consumed more than anaesthetists or medical doctors. Perhaps unsurprisingly in the coffee stakes, the orthopaedic consultant is king, consuming more coffee per annum than any other hospital group.

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