

managed patients with AIS, mainly from the United States but also from Canada and the United Kingdom. Surgeries were performed between 1995 and 2013 and, by dividing this period into quartiles, trends were analyzed. Some obvious trends were confirmed; anterior spinal fusion was frequently used in the first two quartiles of the study but essentially disappeared as a standalone procedure for the treatment of thoracic and thoracolumbar curve types. The use of pedicle screws as the anchor of choice increased from 0% of cases in 1995, rising to 96% in the last quartile. Thoracoplasty use showed a steady decline, dropping from a peak of 76% of cases to a low 20% of cases in the last quartile. A significant decrease in the reported rate of major complication rate was also seen, with a rate of 19% in the first quartile and 5% in the last. There was also a greater use of antifibrinolytic medication, less blood loss, shorter operative times, and shorter length of stay. Improvements in quality-of-life score outcomes were also evident over the study period, indicating that better outcomes are being achieved. Looking to the future, the authors conclude that the role of fusionless and minimally invasive techniques, improving operative

efficiency, and resource utilization are all areas ripe for further study. Overall, this is very encouraging reading. AIS is still a major procedure, but one in which major complications now affect 1:20 patients rather than 1:5, an improvement that has been achieved through the development of improved implants and the optimization of perioperative care.

### Results of casting in severe curves in infantile scoliosis X-ref

■ In this study, authors from the Shriners Hospital in **Greenville, South Carolina (USA)** present their own results with casting children with severe infantile scoliosis.<sup>8</sup> Although bracing is gaining traction in older children with lesser curves, casting has always retained a niche in certain infants who present with curves that are difficult to treat operatively. This study examines the effects of casting in severe infantile curves (50° to 106°), as well as how comorbidities such as a syrinx or associated genetic syndromes affected outcomes. The authors present the largest contemporary series of such a treatment in their report of 44 children with an initial curve of 50° or more, all of whom

were aged three years or under at the start of casting; the minimum follow-up was three years. The authors utilized the Mehta casting technique in all cases. Curve resolution was obtained in 35% of the idiopathic cases (9/26), while, perhaps unsurprisingly, only 17% (3/18) of those with a syrinx or associated genetic syndrome achieved resolution. Of those who did not have resolution of their curves, 14 were maintained over the entire follow-up and 13 improved by 15° or more. This study has demonstrated that curve resolution is possible in children who start casting at least up to three years of age, despite the curve being over 50°. The authors were not able to demonstrate a subgroup that did not have substantial benefits. Even in the oldest children and largest curves, curve resolution and significant delays in the need for surgery are possible using serial casting. Although the technique itself is demanding of patients, parents, and clinicians, it clearly has a place in selected patients where surgery may be avoided at a later stage.

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## Research

### The team approach to safety in paediatric spinal surgery X-ref

■ One of the huge challenges created by short rotas – of all types of theatre staff – is the loss of flexibility in planning and staffing theatre teams for lists. It is well recognized that team working is beneficial for improved outcomes, and teams that rarely consist of the same group of people, or that are thrown together at the last minute, may perform relatively poorly. This paediatric spinal

surgery team from **Vancouver (Canada)** were finding that their operating theatre nurses, paediatric anaesthetists, and neuromonitoring technicians were being assigned *ad-hoc* to the theatre on the day of surgery according to immediate availability.<sup>1</sup> They report on their solution to this problem, which could find application in almost any area of orthopaedic surgery. They established a specialist Paediatric Spinal Surgical Team (PSST) to ensure that only a consistent core

group of staff worked together, and retrospectively reviewed two years of cases that lasted 120 minutes or more before and after implementation to establish if there was any measurable clinical improvement. The report focuses on the outcomes of 407 patients reported over a period straddling the implementation of the PSST. There were 130 patients pre-PSST and 277 post-PSST. The groups were essentially comparable, with no significant differences in age, gender, body mass index

(BMI), preoperative Cobb angle of the major curve, and the number of levels measurable between the two groups. There were, however, statistically significant improvements in almost all of the measured process and outcome measures. The group reported fewer surgical-site infections, shorter mean operating time, shorter length of stay, less requirement for allogenic blood transfusion, and a lower incidence of unplanned staged procedures between the two groups. As the authors point out,

there are clearly a number of possible confounders, not least the increased surgeon experience in this single-surgeon study. The conclusion, unsurprisingly, is that consistent and familiar teams improve results. This study provides further evidence for surgeons wishing for an evidence foundation to justify the implementation of a similar system in their practice.

### The normal knee after knee arthroplasty X-ref

■ The forgotten joint score is a unique and interesting way of assessing patients following major joint surgery. The pretext is that once the patients have 'forgotten' that they have had surgery, then the joint – in this case the knee – can be considered to be 'normal' again. There are, of course, some obvious problems with this approach, in that patients may 'forget' their surgery for a number of reasons, including normalization of function, behavioural adaptations, or expectation changes. Nevertheless, this approach does shed light on recovery following joint arthroplasty. This paper from **Egg Harbor Township, New Jersey (USA)** takes a look at the forgotten joint score in terms of recovery following total knee arthroplasty.<sup>2</sup> The 566 patients in their cross-sectional study were recorded at intervals of one (n=79), six (n=78), 12 (n=81), 24 (n=100), 36 (n=76), 48 (n=75), and 60 (n=77) months. This short but interesting study suggests that patients can continue to improve after their total knee arthroplasty for up to three years, after which their function starts to decline.

### Surgeon-level outcomes improve survival in cancer patients

■ There has been an unsurprising level of concern across the whole surgical fraternity about the publication of surgeon-level outcomes data. Aside from the natural worry that individual surgeons' results might be found wanting, there is also

a genuine concern that case-mix adjustment may not be implemented at all, let alone appropriately. As such, patients and hospital managers may be misled about the actual outcomes. There is also a more worrying concern. In the push to ensure that surgeons are not outliers – remember that half will be, by definition, below average – surgeons may avoid the most difficult of cases.

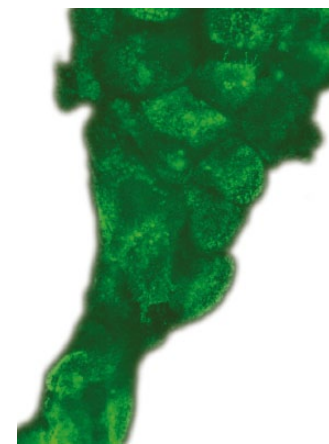
### This paper led by the **Royal College of Surgeons, London (United Kingdom)** looks at a speciality

far removed from orthopaedics in the form of colorectal cancers.<sup>3</sup> The authors included the whole national cohort of 111 431 patients diagnosed with colorectal cancer over a four-year period and included in the National Bowel Cancer Audit. The authors examined the 'before' and 'after' public reporting of 90-day surgeon-specific mortality data, which was introduced in England in June 2013. The authors examined the proportion of patients with colorectal cancer who had an elective major resection, predicted 90-day mortality, observed 90-day mortality adjusted for patients, and tumour characteristics both before and after the move to surgeon-specific reported outcomes. In what is a landmark paper, the authors have managed to establish that – in this subspeciality, at least – the proportion of patients undergoing major resection did not change (63.3% vs 63.2%), nor did the classification as either elective or scheduled (84.5% vs 84.4%) The score predicted 90-day mortality was identical at 2.7%, indicating that the surgery performed and the comorbidity of the patients were unchanged over the study period, as well as could be established. What did change, however, was the observed 90-day mortality, which fell significantly (2.8% vs 2.1%); this may not seem much in absolute terms but is a 25% absolute reduction. Change-point analysis showed that this reduction was over and above the existing downward trend in mortality before

the introduction of public outcome reporting (p=0.03). This study should be reassuring for patients and surgeons alike grappling with surgeon-specific outcomes reporting in all branches of trauma and orthopaedics – not only does this not drive risk-averse behaviours in surgeons, but it appears to also improve outcomes – although the reasons are not explained.

### Steroids and physiotherapy for gluteal tendinopathy X-ref

■ We were delighted to come across this randomized controlled trial from **Brisbane (Australia)** examining the efficacy of physiotherapy and corticosteroid injection into the greater trochanter for patients with a diagnosis of gluteal tendinopathy.<sup>4</sup> The authors designed a prospective, three-arm, single-blinded, randomized clinical trial to evaluate three treatments: physiotherapy and education, corticosteroid injection, and advice alone in the management of gluteal tendinopathy. The study recruited 204 individuals aged between 35 and 70 years, all presenting with lateral hip pain for more than three months, which they rated as at least 4/10 on the pain numerical rating scale. The diagnosis of gluteal tendinopathy was confirmed by clinical diagnosis and MRI, so likely included a narrow range of aetiologies, which was a strength of this study. Patients were excluded if they had received a corticosteroid injection in the previous 12 months, were receiving current physiotherapy, had had a total hip arthroplasty, or had neurological conditions. Patients were randomly allocated to one of three groups: a physiotherapy-led education and exercise programme of 14 sessions over eight weeks (EDX; n=69), one corticosteroid injection (CSI; n=66), and a wait-and-see approach (WS; n=69). Outcomes were assessed using a patient-reported global hip condition scale (11 points and then dichotomized to success or failure) at both eight and 52 weeks. At the



eight-week follow-up, the EDX group were most likely to be successfully treated (77% (n=51/66) vs corticosteroid 58% (n=38/65) and expectant management 29% (n=20/68)). This difference was mirrored in the pain scales reported (1.5 for EDX, 2.7 for CSI, and 3.8 for WS). The results are fairly conclusive, in that for patients with gluteal tendinopathy, education plus exercise and corticosteroid injection was significantly more likely to treat at eight weeks, and patients reported a lower pain score. At long-term 52-week follow-up, education plus exercise was still more likely to lead to better improvement, although it did not lead to superior pain scores at a year. Both interventions were significantly better than a 'wait-and-see' approach.

### Self-reduction of shoulder dislocation? X-ref

■ In this interesting paper from **Sabadell (Spain)**, the authors set out to establish if patients were able to self-reduce their shoulder dislocations without excessive pain.<sup>5</sup> This study was an ambitious randomized study; however, there were large numbers of patients who dropped out prior to the intervention. A total of 378 patients were assessed for eligibility, but only 60 of a possible 197 were included in the study. Patients were randomized either to use the Boss-Holzach-Matter (also known as Davos or Aronen) self-reduction technique, or to receive an active reduction by a medical doctor

utilizing the Spaso technique. The outcomes assessed were pain experienced by the patient during the reduction, measured using the visual analogue scale (VAS). Despite the small numbers eventually included in the trial, the authors were able to report some relatively conclusive results. The self-reduction group experienced significantly less pain as assessed by the VAS score than the doctor reduction group (3.6 vs 5.3). There were no real differences in important outcome measures, including reduction time or success rate. This is an impressive trial to have completed, even considering the low recruitment rate, as patients often do not like being asked to do something themselves that a doctor could do for them. However, there is ample evidence here that the self-reduction method is equally successful and that the patients suffer less pain. This is perhaps something

to consider in more widespread practice.

### Antiseptics interact and may form toxic products

■ There is often the concept in antiseptics that more is more when cleansing the skin prior to surgery. We are aware of surgeons using a variety of skin preparations, often in off-label combinations, and this team from **Stanford (California, United States)** have set out to establish if there is any harm done by such use of antiseptics, specifically chlorhexidine (CHX) and Dakin's solution (NaOCl).<sup>6</sup> In a straightforward study, the authors aimed to determine if the sometimes-seen precipitate was harmful or not with this particular combination of antiseptic solutions. The authors investigated interactions between 4% chlorhexidine gluconate (CHX), 0.5% sodium hypochlorite (NaOCl),

3% hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), and 10% povidone-iodine (BTD) when used in all the possible combinations in a laboratory-based study. CHX and NaOCl, CHX and H<sub>2</sub>O<sub>2</sub>, and CHX and BTD reacted instantly, forming a precipitate. NaOCl and H<sub>2</sub>O<sub>2</sub> reacted to produce a gas. NaOCl and BTD reacted and produced a colour change. The authors advise that surgeons should be aware that the use of combinations of antiseptics may lead to precipitates being formed, and that there is some evidence from the chemistry literature that the by-products from these reactions can be harmful to humans. Caution is clearly the watchword here.

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