

ROUNDUP³⁶⁰

Research

MCID in grip strength and distal radial fracture

x-ref Hand, Trauma

■ The minimally clinically important difference (MCID) is an important concept and is used to define the threshold for which a change in score or outcome actually means something to a patient. The MCID is essentially the quantification of the smallest difference that improves function. It is, by its nature, different for each score, and may also be different for each diagnosis. It is nigh on impossible to make sense of results without knowing the MCID as, confusingly, 'significant differences' are statistically – rather than clinically – significantly different. Noting that grip strength is used as an outcome measure in many clinical studies reporting outcomes in distal radial fractures, researchers in **Seoul (Korea)** set out to establish what exactly the MCID in grip strength for distal radial fractures is.¹ The research team followed 50 patients prospectively treated with a volar locking plate. Grip strengths were measured at one year following surgery in both hands. Patients were asked to subjectively rate their subjective view of grip strength changes in addition to the objective measurements. The authors then used a receiver operating characteristic curve method to determine the MCID. The research team were able to establish that at one year after surgery, grip strength was lower than the calculated pre-injury values (28 kg vs 23 kg). The subjective scoring suggested that

patients' perceptions of their own grip strength changes correlated well with actual changes, and that in terms of absolute figures a reduction of 6.5 kg in absolute grip strength and 19.5% were the MCID for grip strength. While few would argue this paper is on the most scintillating of topics, it contains valuable information on the magnitude of improvement that could be considered to be clinically important – absolutely essential information for evaluating new treatments.

Experiencing rehab in a trial setting

x-ref Shoulder

■ Studying complex interventions carries with it its own trials and tribulations. The recently completed ProFHER study is a prospective randomised controlled trial comparing two interventions of operative *versus* non-operative treatment for proximal humeral fractures. As a pragmatic randomised controlled trial, many of the processes surrounding treatment could be treated pragmatically. However, there was a large number of patients in whom conservative management was to be compared with operative management and in this setting a rigorous approach to delivering rehabilitation within a randomised controlled trial is definitely required. In what is an interesting but slightly niche paper, researchers in **Middlesbrough (UK)** share their experiences of this process.² The research team focused on three initiatives to ensure comparable conservative care was delivered to

each patient. The research team ably document the process of designing standardised patient information sheets for self-care during sling use, standardised physiotherapy protocols and a tool for collecting information on physiotherapy care. The research team were able to report successful implementation of all these steps and highlight the importance of carefully developing these protocols, particularly in multicentre studies where there may be many variations in local policy between units. The involvement of rehabilitation therapists early in study design is crucial in the development of non-operative *versus* operative studies. The experience gained in the development of the ProFHER trial will, we are sure, prove invaluable in future studies.

Electrical stimulation and nerve recovery

■ The difficulty with nerve injuries is predicting, encouraging and achieving recovery. Notoriously difficult to achieve, however, complete recovery is possible for even the most severe of nerve injuries on occasions. There has been some basic scientific evidence to suggest that electrical stimulation may on occasion be used to promote nerve regeneration but this technology is still at a very early stage. Researchers in **Akron (USA)** have been investigating the potential therapeutic effect of electrical stimulation on the peripheral nervous system.³ Building on previous work, they designed a study to evaluate the potential beneficial effects of electri-

cal stimulation on a 10 mm sciatic nerve defect in a rat model. The animals all had 10 mm nerve defects created in their sciatic nerves that were then treated with a conduit (formed of silicone tube filled with collagen gel). The intervention groups were randomised to either ten minutes or 60 minutes of electrical stimulation following surgery, while the control group either received the silicone tube with no stimulation (positive control) or isograft. Outcomes were assessed clinically over a 12-week period through use of a sciatic functional index and postural thrust scores. In addition, histological examination of the nerve was undertaken following sacrifice. The results were quite marked, with a 24% functional improvement in the ten-minute group as compared with the positive control group by week 12. Both the ten- and 60-minute groups demonstrated similar histomorphometric analysis to the isograft group. The demonstration that ten minutes of electrical stimulation is enough to potentially augment nerve repair with silicone conduits is a highly relevant clinical finding, making this technology potentially usable in a clinical setting. While previous data supported a 60-minute stimulation, it is unlikely that this would ever have become feasible in a theatre setting. Ten minutes, however, is a much more realistic prospect.

Molecular diagnosis of TB?

x-ref Spine

■ Acid fast bacteria are notoriously difficult to culture. While histological

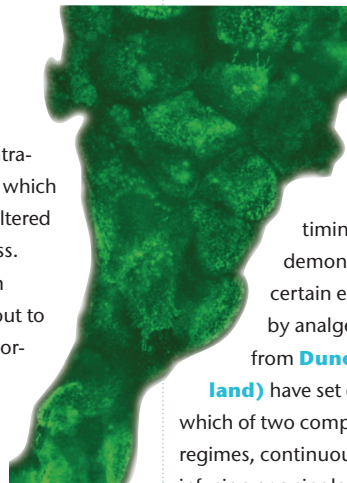
appearances may be suggestive of tuberculosis, actual culture of the organism can be challenging. There is a range of molecular techniques that have been developed to improve the accuracy of diagnosis in respiratory tuberculosis (TB). The improved accuracy and rapid nature of these tests has resulted in their widespread use as a first line diagnostic test for respiratory TB in areas of HIV prevalence or TB drug resistance. It is curious that these have not been validated for use in suspected cases of musculoskeletal TB. Researchers in **Cape Town (South Africa)** have set out to evaluate the use of the GeneXpert diagnostic test, one particular variety of molecular diagnostic test for TB, in their clinical study of 69 consecutive adults with suspected spinal TB.⁴ In their prospective diagnostic study, the GeneXpert test was performed on 71 tissue samples from the spines of 69 patients. The sensitivity and specificity were compared with samples in liquid culture. The research team were able to demonstrate a sensitivity of 95.6% and specificity of 96.2% with the GeneXpert micro-array sample. The results for the micro-array were available within 48 hours as compared with a 35-day median follow-up for cultures. Micro-array analysis, although expensive, is highly specific and sensitive for musculoskeletal TB. There are increasing numbers of molecular techniques in use for the diagnosis of infection of all varieties. The amplification nature of the polymerase reaction makes the tests highly sensitive, but can compromise the specificity. As molecular techniques continue to develop, it is likely that a bewildering array of tests will find their niche in orthopaedic diagnostics.

Acetabular orientation: component and arthritis

x-ref Research, Hip

■ The kerfuffle surrounding metal-on-metal hip arthroplasty has caused a re-evaluation of many accepted orthopaedic facts, including, for one, the best orientation of components

to improve results and longevity. There is now, more than ever before, an emphasis on appropriate component alignment to minimise wear and improve longevity and clinical results. With a range of intra-operative methods for determining acetabular orientation (including use of the transverse acetabular ligament, computer guidance, the Lewinnek safe zone and alignment jigs), many rely on intra-operative landmarks which themselves may be altered by the disease process. A research team from **Glasgow (UK)** set out to establish what the 'normal' acetabular orientation is, in terms of inclination and anteversion, in patients presenting with osteoarthritic hips.⁵ Their study involved 65 patients with symptomatic osteoarthritic hips requiring total hip arthroplasty. The geometry of the acetabulum was measured using a computer navigation system in order to determine inclination and anteversion. There were some significant sex differences, with mean inclinations of 50.5° (standard deviation (sd) 7.8) in men and 52.1° (sd 6.7) in women, and mean anteversions of 8.3° (sd 8.7) in men and 14.4° (sd 11.6) in women. Many surgeons rely on the 'safe zone' described by Lewinnek of anteversion between 5° and 25° and inclination of 30° to 50°. However, 75% of the hips in this study were outside of this zone in at least one of these measures. There is no complete consensus on the ideal placement of the acetabular component, although biomechanical and other studies would advocate a more closed and less anteverted position than has been considered normal in the past – many still rely on the 'safe zone' to guide their cup placement. Whatever the surgeon is aiming for, it is important to know that natural acetabular orientation varies con-



siderably between men and women and that the natural orientation may not be in a desirable position.

Analgesia after knee arthroplasty

x-ref Research, Knee

■ One of the key factors that affects outcomes following surgery is post-operative pain control. Patient perceptions of outcome, engagement with physiotherapy and discharge timings have all been demonstrated to be, to a certain extent, determined by analgesia. Researchers from **Dunedin (New Zealand)** have set out to establish which of two competing analgesia regimes, continuous femoral nerve infusion or a single-shot femoral nerve block, was most effective.⁶ The research team designed a prospective randomised placebo-controlled trial with infusion of either bupivacaine or normal saline following a hot femoral nerve block after total knee arthroplasty. All patients underwent spinal anaesthesia with intrathecal morphine in addition to the nerve block. Outcomes were assessed over 72 hours following surgery with Visual Analogue Scale pain scores as the primary outcome measure. A range of secondary outcome measures including 'top up' analgesia requirements, side-effect profile and length of hospital stay were assessed. The study was adequately powered, with 86 patients included and randomised to one of the two treatment groups. Amazingly, there were no differences between the single-shot and infusion groups in any primary or secondary outcome measure within 72 hours of surgery. A negative randomised controlled trial is not necessarily a negative outcome. This study, without a shadow of doubt, has a clinically relevant message. The added costs, risks and time involved in setting up a continuous nerve infusion do

not pay dividends in terms of better outcomes.

Bisphosphonate-associated femoral fractures

x-ref Trauma

■ The healthcare benefits at a population level are significant from the introduction of bisphosphonates, having been shown in large studies (including population studies in Italy) to reduce fracture risk and also to significantly improve mortality. However, the bisphosphonate story is not all roses. The side-effect profile is significant, including GI upset and osteonecrosis, and more recently bisphosphonate-associated fractures have been recognised and associated with the extended use of bisphosphonates. These, typically subtrochanteric, fractures are challenging to treat, with high complication rates and poor union rates. There are, however, little more than case series describing the incidence and natural history of such fractures. Researchers in **Linköping (Sweden)** set out with a population-based study of 5342 Swedes presenting with femoral fractures over a two-year period.⁷ This massive study represents a 97% inclusion rate of the available population. The research team identified 172 patients with atypical femoral fractures (93% of them in women). This was the basis of a nationwide cohort study and comparison was performed with 952 case controls with typical femoral fractures. For obvious reasons, this was not a case-matched series as the intention was to establish the differences in demographics between the two groups. The research team identified a number of factors associated with bisphosphonate fractures. The first was an age-adjusted relative risk of 55 for bisphosphonate use, a threefold increased risk in women. In addition, the type of bisphosphonate was significant, with alendronate having a twofold relative risk compared with risedronate and a compound risk (with a relative risk of 126 with four years of bisphosphonate use). Absolute risk levels, however,

remained low, with an incidence of 11 per 10 000 person-years of use. The authors were also able to quantify the risk following cessation of use, with a drop in risk by around 70% per year after stopping bisphosphonate use. Although the anecdotal evidence in the literature has suggested all of the findings of this study before, we really do commend the authors of this study for their tenacity. To study an entire population of femoral fractures is

really the only way one can draw such conclusions. Quantification of the risk (and particularly the identification of differential risk) associated with different fracture patterns allows for proper healthcare planning. An excellent paper all round.

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