Confirmation of needle placement within the piriformis muscle of a cadaveric specimen using anatomic landmarks and fluoroscopic guidance.

Gonzalez P, Pepper M, Sullivan W, Akuthota V.

Pain Physician. 2008 May-Jun;11(3):327-31.

Of patients presenting to pain clinics, complaints are of low back or buttock pain with or without radicular leg symptoms is one of the most common. Piriformis syndrome may be a contributor in up to 8% of these patients. The mainstay of treatment is conservative management with physical therapy, anti-inflammatory medications, muscle relaxants, and correction of biomechanical abnormalities. However, in recalcitrant cases, a piriformis injection of anesthetic and/or corticosteroids may be considered. Because of its small size, proximity to neurovascular structures, and deep location, the piriformis muscle is often injected with the use of commuted tomography (CT), magnetic resonance imaging (MRI), ultrasound(US), fluoroscopy, electrical stimulators, or electromyography(EMG). Numerous techniques have been proposed using one or a combination of the above modalities. However, application of these techniques is limited by unavailability of CT, MRI, and EMG equipment as well as a paucity of trained physicians in US-guided procedures in many pain treatment centers throughout the United States. Fluoroscopy, however, is more widely available in this setting. This study utilized a cadaveric specimen to confirm proper needle placement for piriformis or peri-sciatic injection utilizing the previously documented landmarks for fluoroscopic guidance as described by Betts. An anteroposterior of the pelvis with inclusion of the acetabular region of the hip and the inferior aspect of the sacroiliac joint was obtained. The most superior-lateral aspect of the acetabulum and the inferior aspect of the sacroiliac joint were identified. A marker was placed one-third of the distance from the acetabular location to the inferior sacroiliac joint, indicating the target location. A 22 gauge, 3.5 inch spinal needle was directed through the gluteal muscles to the target location using intermittent fluoroscopic guidance. The posterior ileum was contacted and the needle was withdrawn 1-2 mm. This approach found the needle within the piriformis muscle belly 2-3 cm lateral to sciatic nerve. The present study was the first study, to our knowledge, that has confirmed the intramuscular position of the needle within the piriformis muscle of a cadaveric specimen using these anatomic landmarks and fluoroscopic guidance.

Review of occupational medicine practice guidelines for interventional painmanagement and potential implications.

Manchikanti L, Singh V, Derby R, Helm S 2nd, Trescot AM, Staats PS, Prager JP, Hirsch JA.

Pain Physician. 2008 May-Jun;11(3):271-89.

In the modern day environment, workers' compensation costs continue to be a challenge, with a need to balance costs, benefits, and quality of medical care. The cost of workers' compensation care affects all stakeholders including workers, employers, providers, regulators, legislators, and insurers. Consequently, a continued commitment to quality, accessibility to care, and cost contain-

ment will help ensure that workers are afforded accessible, high quality, and cost-effective care. In 2004, workers' compensation programs in all 50 states, the District of Columbia, and federal programs in the United States combined received an income of $87.4 billion while paying out only $56 billion in medical and cash benefits with $31.4 billion or 37% in administrative expenses and profit. Occupational diseases represented only 8% of the workers' compensation claims and 29% of the cost. The American College of Occupational and Environmental Medicine (ACOEM) has published several guidelines; though widely adopted by WCPs, these guidelines evaluate the practice of medicine of multiple specialties without adequate expertise and expert input from the concerned specialties, including interventional pain management. An assessment of the ACOEM guidelines utilizing Appraisal of Guidelines for Research and Evaluation(AGREE) criteria, the criteria developed by the American Medical Association (AMA), the Institute of Medicine (IOM), and other significantly accepted criteria, consistently showed very low scores (< 30%) in most aspects of the these guidelines. The ACOEM recommendations do not appear to have been based on a careful review of the literature, overall quality of evidence, standard of care, or expert consensus. Based on the evaluation utilizing appropriate and current evidence-based medicine (EBM) principles, the evidence ratings for diagnostic techniques of lumbar discography; cervical, thoracic, and lumbar facet joint nerve blocks and sacroiliac joint nerve blocks; therapeutic cervical and lumbar medial branch blocks and radiofrequency neurolysis; cervical interlaminar epidural steroid injections, caudal epidural steroid injections, and lumbar transforaminal epidural injections; caudal percutaneous adhesiolysis; abd spinal cord stimulation were found to be moderate with strong recommendation applying for most patients in most circumstances. The evidence ratings for intradiscal electrothermal therapy (IDET), an automated percutaneous disc decompression and also deserve further scrutiny and analysis. In conclusion, these ACOEM guidelines for interventional pain management have no applicability in modern patient care due to lack of expertise by the developing organization (ACOEM), lack of utilization of appropriate and current EBM principles, and lack of significant involvement of experts in these techniques resulting in a lack of clinical relevance. Thus, they may result in reduced medical quality of care; may severely hinder access to appropriate, medically needed and essential medical care; and finally, they may increase costs for injured workers, third party payors, and the government by transferring the injured worker into a non-productive disability system.

A best-evidence review of diagnostic procedures for neck and low-back pain

Sidney M. Rubinstein DC

Best Pract Res Clin Rheumatol. 2008 Jun;22(3):471-82.

This chapter aims to present an overview of the best available evidence on diagnostic procedures for neck and low-back pain. Relatively little is known about the accuracy of such procedures. Although most spinal conditions are benign and self-limiting, the real challenge to the clinician is to distinguish serious spinal pathology or nerve-root pain from non-specific neck and low-back pain. The use of valid procedures can assist the clinician in this aim. A search was conducted in PubMed to identify relevant systematic reviews and primary studies on diagnostic procedures for the neck and low back. A systematic review was included if at least two independent reviewers were used; a systematic procedure was followed for identifying the literature; and a methodological assessment was conducted. In the absence of systematic reviews, primary studies are reported. Systematic reviews were identified which evaluated evidence for diagnostic procedures in the following categories: history, physical examination, and special studies, including diagnostic imaging, diagnostic blocks, and facet and sacroiliac joint injections. In general, there is much more evidence on diagnostic procedures for the low back than there is for the neck. With regard to the history, a number of factors can be identified which can assist the clinician in identifying sciatica due to disc herniation or serious pathology. With regard to the physical examination, the straight-leg raise is the only sign consistently reported to be sensitive for sciatica due to disc herniation, but is limited by its low specificity. The diagnostic accuracy of other neurological signs and tests is unclear. Orthopaedic tests of the neck,

such as Spurling's or the upper-limb tension test, are useful to rule a radiculopathy in or rule out, respectively. In patients 50 years of age or older, plain spinal radiography together with standard laboratory tests are highly accurate in identifying underlying systemic disease; however, plain spinal radiography is not a valuable tool for non-specific neck or low-back pain. There is strong evidence for the diagnostic accuracy of facet joint blocks in evaluating spinal pain, and moderate evidence for transforaminal epidural injections, as well as sacroiliac joint injections for diagnostic purposes. In conclusion, during the history, the clinician can accurately identify sciatica due to disc herniation, as well as serious pathology. There is sufficient evidence regarding the accuracy of specific tests for identifying sciatica or radiculopathy (such as the straight-leg raise) or certain orthopaedic tests of the neck. Plain spinal radiography in combination with standard laboratory tests is useful for identifying pathology, but is not advisable for non-specific neck or low-back pain.

Psychological predictors of substantial pain reduction after minimally invasive radiofrequency and injection treatments for chronic low back pain.

van Wijk RM, Geurts JW, Lousberg R, Wynne HJ, Hammink E, Knape JT, Groen GJ.

Pain Med. 2008 Mar;9(2):212-21.

OBJECTIVE: In this post hoc observational study, we investigated psychological predictors of outcome after radiofrequency and injection treatments, commonly performed in the management of chronic low back pain (CLBP). DESIGN & SETTING: Data, comprising 161 patients (29 eventually lost to follow-up), were obtained from two randomized controlled trials on efficacy of radiofrequency treatment for back pain and sciatica. Subsequently patients were additionally treated in an open prospective follow-up period. Although all groups presented a significant visual analog scale reduction after 3 and 12 months, no additional pain relief after radiofrequency compared with injection treatment was found. Both trial populations showed sufficient similarities. A principal component (factor) analysis was performed on baseline psychometric tests, SF-36, and physical activity variables. We constructed five clinically relevant psychological profiles: "psychologically negative," "adaptive manager," "rigid qualities," "supporting partner," and "strong ego". These were examined as possible predictors of significant pain relief using logistic regression analysis. RESULTS: The "psychologically negative" dimension showed a negative and the "adaptive manager" dimension a positive prognostic effect on outcome. CONCLUSIONS: Minimally invasive treatment for CLBP leads to significant pain reduction, including potential placebo effects. However, psychologically vulnerable patients, characterized by, among others, reduced life control, disturbed mood, negative self-efficacy, catastrophizing, high anxiety levels, inadequacy, and poor mental health, tend not to respond to this treatment. Patients characterized by a.o. reduced pain and interference levels, positive expectations, and reasonable physical and social functioning, react more favorably. From both a clinical and a financial perspective, psychosocial evaluation and selection of patients seems appropriate, before applying minimally invasive procedures for CLBP.

Baroreflex sensitivity associated hypoalgesia in healthy states is altered by chronic pain

Ok Y. Chung, Stephen Bruehl, Laura Diedrich, André Diedrich, Melissa Chont and David Robertson

Pain. 2008 Aug 15;138(1):87-97. Epub 2007 Dec 31.

While experimental baroreceptor stimulation is known to elicit hypoalgesia in healthy individuals, the impact of spontaneous baroreflex sensitivity (BRS) on acute pain responses is not known. We tested for associations between BRS and pain responses in healthy individuals, whether these associations are altered in chronic low back pain (CLBP), and the role of alpha-2 adrenergic (ADRA2) mechanisms in these effects. Twenty-five healthy controls and 21 CLBP subjects completed three acute pain tasks after receiving placebo or an intravenous ADRA2 antagonist (yohimbine hydrochloride, 0.4 mg/kg)

across two sessions in counterbalanced order. Resting pre-drug spontaneous BRS was assessed using the sequence method. CLBP subjects displayed lower resting BRSDown than controls ($p < .05$). Drug _ BRSDown interactions indicated that significant BRS-related hypoalgesia on thermal pain threshold and tolerance was eliminated with yohimbine ($p's < .05$). Subject Type _ BRSUp interactions on finger pressure (MPQ-Sensory) and ischemic tasks (MPQ-Sensory, pain threshold, intra-task numeric intensity ratings) indicated that inverse BRS/pain associations in controls ($p's < .05$) were absent in CLBP subjects. Subject Type _ Drug _ BRSDown interactions on finger pressure MPQ-Sensory and intra-task numeric intensity ratings ($p's < .05$) indicated that for controls, yohimbine attenuated the significant inverse BRS/pain sensitivity associations noted under placebo. In contrast, CLBP subjects displayed a nonsignificant positive BRS/pain association under placebo, with yohimbine producing an inverse association similar to controls (significant for MPQ-Sensory). Results suggest presence of spontaneous BRS-related hypoalgesia in healthy individuals that is partially mediated by ADRA2 mechanisms, and that CLBP blunts BRS-related hypoalgesia. As a group, the CLBP subjects do not manifest baroreceptor-induced antinociception.

Adolescent social development and chronic pain

Christopher Eccleston, Sarah Wastell, Geert Crombez and Abbie Jordan

Eur J Pain. 2008 Aug;12(6):765-74. Epub 2008 Jan 11.

Adolescents with chronic pain report disability, distress and reduced social functioning. A clinical sample of 110 adolescents, with a mean four year history of pain, was investigated for the psychosocial impact of pain on social development. All participants completed a range of self-report measures of pain intensity, disability, distress, social and family functioning. Also completed was the Bath Adolescent Pain Questionnaire, including its development subscale. The development subscale measures the extent to which adolescents perceive themselves to be ahead or behind their peers on 11 aspects of social development. Three related analyses were undertaken. First, over 50% of adolescents reported themselves to be less developed than their peers on four or more aspects. The item with the highest endorsement of being ahead compared with peers was "dealing with problems". Second, factor analyses revealed three factors of adolescent social development labelled 'independence', 'emotional adjustment' and 'identity formation'. Third, regression analyses revealed that peer support had a positive effect on all three factors, disability and anxiety had a negative effect on perceptions of independence, greater family dysfunction had a negative effect on emotional adjustment, and depressive mood had a negative effect on identity formation. Pain intensity had a negative effect on all three factors. Findings suggest that adolescents with chronic pain judge themselves to be less developed than their peers. Pain intensity has a negative effect on this perception, but peer relations may play a protective role: strong peer relationships are associated with positive social comparisons of the level of social development.