



PAIN MANAGEMENT JUNE 2003

Ackerman, W. "Cannabinoids: the changing scientific evidence." *Journal of the Arkansas Medical Society*. 99, no. 9(2003): 278-9 UI 12674910.

Aida, N., et al. "Respiratory muscle stretch gymnastics in patients with post coronary artery bypass grafting pain: impact on respiratory muscle function, activity, mood and exercise capacity." *Journal of Medical & Dental Sciences*. 49, no. 4(2002): 157-70 UI 12641387.

A new rehabilitation (New-RH) program including respiratory muscle stretch gymnastics (RMSG) was developed to alleviate post-coronary artery bypass grafting pain (PCP). Effects on respiratory muscle function, pain, activities of daily living (ADL), mood and exercise capacity were investigated. Subjects were 16 consecutive patients undergoing median full sternotomy coronary artery bypass grafting (CABG), and were randomly divided into equal New-RH (S-group) and conventional therapy (C-group) groups. Rib cage dominant breathing was observed postoperatively in both groups. With preoperative $\Delta V_{rc}/\Delta V_{ab}$, increases at 1-week postoperatively and decreases at discharge for S-group tended to exceed those of C-group ($p > .05$). Decreased maximum inspiratory and expiratory pressure status for functional residual capacity and percent forced expiratory volume in one second at discharge again only tended to be smaller for S-group ($p > .05$). S-group displayed significantly reduced pain around both scapulas at discharge ($p = .049$), and increased mean overall ADL and profile of mood states (POMS)/Vigor scores ($p = .031$ and $p = .018$, respectively). POMS/Tension-Anxiety scores at discharge for S-group were significantly smaller than those preoperatively ($p = .025$), and S-group displayed significantly increased distance walked over 6-minutes at discharge than C-group ($p = .029$). New-RH improves patient participation in exercise therapy and increases exercise capacity by reducing PCP, relieving anxiety and tension, and improving ADL.

Al-Khalaf, B., et al. "Prospective comparative study of the effectiveness of epidural morphine and ropivacaine for management of pain after spinal operations." *Acta Neurochirurgica*. 145, no. 1(2003): 11-6 UI 12545257.

Objective: Evaluation of the effectiveness of local application of morphine or ropivacaine for treatment of local and radicular pain after lumbar disc operations. Critical review of the literature about the possibilities of management of postoperative pain after spinal operations. Methods: A total of 113 patients were randomly given 5 mg morphine sulfate (N=42), 10 ml 0.25% ropivacaine (N=42) or physiological NaCl solution (N=21) locally after lumbar disc operation before wound closure. Postoperative lumbar and radicular pain was scored by the patients from 0 to 10 and registered on the evening of the day of operation and on the 1., 2., 3., and 5. days. Mean pain numbers of the 3 groups have been compared, subdivided into local lumbar and in radicular pain. Our own results have been compared with the results of reports in the literature. Results: In our own study the morphine group had less lumbar and less radicular pain on all 5 days than both of the two other groups. This difference was statistically significant on days 0, 1, 2, and 3. The ropivacaine group was on all days less effective than the morphine group, better than the placebo group on the operation and first day, but the difference against the placebo group was statistically not significant. Conclusion: Local application of 5 mg morphine sulfate is effective in prevention or reduction of postoperative lumbar and radicular pain after lumbar disc operations. Ropivacain is less effective. The routine application of epidural morphine at the end of spinal

operations can be recommended. It also can be justified to try to prolong the morphine effect by mixing it into a paste as described by Needham and by Hurlbert, and to irrigate the operative field with ropivacaine at the end of the operation.

Anonymous. "The intractable angina patient. Some patients can't be revascularized with PCI or CABG." *Journal of Invasive Cardiology*. 15, no. 3(2003): 145; discussion 145-7 UI 12656071.

Anonymous. "Lidocaine transdermal--Vyteris." *Drugs in R & D*. 3, no. 5(2002): 361-2 UI 12455160.

Anonymous. "Opioids ease neuropathic pain, but." *Health News*. 9, no. 5(2003): 8-9 UI 12739461.

Anonymous. "Taking steps to control patients' pain." *Or Manager*. 19, no. 4(2003): 26-7 UI 12723325.

Arenal, J. J., and M. Bengoechea-Beeby. "Mortality associated with emergency abdominal surgery in the elderly." *Canadian Journal of Surgery*. 46, no. 2(2003): 111-6 UI 12691347.

INTRODUCTION: Elderly patients with life-threatening abdominal disease are undergoing emergency surgery in increasing numbers, but emergency procedures generally are associated with increased morbidity and mortality. We carried out a retrospective and prospective study at a tertiary centre in Spain to analyze the factors contributing to death after emergency abdominal surgery in elderly patients and to determine whether there were differences in the death rate between those aged 70-79 years and those aged 80 years and older. METHODS: The study population comprised 710 patients aged 70 years or older who underwent emergency surgery for intra-abdominal disorders. Between 1986 and 1990, we reviewed the charts of 302 patients, and between 1991 and 1995, we collected prospective data on 408 patients. The patients were divided by age into 2 groups: group 1 - 364 patients aged 70-79 years; and group 2 - 346 patients aged 80 years or older. In the analysis, we considered patient age, sex, perioperative risk, the time between onset of symptoms and admission to hospital and between admission to hospital and surgery, diagnosis, type of operation, operative findings, morbidity, mortality and length of hospital stay. RESULTS: The overall mortality was 22% (19% in group 1 and 24% in group 2). Multiple regression analysis showed that American Society of Anesthesiologists (ASA) grading ($p = 0.0001$), interval from onset of symptoms to admission ($p = 0.007$), mesenteric infarction ($p = 0.005$), a defunctioning stoma and palliative bypass ($p = 0.003$) and nontherapeutic laparotomy ($p = 0.0003$) were predictive of death. CONCLUSIONS: Mortality in elderly patients operated on for an acute abdomen can be predicted by ASA grade (perioperative risk), delay in surgical treatment and conditions that permit only palliative surgery. Increasing age (70-79 yr or $>$ or $=$ 80 yr) does not affect mortality, morbidity or length of hospital stay.

Argoff, C. E. "Targeted topical peripheral analgesics in the management of pain." *Current Pain & Headache Reports*. 7, no. 1(2003): 34-8 UI 12525268.

The term "targeted peripheral analgesics" has been developed to describe analgesics whose mechanism of action appears to be primarily through reducing pain transmission within the peripheral nervous system. Key differences between targeted peripheral and systemic analgesics and the difference between topical and transdermal analgesics are discussed. A review of the clinical conditions that have reportedly responded to targeted peripheral analgesics is described in detail in this article. [References: 37]

Axelsson, P., et al. "Temporary external pedicular fixation versus definitive bony fusion: a prospective comparative study on pain relief and function." *European Spine Journal*. 12, no. 1(2003): 41-7 UI 12592546.

Temporary external pedicular fixation is used as a prognostic instrument when treating degenerative conditions with spinal fusion. We studied the validity of the method and whether a functional test could improve the prognostic value of such fixation. Twenty-six patients with long-standing lumbar pain had an external temporary fixation. Pain levels were registered before fixation on a visual analogue scale at rest, as a mean for the previous week, and at seven different standardized activities. Walking capacity and walking speed for a standardized distance

were also measured. Identical evaluations were then repeated during the external fixation and 1 year after definitive fusion. Based on the outcome of the temporary fixation, 20 patients were recommended for definitive surgical fusion. In six cases, the option of fusion surgery was rejected due to an unfavourable pain response or insufficient pain relief during the test fixation period, and this group was not further followed within the study. One year after surgery, 14 of 20 patients reported a good outcome. Solid bony fusion assessed by conventional radiography was seen in 19 patients. One patient with a poor clinical outcome had a pseudarthrosis. The mean values for pain level at rest, during last week and at the seven different activities in the functional test tended to decrease after fusion compared to the situation with temporary external fixation. In no activity did the external fixator overestimate the mean positive pain-relieving effect after definitive fusion. The walking capacity significantly increased, while the walking speed did not alter at the three different measurements. We conclude that with a good outcome ratio of 14 patients out of 19 having a solid fusion, the external frame improved patient selection and can be used as a valid prognostic instrument. The pain relief and function after definitive fusion can not be quantified by the external fixation, probably due to the fact that the stabilisation with an external frame is partial. The value of the functional test design presented is moderate, and an outcome evaluation comprising pain relief at rest and mean pain level during a week in fixation seems adequate.

Backonja, M. "Anticonvulsants for the treatment of neuropathic pain syndromes." *Current Pain & Headache Reports*. 7, no. 1(2003): 39-42 UI 12525269.

This article is an evidence-based summary of randomized clinical trials published in peer-reviewed journals regarding the efficacy of anticonvulsants for the treatment of neuropathic pain. [References: 26]

Barmeyer, A., and T. Meinertz. "Anaerobic threshold and maximal oxygen uptake in patients with coronary artery disease and stable angina before and after percutaneous transluminal coronary angioplasty." *Cardiology*. 98, no. 3(2002): 127-31 UI 12417811.

In this study, we investigated the effect of percutaneous transluminal coronary angioplasty (PTCA) on functional exercise capacity, oxygen uptake at anaerobic threshold (VO₂ AT) and maximal oxygen uptake (VO₂ max) in patients with coronary artery disease (CAD). Twenty-five patients with CAD and stable angina pectoris underwent spiroergometry before and after PTCA. All patients had reduced functional capacity with Weber class B in 5, class C in 16 and class D in 4 patients with mean VO₂ AT of 9.4 +/- 1.5 ml.kg⁻¹.min⁻¹ and mean VO₂ max of 13.3 +/- 3.3 ml.kg⁻¹.min⁻¹. After PTCA, VO₂ max (15.8 +/- 3.1 ml.kg⁻¹.min⁻¹) increased significantly (p < 0.001) compared to before PTCA. Subgroup analysis revealed that patients with low functional capacity before PTCA (VO₂ max) <15 ml x kg⁻¹ x min⁻¹) had the most benefit from PTCA with an increase in VO₂ AT from 8.7 +/- 1.0 to 9.6 +/- 1.4 ml x kg⁻¹ x min⁻¹ (p < 0.05) and of VO₂ max from 11.3 +/- 2.2 to 14.8 +/- 3.5 ml x kg⁻¹ x min⁻¹ (p < 0.001) whereas in patients with VO₂ max >15 ml x kg⁻¹ x min⁻¹, VO₂ AT (p = 0.9) and VO₂ max (p = 0.2) did not improve significantly. In conclusion, there is reduced functional capacity and VO₂ max which improved after PTCA in CAD patients. In patients with low VO₂ max before PTCA, functional capacity, VO₂ AT and VO₂ max significantly improved after PTCA, suggesting reversible myocardial impairment induced by intermittent myocardial ischemia. Patients with higher VO₂ max had no significant benefit from PTCA with respect to functional capacity, VO₂ max and VO₂ AT. Copyright 2002 S. Karger AG, Basel

Barnsley, L. "Steroid injections: effect on pain of spinal origin." *Best Practice & Research. Clinical Anaesthesiology*. 16, no. 4(2002): 579-96 UI 12516893.

Pain originating from the spine is a common clinical problem that is often difficult to manage. This chapter considers the evidence supporting the use of corticosteroid injections for pain of spinal origin. Clinical problems considered in this review are radicular pain, zygapophyseal joint pain, discogenic pain and non-specific pain from the cervical, lumbar and thoracic spine. Issues of efficacy and adverse events are considered. No useful data were found concerning the treatment of any type of thoracic pain with corticosteroid injections. In the lumbar spine, there is evidence to support the use of transforaminal injections for radicular pain. Intradiscal and intra-articular injections in both lumbar and cervical spines have not been shown to be effective. Sacroiliitis responds well to intra-articular corticosteroids. There is insufficient evidence to support the use of atlanto-axial or atlanto-occipital joint injections. [References: 57]

Barr, J., et al. "Post surgical pain management with poly(ortho esters)." *Advanced Drug Delivery Reviews*. 54, no. 7(2002): 1041-8 UI 12384320.

Poly(ortho esters), POE, are synthetic bioerodible polymers that can be prepared as solid materials, or as viscous, injectable polymers. These materials have evolved through a number of families, and the latest member of this family, POE IV, is particularly well suited to drug delivery since latent acid is integrated into the polymer backbone, thereby, modulating surface erosion. POE IV predominantly undergoes surface erosion and is able to moderate drug release over periods from days to many months. One indication in which the POE IV polymer is currently being investigated is in sustained post-surgical pain management. The local anesthetic agent, mepivacaine, has been incorporated into a viscous, injectable POE IV and its potential to provide longer-acting anesthesia has been explored in non-clinical models. [References: 20]

Ben-David, B., and J. E. Chelly. "Continuous peripheral neural blockade for postoperative analgesia: practical advantages." *Anesthesia & Analgesia*. 96, no. 5(2003): 1537 UI 12707180.

Bizzini, M., et al. "Systematic review of the quality of randomized controlled trials for patellofemoral pain syndrome." *Journal of Orthopaedic & Sports Physical Therapy*. 33, no. 1(2003): 4-20 UI 12570282.

STUDY DESIGN: Systematic review of the literature. OBJECTIVES: To develop a grading scale to judge the quality of randomized clinical trials (RCTs) and conduct a systematic review of the published RCTs that assess nonoperative treatments for patellofemoral pain syndrome (PFPS). BACKGROUND: Systematic reviews of the quality and usefulness of clinical trials allow for efficient synthesis and dissemination of the literature, which should facilitate clinicians' efforts to incorporate principles of evidence-based practice in the clinical decision-making process. METHODS AND MEASURES: Using a scale based on criteria in the Cochrane Collaboration Handbook, we sought to critically appraise the methodology used in RCTs related to the nonoperative management of PFPS, synthesize and interpret our results, and report our findings in a user-friendly fashion. A scale to assess the methodological quality of trials was designed and pilot tested for its content and reliability. Published RCTs identified during a literature search were then selected and rated by 6 raters. We used predefined cutoff scores to identify specific weaknesses in the clinical research process that need to be improved in future clinical trials. RESULTS: The quality scale we developed was demonstrated to be sufficiently reliable to warrant interpretation of the reviewers' findings. The percentage of trials that met a minimum level of quality for each specific criterion ranged from a low of 25% for the adequacy of the description of the randomization procedure to a high of 95% for the description and standardization of the intervention. CONCLUSIONS: Based on the results of trials exhibiting a sufficient level of quality, treatments that were effective in decreasing pain and improving function in patients with PFPS were acupuncture, quadriceps strengthening, the use of a resistive brace, and the combination of exercises with patellar taping and biofeedback. The use of soft foot orthotics in patients with excessive foot pronation appeared useful in decreasing pain. In addition, at a short-term follow-up, patients who received exercise programs were discharged earlier from physical therapy. Unfortunately, most RCTs reviewed contained qualitative flaws that bring the validity of the results into question, thus diminishing the ability to generalize the results to clinical practice. These flaws were primarily in the areas of randomization procedures, duration of follow-up, control of cointerventions, assurance of blinding, accountability and proper analysis of dropouts, number of subjects, and the relevance of outcomes. Also, given the limited number of high-quality clinical trials, recommendations about supporting or refuting specific treatment approaches may be premature and can only be made with caution. [References: 74]

Bjordal, J. M., M. I. Johnson, and A. E. Ljunggreen. "Transcutaneous electrical nerve stimulation (TENS) can reduce postoperative analgesic consumption. A meta-analysis with assessment of optimal treatment parameters for postoperative pain." *European Journal of Pain: Ejp*. 7, no. 2(2003): 181-8 UI 12600800.

AIM: We investigated the literature of randomised placebo-controlled trials to find out if transcutaneous electrical nerve stimulation (TENS) or acupuncture-like transcutaneous electrical nerve stimulation (ALTENS) can reduce analgesic consumption after surgery. RESULTS: Subgroup analysis for adequate treatment (pulse frequency: 1-8Hz [ALTENS] or 25-150Hz

[TENS], current intensity: "strong, definite, subnoxious, maximal tolerable" or above 15mA, and electrode placement in the incision area) were performed. Twenty-one randomised, placebo-controlled trials with a total of 1350 patients were identified. For all trials, the mean reduction in analgesic consumption after TENS/ALTENS was 26.5% (range -6 to +51%) better than placebo. Eleven of the trials comprising 964 patients, had reports which stated that a strong, subnoxious electrical stimulation with adequate frequency was administered. They reported a mean weighted reduction in analgesic consumption of 35.5% (range 14-51%) better than placebo. In nine trials without explicit confirmation of sufficient current intensity and adequate frequency, the mean weighted analgesic consumption was 4.1% (range -10 to +29%) in favour of active treatment. The difference in analgesic consumption was significantly ($p=0.0002$) in favour of adequate stimulation. The median frequencies used in trials with optimal treatment was 85Hz for TENS and 2Hz in the only trial that investigated ALTENS. CONCLUSION: TENS, administered with a strong, subnoxious intensity at an adequate frequency in the wound area, can significantly reduce analgesic consumption for postoperative pain.

Bogduk, N. "Diagnostic nerve blocks in chronic pain." *Best Practice & Research. Clinical Anaesthesiology*. 16, no. 4(2002): 565-78 UI 12516892.

Diagnostic blocks are used to obtain information about the source of a patient's pain. As such they differ in principle and in practice from regional anaesthetic blocks. In order to be valid, diagnostic blocks must be precise and target-specific. They must be controlled in order to exclude false-positive responses. Sympathetic blocks have traditionally been performed without pharmacological controls, but studies have shown that the features of complex regional pain syndromes can be relieved equally well when normal saline is administered as when local anaesthetic is used. This warns that sympathetic blocks must be controlled in each and every case lest false conclusions be drawn about the response. Medial branch blocks of the lumbar and of the cervical dorsal rami have been extensively investigated in order to establish their validity, diagnostic utility and therapeutic utility. They provide an example and benchmark for how diagnostic blocks can and should be validated. [References: 47]

Boyce, R. H., and J. C. Wang. "Evaluation of neck pain, radiculopathy, and myelopathy: imaging, conservative treatment, and surgical indications." *Instructional Course Lectures*. 52(2003): 489-95 UI 12690875.

Neck pain is a common complaint that typically represents a spectrum of disorders affecting the cervical spine. The clinical history and examination of patients with neck pain dictate the proper timing and selection of diagnostic studies such as plain radiography, MRI, and myelography with CT. Most neck pain is self-limiting and will resolve with appropriate conservative care. Nonsurgical treatment is the most appropriate first step in almost all cases of cervical radiculopathy. In contrast, the conservative care of cervical spondylotic myelopathy with measures such as physical therapy, spinal manipulation, medications, collars, and traction is limited. [References: 42]

Boyd, J. E. "You're the flight surgeon. Renal colic." *Aviation Space & Environmental Medicine*. 74, no. 1(2003): 89-90 UI 12546306.

Braverman, D. L., et al. "Interventions in chronic pain management. 3. New frontiers in pain management: complementary techniques." *Archives of Physical Medicine & Rehabilitation*. 84, no. 3 Suppl 1(2003): S45-9 UI 12708558.

This self-directed learning module highlights complementary and alternative therapies that are often used by patients seen in the typical psychiatric practice. This article contains information on acupuncture and its use to treat low back pain, recent therapeutic approaches to lateral epicondylitis, movement therapies appropriate for the osteoporotic patient, and spa therapies. Scientific literature and standards of clinical practice in these areas have been reviewed to put forth the most recent recommendations regarding these diagnoses and therapeutic interventions. OVERALL ARTICLE OBJECTIVES: (a) To familiarize the psychiatrist with complementary techniques that are increasingly popular in the United States and (b) to identify when therapies, such as acupuncture, movement therapies, bodywork, and the like, may be integrated into a comprehensive treatment approach for common psychiatric clinical scenarios. [References: 17]

Breeman, A., et al. "Characteristics, treatment and outcome of patients with non-ST-elevation acute coronary syndromes and multivessel coronary artery disease: observations from PURSUIT (platelet glycoprotein IIb/IIIa in unstable angina: receptor suppression using integrilin therapy)." *Cardiology*. 98, no. 4(2002): 195-201 UI 12566649.

BACKGROUND: The 6-month clinical outcome of patients with multivessel disease enrolled in PURSUIT (Platelet Glycoprotein IIb/IIIa in Unstable Angina: Receptor Suppression Using Integrilin Therapy) is described. Patients with complete angiography data were included; multivessel disease was stratified according to the treatment strategy applied early during hospitalization, i.e. medical treatment, percutaneous coronary intervention (PCI) (balloon), PCI (stent), or coronary artery bypass grafting (CABG). **METHODS:** Patients were divided into three groups according to the treatment strategy applied during the first 30 days of enrolment. Patients who did not undergo a percutaneous or surgical coronary intervention were classified as medically treated. Patients who underwent a PCI (prior to a possible CABG) were separated from those who underwent a CABG (prior to a possible PCI). The PCI group was further subdivided: patients receiving ≥ 1 coronary stents were separated from those in whom no stents were used. **RESULTS:** The mortality rate at 30 days was 6.7, 3.9, 2.4 and 4.8% for the medical treatment, PCI (balloon), PCI (stent) and CABG groups, respectively (p value = 0.002). Differences as observed at 30 days were still present at 6-month follow-up with 11.1, 5.8, 5.5 and 6.5% mortality event rates for the aforementioned groups (p value = 0.002). The 30-day myocardial infarction (MI) rate according to the opinion of the Clinical Events Committee was lower among medically than non-medically treated patients, with the highest event rate observed in the CABG group (27.7%). Approximately half of the MIs in the PCI and CABG subgroups occurred within 48 h after the procedure. **CONCLUSIONS:** The observed differences in clinical outcomes are explained by an imbalance in baseline characteristics and comorbid conditions between the analyzed groups of patients. Copyright 2002 S. Karger AG, Basel

Breivik, H. "How to implement an acute pain service." *Best Practice & Research. Clinical Anaesthesiology*. 16, no. 4(2002): 527-47 UI 12516890.

To implement a successful acute pain service the following factors are the most important for success: anaesthesiologist-supervised pain nurses and an ongoing educational programme for patients and all health personnel involved in the care of surgical patients. The benefits in increased patient satisfaction and improved outcome after surgery will far outweigh the costs of running an acute pain service that raises standards of pain management throughout the hospital. Optimal use of basic pharmacological analgesia will improve relief of post-operative pain for most surgical patients. More advanced approaches, such as well-tailored epidural analgesia, are needed to relieve severe dynamic pain (e.g. when coughing). This may reduce markedly risks of complications in patients at high risk of developing post-operative respiratory infections and cardiac ischaemic events. More aggressive methods for post-operative pain management need robust routines that will discover the early symptoms and signs of potentially serious complications. High preparedness must be present for swift and correct handling of the rare but potentially catastrophic complications of bleeding and infection in the spinal canal. Chronic pain is common after surgery. Better acute pain relief may reduce this distressing long-term complication of surgery. Research into the long-term effects of optimal neuraxial analgesia and drugs that dampen glutamatergic hyperphenomena (hyperalgesia/allodynia) are urgently needed to verify whether these approaches can reduce the problem of intractable chronic post-operative pain. [References: 96]

Bressel, E., and B. J. Larson. "Bicycle seat designs and their effect on pelvic angle, trunk angle, and comfort." *Medicine & Science in Sports & Exercise*. 35, no. 2(2003): 327-32 UI 12569224.

PURPOSE: To examine whether bicycle seats with anterior-medial cutouts influence pelvic angle, trunk angle, and comfort in female subjects during cycling. **METHODS:** Twenty female cyclists pedaled a stationary bicycle with their hands on the tops and drops of the handlebars under three different saddle conditions (standard, partial, and complete cutout designs). Pelvic angle was measured using an inclinometer attached to a caliper whereas trunk angle was quantified from digitization of video images. Comfort level was assessed subjectively by having participants rank the saddles from most to least comfortable. **RESULTS:** Anterior pelvic tilt angles for the partial and complete cutout saddles were 8% and 16% greater, respectively, than values for the standard saddle condition ($P < 0.05$). Trunk flexion angles were greater for the complete

versus standard and partial cutout designs ($P < 0.05$). Participants displayed a 77% greater anterior pelvic tilt angle and an 11% greater trunk flexion angle in the drop versus top handlebar positions ($P < 0.05$). A total of 55% of the subjects ranked the partial cutout saddle as the most comfortable, and 30% ranked the standard saddle as the most comfortable. CONCLUSIONS: These data indicate that partial and complete cutout saddle designs may increase anterior pelvic tilt, and saddles with a complete cutout design may increase trunk flexion angles under select cycling conditions. A saddle with a partial cutout design may be more comfortable than a standard or complete cutout saddle design.

Brown, C. R. "Pain management. Psychologic aspects of pain." *Practical Periodontics & Aesthetic Dentistry*. 9, no. 2(1997): 178 UI 12698524.

Budd, K. "Buprenorphine and the transdermal system: the ideal match in pain management." *International Journal of Clinical Practice. Supplement.*, no. 133(2003): 9-14; discussion 23-4 UI 12665118.

A system for the transdermal administration of the opioid drug buprenorphine has recently been introduced. Buprenorphine has physico-chemical properties, including a low molecular weight and high analgesic potency, that make it an excellent compound for transdermal drug delivery. The new technology (buprenorphine TDS, Transtec) is an advanced system that contains the active drug incorporated into a polymer matrix, which is at the same time the adhesive layer. The patch precisely controls the rate of drug delivery and produces stable plasma concentrations. It is available in three doses (release rates of 35, 52.5 and 70 microg/h), and the suggested duration of use per patch is three days. Buprenorphine TDS was developed for the treatment of moderate to severe cancer pain and severe pain which does not respond to non-opioid analgesics. Not only does this transdermal system provide excellent analgesia and a low incidence of adverse events, but its ease of use results in greater compliance. The patch provides excellent adhesion and has a low susceptibility to damage that might lead to toxicity or opioid abuse. [References: 6]

Camu, F., and C. Vanlersberghe. "Pharmacology of systemic analgesics." *Best Practice & Research. Clinical Anaesthesiology*. 16, no. 4(2002): 475-88 UI 12516886.

Systemic administration of analgesic drugs is still the most widely used method for providing pain relief in acute painful situations. Opioids may be selected on the basis of their physicochemical characteristics and their diffusion index to the brain. But in clinical practice, their very steep concentration-analgesic effect relationship remains a critical aspect of opioid therapy. Thus, small fluctuations in plasma concentrations of opioids may lead to profound fluctuations in analgesic effect when their plasma and effect-site concentrations are near the minimum effective analgesic concentration (MEAC). Combining drugs acting on different mechanisms of nociceptive modulation offers benefits from additive/synergistic effects and will decrease the incidence of their adverse effects. Evidence-based reviews showed that effective pain relief using non-opioid analgesics relied on paracetamol supplemented with non-steroidal anti-inflammatory drugs (NSAIDs). The role of COX-2 selective inhibitors (CSIs) in acute pain relief still requires further evaluation. NSAIDs, CSIs and paracetamol share the property of morphine sparing in situations of severe (post-operative) pain. CSIs may be beneficial in patients in whom post-operative bleeding is a major surgical risk as the effects of NSAIDs on coagulation may last for days. Finally, low-dose ketamine infusions remain a worthwhile addition to opioid therapy. Analgesic concentrations of ketamine are 1/5th to 1/10th the anaesthetic concentration and exert significant inhibition on N-methyl-d-aspartate (NMDA) receptor activation. [References: 68]

Castle, N. "Effective relief of acute coronary syndrome." *Emergency Nurse*. 10, no. 9(2003): 15-9 UI 12655961.

Effective and early pain relief remains a clinical priority, presently no one agent offers the ideal solution to controlling the pain of ACS. The early use of opiates, betablockers and nitrates, as well as reassuring patients, both have vital roles to play in providing effective analgesia. [References: 31]

Cherkin, D., K. Sherman, and D. Eisenberg. "Back pain. Beyond the backache." *Newsweek*. 140, no. 23(2002): 56 UI 12501512.

Chevlen, E. "Opioids: a review." *Current Pain & Headache Reports*. 7, no. 1(2003): 15-23 UI 12525266.

Recent discoveries in opioid pharmacology help explain the enormous variability in clinical responses to these powerful analgesics. Although there is only one m opioid receptor gene, splice variants of that gene's expression result in a panoply of different functioning receptors. Other sources of variable response include polymorphisms in the m opioid receptor regulatory region, and pharmacokinetic differences because of cytochrome P-450 mono-oxygenase heterogeneity. Analgesic tolerance is likely the key phenomenon limiting the benefit of opioids. A plethora of intracellular pathways affects this. Among them are the N-methyl-D-aspartate receptor, protein kinase C gamma activity, nitric oxide synthase, and GM1 ganglioside content of the neuronal membrane. Clinical studies undercut the routine use of meperidine in most settings. Other studies have shown better ways to diminish opioid side effects. [References: 92]

Chong, M. S., and S. E. Libretto. "The rationale and use of topiramate for treating neuropathic pain." *Clinical Journal of Pain*. 19, no. 1(2003): 59-68 UI 12514458.

OBJECTIVE: To outline the modes of action of topiramate and to examine the theoretical reasons as to why topiramate may alleviate neuropathic pain. Results of animal and human studies in the use of topiramate for treating pain are reviewed, together with case studies describing situations where topiramate was effective when other treatments have failed. CONCLUSIONS: Topiramate acts on neuronal transmission in at least five ways: by modulating voltage-gated sodium ion channels, potentiating gamma-aminobutyric acid inhibition, blocking excitatory glutamate neurotransmission, modulating voltage-gated calcium ion channels, and by inhibiting carbonic anhydrase. This review suggests that there are good theoretical reasons for a trial of topiramate in patients with neuropathic pain where conventional medical treatments have failed. Although not currently licensed for treating pain, topiramate should be considered before invasive methods of pain relief are contemplated. Most of the side effects of topiramate are dose dependent, but by starting medication with a low dose (≤ 25 mg/d) that is gradually titrated upward, tolerance is much more easily achieved. [References: 63]

Chouillard, E., and A. Fingerhut. "Acute appendicitis after laparoscopic treatment of acute epiploic appendagitis." *Surgical Endoscopy*. 17, no. 4(2003): 660-1 UI 12574937.

Epiploic appendagitis (EA) is a rare cause of right lower quadrant (RLQ) abdominal pain. We report an unusual case of acute gangrenous appendicitis that developed after laparoscopic treatment of an EA. A 62-year-old man underwent laparoscopy for RLQ abdominal pain. EA was found and a resection was performed. The appendix, which was macroscopically normal, was left undisturbed. One week later, the patient was operated on for acute gangrenous appendicitis. Histologic examination separately confirmed both diagnoses. The definitive outcome was uneventful. The exact origin of this unusual case is unknown: Could acute appendicitis have been secondary to laparoscopic manipulation or initially missed? We conclude that acute appendicitis may be either missed or induced by laparoscopy for RLQ abdominal pain.

Colak, T., et al. "Efficacy of topical nonsteroidal antiinflammatory drugs in mastalgia treatment." *Journal of the American College of Surgeons*. 196, no. 4(2003): 525-30 UI 12691925.

BACKGROUND: The aim of the study was to investigate the effects of topical nonsteroidal antiinflammatory drugs (NSAIDs) on mastalgia. STUDY DESIGN: A prospective, randomized, blinded, placebo-controlled study was performed to evaluate the effects of topical NSAIDs on cyclic and noncyclic mastalgia. A total of 108 patients, 60 with cyclic (group I) and 48 with noncyclic (group II) breast pain were enrolled. Patients within each group were randomly assigned to receive either topical NSAIDs or placebo three times daily for at least 6 months. Severity of pain was measured before and after 6 months of treatment. RESULTS: The pain score decreased significantly when the mean initial breast pain score was compared with the sixth-month breast pain score of the treatment or the placebo group of cyclic ($p = 0.0001$ and $p = 0.0001$, respectively) or noncyclic mastalgia ($p = 0.0001$ and $p = 0.0001$, respectively). Significant differences were found when the mean within-person change in pain values in each treatment group were compared with the change in the respective placebo group for either cyclic or noncyclic mastalgia ($p = 0.0001$ and $p = 0.0001$, respectively). Changes in pain within treatment groups or placebo groups for cyclic versus noncyclic mastalgia were not found to be statistically

different ($p = 0.53$ and $p = 0.96$, respectively). No side effect was seen in any group. CONCLUSIONS: Topical application of NSAIDs was effective in both cyclic and noncyclic mastalgia with minimal side effects.

Comfort, M. B., et al. "A study of the comparative efficacy of three common analgesics in the control of pain after third molar surgery under local anaesthesia." *Australian Dental Journal*. 47, no. 4(2002): 327-30 UI 12587769.

BACKGROUND: The aim of this study was to evaluate the comparative efficacy of three commonly used analgesics (Panadeine, Diflunisal and Etodolac) in the control of pain after third molar surgery under local anaesthesia. METHODS: A randomized control study. Outcome of primary efficacy was judged by overall assessment of the area under the curve of graphs for pain intensity, measured from serial visual analogue scales over a 24-hour period. Other measures of efficacy included the number (per cent) of patients who took 'additional' analgesics and the incidence of adverse effects occurring in each treatment group over the study period. RESULTS: The three drugs were effective in the control of post-operative pain ($p < 0.01$). Variations in pain intensity and the use of additional medication between the treatment groups were observed over the study period. The Diflunisal group experienced less pain than the Panadeine or Etodolac group ($p < 0.01$). Furthermore, a lesser number of those in the Diflunisal group used additional medication compared to the other two groups ($p < 0.01$). The incidence of side effects from all three drugs was low. CONCLUSION: Diflunisal is superior in the control of pain following third molar surgery under local anaesthesia than either Panadeine or Etodolac, and has few side effects.

Conti, A., and G. Berni. "Management strategy of chest pain patients with or without evidence of acute coronary syndrome in the emergency department." *European Journal of Emergency Medicine*. 9, no. 4(2002): 351-7 UI 12501037.

Conwell, D. L., et al. "An endoscopic pancreatic function test with synthetic porcine secretin for the evaluation of chronic abdominal pain and suspected chronic pancreatitis." *Gastrointestinal Endoscopy*. 57, no. 1(2003): 37-40 UI 12518128.

BACKGROUND: Pancreatic function tests are the most reliable methods for the diagnosis or exclusion of chronic pancreatitis in patients without obvious radiologic changes, but they are cumbersome, time consuming, and unavailable in clinical practice. Synthetic porcine secretin, a 27 amino acid peptide identical to the biologic form, is available for exocrine function testing. This study examined the utility of a simple, newly developed, purely endoscopic pancreatic function test with synthetic porcine secretin. METHODS: Three groups of patients were studied: patients with chronic abdominal pain with and without risk factors for chronic pancreatitis, and patients with advanced chronic pancreatitis. All patients with abdominal pain had "pancreatic type" pain for greater than 6 months and negative radiographic imaging studies. All patients with chronic pancreatitis had advanced disease based on retrograde pancreatography and/or CT findings. Participants underwent the following protocol: (1) standard endoscopy to the descending duodenum with the patient under conscious sedation; (2) intravenous administration of secretin (0.2 microgram/kg); (3) endoscopic duodenal fluid collection at 0, 15, 30, 45, and 60 minutes after secretin injection; and (4) fluid analysis for bicarbonate concentration. RESULTS: Eighteen patients were studied (5 abdominal pain without risk factors, 7 abdominal pain with risk factors, and 6 advanced chronic pancreatitis). Median peak (interquartile range) bicarbonate concentrations in meq/L for each group were, respectively, 87 (6, range 84-108), 72 (10, range 68-90), and 35 (27, range 18-88). Median peak bicarbonate concentration values for the 3 groups are significantly different ($p = 0.010$; Kruskal-Wallis test). Bicarbonate secretion in patients with chronic pancreatitis was markedly reduced compared with that in patients with abdominal pain without risk factors ($p = 0.038$; the Fisher exact test). The secretory function curve for patients with abdominal pain with risk factors was markedly abnormal, resembling the attenuated secretory curve seen in patients with chronic pancreatitis. The test was safe and well tolerated. CONCLUSIONS: A simple endoscopic pancreatic function test with synthetic porcine secretin appears to distinguish patients with known chronic pancreatitis from those with chronic abdominal pain without chronic pancreatitis. This simple, practical endoscopic test can be performed during upper endoscopy and may decrease the need for invasive procedures in patients with abdominal pain and normal radiographic imaging studies.

Coudeyre, E., et al. "Beneficial effects of information leaflets before spinal steroid injection." *Joint, Bone, Spine: Revue du Rhumatisme*. 69, no. 6(2002): 597-603 UI 12537268.

How beneficial is the provision of information leaflets to low back pain patients before steroid injection under fluoroscopy? OBJECTIVES: To compare the value of information leaflets with verbal information on steroid injection under fluoroscopy. METHODS: Alternate month design. One hundred and twenty-three low back pain patients hospitalized for steroid injection under fluoroscopy were enrolled in the trial. Fifty-two patients received both written standardized information and non-standardized verbal information (intervention group), seventy one patients received only non-standardized verbal information (control group). Anxiety assessed at baseline evaluation and just before the injection; satisfaction related to the information received assessed on discharge day; knowledge about steroid injection assessed 4 hours and 1 month after the injection. RESULTS: Patients had a high anxiety level at baseline evaluation. Written standardized information did not decrease significantly anxiety ($P = 0.068$) before the injection, had no effect on pain during the injection, but increased patients' knowledge about the adverse effects on the day of injection and 1 month later ($P = 0.040$ and $P = 0.084$ respectively), and improve satisfaction with information received about potential complications of the steroid injections ($P = 0.018$). CONCLUSIONS: Providing an information leaflet to low back pain patients undergoing steroid injection under fluoroscopy tends to reduce state anxiety, and increases patients' knowledge and satisfaction with information about the risks of the injection.

Cowan, A. "Buprenorphine: new pharmacological aspects." *International Journal of Clinical Practice. Supplement.*, no. 133(2003): 3-8; discussion 23-4 UI 12665117.

Buprenorphine is an opioid analgesic, derived from thebaine. Buprenorphine was initially classified as a "mixed agonist-antagonist analgesic" or a narcotic antagonist analgesic. The work of Martin et al (1976) on the animal model of the chronic spinal dog substantiated the substance's action as partial agonist at the mu-opioid receptor. These findings were underscored by the substance's general pharmacological profile. Further, buprenorphine was one of the first narcotic analgesics to be assessed for its abuse liability in humans. The lower abuse liability of the drug in humans soon turned it into a widely used therapeutic agent in patients with opioid dependence. Interest in buprenorphine spanning more than 30 years has been attributed to its unique pharmacological characteristics, including moderate intrinsic activity, high affinity to and slow dissociation from mu-opioid receptors. Early pharmacological studies demonstrated buprenorphine's strong binding to opioid receptors, and an inverted U-shaped dose-response curve in rodents. In the rat paw formalin test, although buprenorphine demonstrated a bell-shaped dose-response curve against an acute noxious stimulus, it showed a classic sigmoidal curve in the later phase of the assay. In most preclinical antinociceptive tests, buprenorphine was shown to be fully efficacious, with an antinociceptive potency 25 to 40 times higher than morphine. A ceiling effect for respiratory depression (but not for analgesia) has been demonstrated in humans. Current studies are focusing on norbuprenorphine, an N-dealkylated metabolite of buprenorphine. Norbuprenorphine is a likely contributor to the overall pharmacology of buprenorphine; in the mouse writhing test, norbuprenorphine provides antinociceptive efficacy similar to buprenorphine, with analgesic activity shown to be dose-dependent. [References: 15]

Cowan, D. T., et al. "The assessment and management of pain among older people in care homes: current status and future directions." *International Journal of Nursing Studies*. 40, no. 3(2003): 291-8 UI 12605951.

Pain is highlighted as a significant, yet neglected problem among older people, particularly in long-term care settings. The effects of inadequate assessment and treatment of pain among older people may lead to multiple problems. Problems arise due to cognitive impairment of clients and inadequate assessment by healthcare professionals. Analgesics are under-used and there is a need for improved education of both healthcare professionals and older people regarding attitudes to pain and ageing. Research is needed into the prevalence of pain among older people in United Kingdom (UK) care homes, how best to further educate healthcare professionals regarding pain management and how to enable older people to be facilitative partners in this process. [References: 64]

Curatolo, M., and G. Svetlicic. "Drug combinations in pain treatment: a review of the published evidence and a method for finding the optimal combination." *Best Practice & Research. Clinical Anaesthesiology*. 16, no. 4(2002): 507-19 UI 12516888.

The evidence of the usefulness of drug combinations in pain management is reviewed and the problem of finding the optimal combination is presented. For post-operative pain, adding a non-steroidal anti-inflammatory drug (NSAID) or paracetamol to intravenous morphine is beneficial. Adding ketamine to intravenous morphine may be advantageous, but ketamine has a narrow therapeutic window. The combination paracetamol-NSAID is probably superior to either component alone. For post-operative epidural analgesia, combinations of low doses of a local anaesthetic, an opioid and adrenaline (epinephrine) are superior to single-drug regimens. There are virtually no data on the advantages of combinations over single drugs in neuropathic and chronic musculoskeletal pain. Adding NSAIDs or ketamine to opioids may be useful in cancer pain. Because of the enormous number of possible combinations, randomized controlled trials may fail to test the optimal combination. A stepwise optimization model that has been applied in clinical investigations is presented. [References: 60]

Dahm, J. B., et al. "Laser-facilitated thrombectomy: a new therapeutic option for treatment of thrombus-laden coronary lesions." *Catheterization & Cardiovascular Interventions*. 56, no. 3(2002): 365-72 UI 12112890.

To overcome the adverse complications of balloon angioplasty in thrombus burden lesions (i.e., distal embolization, platelet activation, no-reflow phenomenon with persistent myocardial hypoxemia), mechanical removal of the thrombus or distal embolization protection devices is required. Pulsed ultraviolet excimer laser light at 308 nm can vaporize thrombus and suppress platelet aggregation. Clinical experience has already shown its efficacy in acute ischemic-thrombotic acute coronary syndromes. Unlike other thrombectomy devices, a 308 nm excimer laser can ablate thrombi as well as the underlying plaque, speed up thrombus clearing, and enhance thrombolytic and GP IIb/IIIa activity. It can also be employed in patients with contraindications for systemic thrombolytic agents or GP IIb/IIIa antagonists. Our report covers clinical data and technical aspects concerning three patients with acute myocardial infarction who presented with a large thrombus burden. After successful laser-transmitted vaporization of the thrombus mass in these patients, the remaining thrombus burden was evacuated, and normal antegrade coronary flow was successfully restored. This approach can be useful for selective patients with acute coronary syndromes. Copyright 2002 Wiley-Liss, Inc.

Damush, T. M., et al. "Randomized trial of a self-management program for primary care patients with acute low back pain: short-term effects." *Arthritis & Rheumatism*. 49, no. 2(2003): 179-86 UI 12687508.

OBJECTIVE: We evaluated the effect of a self-management program (SMP) on primary care patients with acute low back pain (ALBP) from low income, inner city neighborhood health centers and an emergency department of a public teaching hospital. **METHODS:** We randomized 211 primary care patients who visited a physician for ALBP (<90 days duration) to usual care or an SMP. The SMP consisted of 3 group sessions and telephone followup that focused on understanding back pain, increasing physical activity, and dealing with fears and frustrations. **RESULTS:** Of the eligible patients, 52% expressed interest in participation and 39% of all eligible patients were randomized into the study. Among patients in the treatment group, 28.3% attended at least 1 group class, 62.3% received the intervention by mail, telephone, and audiotapes, and 9.4% received no intervention. Interviewers, blinded to the treatment given, collected data at baseline and at 4 months following randomization. Compared with the control group, the intervention group reported significantly better emotional functioning ($P < 0.01$), increased self efficacy to manage ALBP ($P = 0.03$), and less fear of movement ($P = 0.05$) after 4 months. **CONCLUSION:** This SMP produced short-term improvements in emotional functioning and self efficacy to manage symptoms among patients with ALBP living in the inner city. However, methods of program delivery other than group classes are needed to reach a greater portion of the inner city patients.

D'Antono, B., et al. "Sex differences in chest pain and prediction of exercise-induced ischemia." *Canadian Journal of Cardiology*. 19, no. 5(2003): 515-22 UI 12717487.

OBJECTIVES: To examine sex differences pertaining to pain characteristics in patients presenting to the ambulatory emergency department (ED) with nontraumatic chest pain and to the prediction of exercise-induced ischemia on a follow-up electrocardiogram. **METHODS:** This was a prospective study of 131 women and 202 men (mean age 58 years) consulting the ED with a chief complaint of chest pain. Seventy-eight women and 116 men underwent exercise stress testing following the ED consultation. Chest pain location, extension, intensity and quality were measured. Chest pain was classified as nonspecific, or typical or atypical of angina. **RESULTS:** Women received fewer 'typical' angina pain diagnoses ($P<0.05$), rated their pain as more intense ($P<0.05$) and used more affective words to describe their pain ($P<0.05$) compared with men. Pain in the posterior shoulder and middle back areas were more frequently reported by women ($P<0.05$). The presence of pain in the right anterior and posterior shoulder, as well as the absence of pain in the left anterior shoulder, predicted ischemia ($P<0.05$) in both men and women. Only in men, pain in the retrosternal and right middle back areas, as well as a classification of pain as typical or atypical, further contributed to the prediction of ischemia. **CONCLUSIONS:** Sex differences exist in the experience of chest pain and in the prediction of exercise-induced ischemia from pain variables. Further research on the unique symptomatology of men and women is needed to optimize their medical management.

Davison, B. L. "Refracture following plate removal in supracondylar-intercondylar femur fractures." *Orthopedics*. 26, no. 2(2003): 157-9 UI 12597219.

In a study of 41 supracondylar-intercondylar femur fractures treated with open reduction and plate fixation, 15 patients requested plate removal due to lateral knee pain over the hardware. A refracture of the distal femur occurred within 10 weeks of hardware removal in 4 (27%) of 15 patients. All refractures occurred during normal functional activities. Patients who request hardware removal following union of a distal femur fracture treated with open reduction and plating should be informed of the possibility of refracture.

de Leon-Casasola, O. A. "Cellular mechanisms of opioid tolerance and the clinical approach to the opioid tolerant patient in the post-operative period." *Best Practice & Research. Clinical Anaesthesiology*. 16, no. 4(2002): 521-5 UI 12516889.

The high prevalence of opioid use for recreational purposes in the USA and the European Union, as well as the use of opioids for the treatment of chronic non-malignant pain, has resulted in an increase in the number of patients with opioid tolerance who undergo surgery and require post-operative pain management. The approach to post-operative pain control in these patients is significantly different to the strategies used in opioid naive patients. Fortunately, better understanding of the cellular mechanisms of opioid tolerance in animals has resulted in the transfer of concepts from the 'bench' to the clinical arena. This chapter describes the new developments in opioid tolerance and how this knowledge can be applied to clinical practice. [References: 28]

Di Pede, F., et al. "Immediate and long-term clinical outcome after spinal cord stimulation for refractory stable angina pectoris." *American Journal of Cardiology*. 91, no. 8(2003): 951-5 UI 12686334.

The treatment of patients with angina pectoris refractory to medical therapy and unsuitable for revascularization procedures has yet not been well standardized. Previous retrospective studies and small prospective studies have suggested beneficial effects of spinal cord stimulation (SCS) in these patients. We created a Prospective Italian Registry of SCS to evaluate the short- and long-term clinical outcome of patients who underwent SCS device implantation because of severe refractory angina pectoris. Overall, 104 patients were enrolled in the registry (70 men, aged 68 +/- 17 years), most of whom (83%) had severe coronary artery disease. Average follow-up was 13.2 +/- 8 months. Overall, 17 patients (16%) died, 8 (8%) due to cardiac death. Among clinical variables, only age was found to be significantly associated both with total mortality ($p = 0.04$) and cardiac mortality ($p = 0.02$) on Cox regression analysis. A significant improvement of anginal symptoms ($> \text{ or } = 50\%$ reduction of weekly anginal episodes, compared with baseline) occurred in 73% of patients, and Canadian Cardiovascular Society angina class improved by $> \text{ or } = 1$ class in 80% and by $> \text{ or } = 2$ classes in 42% of patients, with a relevant reduction in the rate of hospital admission and days spent in the hospital because of angina ($p < 0.0001$ for both). No life-threatening or clinically serious complications were observed. The most frequent side effect

consisted of superficial infections, either at the site of puncture of electrode insertion or of the abdominal pocket, which occurred in 6 patients. In conclusion, our prospective data point out that SCS can be performed safely and is associated with a sustained improvement of anginal symptoms in a relevant number of patients with refractory stable angina pectoris.

Dubbs, D. "Back talk. Ergonomic furnishings help relieve strain for patients and providers." *Health Facilities Management*. 16, no. 3(2003): 32-6 UI 12690721.

Dubey, P. K., and S. S. Prasad. "Pain on injection of propofol: the effect of granisetron pretreatment." *Clinical Journal of Pain*. 19, no. 2(2003): 121-4 UI 12616182.

OBJECTIVE: To assess the effect of granisetron pretreatment in alleviating propofol injection pain. STUDY DESIGN: A randomized, controlled, double-blind study, using venous retention with a tourniquet. MATERIALS AND METHODS: One hundred fifty adult patients were randomly assigned to one of three groups: group 1 (who received 5 mL of 0.9% saline pretreatment), group 2 (who received 5 mL lidocaine [40 mg in 0.9% saline] pretreatment), and group 3 (who received 5 mL granisetron [2 mg in 0.9% saline] pretreatment). Injections were given in the largest vein on the dorsum of the hand. After 2 minutes, the tourniquet was released and one fourth of the total calculated dose of propofol (2.5 mg/kg body weight) was administered and pain assessment was made. RESULTS: Lidocaine and granisetron significantly reduced the incidence and severity of propofol injection pain more than placebo ($P < 0.001$). The efficacy of granisetron in alleviating the pain on injection of propofol was no different from lidocaine. CONCLUSIONS: Granisetron pretreatment may be used to reduce the incidence of pain on injection of propofol, an advantage added to the useful prevention of postoperative nausea and vomiting.

Eray, O., et al. "The efficacy of urinalysis, plain films, and spiral CT in ED patients with suspected renal colic." *American Journal of Emergency Medicine*. 21, no. 2(2003): 152-4 UI 12671819.

We determined the diagnostic value of urinalysis and plain films in patients with suspected renal colic presenting to an emergency department (ED). Over a 1-year period, 138 patients presented to the ED during the daytime with suspected renal colic, but for technical reasons the diagnostic modalities used in the study could be completed for only 99 patients, and 34 patients were lost to follow-up. A urinalysis; kidney, ureter, and bladder film; and spiral computed tomography (CT) were performed on each patient. The presence of urinary tract stones was determined by their definite presence on helical CT and/or passage of a stone on clinical follow-up (average follow-up = 3 months). A urinary stone was visualized on spiral CT or passed in the urine in 54 of the patients. Using helical CT findings or passage of a stone as the gold standard, plain radiography had a sensitivity of 69% and specificity of 82%. Urinalysis had a sensitivity of 69% and specificity of 27%. The sensitivity increased to 89% if either test was positive, but the specificity remained low at 27%. The sensitivity and specificity of CT in the diagnosis of urinary stones was 91%. Urinalysis and plain films are much less accurate than helical CT for confirming the diagnosis of acute urolithiasis. Further evaluation of the clinical and cost-effectiveness of helical CT should be done to determine its role in the work-up of these patients. Copyright 2003, Elsevier Science (USA). All rights reserved.)

Ericksen, J. J., D. L. Braverman, and R. V. Shah. "Interventions in chronic pain management. 4. Medications in pain management." *Archives of Physical Medicine & Rehabilitation*. 84, no. 3 Suppl 1(2003): S50-6 UI 12708559.

This self-directed learning module, which highlights pharmacologic approaches in the management of chronic pain, focuses on both traditional and nontraditional medications. It is part of the study guide on interventions in chronic pain management in the Self-Directed Physiatric Education Program for practitioners and trainees in physical medicine and rehabilitation. This article highlights medication concepts, including the cyclooxygenase-2 inhibitors, opiate management of chronic pain, and neuropathic pain management; and it reviews some nontraditional approaches such as homeopathy and herbal remedies. OVERALL ARTICLE OBJECTIVE: To summarize pharmacologic approaches available for the management of chronic pain syndromes. [References: 37]

Fortner, B. V., et al. "The Zero Acceptance of Pain (ZAP) Quality Improvement Project: evaluation of pain severity, pain interference, global quality of life, and pain-related costs." *Journal of Pain & Symptom Management*. 25, no. 4(2003): 334-43 UI 12691685.

The Zero Acceptance of Pain (ZAP) Quality Improvement Project was a multi-site effort to improve the lives of outpatients with cancer pain by enhancing the clinical practice of pain assessment and management. Independent samples of patients completed self-report measures of severity of pain, pain interference, global quality of life, pain treatment satisfaction, general medical treatment satisfaction, pain attitudes, and pain-related medical costs before and after the implementation of ZAP. Results suggested that ZAP decreased the severity of recent pain, decreased interference of pain on daily functioning, and improved satisfaction with pain treatment and attitudes about addiction to opioid medication. Direct medical costs consisting of pain-related hospitalizations, emergency department visits, and physician office visits were greatly reduced. In summary, the findings of this study support the idea that clinic-based efforts to improve the practice of pain management are effective in improving the lives of cancer patients who are experiencing pain.

Gabre, P., and K. Sjoquist. "Experience and assessment of pain in individuals with cognitive impairments." *Special Care in Dentistry*. 22, no. 5(2002): 174-80 UI 12580355.

The authors review the literature on pain experience and pain assessment in people with cognitive impairments, focusing on individuals with dementia and mental retardation. The impact of cognitive impairments on pain sensation is not well understood, although some observations have been published. For example, research suggests that pain experience can be influenced by neuropathological processes in the brain and memory impairments. Reporting of pain decreases as cognitive impairment increases. In addition, poor verbal skills lead to difficulties in communicating pain. Pain assessment depends primarily on one's ability to describe the dimensions of pain. Individuals with limited ability to report pain can use pain assessment methods that rely on simple cognitive tasks. For individuals who have no ability to report pain, an outside observer must describe the discomfort experienced by interpreting the patient's body language. The authors conclude that further research is needed to develop valid and reliable assessment methods for people with cognitive impairments. [References: 50]

Garcia-Campayo, J., and C. Sanz-Carrillo. "Topiramate as a treatment for pain in multisomatoform disorder patients: an open trial." *General Hospital Psychiatry*. 24, no. 6(2002): 417-21 UI 12490344.

Multisomatoform disorder (MSD), defined as 3 or more medically unexplained, currently distressing physical symptoms in addition to a long (> or =2 years) history of somatization, is a prevalent and disabling disorder in which few pharmacological trials have been referred to in the literature. Thirty-five MSD patients from the Somatoform Disorders Unit of the Miguel Servet University Hospital, Zaragoza, Spain, with pain of more than 3 months as the main symptom, were treated with topiramate in doses ranging from 300-400 mg/day. Patients were assessed at baseline and at one and six-months follow-up with the McGill Pain Questionnaire (MPQ), Pain Visual Analogue Scale (PVAS), Clinical Global Impression (CGI), Global Assessment Functioning (GAF) and Hospital Anxiety Depression Scale (HADS). Eight patients (22.8%) dropped from the study, 3 due to side-effects and the other 5 because of lack of efficacy. All the outcome measures showed significant improvements at one-month except the ratings on the Hospital Anxiety Depression Scale. At six-months follow-up, clinician-rated assessments (CGI and GAF) still showed significant differences with baseline but less significant than at one-month follow-up. However, patient-rated assessments (MPQ and PVAS) did not present significant differences with baseline. Despite limitations of the study, topiramate seems to be effective in treating multisomatoform disorder patients with pain as the main symptom and a controlled randomized trial in these patients appears warranted. A possible "decay effect" in patient-rated assessments with any drug in somatoform disorder patients is discussed.

Gentili, M. E. "Epidural fibrin glue injection stops postdural puncture headache in patient with long-term intrathecal catheterization." *Regional Anesthesia & Pain Medicine*. 28, no. 1(2003): 70 UI 12567349.

Gilron, I., et al. "Patients' attitudes and prior treatments in neuropathic pain: a pilot study." *Pain Research & Management*. 7, no. 4(2002): 199-203 UI 12518177.

BACKGROUND: Ongoing research continues to expand the knowledge of neuropathic pain. It is vital that established treatments and valuable discoveries ultimately improve patient care. **OBJECTIVES:** Attitudes and prior treatments of patients being screened for neuropathic pain trials were evaluated to provide further understanding of the barriers to the management of neuropathic pain. **METHODS:** A questionnaire was completed by patients with neuropathic pain who were either referred by local physicians or self referred in response to clinical trial advertisements from the authors' facility. **RESULTS:** In total, 151 patients completed the questionnaire. Diagnoses included diabetic neuropathy (55.6%), postherpetic neuralgia (29.8%), idiopathic peripheral neuropathy (9.3%) and others (5.3%). The mean pain duration was 4.7 years, and the mean daily pain (on a score of 0 to 10) was 7.6. During questioning, 72.8% complained of inadequate pain control and 25.2% had never tried any antineuropathic analgesics (tricyclic antidepressants, opioids or anticonvulsants). New antineuropathic analgesics (eg, gabapentin) were being used by only 16.6%. Opioids, tricyclic antidepressants and anticonvulsants had never been tried by 41.1%, 59.6% and 72.2%, respectively. Fears of addiction and adverse effects were expressed by 31.8% and 48.3%, respectively. **CONCLUSIONS:** New, and even conventional, therapies are often not pursued, despite inadequate pain control. Several issues are discussed, including patient barriers to seeking pain management, patient and physician barriers to analgesic drug therapy, and appropriate use of and access to multidisciplinary pain centres. Failure to implement therapeutic advances in pain management not only hinders improvement in patient care, but also may render futile decades of research. Widespread professional, patient and public education, as well as continued interdisciplinary research on treatment barriers, is essential.

Gintautas, J., et al. "Lidocaine and methylprednisolone in management of herpes zoster and post-herpetic neuralgia." *Proceedings of the Western Pharmacology Society*. 45(2002): 73 UI 12434534.

Goel, A., et al. "A painful tibial union." *Injury*. 34, no. 2(2003): 163-5 UI 12565027.

Gopikrishna, V., and A. Parameswaran. "Effectiveness of prophylactic use of rofecoxib in comparison with ibuprofen on postendodontic pain." *Journal of Endodontics*. 29, no. 1(2003): 62-4 UI 12540224.

The purpose of this study was to determine if prophylactic rofecoxib would significantly reduce postendodontic pain, when compared with ibuprofen or placebo. An additional objective was to establish if any relationship exists between periapical diagnosis and the need for additional medication after completion of pulpectomy. A total of 45 patients consented to a double-blind, single-dose oral administration of 50 mg of rofecoxib, 600 mg of ibuprofen, or a placebo before conventional root canal therapy. The root canal treatment was performed in two appointments. Patient-reported visual analog scale ratings of pain intensity were conducted upon initial clinical presentation and at 4, 8, 12, 24, 48, and 72 h after completion of pulpectomy. Results showed that at the 4- and 8-h periods, both rofecoxib and ibuprofen provided significantly better pain relief than placebo. At the 12- and 24-h periods, rofecoxib demonstrated significantly better pain relief than both ibuprofen and placebo. Patients with a periapical diagnosis of acute apical periodontitis showed a significantly increased need for additional medication after completion of pulpectomy compared with all other periapical diagnoses.

Gottschalk, A., C. L. Wu, and E. A. Ochroch. "Current treatment options for acute pain." *Expert Opinion on Pharmacotherapy*. 3, no. 11(2002): 1599-611 UI 12437494.

The pain that accompanies surgical procedures remains prevalent and is an aspect of the perioperative experience that generates the greatest concern for patients about to undergo surgery. There is also a growing recognition of the extent that acute painful experiences can lead to longer-term painful consequences, even when tissue healing appears to be complete. The neurobiologic basis of this has been partially elucidated. The key observations are that multiple sites and multiple receptors collectively contribute, and that noxious stimuli initiate a cascade of events that sensitise the nervous system so that subsequent noxious stimuli are perceived with greater intensity and even previously non-painful stimuli can be painful. Incorporating these

observations into effective perioperative regimens designed to limit acute pain and its consequences leads to a multimodal pre-emptive approach to acute pain management. Acute perioperative pain is an ideal setting for the use of pre-emptive analgesic techniques because the timing of noxious stimuli is known in advance and surgical sensitisation of the nervous system is ongoing despite adequate levels of general anaesthesia with volatile anaesthetics. The relevant neurobiology of pain, reviewed in this article, is the basis for advocating an aggressive, multimodal, pre-emptive approach to acute pain therapy throughout the entire perioperative period. A growing body of outcome studies demonstrates the long-term efficacy of this approach. [References: 197]

Govindarajan, A., and M. Schull. "Effect of socioeconomic status on out-of-hospital transport delays of patients with chest pain.[comment]." *Annals of Emergency Medicine*. 41, no. 4(2003): 481-90 UI 12658247.

STUDY OBJECTIVES: The effect of socioeconomic status on out-of-hospital care has not been widely examined. We determine whether socioeconomic status was associated with out-of-hospital transport delays for patients with chest pain. **METHODS:** A retrospective study of patients with chest pain transported by means of ambulance in Toronto, Ontario, Canada, in 1999 was conducted. The primary outcome measure was the 90th percentile system response interval, with secondary outcomes being the 90th percentile on-scene interval, transport interval, and total out-of-hospital interval. Socioeconomic status was the primary independent variable. Covariates were age, sex, case severity, dispatch and return priority, time and day of transport, paramedic training, and percentage of high-rise apartments in the region. **RESULTS:** Four thousand three hundred fifty-six patients met the inclusion criteria. The 90th percentile system response interval and total out-of-hospital interval were 11 minutes and 49 minutes, respectively. In multivariate analyses, the highest socioeconomic status neighborhoods were significantly associated with decreased system response interval (34.0 seconds; 95% confidence interval [CI] 6.2 to 70.9 seconds) and transport interval (132.3 seconds; 95% CI 24.1 to 229.6 seconds). In addition, age (+45.3 seconds per 10 years; 95% CI 13.3 to 75.1 seconds), female sex (+205.0 seconds; 95% CI 78.1 to 287.7 seconds), and advanced care paramedic crews (+371.6 seconds; 95% CI 263.3 to 490.1 seconds) were associated with delays in total out-of-hospital interval. Lastly, calls originating from the highest socioeconomic status neighborhoods were dispatched the highest proportion of advanced care paramedic crews, despite similar dispatch priorities and case severities. **CONCLUSION:** High socioeconomic status neighborhoods were associated with shorter out-of-hospital transport intervals for patients with chest pain. In addition, out-of-hospital delays were associated with age, sex, and advanced care paramedic crew type, with calls from the highest socioeconomic status neighborhoods being most likely to receive advanced care paramedic crews.

Gowda, M. S., et al. "Differential benefits and outcomes of tirofiban vs abciximab for acute coronary syndromes in current clinical practice." *Angiology*. 54, no. 2(2003): 211-8 UI 12678197.

Little comparative data exist for glycoprotein IIb/IIIa inhibitors in acute coronary syndromes (ACS). Two hundred twenty-eight patients were studied: 114 received tirofiban (TI) and 114 received abciximab (AB) for either unstable angina (UA) or myocardial infarction (MI). All patients received aspirin, heparin, and ticlopidine or clopidogrel. Baseline characteristics were similar between the 2 groups for admitting diagnosis (UA vs MI), age, gender, ejection fraction, diabetes mellitus, prior coronary artery disease, prior myocardial infarction (MI), prior bypass surgery, hypertension, congestive heart failure, hyperlipidemia, MI type (Q vs non-Q), or location. Drug administration time (mean) was 13 hours (AB) and 24 hours (TI). All AB was administered in the catheterization laboratory as compared to TI (34% in laboratory and 66% before laboratory). More AB patients received angioplasty or stent (92% vs 80%, $p = 0.008$) while more TI patients had CABG (10% vs 3%, $p = 0.027$). In-hospital complications including death, MI, urgent revascularization, cerebrovascular accidents or transient ischemic attacks, and access site bleeding were similar ($p = \text{NS}$). Multivariate predictors of events (odds ratios) were prior coronary artery bypass graft (2.3), diabetes (1.7), and prior percutaneous transluminal coronary angioplasty (1.7), but not the agent used. Over a mean follow-up of 13 months, the individual endpoints of death, MI, revascularization, or hospitalization were similar for both groups. The AB patients had improved freedom from revascularization (100% vs 81%, $p = 0.015$) in an emergent

setting and TI patients had improved freedom from revascularization (93% vs 77%, $p = 0.038$) with elective procedures. Tirofiban and abciximab appear effective and safe when used for ACS when recommended dosing and precautions are followed. Major adverse outcomes are rare and bleeding complications uncommon.

Gray, T. J., et al. "Percutaneous myocardial laser revascularization in patients with refractory angina pectoris." *American Journal of Cardiology*. 91, no. 6(2003): 661-6 UI 12633794.

This study aimed to determine the safety and efficacy of percutaneous myocardial laser revascularization (PMLR). Seventy-three patients with stable angina pectoris (class III or IV) who were unsuitable for conventional revascularization and had evidence of reversible ischemia by thallium-201 scintigraphy, ejection fraction of $>$ or $=25\%$, and myocardial wall thickness $>$ or $=8$ mm were randomized to optimal medical therapy alone ($n = 37$) or PMLR with optimal medical therapy ($n = 36$). Patients were followed up at 3, 6, and 12 months. The primary end point was exercise time. Secondary end points included angina scores, left ventricular ejection fraction, quality of life, changes in medical therapy, and hospitalizations. All 36 patients randomized to PMLR underwent the procedure successfully with no periprocedure deaths. One patient developed sustained ventricular tachycardia that required electrical cardioversion, and 1 patient developed cardiac tamponade that required surgical drainage. At 12 months, exercise times improved by 109 seconds in the PMLR group but decreased by 62 seconds in the control group ($p < 0.01$). Angina scores improved by 2 classes in 36% of PMLR-treated patients at 12 months compared with 0% of the control patients ($p < 0.01$). We conclude that PMLR is a relatively safe procedure that provides patients with symptomatic angina relief and improvement in exercise capacity and quality of life.

Grilo, R. M., et al. "Opioid rotation in the treatment of joint pain. A review of 67 cases." *Joint, Bone, Spine: Revue du Rhumatisme*. 69, no. 5(2002): 491-4 UI 12477234.

OBJECTIVE: To determine that opioid rotation can be useful for establishing a more advantageous analgesia/toxicity relationship in rheumatologic pain. **METHODS:** Among patients treated with opioids for rheumatologic non-malignant pain, 67 patients with opioid rotation were enrolled retrospectively. In all cases, the other analgesics had failed. The opioids used were: oral morphine, oral hydromorphone, oral buprenorphine and transdermal fentanyl. The reasons for rotation were noted and the improvement of pain was assessed by comparing baseline and post-treatment visual analog scales (VAS in mm). **RESULTS:** The 67 patients suffered from low back pain with sciatica in 27 cases, inflammatory arthritis in 14 cases, brachial neuralgia in six cases, osteoarthritis in eight cases and miscellaneous in 12 cases. The opioid rotations were the substitution of morphine by transdermal fentanyl, by oral hydromorphone in most of the cases. The principal reason for opioid rotation was failure of the first treatment. The mean of VAS improvement was 30 mm ($P < 0.001$). **CONCLUSION:** In rheumatologic non-malignant pain, the opioid rotation might allow the physician to bypass side effects or failure to alleviate pain in most cases.

Hagg, O., et al. "The clinical importance of changes in outcome scores after treatment for chronic low back pain." *European Spine Journal*. 12, no. 1(2003): 12-20; discussion 21 UI 12592542.

When measuring treatment effect in chronic low back pain with multi-item outcome instruments, it is necessary, both for clinical decision-making and research purposes, to understand the clinical importance of the outcome scores. The aims of the present study were three-fold. Firstly, it aimed to estimate the minimal clinically important difference of three multi-item outcome instruments (the Oswestry Disability Index, the General Function Score and the Zung Depression Scale) and of the visual analogue scale (VAS) of back pain. Secondly, it aimed to estimate the error of measurement of these instruments; and its third aim was to describe the clinical meaning of score change. The study population consisted of 289 patients treated surgically or non-surgically in a randomised controlled trial. The minimal clinically important difference was estimated with patient global assessment as the external criterion. It was compared with the standard error of measurement of the instruments. The individual items of the instruments were compared for score changes related to improvement and deterioration. The standard error of measurement of the Oswestry Disability Index, the General Function Score and the Zung Depression Scale was 4, 6 and 3 units, respectively. The 95% tolerance interval was 10, 16 and 8 units, respectively. The minimal clinically important difference was 10, 12 and 8-9

units, respectively, thus not significantly exceeding the tolerance interval. The minimal clinically important difference of VAS back pain was 18-19 units, well exceeding the 95% tolerance interval, which was 15 units. Improvement after treatment for chronic low back pain tends to occur to a greater extent in sleep disturbance, ability to do usual things and psychological irritability, but to a lesser extent in the ability to sit, stand and lift. We conclude that the VAS of back pain is responsive enough to detect the minimal clinically important difference, whereas the smallest acceptable score changes of the Oswestry Disability Index, the General Function Score and the Zung Depression Scale may require an increase to exceed the 95% tolerance interval when used for clinical decision making and for power calculation. Despite improvement after treatment, the ability to sit, stand and lift, remain notable problems.

Haltiavaara, K. M., et al. "Failure of interscalene brachial plexus blockade to produce pre-emptive analgesia after shoulder surgery." *European Journal of Anaesthesiology*. 20, no. 1(2003): 72-3 UI 12553393.

Heedman, P. A., and P. Strang. "Pain and pain alleviation in hospital-based home care: demographic, biological and treatment factors." *Supportive Care in Cancer*. 11, no. 1(2003): 35-40 UI 12527952.

The aim of this study was to contrast two opposed groups, namely palliative cancer patients who were suffering significant pain (VAS > or =4) and palliative cancer patients with no pain (VAS = 0) in hospital-based home care and, retrospectively, to study possible differences in relation to demographic, biological and treatment factors. The ESAS (Edmonton Symptom Assessment Scale) was used to assess 191 palliative cancer patients on admission and after 1 week of home care. Fifty-two (27%) had pain (mean 5.5+/-1.7) and 72 (38%) had no pain on admission [the middle group (n=67) had VAS 1-3]. Activity was more severely affected (5.4 vs 4.2, p<0.01) and nausea less well controlled in patients with pain (2.3 vs 0.7, P<0.0001). Pain was associated with the diagnosis of prostate cancer (P<0.01) and the presence of skeletal metastases (P<0.001), whereas pain-free patients, with or without analgesics, more often had colorectal cancer (P<0.01) or melanoma (P<0.05). The medication profiles differed between the two groups: 22 (42%) of the 52 patients with pain were on step 3 of the WHO analgesic ladder and 24 of 51 (47%) were receiving antiemetics, whereas 42 (58%) of the 72 patients with no current pain had no analgesic prescribed and only 25% of them had antiemetics prescribed, indicating biological differences. If pain was present on admission a pain analysis was formally documented in 23 (44%) of the 52 cases and the medication was changed in 27 of the 52 (52%). The patients improved after 1 week (5.4+/-1.6 vs 3.9+/-2.3, P<0.001), and the improvement was significant even when a pain analysis was not documented or when medication was not changed. In conclusion, the results of this study indicate biological differences in pain alleviation and the need for a more structured way of working.

Heeschen, C., et al. "Serum level of the antiinflammatory cytokine interleukin-10 is an important prognostic determinant in patients with acute coronary syndromes." *Circulation*. 107, no. 16(2003): 2109-14 UI 12668510.

BACKGROUND: Convincing evidence suggests that atherosclerosis is an inflammatory disease. The inflammatory response is an important determinant of atherosclerotic plaque instability. Therefore, we investigated the prognostic impact of key inflammatory players, namely the inflammatory marker C-reactive protein (CRP) and the antiinflammatory cytokine interleukin-10 (IL-10), in patients with acute coronary syndromes. **METHODS AND RESULTS:** IL-10, CRP, and troponin T were measured at baseline and before discharge in 547 patients enrolled in the placebo group of the c7E3 Anti Platelet Therapy in Unstable Refractory angina (CAPTURE) trial. Death and nonfatal myocardial infarction were recorded during 6-month follow-up. IL-10 levels did not correlate with troponin T concentrations but were inversely correlated with CRP levels (P<0.001). Patients with elevated IL-10 levels (>3.5 pg/mL; n=276) were at significantly lower risk compared with patients with elevated IL-10 levels (hazard ratio, 0.33; 95% confidence interval [CI], 0.25 to 0.76; P=0.002). The predictive value of IL-10 was independent of myocardial necrosis but significantly interacted with CRP levels. CRP-positive patients with IL-10 serum levels above the calculated threshold value of 3.5 pg/mL were protected from the increased cardiac risk of CRP-positive patients with low IL-10 levels (adjusted hazard ratio, 0.25; 95% CI, 0.10 to 0.63; P=0.003). Moreover, discharge IL-10 levels >2.5 pg/mL were associated with lower

cardiac risk during 6-month follow-up (hazard ratio, 0.38; 95% CI, 0.19 to 0.83; P=0.005). CONCLUSIONS: Elevated IL-10 serum levels are associated with a more favorable prognosis in patients with acute coronary syndromes and elevated CRP levels. These data demonstrate the importance of the balance between proinflammatory and antiinflammatory markers as a major determinant of patients' outcome in acute coronary syndromes.

Helle, J., et al. "Development and applications of injectable poly(ortho esters) for pain control and periodontal treatment." *Biomaterials*. 23, no. 22(2002): 4397-404 UI 12219830.

Poly(ortho esters) with a low glass transition temperature are semi-solid materials so that therapeutic agents can be incorporated at room temperature, without the use of solvents, by a simple mixing procedure. When molecular weights are limited to < 5 kDa, such materials are directly injectable using a needle size no larger than 22 gauge. Somewhat hydrophilic polymers can be produced by using the diketene acetal 3,9-diethylidene-2,4,8,10-tetraoxaspiro[5.5]undecane and triethylene glycol (TEG), while hydrophobic materials can be produced by using the diketene acetal and 1,10-decanediol. Molecular weight can be reproducibly controlled by using an excess of the diol, or by use of an alcohol that acts as a chain-stopper. Erosion rates can be controlled by varying the amount of latent acid incorporated into the polymer backbone. Toxicology studies using the TEG polymer have been completed and have shown that the polymer is non-toxic. Toxicology studies using the decanediol polymer are underway. Development studies using the TEG polymer aimed at providing a sustained delivery of an analgesic agent to control post-surgical pain are under development and human clinical trials using the decanediol polymer for the treatment of periodontitis are also underway.

Hewitt, D. J. "N-methyl-D-aspartate- enhanced analgesia." *Current Pain & Headache Reports*. 7, no. 1(2003): 43-7 UI 12525270.

A greater understanding of the mechanisms that produce chronic pain states has led to a search for novel agents with the potential to produce analgesia by directly modulating specific processes involved in the transduction, transmission, modulation, perception, and encoding of pain. It is hoped that compounds directed at these specific targets will produce better analgesics with an improved side-effect profile. The N-methyl-D-aspartate receptor has been shown to play an important role in pain modulation and has become a target for potential analgesic compounds. Antagonists to the N-methyl-D-aspartate receptor were antinociceptive in a number of animal models, and analgesic in experimental pain models in healthy subjects and in chronic neuropathic pain syndromes. In addition, these compounds have demonstrated the ability to prevent the development of tolerance to opioid analgesic therapy. This has led to investigations of therapies that combine an opioid agonist with an N-methyl-D-aspartate receptor antagonist. [References: 30]

Hilzenrat, N., et al. "Does insertion of a rectal tube after colonoscopy reduce patient discomfort and improve satisfaction?" *Gastrointestinal Endoscopy*. 57, no. 1(2003): 54-7 UI 12518131.

BACKGROUND: Distention of the colon is a major contributor to patient discomfort after colonoscopy. Some physicians and nurses believe insertion of a rectal tube relieves this discomfort and improves patient satisfaction with the procedure. This prospective, randomized, controlled trial assessed rectal tube insertion for reduction or prevention of abdominal bloating and discomfort after colonoscopy. METHODS: One hundred fifty-seven patients were prospectively randomized to groups with (n = 68) and without (n = 89) rectal tube insertion after colonoscopy. Patients were evaluated for bloating, discomfort, and pain before the procedure, at its conclusion, at discharge, and 24 hours later (by telephone). Satisfaction was also assessed at discharge and 24 hours later. RESULTS: There were no differences between groups with respect to age, gender, hospitalization status, comorbidity, or socioeconomic status. In both groups the cecum was reached in 90% of patients and procedure time was similar. There were no differences between the groups in abdominal bloating (patient and nurse assessment), abdominal discomfort, or satisfaction at any time point. There were no serious complications. The subgroup of patients who experienced more severe pain and discomfort, regardless of whether a rectal tube was inserted, was characterized by more complaints of bloating, more incomplete procedures, and a higher rate of previous abdominal operations. CONCLUSIONS: Insertion of a rectal tube after colonoscopy does not affect abdominal bloating, pain, or discomfort during

recovery from the procedure or over the subsequent 24 hours, nor does it affect overall patient satisfaction.

Hodgins, M. J. "Interpreting the meaning of pain severity scores." *Pain Research & Management*. 7, no. 4(2002): 192-8 UI 12518176.

Poor pain management practices are generally discussed in terms of barriers associated with the patient, clinician and/or health care organization. The impact of deficiencies in the tools that are used to measure pain are seldom addressed. Three factors are discussed that complicate the measurement of pain: the nature of pain, the lack of meaning associated with scores generated by pain scales, and treatment goals that lack specificity and are not linked to patients' pain scores. The major premise presented in the present article is that the utility of pain measurement is limited because health care professionals do not have a common understanding of the meaning of scores generated by pain measurement tools, especially within the acute care setting. To address this issue, approaches to establishing instrument validity need to be broadened to include the examination of the meaning and consequences of these measurements within a specific context. Substantive improvements in pain management are unlikely to occur until criteria are identified to link explicitly the scores generated by pain measurement tools to treatment goals. [References: 59]

Ilfeld, B. M., et al. "Continuous interscalene brachial plexus block for postoperative pain control at home: a randomized, double-blinded, placebo-controlled study." *Anesthesia & Analgesia*. 96, no. 4(2003): 1089-95, table of contents UI 12651666.

In this study, we investigated the efficacy of patient-controlled regional analgesia for outpatients undergoing moderately painful orthopedic surgery of the shoulder. Preoperatively, patients (n = 20) received an interscalene nerve block and perineural catheter. Postoperatively, patients were discharged home with both oral opioids and a portable infusion pump delivering either 0.2% ropivacaine or 0.9% saline, determined randomly in a double-blinded manner. Daily end points included pain scores, opioid use and side effects, sleep quality, and technique complications. Ropivacaine (n = 10) infusion significantly reduced pain compared with saline (n = 10) infusion. The average pain at rest (scale: 0-10) on postoperative day 1 (median, 25th-75th percentiles) was 4.8 (4.0-5.0) for the saline group, versus 0.0 (0.0-2.0) for the ropivacaine group (P < 0.001). Oral opioid use and related side effects were also significantly decreased in the ropivacaine group. On postoperative day 1, median tablet consumption was 8.0 (6.5-9.5) and 0.5 (0.0-1.0) for the saline and ropivacaine groups, respectively (P < 0.001). Sleep disturbance scores were nearly threefold greater on the first postoperative night for patients receiving saline (P = 0.013). We conclude that after moderately painful orthopedic surgery of the shoulder, ropivacaine infusion using a portable infusion pump and an interscalene perineural catheter at home decreased pain, opioid use and related side effects, and sleep disturbances. IMPLICATIONS: This randomized, double-blinded, placebo-controlled study demonstrated that ropivacaine, infused with a portable infusion pump via an interscalene perineural catheter for 3 days at home, significantly decreased postoperative pain after orthopedic surgery of the shoulder. In addition to providing potent analgesia and increasing patient satisfaction, perineural infusion decreased opioid requirements and their associated side effects.

Iskandar, H., et al. "Femoral block provides superior analgesia compared with intra-articular ropivacaine after anterior cruciate ligament reconstruction." *Regional Anesthesia & Pain Medicine*. 28, no. 1(2003): 29-32 UI 12567340.

BACKGROUND AND OBJECTIVES: Arthroscopic anterior cruciate ligament (ACL) reconstruction of the knee is a painful procedure requiring intensive postoperative pain management. This prospective study investigates analgesic quality after a femoral block as compared with intra-articular injection of local anesthetic. **METHODS:** Eighty patients scheduled for elective ACL repair under general anesthesia were included in our study. Upon completion of surgery, the patients were randomly assigned into 1 of 2 groups: femoral group (n = 40) received a femoral block with 20 mL 1% ropivacaine; intra-articular group (n = 40) received 20 mL 1% ropivacaine injected intra-articularly. During the first 24 hours after surgery, all patients received 2 g propacetamol and 100 mg ketoprofen, intravenously. Additional postoperative analgesia was available with parenteral morphine if required. Analgesic duration was defined as the time from end of surgery to the first requirement for a supplemental analgesic. Data collection included

patient demographics, visual analog scale (VAS) scores, analgesic duration, and morphine use. Analysis of variance (ANOVA) test was used to compare the 2 groups. RESULTS: VAS score in the recovery room and during rehabilitation was higher in the intra-articular group than in the femoral group ($P < .001$). Morphine use was lower in the femoral group than in the intra-articular group ($P < .001$). Similarly, analgesic duration was longer in the femoral group than the intra-articular group ($P < .0001$). CONCLUSIONS: Compared with intra-articular injection of local anesthetic, femoral nerve block (FNB) provides better analgesia and allows a significant morphine-sparing effect after ACL repair.

Johnson, L. "Effective pain management of post-herpetic neuralgia." *Nursing Times*. 99, no. 10(2003): 32-4 UI 12677936.

Post-herpetic neuralgia is a severe type of pain that can have a devastating impact on a patient's quality of life. Successful management requires early recognition and treatment with appropriate drugs, topical agents, non-pharmacological treatments, and psychological support. [References: 16]

Kakumoto, M., et al. "MDR1-mediated interaction of digoxin with antiarrhythmic or antianginal drugs." *Biological & Pharmaceutical Bulletin*. 25, no. 12(2002): 1604-7 UI 12499648.

The multidrug transporter, MDR1-mediated interaction of digoxin with antiarrhythmic or antianginal drugs was examined in vitro by using the MDR1-overexpressing LLC-GA5-COL150 cells, which were established by transfection with human MDR1 cDNA into porcine kidney epithelial LLC-PK(1) cells. Amiodarone, its active metabolite monodesethyl-amiodarone (DEA), and quinidine markedly inhibited the basal-to-apical transport (renal secretion) of [(3)H]digoxin and increased the apical-to-basal transport (reabsorption), but cibenzoline and lidocaine showed slight inhibition of the transport, and disopyramide and mexiletin had no such effects. The IC(50) values for amiodarone, DEA and quinidine on [(3)H]digoxin transport in LLC-GA5-COL150 cells were 5.48 microM, 1.27 microM and 9.52 microM, respectively. These were comparable to, or only several times the achievable concentration in clinical use, suggesting that MDR1 could be responsible for the drug interaction between digoxin and amiodarone found in clinical reports and that DEA contributes the elevation of digoxin serum concentration. Similarly, dipyridamole altered the transport, but isosorbide showed only slight modification of the transport. The IC(50) value for dipyridamole was 40.0 microM, also only several times the achievable concentration in clinical use, indicating a risk of interaction.

Kedlaya, D., L. Reynolds, and S. Waldman. "Epidural and intrathecal analgesia for cancer pain." *Best Practice & Research. Clinical Anaesthesiology*. 16, no. 4(2002): 651-65 UI 12516896.

The three-step analgesic ladder approach developed by the World Health Organization works well in treating the vast majority (70-90%) of patients suffering from pain related to cancer. In those patients who do not get pain relief by this three-step approach, intraspinal agents can be a fourth step in managing pain of malignant origin. Although morphine is the only opioid approved by the US Food and Drug Administration for intraspinal use, many different opioid analgesics are used intraspinally, including hydromorphone, fentanyl, sufentanil, meperidine and methadone in the treatment of cancer pain. Many non-opioid agents have also been used intraspinally either alone or in combination with opioids in the treatment of intractable cancer pain. This chapter summarizes the clinical use of these agents with some practical points. [References: 83]

Kim, D. J., Y. H. Yun, and J. M. Wang. "Nerve-root injections for the relief of pain in patients with osteoporotic vertebral fractures." *Journal of Bone & Joint Surgery - British Volume*. 85, no. 2(2003): 250-3 UI 12678362.

We have studied 58 patients with pain from osteoporotic vertebral fractures which did not respond to conservative treatment. These were 53 women and five men with a mean age of 72.5 years. They received a nerve-root injection with lidocaine, bupivacaine and DepoMedrol. The mean follow-up period was 13.5 months. The mean pain scores before treatment, at one and six months after treatment and at the final follow-up were 85, 24.9, 14.1, and 17.4, respectively. According to our modified criteria for grading results, six patients were considered to have an excellent result, 42 good and ten fair. A newly developed compression fracture was noted in three patients. There were no complications related to the injection. Our study suggests that nerve-root injections are effective in reducing pain in patients with osteoporotic vertebral fractures and that

these patients should be considered for this treatment before percutaneous vertebroplasty or operative intervention is attempted.

Klein, W. W., G. Jackson, and L. Tavazzi. "Efficacy of monotherapy compared with combined antianginal drugs in the treatment of chronic stable angina pectoris: a meta-analysis." *Coronary Artery Disease*. 13, no. 8(2002): 427-36 UI 12544718.

OBJECTIVE: To determine the relative efficacy of antianginal drugs administered as monotherapy or in combination in patients with chronic stable angina. METHODS: A meta-analysis was performed on randomized trials, published in English between 1980 and 1999, that directly compared combined treatment and monotherapy. Twenty-two articles were included, all on the comparison of β -blocker monotherapies to their combination with a calcium antagonist and 10 on the comparison of calcium antagonist monotherapies to their combination with a β -blocker. RESULTS: Time to 1 mm ST-segment depression, total exercise duration and time to onset of anginal pain were significantly increased with the combined therapy compared to β -blocker alone (by 8, 5 and 12%, respectively). Only time to 1 mm ST-segment depression was significantly increased with the combined therapy compared to calcium antagonist alone (by 9%). For all these parameters, the adjusted differences were significant only within 6 h following drug intake and were not significant after 6 h. No analysis of safety data could be performed. CONCLUSION: As far as exercise testing is concerned, the combination of a calcium antagonist and a β -blocker is statistically more effective than either monotherapy. Further studies are needed to confirm the higher efficacy after the first 6 h following drug intake. [References: 46]

Kober, A., et al. "The influence of local active warming on pain relief of patients with cholelithiasis during rescue transport." *Anesthesia & Analgesia*. 96, no. 5(2003): 1447-52, table of contents UI 12707148.

Upper abdominal pain, a frequent symptom of the presence of gallstone disease, is the cause of 6% of the emergency calls of the Austrian emergency system. Pain resulting from cholelithiasis is characteristically severe. Recent data show that active warming during emergency transport of trauma victims is effective in reducing pain. Therefore, we hypothesized that local active warming of the abdomen would be an effective pain treatment for patients with acute cholelithiasis and could be provided by paramedics. Sixty patients (>19 yr) consented to participate in this study. They were divided into two groups: Group 1, who received active warming of the upper abdomen with a carbon-fiber warming blanket (42 degrees C), and Group 2, who received no warming of the abdomen. Neither group received any drug-based pain care. Patients were asked to rate their pain and anxiety by using visual analog scales (VAS). Statistical evaluation was performed with Student's t-test; $P < 0.05$ was considered significant. In Group 1, a significant ($P < 0.01$) pain reduction was recorded in all cases on a visual analog scale (VAS), from 86.8 +/- 5.5 mm to 41.2 +/- 16.2 mm. In Group 2, the patients' pain scores remained comparable, from 88.3 +/- 9.9 mm to 88.1 +/- 10.0 mm on a VAS. In comparing Group 1 with Group 2 on arrival at the hospital, pain scores showed a significant difference ($P < 0.01$). In Group 1, the VAS score changes for anxiety were significantly reduced ($P < 0.01$), from 82.7 +/- 10.8 mm before treatment to 39.0 +/- 14.0 mm after treatment. In Group 2, a nonsignificant change of this score was noted, from 84.5 +/- 14.6 mm to 83.5 +/- 8.4 mm. Comparing Group 1 with Group 2 on arrival at the hospital showed a significant difference in anxiety scores ($P < 0.01$). We conclude that local active warming is an effective and easy-to-learn treatment for pain resulting from acute cholelithiasis in emergency care. IMPLICATIONS: Active local warming of the upper abdomen is an effective treatment for patients with cholelithiasis being transported to the hospital by paramedics who are not permitted to provide any drug-based pain care. We observed no negative side effects of this treatment.

Krames, E. "Implantable devices for pain control: spinal cord stimulation and intrathecal therapies." *Best Practice & Research. Clinical Anaesthesiology*. 16, no. 4(2002): 619-49 UI 12516895.

Untreated chronic pain is costly to society and to the individual suffering from it. The treatment of chronic pain, a multidimensional disease, should rely on the expertise of varying health care providers and should focus not only on the neurobiological mechanisms of the process but also on the psychosocial aspects of the disease. Implantable devices are costly and invasive, and such efficacious therapies should be used only when more conservative and less costly therapies have failed to provide relief of pain and suffering. Spinal cord stimulation provides

neuromodulation of neuropathic, but not nociceptive, pain signals and when used for appropriate indications in the right individuals provides approximately 60-80% long-term pain relief in 60-80% of patients trialled for efficacy. Intrathecal therapies with opioids such as morphine, fentanyl, sufentanil or meperidine--or non-opioids such as clonidine or bupivacaine--provide analgesia in patients with nociceptive or neuropathic pain syndromes. Baclofen, intrathecally, provides profound relief of muscle spasticity due to multiple sclerosis, spinal cord injuries, brain injuries or cerebral palsy. [References: 134]

Kwekkeboom, K. L. "Music versus distraction for procedural pain and anxiety in patients with cancer." *Oncology Nursing Forum. Online*. 30, no. 3(2003): 433-40 UI 12719743.

PURPOSE/OBJECTIVES: To test the hypotheses that the effects of a music intervention are greater than those of simple distraction and that either intervention is better at controlling procedural pain and anxiety than treatment as usual. DESIGN: Randomized, controlled experiment. SETTING: A midwestern comprehensive cancer center. SAMPLE: 60 people with cancer having noxious medical procedures such as tissue biopsy or port placement or removal; 58 provided usable data. METHODS: Participants completed measures of pain and anxiety before and after their medical procedures and provided a rating of perceived control over pain and anxiety after the procedure. MAIN RESEARCH VARIABLES: Procedural pain, state anxiety, and perceived control over pain and anxiety. FINDINGS: Contrary to hypotheses, outcomes achieved with music did not differ from those achieved with simple distraction. Moreover, outcomes achieved under treatment as usual were not significantly different from those obtained with music or distraction interventions. Some patients found that the interventions were bothersome and reported that they wanted to attend to the activities of the surgeon and the medical procedure itself. CONCLUSIONS: The effects of music, distraction, and treatment as usual are equivocal. In addition, patients have individual preferences for use of distraction during painful or anxiety-provoking procedures. IMPLICATIONS FOR NURSING: Patients having noxious medical procedures should be asked about their desire to be distracted before and during the procedure and offered a strategy that is consistent with their preferences.

Lacerte, M., and R. V. Shah. "Interventions in chronic pain management. 1. Pain concepts, assessment, and medicolegal issues." *Archives of Physical Medicine & Rehabilitation*. 84, no. 3 Suppl 1(2003): S35-8 UI 12708556.

This self-directed learning module highlights the concepts of pain and suffering, and chronic pain management from basic science and medicolegal perspectives. It is part of the study guide on chronic pain management in the Self-Directed Physiatric Education Program for practitioners and trainees in physical medicine and rehabilitation. This article specifically focuses on explaining the concepts of pain and suffering as an expert witness, the causes and mechanisms of pain, and qualifying as an expert witness. The article also discusses chronic pain management OVERALL ARTICLE OBJECTIVE: To summarize the concepts of pain and suffering in a medicolegal context. [References: 22]

Lang, A. M. "Botulinum toxin type A therapy in chronic pain disorders." *Archives of Physical Medicine & Rehabilitation*. 84, no. 3 Suppl 1(2003): S69-73; quiz S74-5 UI 12708561.

This self-directed learning module highlights that the underlying problem in many types of muscle pain disorders is a distortion of critical structures that causes functional deficits and pain. An objective of treatment is to reverse this distortion, enabling repair of damaged tissues and strengthening of weakened muscles. Administering botulinum toxin type A (BTX-A; Botox) to reduce muscle tone and overactivity warrants consideration as part of an overall treatment approach that includes physical therapy to help restore normal muscle length and biomechanical balance to improve the prospect of ensuring long-term relief from associated pain. This article specifically focuses on pertinent review articles, results of controlled and open-trial data, and case reports to assess the role of BTX-A treatment in chronic pain disorders. OVERALL LEARNING OBJECTIVE: To review the clinical trial data of the safety and efficacy of BTX-A for the treatment of chronic pain syndromes associated with muscle disorders. [References: 47]

Linton, S. J., and K. Boersma. "Early identification of patients at risk of developing a persistent back problem: the predictive validity of the Orebro Musculoskeletal Pain Questionnaire." *Clinical Journal of Pain*. 19, no. 2(2003): 80-6 UI 12616177.

OBJECTIVE: To test the predictive utility of the Orebro Musculoskeletal Pain Screening Questionnaire in identifying patients at risk for developing persistent back pain problems. **DESIGN:** Prospective, where participants completed the questionnaire and their cases were followed for 6 months to assess outcome with regard to pain, function, and absenteeism due to sickness. **PARTICIPANTS:** One hundred seven patients, recruited from seven primary care units. **RESULTS:** Discriminant analyses showed that the items on the questionnaire were significantly related to future problems. For absenteeism due to sickness, 68% of the patients were correctly classified into one of three groups, whereas an even distribution would have produced 33%. The analyses for function correctly classified 81%, and for pain 71%, into one of two groups, compared with a chance level of 50%. A total score analysis demonstrated that a cutoff score of 90 points had a sensitivity of 89% and a specificity of 65% for absenteeism due to sickness, and a sensitivity of 74% and a specificity of 79% for functional ability. **CONCLUSIONS:** The results underscore that psychological variables are related to outcome 6 months later, and they replicate and extend earlier findings indicating that the Orebro Screening Questionnaire is a clinically reliable and valid instrument. The total score was a relatively good predictor of future absenteeism due to sickness as well as function, but not of pain. The results suggest that the instrument could be of value in isolating patients in need of early interventions and may promote the use of appropriate interventions for patients with psychological risk factors.

Lipton, R. B., et al. "Why headache treatment fails." *Neurology*. 60, no. 7(2003): 1064-70 UI 12682307.

Management of headache disorders, a leading reason for neurologic outpatient visits, is often difficult. In this article, the authors summarize and categorize the common reasons for treatment failure leading to referral to subspecialty headache centers. They have grouped these treatment failures into five broad categories: 1) the diagnosis is incomplete or incorrect; 2) important exacerbating factors have been missed; 3) pharmacotherapy has been inadequate; 4) nonpharmacologic treatment has been inadequate; 5) other factors, including unrealistic expectations and comorbidity, exist. The authors present an orderly approach to treatment failure to assist neurologists in managing difficult patients. Most refractory headache patients have a biologically determined problem and can be helped by accurate diagnosis or effective treatment. Persistence in treating these patients can be very rewarding. The authors provide a checklist intended to facilitate the management of refractory patients. [References: 72]

Liukkonen, K., et al. "Peroral tramadol premedication increases postoperative nausea and delays home-readiness in day-case knee arthroscopy patients." *Scandinavian Journal of Surgery: SJS*. 91, no. 4(2002): 365-8 UI 12558088.

BACKGROUND AND AIMS: To evaluate the effect of preoperative oral tramadol on postoperative pain and its effect on the patient's home-readiness after diagnostic day-case knee arthroscopy performed under spinal anaesthesia. **MATERIAL AND METHODS:** We studied 156 outpatients in a prospective, randomized, double-blind fashion to examine the postoperative analgesic effect of preoperative oral slow-release tramadol. Postoperative pain was measured using a 100-mm visual analogue scale (VAS). Postoperative nausea and vomiting (PONV) and the patients home-readiness were assessed. **RESULTS:** There were no statistically significant differences in the postoperative VAS scores between the tramadol and placebo groups, nor was there any significant difference in the need for postoperative pain medication. Patients in the tramadol group had higher incidence of PONV and they were discharged from hospital later than those given placebo although the tramadol patients required less intravenous midazolam for sedation. **CONCLUSIONS:** Preoperatively given slow-release tramadol is ineffective for reduction of postoperative pain after day-case arthroscopy of the knee. Additionally, preoperative tramadol is associated with higher incidence of PONV and it seems to cause delay in the patient's home-readiness.

Lord, S. M., and N. Bogduk. "Radiofrequency procedures in chronic pain." *Best Practice & Research. Clinical Anaesthesiology*. 16, no. 4(2002): 597-617 UI 12516894.

Radiofrequency current is simply a tool used for creating discrete thermal lesions in neural pathways in order to interrupt transmission. In pain medicine, radiofrequency lesions have been used to interrupt nociceptive pathways at various sites. This is a palliative treatment not without complications, so its use should be limited to those patients with cancer pain or chronic non-

cancer pain for whom conservative non-surgical therapies have been ineffective or intolerable. With the development of alternatives such as intrathecal opioid infusion and neuromodulation technologies, the number of patients considered for neuroablative therapy may dwindle. Nevertheless, there is evidence that radiofrequency neurotomy has an important role in the management of trigeminal neuralgia, nerve root avulsion and spinal pain. In this chapter the evidence for efficacy and safety is reviewed and interrogated with special emphasis on the available randomized controlled trials and systematic review. [References: 99]

Madan, S. S., J. M. Harley, and N. R. Boeree. "Circumferential and posterolateral fusion for lumbar disc disease." *Clinical Orthopaedics & Related Research.*, no. 409(2003): 114-23 UI 12671493.

Clinical outcome of low back fusion is unpredictable. There are various reports discussing the merits and clinical outcome of these two procedures. The patients were selected from a population of patients who had chronic low back pain unresponsive to conservative treatment. Thirty-six instrumented posterolateral fusions and 35 instrumented circumferential fusions with posterior lumbar interbody fusions were done simultaneously. Preoperative radiographic assessment included plain radiographs, magnetic resonance imaging scans, and provocative discography in all the patients. Posterolateral fusion or anterior lumbar interbody fusion was done for internal disc disruption. The Oswestry disability index, subjective scoring, and assessment of fusion were done at a minimum followup of 2 years. On subjective scoring assessment there was a satisfactory outcome of 63.9% (23 patients) in the posterolateral fusion group and 82.8% (29 patients) in the posterior lumbar interbody fusion group. On assessment by the Oswestry index no difference was found in outcome between the two groups. The posterolateral fusion group had a 63.9% satisfactory outcome and the posterior lumbar interbody fusion group had an 80% satisfactory outcome using the Oswestry disability index for postoperative assessment. There was 61.1% improvement in working ability in the posterolateral fusion group and 77.1% improvement in the posterior lumbar interbody fusion group which was not statistically significant. The authors consider instrumented circumferential fusion with posterior lumbar interbody fusion better than instrumented posterolateral fusion for managing chronic disabling low back pain.

Malach, S., et al. "Sickle cell disease -- when opioids and physicians fail." *General Hospital Psychiatry.* 24, no. 6(2002): 442-7 UI 12490348.

An interview with a 32-year-old male with sickle cell anemia and multiple sequential admissions for vaso-occlusive crises, receiving high dose narcotic analgesics, is presented. The subsequent clinical discussion outlines psychiatric, psychosocial and treatment issues. Management of acute vaso-occlusive crisis is summarized along with a discussion of the value of comprehensive care for sickle cell disease patients. This article will be useful to physicians and consultation-liaison psychiatrists treating patients with sickle cell disease as well as policy makers developing service delivery models for this population.

Malan, T. P., Jr., et al. "Parecoxib sodium, a parenteral cyclooxygenase 2 selective inhibitor, improves morphine analgesia and is opioid-sparing following total hip arthroplasty." *Anesthesiology.* 98, no. 4(2003): 950-6 UI 12657858.

BACKGROUND: This study examined the opioid-sparing effectiveness, analgesic efficacy, and tolerability of postoperative administration of the parenteral cyclooxygenase 2 selective inhibitor, parecoxib sodium, in total hip arthroplasty patients. METHODS: This was a multicenter, multiple-dose, randomized, double-blind, placebo-controlled study to compare the opioid-sparing effects, analgesic efficacy, and tolerability of postoperative 20 and 40 mg intravenous parecoxib sodium with placebo in hip arthroplasty patients. The first dose of study medication was administered after surgery with an intravenous bolus dose of 4 mg morphine when patients first requested pain medication; remedication with the study medication occurred at 12 and 24 h. Subsequent morphine doses (1-2 mg) were administered by patient-controlled analgesia. Efficacy was assessed by total morphine used, pain relief and pain intensity, time to last dose of morphine, and Global Evaluation rating of the study medication. RESULTS: Parecoxib sodium, 20 and 40 mg, reduced the total amount of morphine required over 36 h by 22.1% (56.5 mg morphine) and 40.5% (43.1 mg morphine), respectively, compared with placebo (72.5 mg morphine; $P < 0.01$). Patients receiving 20 and 40 mg parecoxib sodium experienced significantly greater maximum pain relief compared with those in the placebo group ($P < 0.05$). Patients who

received 20 and 40 mg parecoxib sodium discontinued PCA morphine earlier than patients receiving placebo and had significantly higher Global Evaluation ratings. Parecoxib sodium, 40 mg, plus morphine demonstrated a significantly lower incidence of fever and vomiting compared with placebo plus morphine. CONCLUSIONS: Administration of parecoxib sodium with PCA morphine resulted in significantly improved postoperative analgesic management as defined by reduction in opioid requirement, lower pain scores, reduced time on PCA morphine, and higher Global Evaluation ratings.

Marcus, D. A. "Tips for managing chronic pain. Implementing the latest guidelines." *Postgraduate Medicine*. 113, no. 4(2003): 49-50, 55-6, 59-60 passim UI 12718235.

Recently revised guidelines from the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) call for an increased awareness of the impact of chronic pain and recommend that physicians assess and treat pain complaints seriously. Although significant and persistent chronic pain is a common reason for primary care visits, the incidence of psychologic distress and personality disorder in patients with chronic pain often makes this population a difficult one for physicians and staff to treat. This discussion offers practical tips for managing patients with chronic pain and reducing staff burnout. The author also dispels various myths about chronic pain and focuses on the effective management of its comorbidities. [References: 16]

Mateos-Careres, P. J., et al. "Prior aspirin use in unstable angina patients with modified plasma inflammatory markers and endothelial nitric oxide synthase in neutrophils." *European Journal of Clinical Investigation*. 32, no. 12(2002): 895-900 UI 12534448.

BACKGROUND: Prior use of aspirin in patients with acute coronary syndrome has been associated with a lower incidence of acute myocardial infarction. The aim of this study was to explore if prior aspirin therapy in unstable angina (UA) patients could modify systemic inflammatory markers such as interleukin-6 (IL-6), tumour necrosis factor-alpha (TNF-alpha) and intercellular adhesion molecule-1 (ICAM-1) and the expression of endothelial nitric oxide synthase (eNOS) in neutrophils. MATERIALS AND METHODS: Unstable angina was defined as transient S-T segment changes without significant increases in CK and CK-MB. We studied 50 consecutive patients admitted to hospital within 24 h after the onset of chest pain. The number of patients with prior aspirin was significantly higher (n = 32) than those not taking aspirin (n = 18) on admission. RESULTS: Plasma levels of IL-6 and ICAM-1 were significantly increased in the UA patients when compared with the healthy control volunteers (n = 20) used as a reference for normal values. Plasma levels of both IL-6 and ICAM-1 were reduced in patients taking aspirin. There were no differences in the plasma levels of TNF-alpha between the UA patients and the control volunteers. The eNOS protein expression was also higher in neutrophils from the UA patients taking aspirin than in those not taking aspirin. CONCLUSION: Patients taking aspirin before UA showed a lower systemic inflammatory response and higher eNOS protein expression in their neutrophils

McCaffery, M., and C. Pasero. "Breakthrough pain." *AJN, American Journal of Nursing*. 103, no. 4(2003): 83-4, 86 UI 12677130.

McDonnell, A., J. Nicholl, and S. M. Read. "Acute pain teams and the management of postoperative pain: a systematic review and meta-analysis." *Journal of Advanced Nursing*. 41, no. 3(2003): 261-73 UI 12581114.

BACKGROUND: The introduction of acute pain teams (APTs) in every hospital performing surgery in the UK has been recommended in order to reduce postoperative pain. However, recent evidence suggests that many APTs are under-resourced. Purchasers may be more prepared to invest in these services if they are persuaded that they result in measurable improvements in patient outcomes. AIM: A systematic review of the literature and meta-analysis were performed to determine the effectiveness of APTs in improving the quality of analgesia and other postoperative outcomes of adult patients undergoing surgery. METHODS: A broad search strategy using the terms 'pain team' and 'pain service' was adapted for a variety of databases. Key journals were hand-searched and reference lists of selected reports were reviewed. Subject experts and study authors were contacted. Studies describing the impact of the APT/acute pain service (APS) on postoperative pain relief, other postoperative outcomes or the processes of postoperative pain

were included. Study quality was assessed using a multidimensional instrument. A broad qualitative overview of the included studies was conducted. Continuous outcome data for pain in the first 24 hours postoperatively (in one case worst pain at 24-48 hours) were pooled. RESULTS: Fifteen studies were included in the review. There were considerable differences in study design and quality, the nature of the APT and the outcomes measured. Of the nine studies measuring pain, it was possible to present data as Standardized Mean Differences for only four studies. Quantitative synthesis indicates a statistically significant overall estimate of effect using a fixed effects model only. LIMITATIONS: Only published studies in English were included. Study inclusion decisions and data extraction were performed by one reviewer only. CONCLUSION: There is insufficient robust research to assess the impact of APTs on postoperative outcomes of adult patients or on the processes of postoperative pain relief. [References: 33]

McMillan, S. C., and L. E. Moody. "Hospice patient and caregiver congruence in reporting patients' symptom intensity." *Cancer Nursing*. 26, no. 2(2003): 113-8 UI 12660560.

As healthcare increasingly moves out of hospitals, the care of patients with cancer is provided in the community with the help of family caregivers. In many cases, nurses depend on family caregivers to provide assessment data about patients. This makes the accuracy and dependability of the data given by caregivers particularly important. However, it is not clear whether caregivers can accurately and dependably report such subjective data as symptom intensity. The purpose of this project was to evaluate the ability of the primary caregiver to report the symptom intensity of hospice patients with cancer. The sample consisted of 264 newly admitted adult patients with advanced cancer in hospice home care and their primary caregivers. These subjects were part of a large National Institutes of Health (NIH)-funded randomized clinical trial focused on symptom management and quality of life. The patients were alert and oriented. Among the questionnaires completed by both patients and caregivers on admission were numeric rating scales for pain and dyspnea and the Constipation Assessment Scale. All of these scales were designed to describe the patient's symptom intensity. The patient sample was predominantly white (83%) and male (57%), with a mean age of 71.6 years. The caregiver sample was predominantly white (85%) and female (78%), with a mean age of 62 years. The results indicated that caregivers significantly overestimated symptom intensity for all three symptoms ($P = .000$). Furthermore, the limited variance accounted for by the two sets of scores for each of the symptoms ($R^2 = .16-.26$) indicated much more error in the scores than agreement between patient and caregiver. It appears that family caregivers cannot reliably report patient symptom intensity. Healthcare providers need to train family caregivers in conducting systematic assessments instead of assuming that they understand patient symptoms.

McQueen, A. L., and S. A. Baroletti. "Adjuvant ketamine analgesia for the management of cancer pain." *Annals of Pharmacotherapy*. 36, no. 10(2002): 1614-9 UI 12243612.

OBJECTIVE: To review the clinical literature evaluating the utilization of intravenous ketamine for the management of cancer-related pain, to summarize the data that suggest ketamine is an appropriate adjuvant method of providing analgesia and to report a case of successful pain management using ketamine in a patient with recurrent testicular cancer at our institution. DATA SOURCES: Primary literature was identified through a MEDLINE search (1966-March 2002), and additional information was obtained through secondary and tertiary sources. DATA SYNTHESIS: The available data suggest that supplementation of morphine with ketamine improves analgesia in patients with cancer, and also provides insight to the controversy regarding the efficacy and adverse effects of various ketamine doses. At subanesthetic doses, ketamine may be beneficial at reducing opioid requirements and related adverse effects. CASE SUMMARY: A 34-year-old white man with recurrent testicular cancer was admitted with radiating neuropathic pain of the legs and lower back. The patient was suspected to also be experiencing opioid adverse effects; therefore, alternative analgesic options were warranted. Ketamine was successful in reducing patient-reported pain and was also well tolerated. CONCLUSIONS: Ketamine is an adjuvant analgesic for the treatment of cancer-related pain when other agents either fail or are intolerable. Accordingly, there are several factors that may prevent adequate pain control with opioid use; therefore, alternative analgesic options should be considered. Promise exists for ketamine as a contemporary analgesic in the appropriate patient. [References: 32]

Meier, D. E. "When pain and suffering do not require a prognosis: working toward meaningful hospital-hospice partnership." *Journal of Palliative Medicine*. 6, no. 1(2003): 109-15 UI 12710583.

Menten, J., et al. "Longitudinal follow-up of TTS-fentanyl use in patients with cancer-related pain: results of a compassionate-use study with special focus on elderly patients." *Current Medical Research & Opinion*. 18, no. 8(2002): 488-98 UI 12564660.

GOALS OF THE WORK: This open compassionate-use prospective registration study evaluated the tolerability, ease of use and applied doses of transdermal (TTS) fentanyl in adult patients with cancer-related pain requiring strong opioid analgesia. Elderly patients were particularly focussed on. **PATIENTS AND METHODS:** Previous pain medication was converted to an appropriate dose of TTS-fentanyl. Immediate-release morphine rescue medication was allowed as needed for breakthrough pain. Dose adjustments of TTS-fentanyl, rescue morphine requirements, the ease of use and side-effects were assessed monthly, with special emphasis paid to the severity of constipation and the use of laxatives. **MAIN RESULTS:** A total of 663 patients with cancer-related pain, including 8% opioid-naive patients, were enrolled; 661 patients used at least 1 patch of TTS-fentanyl. Of these, 455 subjects were assessed at baseline and at 1 post-baseline visit at least. Individual treatment ranged from a few days to 2 1/2 years; TTS-fentanyl doses ranged from 25 to 950 microg/h. The major reason for study termination was non-drug-related death (61%). Approximately 40% of patients reported constipation. The frequency of constipation depended on the rescue morphine dose used, but no dose-relationship was found for TTS-fentanyl. Patient acceptance of the patches was high; around 85% of patients rated convenience as good to excellent. The ease of use and tolerability of TTS-fentanyl in the elderly patients were comparable to that in the total population, except for a slight increase of non-serious adverse events. **CONCLUSIONS:** TTS-fentanyl can be applied as long-term therapy to patients with cancer-related pain, including the elderly.

Mercadante, S., P. Villari, and P. Ferrera. "Burst ketamine to reverse opioid tolerance in cancer pain." *Journal of Pain & Symptom Management*. 25, no. 4(2003): 302-5 UI 12691680.

Miller, C., K. Lipscomb, and N. Curzen. "Are district general hospital patients with unstable angina at a disadvantage?" *Postgraduate Medical Journal*. 79, no. 928(2003): 93-8 UI 12612324.

OBJECTIVE: To determine whether patients with non-ST elevation acute coronary syndromes requiring coronary angiography and revascularisation have inferior access to these services if admitted to district general hospitals (DGHs) compared with similar patients admitted to a base hospital containing a tertiary cardiac centre. **DESIGN:** Prospective, consecutive monitoring of all patients with acute coronary syndromes accepted by the tertiary cardiac centre for angiography and revascularisation over a three month period (1 April to 30 June 2002). **PARTICIPANTS:** All patients accepted for angiography from DGHs and from within the base hospital with a diagnosis of acute coronary syndromes. **SETTING:** Tertiary cardiac facility (Manchester Heart Centre at Manchester Royal Infirmary (MRI)). **MAIN OUTCOME MEASURE:** Time waited from referral to angiography and revascularisation. **RESULTS:** A total of 184 patients with a diagnosis of non-ST elevation acute coronary syndromes underwent angiography with a view to revascularisation. Of these, 89 (48%) were admitted initially to MRI and 95 (52%) were admitted to a feeder DGH. DGH patients waited significantly longer from admission to angiography than MRI patients (median 13 days (25th-75th percentiles 7-19) v 5 days (3-8) respectively; $p < 0.0005$). DGH patients therefore also waited longer from admission to revascularisation (15 days (6-20) v 6 days (3-9) respectively). Once transferred into the Manchester Heart Centre, DGH patients underwent angiography within a median of 1 day (1-2). More DGH patients than those from MRI underwent both coronary artery bypass grafting (21 (22%) v 8 (9%) respectively; $p = 0.015$) and percutaneous coronary intervention (44 (46%) v 32 (36%) respectively; $p = \text{NS}$). **CONCLUSION:** Patients admitted to feeder DGHs with non-ST elevation acute coronary syndromes wait significantly longer for access to invasive coronary assessment and revascularisation than similar patients admitted in the hospital that incorporates the tertiary cardiac centre. This inequity of access is determined by postcode rather than clinical priority.

Montalescot, G., et al. "Comparison of effects on markers of blood cell activation of enoxaparin, dalteparin, and unfractionated heparin in patients with unstable angina pectoris or non-ST-

segment elevation acute myocardial infarction (the ARMADA study)." *American Journal of Cardiology*. 91, no. 8(2003): 925-30 UI 12686329.

The low-molecular-weight heparins (LMWHs) enoxaparin and dalteparin have shown superior and equivalent efficacy, respectively, over unfractionated heparin (UFH) in patients with unstable angina pectoris (UAP) or non-ST-segment elevation myocardial infarction (NSTEMI). This study aimed to identify markers of blood cell activation that are independent predictors of outcomes at 1 month and to compare the effects of enoxaparin, dalteparin, and UFH on any such markers. In this multicenter, prospective, open-label study, 141 patients with UAP or NSTEMI were randomized to treatment for 48 to 120 hours with enoxaparin (n = 46), dalteparin (n = 48), or UFH (n = 47). Blood samples were taken at the time of randomization and after > or =48 hours of treatment but before catheterization. Multivariate analysis identified increased plasma levels of von Willebrand factor (vWF) and decreased platelet levels of glycoprotein Ib/IX complexes as independent predictors of 1-month adverse outcome (a composite of death, myocardial infarction, and recurrent ischemia). vWF release was strongly related to and may have been released by inflammation as measured by C-reactive protein. Both LMWHs reduced the release of vWF in plasma (as well as C-reactive protein) compared with UFH. Enoxaparin had a more favorable effect on glycoprotein Ib/IX complexes than either dalteparin or UFH. The incidence of the composite clinical efficacy end point was: 13% (enoxaparin), 19% (dalteparin), and 28% (UFH). vWF and its receptor glycoprotein Ib/IX play a key role in acute coronary syndromes. vWF is linked to inflammation and, like glycoprotein Ib/IX, is affected more favorably by the LMWHs than by UFH.

Monteforte, P., and G. Rovetta. "Changes in size of periartthritis calcifications in patients with painful shoulder treated with injectable disodium-clodronate." *International Journal of Clinical Pharmacology Research*. 22, no. 1(2002): 7-12 UI 12395913.

Calcific periarticular disease is characterized by the deposition of calcium phosphate crystals in many tendons and particularly in the rotator cuff tendons. Calcifications of any size may be accompanied by painful shoulder syndrome and tendon tears. Ecographic assessment of changes in the size of calcifications may be a marker of tissue changes in evolving shoulder periarthropathies. The aim of this study was to compare variations in pain and ultrasound dimensions in the calcifications in the tendons of the rotator cuff in patients treated with disodium-clodronate compared with those treated with paracetamol and nimesulide. In all groups, pain reduction occurred over a 6-month period, but was significantly greater in patients administered disodium-clodronate than in those administered nimesulide or paracetamol. A significant reduction in the size of calcifications was also observed in all three groups, but this reduction was more marked in the disodium-clodronate group.

Morita, T., et al. "Similarity and difference among standard medical care, palliative sedation therapy, and euthanasia: a multidimensional scaling analysis on physicians' and the general population's opinions." *Journal of Pain & Symptom Management*. 25, no. 4(2003): 357-62 UI 12691687.

There is a strong controversy about the differences among standard medical care, palliative sedation therapy, and euthanasia in recent medical literature. To investigate the similarities and differences among these medical treatments, a secondary analysis of two previous surveys was performed. In those surveys, Japanese physicians and the general population were asked to identify their treatment recommendations or preferences for intolerable and refractory distress in the terminal stage. The options were standard medical care without intentional sedation, mild sedation, intermittent deep sedation, continuous deep sedation, and physician-assisted suicide (PAS)/euthanasia. Multidimensional scaling analysis mapped their responses. The physician responses were clustered into 3 groups: 1) standard medical care, 2) palliative sedation therapy including mild, intermittent deep, continuous deep sedation, and 3) PAS/euthanasia. The general population's responses were classified into 3 subgroups: 1) standard medical care, 2) mild and intermittent deep sedation, and 3) a group including continuous deep sedation and PAS/euthanasia. Physicians placed continuous deep sedation closer to mild and intermittent sedation, while the general population mapped it closer to PAS/euthanasia. In conclusion, physicians and general population can generally differentiate the three approaches—standard medical care, palliative sedation therapy, and PAS/euthanasia. We recommend that mild and intermittent deep sedation should be differentiated from standard medical care, and that

continuous deep sedation should be dealt with separately from other types of sedation. Clear definitions of palliative sedation therapy will contribute to quality discussion.

Morita, T., Y. Tei, and S. Inoue. "Correlation of the dose of midazolam for symptom control with administration periods: the possibility of tolerance." *Journal of Pain & Symptom Management*. 25, no. 4(2003): 369-75 UI 12691689.

Although tolerance to midazolam is sometimes described in the palliative care literature, no studies have systemically examined the possibility. To explore the association between midazolam dose for symptom palliation and the administration period, a retrospective study was performed on 62 terminally ill cancer patients who required parenteral midazolam in the final three days of life. The mean maximum dose and administration period of midazolam were 38 +/- 45 mg/day (median = 24) and 10 +/- 19 days (median = 2.5), respectively. Thirteen patients (21%) received midazolam at a dose of 60 mg/day or more, and 13 patients (21%) received it for 14 days or longer. The maximum doses were significantly correlated with patient age ($\rho = -0.32$, $P = 0.012$) and the administration period ($\rho = 0.47$, $P < 0.01$); and were significantly higher in patients who received midazolam for 14 days or longer (74 +/- 63 mg/day vs. 28 +/- 34 mg/day, $P < 0.01$). Multivariate analyses revealed that younger age ($< \text{or } = 70$) and longer administration periods ($> \text{or } = 14$ days) were independent determinants for a midazolam requirement of 60 mg/day or more (odds ratios [95% C.I.] = 0.091 [0.009 - 0.92], $P = 0.042$; 11 [2.3 - 54], $P < 0.01$; respectively). The significant correlation of midazolam doses with administration period suggests that the longer use of midazolam can result in the development of tolerance. This finding suggests that midazolam should be reserved for patients with limited prognoses.

Moskowitz, R. W., et al. "American pain society pain questionnaire and other pain measures in the assessment of osteoarthritis pain: a pooled analysis of three celecoxib pivotal studies." *American Journal of Therapeutics*. 10, no. 1(2003): 12-20 UI 12522515.

The aim of this study was to evaluate the utility of the American Pain Society (APS) questionnaire in the assessment of osteoarthritis (OA) pain and to determine the onset of action of celecoxib in the treatment of acute flare pain in patients with OA of the knee or hip. Pooled data from three pivotal, randomized, double-blind, placebo-controlled, 12-week trials of patients with OA who exhibited a flare of disease activity after withdrawal of nonsteroidal anti-inflammatory drug or analgesic therapy were evaluated. Patients completed the APS Pain Measure Questionnaire, which evaluates pain intensity and quality of life, at baseline and daily for the first 7 days of therapy. In addition, patients underwent a range of standard OA assessments to evaluate the analgesic efficacy of celecoxib up to 12 weeks. Three thousand two hundred fifty-eight patients were enrolled in the three studies, of whom 2041 completed the APS questionnaire (1010 received celecoxib, 513 received naproxen, and 518 received placebo). Within the first 24 hours, celecoxib at a dose of 200 or 400 mg/d significantly reduced the amount of acute pain experienced compared with placebo for four of the five measures, and statistical significance for the remaining parameter, "pain in the last 24 hours," was achieved on day 2. Celecoxib at a dose of 200 to 400 mg/d provided similar efficacy to naproxen at a dose of 1000 mg/d. The pain relief observed with celecoxib was maintained for the APS evaluation period. Long-term efficacy assessments showed the efficacy of 200 mg/d of celecoxib to be continuous and maintained for at least the 12 weeks of the study and that it was equivalent to 400 mg/d of celecoxib and 1000 mg/d of naproxen. This study demonstrates that the APS questionnaire is a useful measure of pain and therapeutic response in OA. Celecoxib furthermore seems to be an effective acute and chronic analgesic in OA.

Neal, J. M., et al. "Suprascapular nerve block prolongs analgesia after nonarthroscopic shoulder surgery but does not improve outcome." *Anesthesia & Analgesia*. 96, no. 4(2003): 982-6, table of contents UI 12651646.

Suprascapular nerve block (SSNB) reportedly improves analgesia and 24-h outcomes after arthroscopic shoulder surgery performed under general anesthesia. In this study, we assessed the analgesic and clinical outcome efficacy of SSNB as an adjunct to interscalene brachial plexus block (ISB) for ambulatory nonarthroscopic shoulder surgery. Fifty patients were randomized to receive either a SSNB or sham injection as part of a standardized ISB-general anesthesia regimen. Time to first significant pain (the primary outcome measure) was significantly delayed in

the SSNB group (594 +/- 369 min versus 375 +/- 273 min, respectively; P = 0.02). There were no other differences between groups with regard to postanesthesia recovery unit measures, 24-h assessment of pain, supplemental analgesic use, or quality of life outcomes. We conclude that adjunctive SSNB adds minimal value to a primary ISB anesthetic for nonarthroscopic shoulder surgery. IMPLICATIONS: When used as an adjunct to an interscalene block combined with general anesthesia, suprascapular nerve block with bupivacaine moderately prolongs analgesia without improving other outcome measures after ambulatory nonarthroscopic shoulder surgery.

Nepp, J., et al. "Is acupuncture an useful tool for pain-treatment in ophthalmology?" *Acupuncture & Electro-Therapeutics Research*. 27, no. 3-4(2002): 171-82 UI 12638737.

Pain that does not respond to conventional treatment procedures makes it necessary to look for alternative methods. Acupuncture is an ancient procedure with empirical effects on pain. Previous studies established the increased output of messengers at neuronal junctions in spinal cord and hypothalamic locations, especially of endorphins which inhibit the perception of pain. We treated several painful symptoms with acupuncture and evaluated the outcome of the treatment. Patients with various kinds of therapy-refractory pain and patients in whom conventional treatment methods could not be applied were included in the study. The diagnoses included glaucoma, Tolosa-Hunt-Syndrome, ophthalmic migraine, blepharospasm, and dry eyes. In one case acupuncture was used for analgesia during surgery. Acupuncture was performed with sterile disposable needles, at points known to have an empirical analgesic effect. The stimulation was adapted to the patient's individual needs. VAS assessments before and after acupuncture were compared. The t-test was used for statistical evaluation. Acupuncture had no side effects, but reduced pain to a variable extent. Especially in cases of severe pain and in surgery, very effective pain reduction was achieved. In general, pain was significantly reduced in all patients by the use of acupuncture. A statistically significant effect was noted ($p < 0.05$). Further studies should be conducted to demonstrate the specific effect in larger patient populations. Monitoring neurotransmitter activity will possibly help to illustrate the effect.

Nicholson, B. "Responsible prescribing of opioids for the management of chronic pain." *Drugs*. 63, no. 1(2003): 17-32 UI 12487620.

The management of patients with chronic pain is a common clinical challenge. Indeed, chronic pain is often inadequately controlled in patients with cancer and in those with non-cancer chronic pain. Because of the complex nature of chronic pain, successful long-term treatment is more difficult than for acute pain. Most often acute pain is nociceptive, whereas chronic pain can be nociceptive (i.e., in response to noxious stimuli), neuropathic (i.e., initiated by a primary lesion or dysfunction in the nervous system) or mixed in origin. Opioids are the current standard of care for the treatment of moderate or severe nociceptive pain. Opioids mediate their actions by binding and activating receptors both in the peripheral nervous system and those that are found in inhibitory pain circuits that descend from the midbrain to the spinal cord dorsal horn. Opioid agonists exert a number of physiological responses including analgesia, which increases with increasing doses. The use of opioids to manage pain in patients with cancer is well accepted. The WHO step-wise algorithm for analgesic therapy based on pain severity reserves the use of opioid therapy for moderate and severe pain. The WHO algorithm has proven to be highly effective for the management of cancer pain. However, the use of opioids to treat patients with chronic non-cancer pain is controversial because of concerns about efficacy and safety, and the possibility of addiction or abuse. The results of clinical surveys and retrospective case series involving patients with non-cancer chronic pain have been inconsistent in regard to resolving these controversial issues. The oral route of drug administration is most appropriate for patients receiving opioids; although rectal, transdermal and parenteral routes of administration are used in specific situations. For continuous chronic pain, opioids should be administered around-the-clock and several long-acting formulations are available that require administration only once or twice daily. Opioid doses should be titrated according to agent-specific schedules to maximise pain relief and maintain tolerability. Adverse effects include constipation, nausea and vomiting, sedation, cognitive impairment and respiratory depression. Tolerance to the analgesic and adverse effects as well as physical dependence, which causes withdrawal symptoms upon discontinuance, may occur with opioid use. Estimates of addiction rates among patients with chronic non-cancer pain range from 3.2 to 18.9%. Successful pain treatment and symptom management is an attainable goal for the majority of patients with chronic pain. Further controlled clinical trials are needed to

define the role of opioid therapy in chronic non-cancer pain, and to establish criteria for patient selection and specific treatment algorithms. [References: 62]

Nitahara, K., et al. "Effect of continuous low-dose intravenous diltiazem on epidural fentanyl analgesia after lower abdominal surgery." *BJA: British Journal of Anaesthesia*. 90, no. 4(2003): 507-9 UI 12644426.

BACKGROUND: The postoperative opioid-sparing effects of systemic L-type calcium channel blockers are controversial. We investigated whether the postoperative analgesic effect of epidural fentanyl was enhanced by i.v. infusion of diltiazem at a rate that would minimize any cardiovascular depressant effect. **METHODS:** After elective lower abdominal gynaecological surgery, 30 patients were randomized to receive continuous i.v. diltiazem 1 micro g kg(-1) min(-1) (diltiazem group) or the same volume of saline (control group) for 24 h. Cumulative postoperative epidural fentanyl consumption, visual analogue scale (VAS) scores and verbal rating scores (VRS) at rest and during mobilization, sedation scores, incidence of side-effects and overall patient satisfaction were assessed. **RESULTS:** There was no significant difference in cumulative epidural fentanyl consumption between the groups at any period. Although there were no statistically significant differences in VAS scores, VRS, sedation scores, incidence of side-effects and overall patient satisfaction, there was a trend to an increased incidence of nausea in the diltiazem group. **CONCLUSIONS:** Continuous i.v. infusion of diltiazem did not reduce epidural fentanyl consumption when administered at dosages having minimal haemodynamic depressant effects.

Okeke, L. I. "Experience with caudal block regional anesthesia for transurethral resection of the prostate gland." *West African Journal of Medicine*. 21, no. 4(2002): 280-1 UI 12665263.

Ninety five consecutive patients with obstructing prostatic enlargement requiring surgery underwent caudal anesthesia for transurethral resection of the prostate gland (TURP). Their mean age was 73 +/- 7.8 years, the mean preoperative volume of the prostate gland was 160cc and the mean resection time was 97.3 +/- 30 minutes. The anesthesia was satisfactory with a mean pain score of 0.3 +/- 0.6 on the 0-10 pain rating scale. No complication of the anesthetic procedure occurred. Ten patients were discharged free of catheter on the same day while all the remaining 85 patients were discharged within 48 hours of surgery. It is concluded that caudal anesthesia with 2% xylocaine with 1 in 80,000 adrenaline gives adequate anesthesia for transurethral resection of the prostate gland.

Ornato, J. P. "Alleviating angina. New guidelines update advice on treating chest pain." *Health News*. 9, no. 3(2003): 3 UI 12703433.

Panda, M., N. Doshi, and N. Desbiens. "Use of IM narcotic injections in hospitalized patients with IV access: causing pain to relieve pain." *Journal of Pain & Symptom Management*. 25, no. 4(2003): 297-9 UI 12691678.

Peres, M. F. "Fibromyalgia, fatigue, and headache disorders." *Current Neurology & Neuroscience Reports*. 3, no. 2(2003): 97-103 UI 12583836.

Fibromyalgia, chronic fatigue, and primary headaches are common and debilitating disorders, and their related symptoms of widespread pain, fatigue, and headache have complex interactions and different implications for classification, diagnosis, mechanisms, and treatment. The "continuum" or "spectrum" idea and the modular headache theory are fundamental concepts in understanding these interactions. The overlap between symptom-based conditions leads the reasons to consider them as "functional somatic syndromes." Management of these patients includes a correct diagnosis, appropriate investigation for associated conditions, adequate treatment, and considering the therapeutic opportunities and limitations the comorbid disorders may impose. [References: 51]

Petersen-Felix, S., and L. Arendt-Nielsen. "From pain research to pain treatment: the role of human experimental pain models." *Best Practice & Research. Clinical Anaesthesiology*. 16, no. 4(2002): 667-80 UI 12516897.

There is no objective measure of a complete pain perception; we can, however, measure different aspects of nociceptive processing and pain perception. Earlier, experimental pain

models often only involved induction of cutaneous pain using a single stimulus modality. Recently new experimental models have been developed eliciting various modalities of deep and visceral pain which more closely resemble clinical pain conditions. It is imperative to use multi-modal and multi-structure pain induction and assessment techniques, because a simple model cannot describe the very complex and multi-factorial aspects of clinical pain. Furthermore, it is important to assess pain under normal and pathophysiological conditions. The importance of peripheral and central hyperexcitability for acute and chronic pain has been demonstrated in animals and, to some extent, in humans. However, in spite of our immense knowledge, we still do not know how to prevent and treat this hyperexcitability efficiently. Our understanding of nociceptive mechanisms involved in acute and chronic pain and the effects of anaesthetic drugs or combinations of drugs on these mechanisms in humans may also be expanded using human experimental models. This mechanism-based approach may help us to develop and test therapeutic regimens in patients with acute and chronic pain. [References: 81]

Pieri, M., et al. "Control of acute pain after major abdominal surgery in 585 patients given tramadol and ketorolac by intravenous infusion." *Drugs Under Experimental & Clinical Research*. 28, no. 2-3(2002): 113-8 UI 12224377.

The aim of this study was to assess the efficacy and safety of postoperative pain relief using tramadol and ketorolac in continuous intravenous infusion. The 585 patients included in the study underwent major surgery according to a protocol involving the parenteral administration of 100 mg tramadol approximately 40 min before the end of surgery. This was followed by the continuous intravenous infusion of 600 mg tramadol and 180 mg ketorolac diluted with physiological solution to a total volume of 96 ml. Delivery was carried out using an elastomeric pump or a syringe pump and administered over a 48-hour period at a constant rate of 2 ml/h. Any further doses consisted of 100 mg tramadol up to a maximum of 300 mg over a 24-h period. Pain was assessed on a verbal numeric scale (VNS). For each patient the intensity of pain was assessed both at rest and on movement (coughing, deep breathing, movement of lower limbs). At the scheduled times (T0-T72, every 6 h), the following parameters were evaluated: hemodynamic stability; respiratory function; the appearance of any side effects; the level of sedation; and the need for any further doses of analgesic. The analysis of the data obtained showed the good quality of postoperative pain relief achieved: pain intensity at rest was, on average, always below VNS level 3, while during movement it always had an average VNS level of 3-4. The only side effects found with any frequency were nausea (22.6%) and vomiting (8.5%); hemodynamic and respiratory parameters remained stable. The method adopted was of limited cost and was well accepted by both patients and staff. On the basis of the data obtained, it is possible to affirm that the post-operative pain protocol proposed is effective, safe, without significant side effects, and of limited cost. Therefore, it is the first choice protocol for our operating unit after major abdominal surgery.

Pistevou-Gombaki, K., et al. "Palliative treatment of painful bone metastases from non-Hodgkin lymphoma with disodium pamidronate." *Journal of Experimental & Clinical Cancer Research*. 21, no. 3(2002): 429-32 UI 12385590.

We report a case of a 72-year-old male, with a known history of non-Hodgkin lymphoma of the left tonsil for two years, histologically proved and successfully treated by radical surgical excision in combination with external radiotherapy. He presented with diffuse bone pain the last month, especially at the lower left ribs, which was found to be due to multiple osseous metastases by bone scintigraphy. The patient was initially treated by common analgesics and when the pain deteriorated he was administered 180 mg i.v. disodium pamidronate (AREDIA, Novartis Inc.). The patient showed excellent pain relief as well as dramatic improvement of WHO status and stopped the analgesics. An interesting point of our case was that the pain deteriorated again after a month and reduced soon after the re-administration of pamidronate, which was continued every month. So far, 10 months after the first pamidronate injection, our patient remains stable with excellent pain relief. Despite the absence of related data in the current literature, we consider the use of high dose pamidronate intravenous therapy safe and an effective method of palliative management of painful osseous metastases from non-Hodgkin lymphoma.

Puig, S., et al. "Posterior "Nutcracker" phenomenon in a patient with abdominal aortic aneurysm." *European Radiology*. 12, no. Suppl 3(2002): S133-5 UI 12522623.

We report on a posterior "nutcracker" phenomenon due to an abdominal aortic aneurysm in a patient with a retro-aortic left renal vein. A 71-year-old man with a known abdominal aortic aneurysm presented in the emergency room with mild hematuria and flank pain. Computed tomography angiography revealed an aortic aneurysm, which compressed the left renal vein between the aorta and the vertebral column. Compression of the left renal vein, due to the aorta with consecutive congestion and hematuria as well as flank pain, was previously described as nutcracker phenomenon. In case of a retro-aortic left renal vein, increase of the aortic diameter can lead to compression of the renal vein and furthermore to the classical signs and symptoms of the "nutcracker" phenomenon, even though the aneurysm is not ruptured or there are no aorto-caval or aorto-left renal vein fistulas.

Quigley, C., et al. "Plasma concentrations of morphine, morphine-6-glucuronide and morphine-3-glucuronide and their relationship with analgesia and side effects in patients with cancer-related pain." *Palliative Medicine*. 17, no. 2(2003): 185-90 UI 12701850.

Morphine, the recommended drug for the management of moderate to severe cancer pain, is metabolized predominantly to the glucuronides morphine-6-glucuronide (M6G) and morphine-3-glucuronide (M3G). The quantitative clinical importance of these metabolites following the administration of oral morphine is unclear. This study investigates the relationship between plasma concentrations of morphine (M), M6G, M3G and clinical effects in patients receiving sustained release oral morphine for cancer-related pain. Peak and trough plasma concentrations of morphine and its metabolites were determined by high-performance liquid chromatography (HPLC). At corresponding time points, pain [Visual Analogue Scales (VAS), Verbal Rating Scales (VRS), Pain Relief Scores (PRS)] and toxicity (VAS and VRS) were assessed. Renal and liver function tests were performed. Forty-six patients were included in the study. There was a significant correlation between dose and both peak and trough plasma M, M6G and M3G ($r > 0.60$, $P < 0.001$ for each). Differences between peak and trough M, M6G, M3G, M+M6G, M6G:M, M3G:M and M3G:M6G were all significant ($P < 0.001$ for each). Pain was generally well controlled in the group, with a median VAS of 15 mm at the peak blood sampling time point. The differences between peak and trough values for VAS pain, VAS nausea and VAS drowsiness were not statistically significant ($P = 0.078$, 0.45 and 0.099 , respectively). There were no differences in peak or trough morphine and metabolite concentrations or ratios between patients with low ($<$ median) or high pain scores. Similarly, there was no significant relationship between high and low plasma concentrations and clinical effect. This study did not identify a simple relationship between plasma concentrations of morphine, morphine metabolites or metabolite ratios and clinical effects in patients with cancer and pain who were receiving chronic oral morphine therapy. Although overall pain control was good, there was marked interpatient variability in the dose of morphine and the plasma concentrations necessary to achieve this degree of analgesia.

Radbruch, L. "Buprenorphine TDS: use in daily practice, benefits for patients." *International Journal of Clinical Practice. Supplement.*, no. 133(2003): 19-22; discussion 23-4 UI 12665120.

In Germany and many other countries, buprenorphine has been used for a long time for the management of pain in both cancer and non-cancer patients. Although a transdermal delivery system for buprenorphine (Transtec) has recently been introduced, the clinical experience in daily practice with this drug, delivered in a matrix patch, is only now being evaluated. In preliminary data from a survey of 3,255 patients with chronic pain, 26% had cancer pain, while the most common diagnoses of the other respondents included back pain (33%), osteoarthritis (22%), osteoporosis (17%), and neuropathic pain (10%, multiple entries). Before being switched to the buprenorphine patch, most patients had been pretreated with World Health Organization (WHO) Step II opioids (47%) or WHO Step III opioids (18%), including tramadol (in 35% of patients) and a tilidin/naloxone combination (15%); 9% had not been prescribed any opioids in advance of receiving transdermal buprenorphine. Most patients (77%) in the survey had been started on the lowest dose of the buprenorphine patch (35 microg/h), and nearly half (49%) were placed on adjuvant analgesics, including tramadol or tilidin/naloxone. Pain relief was rated as good or very good by 81% of the respondents. Adverse effects were similar to those seen on other opioids, although their intensity was mild in most cases. Local side effects, including erythema (4% of cases) and pruritus (1%), were transitory. Based on the survey results, transdermal buprenorphine is considered an effective opioid treatment for patients with stable cancer and non-

cancer pain; it may prove particularly useful in patients who have experienced side effects taking oral analgesic preparations, as well as in those who are taking extensive co-medications.

Radbruch, L., and A. Vielvoye-Kerkmeier. "Buprenorphine TDS: the clinical development rationale and results." *International Journal of Clinical Practice. Supplement.*, no. 133(2003): 15-8; discussion 23-4 UI 12665119.

Buprenorphine, a powerful opioid, is newly available for delivery in a transdermal formulation. The transdermal system's matrix patch provides rate-controlled administration of the drug. Three double-blind, placebo-controlled trials were conducted to evaluate efficacy and tolerability of the buprenorphine transdermal system (buprenorphine TDS, Transtec). A total of 445 patients were enrolled in the studies. All suffered from moderate to severe and very severe pain, both cancer- or non-cancer-related. The percentage of responders increased as the rate of buprenorphine delivered by the transdermal system rose, ranging from a 29% (cancer) and 36% (non-cancer) response rate associated with the lowest dose (35 microg/h), to 40% (cancer) and 46% (non-cancer) with the highest dose (70 microg/h). Patients receiving buprenorphine TDS slept longer, uninterrupted by pain, than patients from the placebo group. Systemic adverse effects reported in the drug cohorts included nausea, vomiting and dizziness, and were typical of those reported in other studies of opioids; local adverse events, most commonly erythema and pruritus, were transient and mild to moderate. In an open-label, follow-up trial, in which 239 patients from the original clinical studies participated, 90% of patients reported that their analgesia was satisfactory or even better over a mean duration of 4.7 months; nearly 95% of patients found the patch to be user-friendly. The new buprenorphine TDS appears to be an important new modality for administering analgesia in patients with non-acute pain. [References: 4]

Rao, R. "Neck pain, cervical radiculopathy, and cervical myelopathy: pathophysiology, natural history, and clinical evaluation." *Instructional Course Lectures.* 52(2003): 479-88 UI 12690874.

Degenerative cervical disk disease is a ubiquitous condition that is, for the most part, asymptomatic. When symptoms do arise as a result of these degenerative changes, they can be easily grouped into axial pain, radiculopathy and myelopathy. While the pathophysiology of radiculopathy and myelopathy is better understood, the source of neck pain remains somewhat controversial. A discussion of the mechanisms of neck and suboccipital pain, and the chemical and mechanical factors responsible for neurologic symptoms is warranted. Examination of the patient with these symptoms will reveal variations in the clinical presentation. A thorough understanding of the natural history of these conditions will allow appropriate treatment to be carried out. The natural history of these conditions suggests that for the most part patients with axial symptoms are best treated without surgery, while some patients with radiculopathy will continue to be disabled by their pain, and may be candidates for surgery. Myelopathic patients are unlikely to show significant improvement, and in most cases will show stepwise deterioration. Surgical decompression and stabilization should be considered in these patients. [References: 53]

Raphael, K. G., et al. "Is bruxism severity a predictor of oral splint efficacy in patients with myofascial face pain?" *Journal of Oral Rehabilitation.* 30, no. 1(2003): 17-29 UI 12485379.

Both the efficacy and mechanism of any effect of oral splint therapy for patients with temporomandibular disorders (TMDs) are a matter of controversy. To address these issues, this study tested the hypothesis that oral splints produce the most marked pain relief for those TMD patients with myofascial face pain (MFP) who also brux (i.e. grind or clench) more than other MFP patients. In a 6-week randomized controlled clinical trial, 52 women with MFP were randomly assigned to receive either a full-coverage hard acrylic splint or a palatal-only splint. Bruxism was assessed both by self-report and by an objective assessment of molar microwear changes over a 2-week period prior to the start of the trial. Tested across multiple outcome measures, results indicated that those receiving the full-coverage splint had marginally better improvement on some pain-related measures than those receiving the palatal splint, but severity of bruxism did not moderate the therapeutic effect of the full-coverage splint. These findings strongly argue against the belief that oral splints reduce MFP by reducing bruxism and raise questions about the importance of bruxism in the maintenance of MFP.

Rashbaum, I. G., et al. "Interventions in chronic pain management. 5. Disease-specific issues in chronic pain." *Archives of Physical Medicine & Rehabilitation*. 84, no. 3 Suppl 1(2003): S57-62; quiz S63-8 UI 12708560.

This self-directed learning module highlights the importance of applying principles described earlier in the Study Guide to specific diseases encountered by practitioners managing chronic pain in order to administer appropriate treatment. This chapter focuses on several challenging and increasingly common maladies and attempts to delineate rationales for holistic, comprehensive care. OVERALL ARTICLE OBJECTIVE: To explore diagnostic concepts and therapeutic strategies in fibromyalgia syndrome, central pain, multiple sclerosis, complex regional pain syndrome, and postherpetic neuralgia. [References: 37]

Rashbaum, I. G., and J. E. Sarno. "Psychosomatic concepts in chronic pain." *Archives of Physical Medicine & Rehabilitation*. 84, no. 3 Suppl 1(2003): S76-80; quiz S81-2 UI 12708562.

This self-directed learning module highlights the obstacles faced by physicians treating chronic pain, in particular, the occasional lack of correlation between test results and symptoms, and the treatment pitfalls that may occur. A review of psychosomatic pain disorders is presented along with a psychodynamically based diagnostic and management approach. Popular mind-body treatments for chronic pain are presented with pertinent references. OVERALL ARTICLE OBJECTIVES: (a) To review the diagnostic and therapeutic limitations of conventional chronic pain management, (b) to explore a psychodynamically based psychosomatic chronic pain diagnostic and therapeutic construct, and (c) to examine several additional mind-body chronic pain treatments. [References: 59]

Reisner, L. "Antidepressants for chronic neuropathic pain." *Current Pain & Headache Reports*. 7, no. 1(2003): 24-33 UI 12525267.

Tricyclic antidepressants have been used to manage pain for several decades, and are superior treatments for some patients suffering from neuropathic pain. Unfortunately, older antidepressants have dose-limiting side effects that can lead to drug intolerance. The most common are anticholinergic side effects, although some patients experience sexual dysfunction. Cognitive impairment, sedation, and orthostatic hypotension also are relatively common. Taking an overdose of tricyclic antidepressants can be lethal in overdose. Several weeks of therapy may be required before antinociception occurs, but tricyclic antidepressants in optimal doses appear to be the most effective treatment for neuropathic pain; this is supported by systematic reviews comparing them with other agents. Newer medications such as atypical antidepressants and anticonvulsants may be overtaking older antidepressants, but they should not be overlooked as important options for the management of pain. [References: 64]

Root, J. "Pain and debility associated with spinal compression fractures." *Journal - Oklahoma State Medical Association*. 96, no. 3(2003): 147-9 UI 12688229.

Approximately twenty percent of women will suffer a compression fracture sometime in their later years. Almost always the result of postmenopausal osteoporosis, they create dramatic and lasting consequences that lead to pain, reduced physiologic function and increased frailty. Recognition and treatment of compression fractures is an important step in maintaining an acceptable level of comfort and an optimal functional ability. [References: 10]

Shah, R. V., J. J. Ericksen, and M. Lacerte. "Interventions in chronic pain management. 2. New frontiers: invasive nonsurgical interventions." *Archives of Physical Medicine & Rehabilitation*. 84, no. 3 Suppl 1(2003): S39-44 UI 12708557.

Invasive nonsurgical techniques have a central role in the management of patients suffering from acute and chronic pain. This article surveys common percutaneous pain procedures: trigger point injections, intra-articular injections, spinal injections, nerve blocks, radiofrequency lesioning (thermocoagulation and pulsed-mode), epidural adhesiolysis and decompressive neuroplasty, neural mapping, intradiscal and intra-annular procedures, neuromodulation, continuous intrathecal analgesia, and deep brain stimulation. Psychiatrists must understand the guiding principles behind these procedures before practicing interventional pain management. OVERALL ARTICLE OBJECTIVE: To review invasive, nonsurgical pain management procedures. [References: 32]

Shechter, M., et al. "Effects of oral magnesium therapy on exercise tolerance, exercise-induced chest pain, and quality of life in patients with coronary artery disease." *American Journal of Cardiology*. 91, no. 5(2003): 517-21 UI 12615252.

Previous studies have demonstrated that magnesium supplementation improves endothelial function in patients with coronary artery disease (CAD). However, the impact on clinical outcomes, such as exercise-induced chest pain, exercise tolerance, and quality of life, has not been established. In a multicenter, multinational, prospective, randomized, double-blind and placebo-controlled trial, 187 patients with CAD (151 men, 36 women; mean +/- SD age 63 +/- 10 years, range 42 to 83) were randomized to receive either oral magnesium 15 mmol twice daily (Magnosolv-Granulat, total magnesium 365 mg provided as magnesium citrate) (n = 94) or placebo (n = 93) for 6 months. Symptom-limited exercise testing (Bruce protocol) and responses given on quality-of-life questionnaires were the outcomes measured. Magnesium therapy significantly increased intracellular magnesium levels ([Mg²⁺]) in a substudy of 106 patients at 6 months compared with placebo (35.5 +/- 3.7 vs 32.6 +/- 2.9 mEq/L, p = 0.0151). Magnesium treatment significantly increased exercise duration time compared with placebo (8.7 +/- 2.1 vs 7.8 +/- 2.9 minutes, p = 0.0075), and lessened exercise-induced chest pain (8% vs 21%, p = 0.0237). Quality-of-life parameters significantly improved in the magnesium group. These findings suggest that oral magnesium supplementation in patients with CAD for 6 months results in a significant improvement in exercise tolerance, exercise-induced chest pain, and quality of life, suggesting a potential mechanism whereby magnesium could beneficially alter outcomes in patients with CAD.

Shmerling, R., C. Ulbricht, and E. Basch. "Osteoarthritis. Options for arthritis pain." *Newsweek*. 140, no. 23(2002): 53 UI 12501510.

Sites, B. D., et al. "Intrathecal clonidine added to a bupivacaine-morphine spinal anesthetic improves postoperative analgesia for total knee arthroplasty." *Anesthesia & Analgesia*. 96, no. 4(2003): 1083-8, table of contents UI 12651665.

Postoperative pain after total knee arthroplasty (TKA) is severe and can complicate early physical therapy. We tested the hypothesis that intrathecal clonidine would improve postoperative analgesia for TKA using a hyperbaric bupivacaine spinal anesthetic. In a double-blinded, placebo-controlled protocol, 81 ASA physical status I-III patients undergoing either a single or bilateral TKA were randomized into 4 groups with the following 2-mL solutions added to 15 mg of hyperbaric bupivacaine: 1) sterile saline, 2) morphine (250 microg), 3) morphine (250 microg) with clonidine (25 microg), and 4) morphine (250 microg) with clonidine (75 microg). At 1, 2, 4, 6, 12, and 24 h postoperatively, we measured visual analog scales (VAS), cumulative IV morphine consumption, hemodynamics, nausea, ancillary drugs, and side effects. Our primary comparison was between the clonidine with morphine groups versus the morphine group. We found that the combined administration of intrathecal clonidine and morphine decreased 24 h IV morphine consumption by 13 mg (P = 0.028) when compared with intrathecal morphine alone. This corresponded to a decrease in the VAS score of 1.3 cm at 24 h postoperatively (P = 0.047). Adverse side effects were similar among all groups with the exception of more relative hypotension in the clonidine groups through postoperative hour 6. We conclude that the coadministration of intrathecal clonidine and morphine decreases the 24-h IV morphine consumption and improves the 24-h VAS score when compared with intrathecal morphine alone. IMPLICATIONS: In this prospective, randomized, double-blinded, and placebo-controlled trial, we identify an effective postoperative analgesic approach in total knee replacement surgery. Intrathecal morphine (250 microg) combined with clonidine (25 or 75 microg) provided superior analgesia compared with intrathecal morphine alone.

Slagel, B., E. Kingstone, and S. Bhalerao. "Gamma hydroxybutyrate withdrawal in an orthopedic trauma patient." *Canadian Journal of Psychiatry - Revue Canadienne de Psychiatrie*. 48, no. 2(2003): 131-2 UI 12655920.

Smith-Toner, M. "How Buddhism influences pain control choices." *Nursing*. 33, no. 4(2003): 17 UI 12722701.

Soffer, D., et al. "Suboptimal inhibition of platelet aggregation following tirofiban bolus in patients undergoing percutaneous coronary intervention for unstable angina pectoris." *American Journal of Cardiology*. 91, no. 7(2003): 872-5 UI 12667576.

Soscia, J. "Assessing pain in cognitively impaired older adults with cancer." *Clinical Journal of Oncology Nursing*. 7, no. 2(2003): 174-7 UI 12696213.

Assessing pain in cognitively impaired older adults with cancer presents a challenge to healthcare providers. As the age and number of older adults with cancer and cognitive impairments increase, so does the need for appropriate methods and instruments to adequately assess pain in this population. Oncology nurses report pain control to be one of the more challenging aspects of caring for patients with cancer. This article discusses methods and tools used by healthcare providers to accurately assess pain in cognitively impaired older adults with cancer, specific behavioral indicators that healthcare providers should recognize to assess pain accurately among this population, and the most appropriate pain scales to use when assessing pain in this population. [References: 15]

Soto, R. G., and E. S. Fu. "Acute pain management for patients undergoing thoracotomy." *Annals of Thoracic Surgery*. 75, no. 4(2003): 1349-57 UI 12683601.

Management of thoracotomy pain can be difficult, but the benefits of effective pain control are significant. A variety of modalities for treating postoperative pain after thoracotomy are available, including systemic opiates, regional analgesics, and new oral and parenteral agents. This work provides a review of the literature and recommendations for the clinician. [References: 99]

Srivastava, M., and D. Walsh. "Diazepam as an adjuvant analgesic to morphine for pain due to skeletal muscle spasm." *Supportive Care in Cancer*. 11, no. 1(2003): 66-9 UI 12527958.

Side effects of morphine are common when it is given in titrated doses to control severe pain in advanced cancer. We describe a case of severe back pain resistant to parenteral morphine accompanied by muscle spasm, in which the addition of diazepam both had an opioid-sparing effect and provided superior symptomatic relief. Diazepam appears to have a specific role as an adjuvant analgesic for pain due to skeletal muscle spasm associated with painful vertebral metastases.

Steihaug, S., B. Ahlsen, and K. Malterud. "'I am allowed to be myself': women with chronic muscular pain being recognized." *Scandinavian Journal of Public Health*. 30, no. 4(2002): 281-7 UI 12680504.

AIMS: Since 1992, the authors have completed 11 treatment groups for women with chronic muscular pain. The programme includes movement training and group discussions. Qualitative data indicate that the participants valued the experience of being recognized in the groups as a crucial and beneficial effect of the treatment. In the present article, this finding is examined in more detail by studying the types of action and interaction that the women considered to have benefited from by participating in group treatment. METHODS: Data are drawn from an action research project and the material originates from three treatment groups where 24 participants completed the programme. Qualitative data originating from five focus group interviews are analysed using Giorgi's principles of phenomenological analysis. RESULTS: The women described different concrete aspects of interaction and awareness illustrating psychologist Lovlie Schibbye's theoretical perspectives of a recognizing attitude: listening, understanding, acceptance, tolerance, and confirmation. The women tell how they themselves have experienced these expressions of recognition from other group members and from the group leaders. CONCLUSIONS: The women confirmed that recognition had an important effect on how much they benefited from the treatment programme. The need for mutual recognition draws attention to the power and possible abuse of power inherent in human relationships, as exemplified by the relationship between the patient and healthcare providers. An explicit presentation of the human and moral value behind the treatment programme represents a challenge.

Stojanovic, M. P., et al. "Single needle approach for multiple medial branch blocks: a new technique." *Clinical Journal of Pain*. 19, no. 2(2003): 134-7 UI 12616184.

BACKGROUND AND OBJECTIVES: Medial branch blocks are an important tool for the diagnosis of facet joint arthropathy. The most commonly used technique involves multiple needle

placements, one for each nerve blocked. This multiple needle technique may require a large amount of local anesthetic for anesthetizing the skin, thereby increasing the rate of false-positive blocks. **TECHNIQUE:** Diagnostic lumbar medial branch blocks are usually performed using multiple needles, one for each branch. The authors describe a different technique using a single needle for all levels. Initially, the needle is directed toward the medial branch located at the level of the affected facet joint in the antero-posterior view. After anesthetizing this nerve with local anesthetic, the same needle is withdrawn to the skin with the tip still in the subcutaneous tissue and repositioned to block the medial branch above, and thereafter below, while continuing to use only the antero-posterior view, thereby using only one entry site. **CONCLUSIONS:** When performed correctly, the single needle technique provides accuracy similar to the more conventional multiple needle approach during the performance of diagnostic facet joint nerve blocks. Because only one skin entry point is needed, however, this technique may afford several advantages over the multiple needle approach. These may include less patient discomfort, less time required and less radiation exposure since only one C-arm position is used, a smaller volume of local anesthetic, and possibly a lower incidence of false-positive blocks.

Swank, D. J., et al. "Laparoscopic adhesiolysis in patients with chronic abdominal pain: a blinded randomised controlled multi-centre trial." *Lancet*. 361, no. 9365(2003): 1247-51 UI 12699951.

BACKGROUND: Laparoscopic adhesiolysis for chronic abdominal pain is controversial and is not evidence based. We aimed to test our hypothesis that laparoscopic adhesiolysis leads to substantial pain relief and improvement in quality of life in patients with adhesions and chronic abdominal pain. **METHODS:** Patients had diagnostic laparoscopy for chronic abdominal pain attributed to adhesions; other causes for their pain had been excluded. If adhesions were confirmed during diagnostic laparoscopy, patients were randomly assigned either to laparoscopic adhesiolysis or no treatment. Treatment allocation was concealed from patients, and assessors were unaware of patients' treatment and outcome. Pain was assessed for 1 year by visual analogue score (VAS) score (scale 0-100), pain change score, use of analgesics, and quality of life score. Analysis was by intention to treat. **FINDINGS:** Of 116 patients enrolled for diagnostic laparoscopy, 100 were randomly allocated either laparoscopic adhesiolysis (52) or no treatment (48). Both groups reported substantial pain relief and a significantly improved quality of life, but there was no difference between the groups (mean change from baseline of VAS score at 12 months: difference 3 points, $p=0.53$; 95% CI -7 to 13). **INTERPRETATION:** Although laparoscopic adhesiolysis relieves chronic abdominal pain, it is not more beneficial than diagnostic laparoscopy alone. Therefore, laparoscopic adhesiolysis cannot be recommended as a treatment for adhesions in patients with chronic abdominal pain.

Swezey, R. L. "Overdiagnosed sciatica and stenosis, underdiagnosed hip arthritis." *Orthopedics*. 26, no. 2(2003): 173-4; discussion 174 UI 12597222.

A retrospective analysis of 43 consecutive patients with hip osteoarthritis was performed. Twenty-four patients had previously been diagnosed with hip osteoarthritis, and 19 were treated solely for coexistent spine-related disorders without recognition of hip osteoarthritis. Four of 19 patients had previous spinal surgery for sciatica or spinal stenosis, 6 of 19 had epidural injections, 17 of 19 had magnetic resonance imaging or computed tomography, and 3 of 19 had electrodiagnostic studies.

Tse, D. M., et al. "An ad libitum schedule for conversion of morphine to methadone in advanced cancer patients: an open uncontrolled prospective study in a Chinese population." *Palliative Medicine*. 17, no. 2(2003): 206-11 UI 12701853.

Methadone has been used as an alternative strong opioid to morphine in the management of cancer pain. The conversion of morphine to methadone is not straightforward because of the high individual variability and unpredictability in the pharmacokinetics of methadone. An ad libitum schedule for conversion of morphine to methadone was used in 37 cancer patients who had intolerable morphine-related side effects or had pain not satisfactorily controlled by morphine. Oral morphine was discontinued on the day of conversion. Methadone was given at a dose calculated as one-twelfth of the total daily dose of morphine, up to a maximum of 30 mg/dose. Methadone was administered at patient-controlled intervals not more frequent than three hours, the need of which was indicated by the presence of pain of moderate intensity or above as rated by a verbal rating scale. When the demand for methadone was stabilized, the total daily dose was

given regularly in divided doses. Pain control on day 7 was taken as the primary endpoint. Twenty-seven patients completed the study. Twenty-four patients (88.9%) were in good pain control on day 7, and all reached good pain control by day 11. The median time required to achieve good pain control was three days (range 1-11 days). A majority (88.6%) of morphine-related adverse effects improved or resolved after conversion to methadone. This ad libitum schedule is effective in conversion of morphine to methadone in these patients.

Tsubokawa, A., et al. "Effect of intracoronary nicorandil administration on preventing no-reflow/slow flow phenomenon during rotational atherectomy." *Circulation Journal*. 66, no. 12(2002): 1119-23 UI 12499617.

A major limitation of the rotational atherectomy (RA) procedure is the occurrence of the no-reflow/slow flow phenomenon and the optimal strategy is still evolving. Recent clinical studies have demonstrated the beneficial effects of nicorandil, an adenosine triphosphate (ATP)-sensitive potassium channel opener, on no-reflow in patients with acute myocardial infarction. The purpose of this study was to evaluate the effect of nicorandil on no-reflow/slow flow phenomenon during RA procedures. Sixty-one patients who underwent RA of complex coronary lesions were randomly divided into 2 groups: (i) nicorandil cocktail (n=24 patients, 37 lesions) and (ii) verapamil cocktail (n=37 patients, 63 lesions). In each group, the drug cocktail mixed with pressurized saline was infused through the 4Fr Teflon sheath of the rotablator system during the RA procedure. In the nicorandil group, the drug cocktail consisted of 24 mg of nicorandil, 5 mg of nitroglycerin, and 10,000 U of heparin. In the verapamil group, the drug cocktail consisted of 10 mg of verapamil, 5 mg of nitroglycerin, and 10,000 U of heparin. Baseline and procedure characteristics did not differ between the 2 groups. RA was performed successfully, and death, Q-wave myocardial infarction, or emergency coronary artery bypass surgery did not occur in any patients. The no-reflow/slow flow phenomenon was observed in 11/63 (17.4%) lesions of the verapamil group, but in only 1/37 (2.7%) lesions of the nicorandil group (p=0.03). No untoward complications were observed during nicorandil infusion. These data indicate that the intracoronary continuous infusion of nicorandil during RA procedures is easy and safe, and prevents no-reflow/slow flow phenomenon more effectively than infusion of verapamil.

Ueta, K., et al. "A small preoperative test dose of intravenous fentanyl can predict subsequent analgesic efficacy and incidence of side effects in patients due to receive epidural fentanyl." *Anesthesia & Analgesia*. 96, no. 4(2003): 1079-82, table of contents UI 12651664.

Because individual variation is a likely factor affecting both the incidence and severity of side effects and the analgesic efficacy of epidural opioids, assessment of individual variation could be useful in deciding optimal dosage. By evaluating the response to a small test dose of IV fentanyl, we designed this study to predict the degree of pain relief and the incidence of side effects in patients who would be receiving postoperative epidural fentanyl. Before the induction of anesthesia, 50 micro g of fentanyl was administered IV, and 2 min after fentanyl, the patient response was evaluated. Twenty-three patients, who reported nausea, sleepiness, dizziness, sensation of warmth, and other symptoms, were categorized as responders (Group R); the remaining 20 patients were categorized as nonresponders (Group NR). At the completion of surgery, infusion of epidural fentanyl was administered (0.3 mg/d in 0.25% bupivacaine) for 96 h. At postoperative Hours 6 and 24, Group R had significantly lower visual analog scale scores for postoperative pain intensity and required fewer analgesics than Group NR. The incidence of side effects, however, was 74% for Group R and 10% for Group NR (P < 0.05), and side effects were more serious in Group R. This study demonstrates that preoperative administration of a small dose of fentanyl during the induction of anesthesia enables prediction of the analgesic efficacy of postoperative epidural fentanyl and the incidence and severity of side effects. IMPLICATIONS: Preoperative administration of a small dose of fentanyl during the induction of anesthesia enables prediction of the analgesic efficacy of postoperative epidural fentanyl and the incidence and severity of side effects.

van den Hout, J. H., et al. "Secondary prevention of work-related disability in nonspecific low back pain: does problem-solving therapy help? A randomized clinical trial." *Clinical Journal of Pain*. 19, no. 2(2003): 87-96 UI 12616178.

OBJECTIVES: Given the individual and economic burden of chronic work disability in low back pain patients, there is a need for effective preventive interventions. The aim of the present study

was to investigate whether problem-solving therapy had a supplemental value when added to behavioral graded activity, regarding days of sick leave and work status. DESIGN: Randomized controlled trial. PATIENTS AND SETTING: Employees who were recently on sick leave as a result of nonspecific low back pain were referred to the rehabilitation center by general practitioner, occupational physician, or rehabilitation physician. Forty-five employees had been randomly assigned to the experimental treatment condition that included behavioral graded activity and problem-solving therapy (GAPS), and 39 employees had been randomly assigned to behavioral graded activity and group education (GAGE). OUTCOME MEASURES: Days of sick leave and work status. Data were retrieved from occupational health services. RESULTS: Data analyses showed that employees in the GAPS group had significantly fewer days of sick leave in the second half-year after the intervention. Moreover, work status was more favorable for employees in this condition, in that more employees had a 100% return-to-work and fewer patients ended up receiving disability pensions one year after the intervention. Sensitivity analyses confirmed these results. CONCLUSIONS: The addition of problem-solving therapy to behavioral graded activity had supplemental value in employees with nonspecific low back pain.

Walker, G., et al. "The acceptability of different routes of administration of analgesia for breakthrough pain." *Palliative Medicine*. 17, no. 2(2003): 219-21 UI 12701855.

Wells, H. J., T. Pincus, and E. McWilliams. "Information processing biases among chronic pain patients and ankylosing spondylitis patients: the impact of diagnosis." *European Journal of Pain: Ejp*. 7, no. 2(2003): 105-11 UI 12600791.

The aim of this research was to explore the impact that diagnostic status has on information processing biases among chronic pain (CP) and ankylosing spondylitis (AS) patients. AS patients, CP patients, and healthy hospital staff controls, completed a questionnaire and short computer task. During the computer task participants endorsed sensory, depression, illness, and neutral adjectives, following a cue question (which facilitated encoding of the adjectives in relation to the self). They were then asked to recall the adjectives in a surprise memory task. Diagnosed CP patients demonstrated a recall bias away from depression related stimuli, whilst the non-diagnosed CP patients did not. The results also suggest an association between receipt of a diagnosis and better psychological outcome in terms of information processing biasing. It was questioned whether the presence of a diagnosis among CP patients who are not currently depressed may protect or 'buffer' them against cognitive biasing towards classic depression related stimuli. The diagnosed AS group showed a bias towards sensory stimuli, perhaps reflecting the presence of an enduring and over-riding pain schema. The non-pain control group also displayed a sensory bias, which was attributed to a frequency effect as a result of working in an environment where they were regularly exposed to sensory language. The results are discussed in relation to existing literature in this area and implications for clinical practice are provided.

Wells, N., et al. "Improving cancer pain management through patient and family education." *Journal of Pain & Symptom Management*. 25, no. 4(2003): 344-56 UI 12691686.

The purpose of this study was to determine if continued access to information following a baseline pain education program would increase knowledge and positive beliefs about cancer pain management, thus resulting in improved pain control during a 6-month follow-up period. Patients with cancer-related pain and their primary caregivers received a brief pain education program, and were then randomized into one of three information groups: a) usual care, b) pain hot line, and c) weekly provider-initiated follow-up calls for 1 month post-education. Sixty-four patients and their primary caregivers were recruited. Both patients and caregivers showed an improvement in knowledge and beliefs after the baseline pain education program. Continued access to pain information with either the pain hot line or provider-initiated weekly follow-up calls did not affect long-term outcomes of pain intensity, interference because of pain, adequacy of analgesics used, or pain relief. In addition, long-term outcomes did not differ between patients who had improvement and those who showed decline in knowledge and beliefs pre-post education. These findings suggest that a brief pain education program can improve knowledge and beliefs of both patient and primary caregiver. Continued access to pain related information using either a patient- or provider-initiated format did not affect long-term pain outcomes.

Westermeyer, R. R. "Odontoid hypoplasia presenting as torticollis: a discussion of its significance." *Journal of Emergency Medicine*. 24, no. 1(2003): 15-8 UI 12554034.

Odontoid dysplasias are considered rare but are becoming increasingly recognized. Patients may have no symptoms, localized neck pain, or neurologic symptoms. Because patients with odontoid anomalies have the potential for craniovertebral instability, recognition of the entity is essential. A discussion of the axis, its development and anomalies follows. Copyright 2003 Elsevier Science Inc.

Williams, R. J., 3rd, et al. "The short-term outcome of surgical treatment for painful varus arthritis in association with chronic ACL deficiency." *The Journal of Knee Surgery*. 16, no. 1(2003): 9-16 UI 12568260.

A review of patients with anterior cruciate ligament (ACL) insufficiency, symptomatic medial compartment osteoarthritis, and varus malalignment of the knee was performed. Twenty-six patients met the inclusion criteria. Twelve patients were treated with a valgus closing-wedge high tibial osteotomy (group 1). Fourteen patients were treated with a valgus closing-wedge high tibial osteotomy combined with arthroscopic ACL reconstruction (group 2). Twenty-five patients were available for follow-up at a minimum of 2 years. For group 1 patients, high tibial osteotomy alone had no effect on the Lachman test or pivot shift phenomena. For group 2 patients, combined high tibial osteotomy/ACL reconstruction resulted in a grade 1 Lachman test in 11 of 13 patients, and a negative pivot shift in 12 of 13 patients. No deficits in range of motion were noted in either group. Prior to surgery, 14 (56%) patients participated in recreational sports; 23 (92%) patients were able to participate in recreational sports at follow-up. Radiographs demonstrated osteoarthritic progression in group 1 and 2 patients ($P < .05$). The results of this study suggest that high tibial osteotomy alone and combined high tibial osteotomy/ACL reconstructions are effective in the surgical treatment of varus, ACL-deficient knees with symptomatic medial compartment arthritis; however, good or excellent results were more often seen after the combined procedure.

Wohrle, J., et al. "Reduction of major adverse cardiac events with intracoronary compared with intravenous bolus application of abciximab in patients with acute myocardial infarction or unstable angina undergoing coronary angioplasty." *Circulation*. 107, no. 14(2003): 1840-3 UI 12682003.

BACKGROUND: In patients with acute myocardial infarction or unstable angina undergoing coronary angioplasty, abciximab reduces major adverse cardiac events (MACE). Clinical trials have studied intravenous administration only. Intracoronary bolus application of abciximab causes very high local drug concentrations and may be more effective. We studied whether intracoronary bolus administration of abciximab is associated with a reduced MACE rate compared with the standard intravenous bolus application. **METHODS AND RESULTS:** We stratified 403 consecutive patients with acute myocardial infarction or unstable angina undergoing coronary angioplasty according to the type of application of abciximab. A 20-mg bolus of abciximab was given intravenously in 109 patients and intracoronarily in 294 patients. There were no differences between the groups with regard to diabetes mellitus, cardiogenic shock, successful intervention, or preprocedural and postprocedural TIMI flow. At 30 days, the incidence of MACE (death, myocardial infarction, urgent revascularization) was significantly lower in the patients with intracoronary compared with intravenous administration of abciximab (10.2% versus 20.2%; $P < 0.008$), which was independent from stenting in multivariate analysis. The effect was most pronounced in patients with preprocedural TIMI 0/1 flow (MACE: intracoronary 11.8% versus intravenous 27.5%, $P < 0.002$; $n = 273$). **CONCLUSIONS:** In patients with acute myocardial infarction or unstable angina undergoing emergency coronary angioplasty, intracoronary bolus application of abciximab is associated with a reduction of MACE compared with the standard intravenous bolus application of abciximab. Prospective, randomized trials are warranted to further assess intracoronary application of abciximab.

Wolfe, F. "Pain extent and diagnosis: development and validation of the regional pain scale in 12,799 patients with rheumatic disease." *Journal of Rheumatology*. 30, no. 2(2003): 369-78 UI 12563698.

OBJECTIVE: To develop and validate a pain scale that measures the extent of body pain. **METHODS:** A total of 12,799 patients with rheumatoid arthritis (RA), osteoarthritis (OA), and fibromyalgia (FM) completed a mailed survey regarding the location and intensity of their pain in 38 articular and nonarticular regions. The data were analyzed using item response theory (IRT)

by nonparametric Mokken analysis followed by Rasch analysis. The resultant scale was examined for its association with clinical severity variables and its ability to distinguish patients diagnosed with and without FM. RESULTS: The resultant 19 item regional pain scale (RPS) was composed primarily of nonarticular regions. The scale had strong scalability as measured by the Mokken H statistic ($H = 0.52$), and satisfied the Mokken monotonicity and double monotonicity criteria. The RPS also fit the Rasch model and had satisfactory reliability and separation statistics. Of all clinical variables assessed by survey, the RPS best identified patients diagnosed with FM. In addition, the scale correlated with measures of clinical severity, regardless of diagnosis, and predicted measures of utilization. CONCLUSION: The RPS is a valid scale of pain extent. It can be useful to identify patients with FM or can be used to develop a new definition of FM, even among patients with concomitant illnesses such as RA and OA. In addition, it is a measure of pain extent that is disease independent, and works as well in RA and OA as in FM to identify patients with increased severity and resource utilization.

Wu, C. L., and M. D. Caldwell. "Effect of post-operative analgesia on patient morbidity." *Best Practice & Research. Clinical Anaesthesiology*. 16, no. 4(2002): 549-63 UI 12516891.

The pathophysiology that commonly follows surgery results in detrimental physiological effects and may be associated with post-operative mortality and morbidity. The use of post-operative epidural analgesia, but not systemic opioids, may attenuate some of these adverse physiological effects and result in a decrease in patient-related morbidity post-operatively. Randomized trials suggest that the perioperative use of epidural analgesia may facilitate return of gastrointestinal function, attenuate hypercoagulable events and diminish post-operative pulmonary complications. A multimodal approach incorporating the use of epidural analgesia to control perioperative pathophysiology will facilitate the patient's recovery. [References: 94]

Yaksh, T. L. "Future advances in pain pharmacology: what does the present say about the future?" *Proceedings of the Western Pharmacology Society*. 45(2002): 211-8 UI 12434582.

Zairis, M. N., et al. "C-reactive protein and ST-segment monitoring by continuous 12-lead electrocardiogram in patients with primary unstable angina pectoris." *American Journal of Cardiology*. 91, no. 5(2003): 600-3 UI 12615271.

Zipple, J. T., R. L. Hammer, and P. V. Loubert. "Treatment of fabella syndrome with manual therapy: a case report." *Journal of Orthopaedic & Sports Physical Therapy*. 33, no. 1(2003): 33-9 UI 12570284.

STUDY DESIGN: Clinical case report. OBJECTIVES: To educate clinicians about fabella syndrome as a possible cause for posterolateral knee pain and dysfunction. Also to describe a physical therapy intervention strategy for posterolateral knee pain secondary to hypomobility or malposition of a fabella. BACKGROUND: A 44-year-old, physically fit, Caucasian male with a 10-year history of left posterolateral knee pain and functional limitations during athletic activities, walking, and activities of daily living presented for evaluation and treatment. He had previously experienced relief of symptoms after experimenting with a mechanical maneuver administered by his wife. METHODS AND MEASURES: A thorough examination for strength, range of motion, and accessory motions was performed. A fabella was palpable in the lateral head of the gastrocnemius muscle and a provisional diagnosis of fabella syndrome was made. While in a prone position, the patient received soft tissue mobilization of the lateral gastrocnemius, followed by medial, lateral, and inferior glides of the fabella. RESULTS: The patient reported an immediate reduction in posterolateral knee pain and demonstrated a 30 degrees increase in active knee flexion. CONCLUSIONS: Physical therapists may be unaware that fabella syndrome is a possible source of posterolateral knee pain and dysfunction. This simple manual therapy intervention was effective in reducing symptoms of pain and increasing tolerance for activities involving knee flexion, extension, and rotation. Physical therapists may wish to add this diagnosis and the corresponding examination and intervention techniques to their management strategy for patients with fabella syndrome.