Non-Medication Treatment and Management of Pain

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LECOM Lifestyle and Integrative Medicine
LECOM Primary Care Update
Peek’n Peak CME
2017

Objectives:

• Describe specific injection techniques used in clinical practice which may decrease the need for medications used for pain.
• Review the 2017 American College of Physician’s (ACP) clinical practice guideline.
• Appreciate the role of lifestyle and integrative medicine within the role of pain management.
• Compare and contrast acute inflammatory pain patterns and the issue of losing tissue integrity often seen in subacute and chronic pain.
Realities of Exercise and Movement

- The body is a unit.
- The body possesses self-regulatory mechanisms.
- Structure and function are reciprocally interrelated.
- Rational therapy is based upon an understanding of body unity, self-regulatory mechanisms, and the inter-relationship of structure and function.

Osteopathic Medicine
Earl Gedney, DO

- 1931 graduate of PCOM
- Orthopedic surgeon
- Gedney caught his thumb in closing surgical suite doors thereby stretching the joint and causing severe pain and instability. After being told by his colleagues that nothing could be done for his condition and that his surgical career was over,
- Gedney knew of a group of doctors called “herniologists” that used irritating solutions to stimulate the repair of the distended connective tissue ring in hernias.
- He extrapolated this knowledge to inject his injured thumb and was able to fully rehabilitate it.
Noninvasive Treatments for Acute, Subacute, and Chronic Low Back Pain: A Clinical Practice Guideline From the American College of Physicians

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For author affiliations, see end of text.
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Description: The American College of Physicians (ACP) developed this guideline to present the evidence and provide clinical recommendations on noninvasive treatment of low back pain.

Methods: Using the ACP grading system, the committee based these recommendations on a systematic review of randomized, controlled trials and systematic reviews published through April 2015 on noninvasive pharmacologic and nonpharmacologic treatments for low back pain. Updated searches were performed through November 2016. Clinical outcomes evaluated included reduction or elimination of low back pain, improvement in back-specific and overall function, improvement in health-related quality of life, reduction in work disability and return to work, global improvement, number of back pain episodes or time between episodes, patient satisfaction, and adverse effects.

Target Audience and Patient Population: The target audience for this guideline includes all clinicians, and the target patient population includes adults with acute, subacute, or chronic low back pain.

Recommendation 1: Given that most patients with acute or subacute low back pain improve over time regardless of treatment, clinicians and patients should select nonpharmacologic treatment with superficial heat (moderate-quality evidence), massage, acupuncture, or spinal manipulation (low-quality evidence). If pharmacologic treatment is desired, clinicians and patients should select nonsteroidal anti-inflammatory drugs or skeletal muscle relaxants (moderate-quality evidence). (Grade: strong recommendation)

Recommendation 2: For patients with chronic low back pain, clinicians and patients should initially select nonpharmacologic treatment with exercise, multidisciplinary rehabilitation, acupuncture, mindfulness-based stress reduction (moderate-quality evidence), tai chi, yoga, motor control exercise, progressive relaxation, electromyography biofeedback, low-level laser therapy, operant therapy, cognitive behavioral therapy, or spinal manipulation (low-quality evidence). (Grade: strong recommendation)

Recommendation 3: In patients with chronic low back pain who have had an inadequate response to nonpharmacologic therapy, clinicians and patients should consider pharmacologic treatment with nonsteroidal anti-inflammatory drugs as first-line therapy, or tramadol or duloxetine as second-line therapy. Clinicians should only consider opioids as an option in patients who have failed the aforementioned treatments and only if the potential benefits outweigh the risks for individual patients and after a discussion of known risks and realistic benefits with patients. (Grade: weak recommendation, moderate-quality evidence)
Tiers of Non-Surgical Treatment

1. Conservative management
   - Biomechanical assessment
   - **Osteopathic Manual Medicine**/Chiropractic/Physical Therapy/Massage/Graston Techniques
   - Home exercises (HEP)
   - Lifestyle Modifications (weight management, stress reduction, sleep hygiene)
   - Nutrition/Supplements (Anti-inflammatory food focus with focus on Vitamin D3/Omega-3 fatty acids/Anti-inflammatory spices)
   - Acupuncture & Dry needling

2. Viscosupplementation (Hyaluronic Acid)

3. Alkalinizing solutions (Sodium bicarbonate +/- Calcium gluconate)

4. **Prolotherapy** (Fenestrating injection technique with 15% dextrose)

5. Autologous whole blood injection (ABI)

6. Platelet rich plasma (PRP)

7. Stem Cell Therapies: Bone marrow aspirate concentrate (BMAC), Adipocytes and Amnion

8. Perineural Injection Techniques (PIT)

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**Autonomic Nervous System**

[Diagram showing Parasympathetic and Sympathetic nervous system functions]
Impact of Concussions:

**SCHOOL OF HARD KNOCKS**

A concussion occurs when a sudden blow to the head or an impact that causes the head to move rapidly back and forth results in the brain bumping against the inside of the skull. This can cause the brain to impact the skull, stretch, and swell. A concussion can range from mild to severe and can cause symptoms that last for weeks or months.

**CONCUSSIONS BY THE NUMBERS**

- **2.5 million** concussions treated each year in U.S. emergency departments
- **1.5 million** with no hospitalization
- **250,000** with a hospital stay

**SCHOOL OF HARD KNOCKS**

1. **Flew football player**
2. **240,000** emergency room visits
3. **25,000** hospitalizations

Source: Injury Prevention and Management

Significance of the Jugular Foramen
Painful Statistics:

- 91 AMERICANS die every day from an opioid overdose (that includes prescription opioids and heroin).
- Each day, more than 1,000 PEOPLE are treated in emergency departments for not using prescription opioids as directed.

Painful Realities

Since 1999, sales of prescription opioids in the U.S. have quadrupled.

• Centers for Disease Control and Prevention National Center for Injury Prevention and Control Division of Unintentional Injury Prevention March 2016
Realities of Treating Pain

Nearly 2 million Americans abused or were dependent on prescription opioids in 2014.

Realities of Pain Management

An estimated 1 out of 5 patients with non-cancer pain or pain-related diagnoses are prescribed opioids.

Centers for Disease Control and Prevention National Center for Injury Prevention and Control Division of Unintentional Injury Prevention March 2016
Partnering with Pain

Partner with patients to provide safer, more effective pain management. Talk to your patients about risks and benefits of all treatment options.

Partnering with Patients

"What's wrong with me?"
What is the main pain generator?

Pain beyond the physical.......
Lifestyle and Integrative Medicine

LECOM Lifestyle and Integrative Medicine Fellowship

- Osteopathic Assessment & Treatment.
- Aqua Healing
- Medical Acupuncture
- Cupping/Gua Sha
- Yoga for Chronic Pain
- Physician Guided Meditation Programs
- Nutrition
- Dietary Supplements
- Stress Management Strategies
- MSK Ultrasound
- Regenerative Injection Therapies
The principles of integrative medicine:

- A partnership between patient and practitioner in the healing process.
- Appropriate use of conventional and alternative methods to facilitate the body's innate healing response.
- Consideration of all factors that influence health, wellness and disease, including mind, spirit and community as well as body.
- A philosophy that neither rejects conventional medicine nor accepts alternative therapies uncritically.

The principles of integrative medicine:

- Recognition that good medicine should be based in good science, be inquiry driven, and be open to new paradigms.
- Use of natural, effective, less-invasive interventions whenever possible.
- Use of the broader concepts of promotion of health and the prevention of illness as well as the treatment of disease.
- Training of practitioners to be models of health and healing, committed to the process of self-exploration and self-development.
Empowering The Patient

Tiers of Non-Surgical Treatment

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   - Lifestyle Modifications (weight management, stress reduction, sleep hygiene)
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   - Acupuncture & Dry needling
2. Viscosupplementation (Hyaluronic Acid)
3. Alkalining solutions (Sodium bicarbonate +/- Calcium gluconate)
4. Prolotherapy (Fenestrating injection technique with 15% dextrose)
5. Autologous whole blood injection (ABI)
6. Platelet rich plasma (PRP)
7. Stem Cell Therapies: Bone marrow aspirate concentrate (BMAC), Adipocytes and Amnion
8. Perineural Injection Techniques (PIT)
Anti-inflammatory Food Pyramid
Anti-inflammatory Agents:

- Plant based diets
- Organic Tart Cherry Juice
- Unsweetened Cocoa Powder
- Cinnamon, turmeric, garlic and ginger
- Optimizing Vitamin D and Omega 3 fatty acids (2-4 grams of DHA/EPA)
- Ice

Joint Health Considerations:

- Osteopathic Structural Evaluation
- Optimization of Nutrition
- Weight Management
- Stretching and Strengthening exercises
- Aerobic exercise/Aquatic therapy
- Supportive Shoewear
- Consideration of supplements:
  - Glucosamine (1500mg/D) and Chondroitin (1200mg/D)
  - Omega-3 Fatty Acids (2-4 grams/D)
  - Vitamin D3 (2,000IUs D3/D)
  - Organic Tart Cherry Juice
  - Zyflamend (Botanical COX-2 inhibitor)
  - SAMe (400mg/D)
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Dr. Jon Kabat-Zinn

- “Instead, we befriend ourselves as we are. We learn how to drop in on ourselves, visit, and hang out in awareness.”
- “There are tremendous benefits that arise from mindfulness practice, but it works precisely because we don’t try to attain benefit.”
Meditation

- In a 1985 study conducted by Kabat-Zinn, patients with chronic pain showed a statistically significant reduction in various measures of pain symptoms when trained in mindfulness based stress reduction (MBSR).
- Meditation practices have also shown beneficial effects in the treatment of tension headaches, psoriasis, blood pressure, serum cholesterol, smoking cessation, carotid atherosclerosis, coronary artery disease, longevity and cognitive function in the elderly, psychiatric disorders use of medical care, and medical costs in treating chronic pain.
- A 2004 meta-analysis found MBSR training useful for a broad range of chronic disorders such as depression, anxiety, fibromyalgia, mixed cancer diagnoses, coronary artery disease, chronic pain, obesity, and eating disorders.
Basics of Mindfulness

- **Mindfulness meditation**
- Sit quietly and focus on your natural breathing or on a word or “mantra” that you repeat silently. Allow thoughts to come and go without judgment and return to your focus on breath or mantra.
- 10-20 minutes per day

Mindfulness Can Improve Well Being

- Increasing your capacity for mindfulness supports many attitudes that contribute to a satisfied life.
- Being mindful makes it easier to savor the pleasures in life as they occur, helps you become fully engaged in activities, and creates a greater capacity to deal with adverse events.
- By focusing on the here and now, many people who practice mindfulness find that they are less likely to get caught up in worries about the future or regrets over the past, are less preoccupied with concerns about success and self-esteem, and are better able to form deep connections with others.
Heart Rate Variability

Meditation

- Research conducted at the University of Wisconsin-Madison suggests a positive correlation between meditation practice and left-sided prefrontal cortex activity, which is associated with positive affective mental states. In this study, meditation was associated with increases in antibody titers to influenza vaccine suggesting correlation among meditation, positive emotional states, localized brain activity, and improved immune function.
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Symptomatic Lumbar Spondylosis
Common Trigger Points

3 Gluteus Medius Trigger Points
2 Gluteus Medius Trigger Points

TrP₁
TrP₂
TrP₃
Why Acupuncture?

- >100,000 Americans die each year from drug related issues.
- Most patients want non-medication and nonsurgical options.
- Influences the ANS
- Cost effective
- Minimal side effects
- Professionally rewarding

Battlefield Acupuncture

- Developed by Richard Niemtzow, MD in 2001
- Treatment for pain
- Acupoints:
  - Cingulate gyrus
  - Thalamus
  - Omega 2
  - Point Zero
  - Shenmen

www.nyacuhealth.com
Common Trigger Points

Gua Sha & Cupping
Tiers of Non-Surgical Treatment

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Common Pain Patterns

Figure 1

Figure 2
Medial Knee Pain

Fundamentals of Ligaments

- All are richly innervated (Pacinian corpuscles, muscle spindle apparati, Golgi tendon organs.)
- Form connections between vertebral bodies, facets, multifidi, sacrum to pelvis-sacroiliac joints, sacrum to posterior pelvis and coccyx to pelvis and sacrum.
- Proprioceptive input from ligaments, followed by CNS processing, regulates tone, posture, firing patterns of axial and appendicular musculature.
Effectiveness of intra-articular injections of sodium bicarbonate and calcium gluconate in the treatment of osteoarthritis of the knee: a randomized double-blind clinical trial

Sandra García-Padilla¹, Miguel Angel Duarte-Vázquez², Karla Elena Gonzalez-Romero¹, María del Carmen Caamaño¹,² and Jorge L Rosado³,⁴

Abstract

Background: A novel therapeutic management of osteoarthritis (OA) of the knee was assessed. The study aimed to evaluate the effect of monthly sodium bicarbonate with a single (SBCG1) or double dose (SBCG2) of calcium gluconate injections on OA of the knee, as well as the efficacy and safety of both SBCG interventions in the long term.

Methods: A double-blind parallel-group clinical trial with 74 knee OA patients was performed during 12 months, both SBCG interventions were followed-up for another 6 mo after intervention. The outcome variables were the Western Ontario-McMaster University Osteoarthritis Index (WOMAC), the Lequesne's functional index and joint space width changes from serial radiographs.

Results: After 12 months, group SBCG1 decreased −14.8 (95% CI: −14.2, −17.0) and group SBCG2 decreased −14.6 (−16.9, −12.6) in the global WOMAC score; the mean changes represent 80% and 82% lessened pain, respectively. In the Lequesne Functional Index scale, SBCG1 decreased −11.9 (−16.4, −14.3) and SBCG2 decreased −11.9 (−15.8, −10.0), representing 66% and 69% of improvement. Both mean scores were maintained after intervention discontinued. SBCG2 improved the knee's joint space width more than SBCG1 at 3 and 18 months, both SBCG interventions were well tolerated after 12 months of treatment.

Conclusion: A solution of sodium bicarbonate and calcium gluconate is effective on reducing the symptoms associated with OA. Its beneficial effect is maintained for one year of continuous monthly administration and at least for 6 months after the administration is discontinued. When the dose of calcium gluconate is increased, it prevents further narrowing of joint space.


Keywords: Osteoarthritis, knee, sodium bicarbonate, calcium gluconate.

Knee Acupuncture
Perineural Injection Technique
John Lyftogt MD

Perineural injection technique is a technique in which subcutaneous tissue is injected with a 5% dextrose solution using approximately 0.5mL of D5W at each point at a 45 degree angle 1-2cm apart. The cutaneous nerve is targeted to decrease nerve inflammation. The needle was inserted 0.5-1cm deep and the solution was injected while withdrawing the needle to create a skin bleb.

Earl Gedney, DO

- 1931 graduate of PCOM
- Orthopedic surgeon
- Gedney caught his thumb in closing surgical suite doors thereby stretching the joint and causing severe pain and instability. After being told by his colleagues that nothing could be done for his condition and that his surgical career was over,
- Gedney knew of a group of doctors called "herniologists" that used irritating solutions to stimulate the repair of the distended connective tissue ring in hernias.
- He extrapolated this knowledge to inject his injured thumb and was able to fully rehabilitate it.
Important Growth Factors in PRP

<table>
<thead>
<tr>
<th>Growth Factor</th>
<th>Phase in Which Most Active</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>IGF-1</td>
<td>Inflammation, proliferation</td>
<td>Promotes proliferation and migration of cells, stimulates matrix production</td>
</tr>
<tr>
<td>TGF-β</td>
<td>Inflammation</td>
<td>Regulates cell migration, proteinase expression, fibronectin binding interactions, termination of cell proliferation, stimulation of collagen production</td>
</tr>
<tr>
<td>VEGF</td>
<td>Proliferation, remodeling</td>
<td>Promotes angiogenesis</td>
</tr>
<tr>
<td>PDGF</td>
<td>Proliferation, remodeling</td>
<td>Regulates protein and DNA synthesis at injury site, regulates expression of other growth factors</td>
</tr>
<tr>
<td>bFGF</td>
<td>Proliferation, remodeling</td>
<td>Promotes cellular migration, angiogenesis</td>
</tr>
<tr>
<td>EGF</td>
<td>Proliferation, remodeling</td>
<td>Stimulates proliferation and differentiation of epidermal cells, stimulates angiogenesis</td>
</tr>
</tbody>
</table>
Infrapatellar tendinosis

PRP-Before and After

Pre-procedure  9 months post-procedure
Stem Cell Procedure (BMAC+PRP)

Researchers in Regenerative Medicine

- David Rabago, MD - Univ. of Wisconsin
- Dean Reeves, MD - Univ. of Kansas
- Michael Scarpone, DO - Univ. of Pittsburgh
- Bradley Fullerton, MD - Univ. of Texas
- Shane Shapiro, MD - Mayo Clinic, FL
- Brian Cole, MD, MBA - Rush Univ. Chicago, IL
- Steven Sampson, DO - Los Angeles, CA
Hyaluronic Acid Versus Platelet-Rich Plasma

Brian J. Cole, MD, MBA*, Vasili Karas, MD, MS, Kristen Hussey, MS, Kyle Pilz, MMS, PA-C, Lisa A. Fortier, DVM, PhD, DACVS

AJSM 2017

- A Prospective, Double-Blind Randomized Controlled Trial Comparing Clinical Outcomes and Effects on Intra-articular Biology for the Treatment of Knee Osteoarthritis
- Conclusion: no difference between HA and PRP at any time point in the primary outcome measure: the patient-reported WOMAC pain score.
- Significant improvements were seen in other patient-reported outcome measures, with results favoring PRP over HA.
- Preceding a significant difference in subjective outcomes favoring PRP, there was a trend toward a decrease in 2 proinflammatory cytokines, which suggest that the anti-inflammatory properties of PRP may contribute to an improvement of symptoms.

A Prospective, Single-Blind, Placebo-Controlled Trial of Bone Marrow Aspirate Concentrate for Knee Osteoarthritis

Shane A. Shapiro, MD, RMSK*, Shari E. Kaimerchak, BSN, Michael G. Heckman, MS, Abba C. Zubair, MD, PhD, Mary J. O'Connor, MD

AJSM 2016

- Conclusion: Early results show that BMAC is safe to use and is a reliable and viable cellular product. Study patients experienced a similar relief of pain in both BMAC- and saline-treated arthritic knees. Further study is required to determine the mechanisms of action, duration of efficacy, optimal frequency of treatments, and regenerative potential.
Effect of Leukocyte Concentration on the Efficacy of Platelet-Rich Plasma in the Treatment of Knee Osteoarthritis

Jonathan C. Riboh, MD*, Bryan M. Saltzman, MD, Adam B. Yanke, MD, Lisa Fortier, DVM, PhD, Brian J. Cole, MD, MBA

• Conclusion: LP-PRP results in improved functional outcome scores compared with hyaluronic acid and placebo when used for treatment of knee osteoarthritis.

• LP-PRP and LR-PRP have similar safety profiles, although both induce more transient reactions than does hyaluronic acid. Adverse reactions to PRP may not be directly related to leukocyte concentration.

Effects of Meditation on Physician Well-Being

• Led by LECOM Integrative Medicine Fellow: Christy Taoka, MD

• 6-7pm

• 5215 Peach Street (just south of St. George’s same side of Peach Street—parking in the back and adjacent former Long John Silver’s)

• Tuesday evenings March 21- April 11

• Tuesday evenings April 25-May 16
Take Home Points

- Embrace some integrative therapies for yourself like meditation, OMT, or acupuncture to further your own understanding and help your own health.
- Explore different ways to broaden your own skill set as it relates to the treatment of pain.
- Consider supplements (Vitamin D3 2,000IUs/D, Omega-3 fatty acids, healthy spices) which may provide healthier ways to reduce inflammation.
- Remember that tissue integrity issues within ligaments and tendons do not respond well to chronic steroid injections or long term use of anti-inflammatory agents. Different type of regenerative injections may be helpful for arthritic, tendon and ligament pain. Consider a referral for acupuncture or regenerative injection therapies.
References:


References: