

Non-Medication Treatment and Management of Pain

Gregory W. Coppola, DO, FAOASM
LECOM Lifestyle and Integrative Medicine

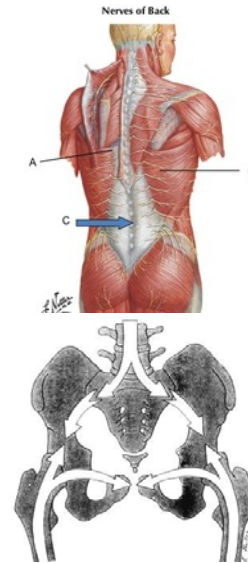
LECOM Primary Care Update
Peek'n Peak CME
2017

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



Osteopathic Medicine

- 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.



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

Amir Qaseem, MD, PhD, MHA; Timothy J. Wilt, MD, MPH; Robert M. McLean, MD; and Mary Ann Forciea, MD; for the Clinical Guidelines Committee of the American College of Physicians*

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)

Ann Intern Med. doi:10.7326/M16-2367

Annals.org

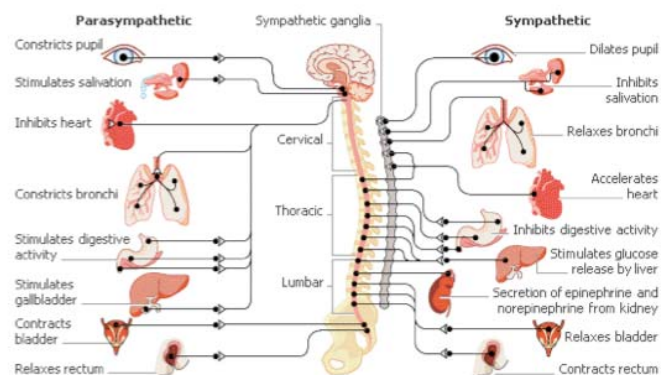
For author affiliations, see end of text.

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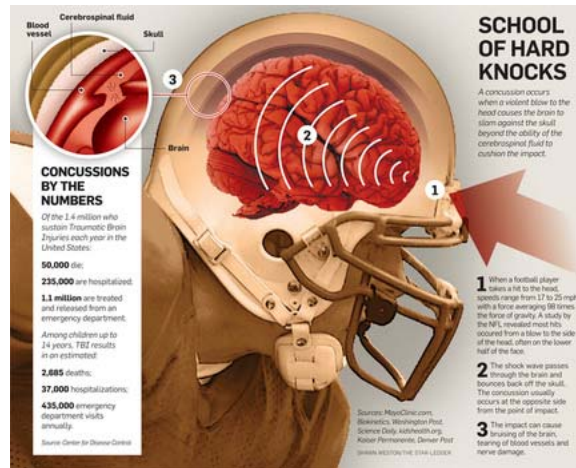
Tiers of Non-Surgical Treatment

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)

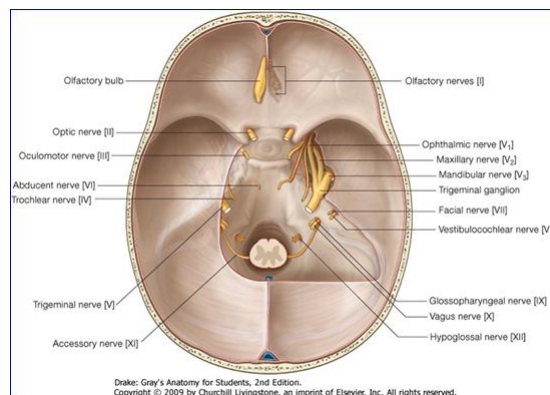
Autonomic Nervous System



Impact of Concussions:



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.**

4x



- 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

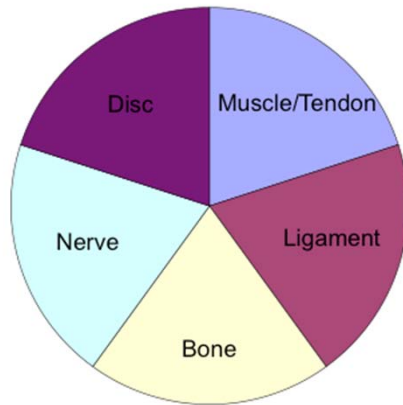
Partnering with Pain



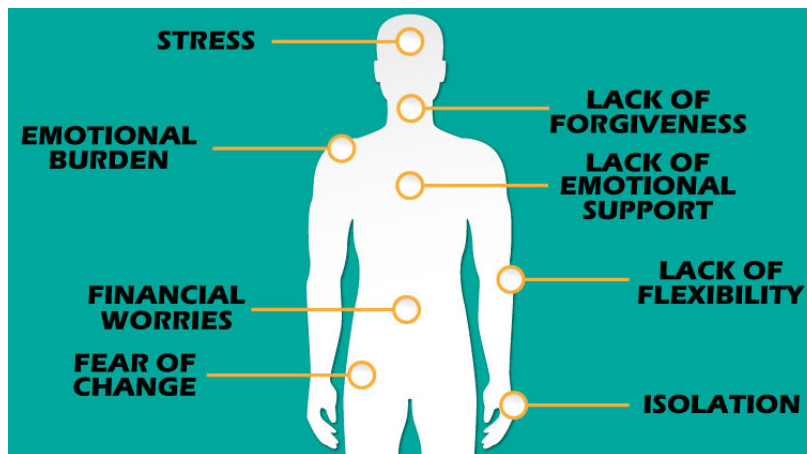
Partnering with Patients



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.

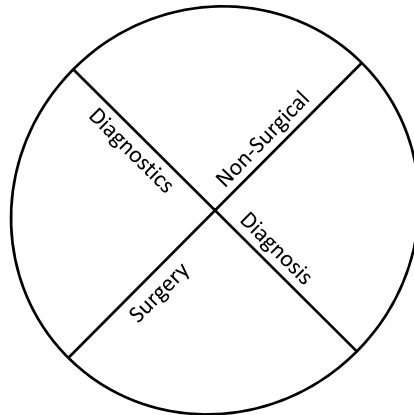


The principles of integrative medicine:

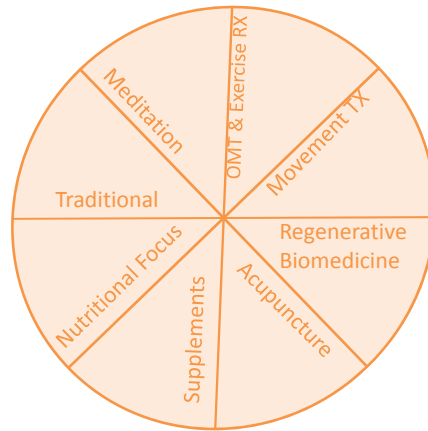
- Recognition that good medicine should be based in good science, be inquiry driven, and be open to new paradigms.
- Use of natural, effective, less-invasive interventions whenever possible.
- Use of the broader concepts of promotion of health and the prevention of illness as well as the treatment of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



Empowering The Patient



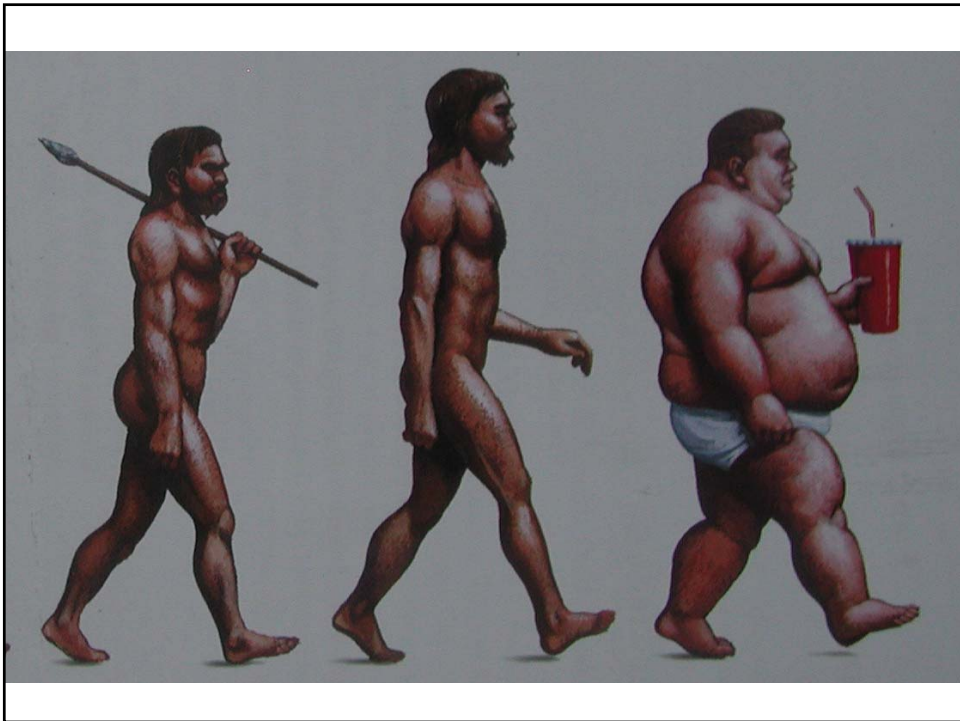
Traditional
Medicine

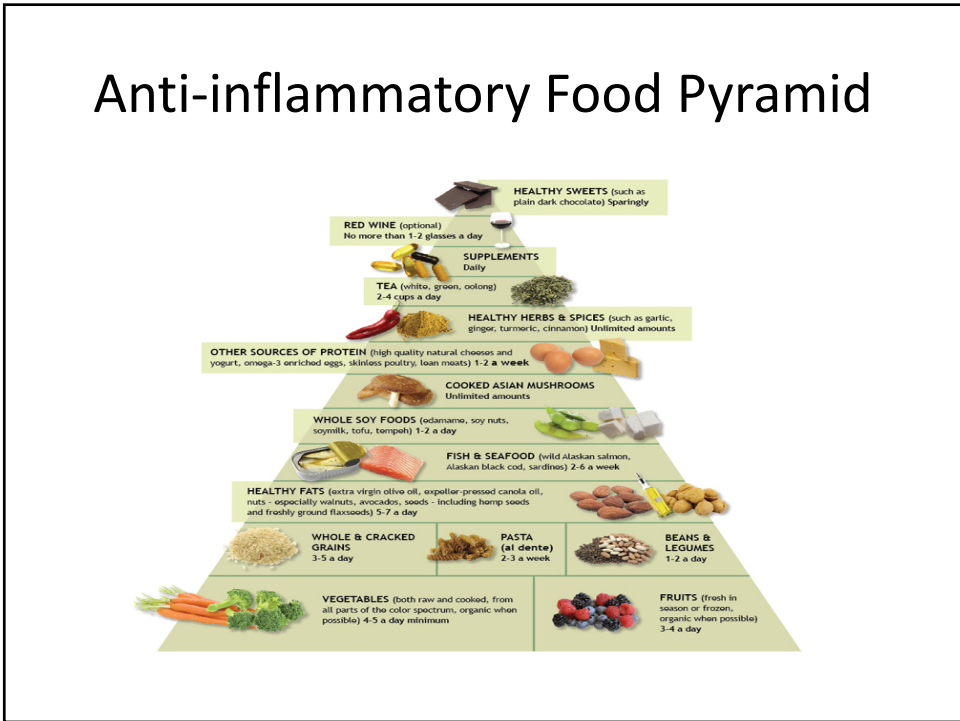
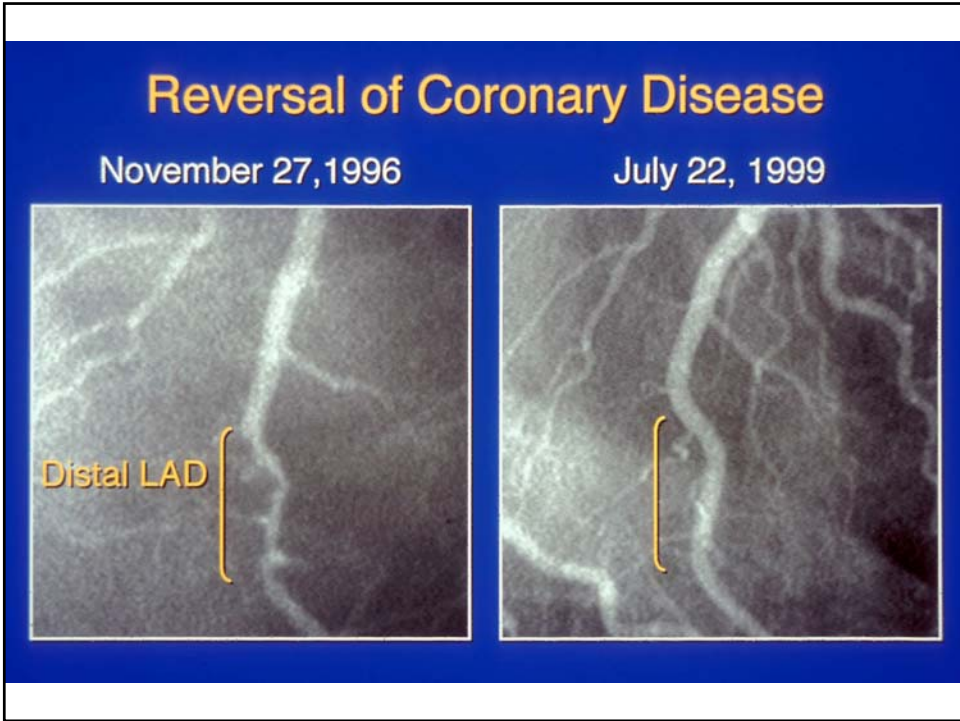


Integrative
Medicine

Tiers of Non-Surgical Treatment

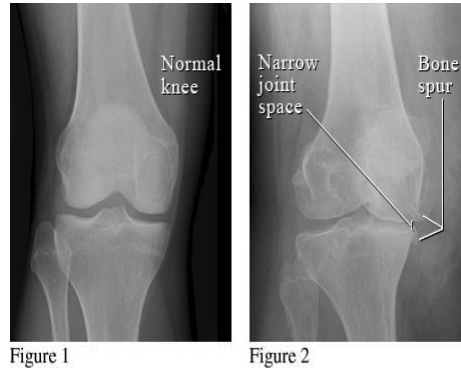
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 - Biomechanical assessment
 - Osteopathic Manual Medicine/Chiropractic/Physical Therapy/Massage/Graston Techniques
 - Home exercises (HEP)
 - Lifestyle Modifications (weight management, stress reduction, sleep hygiene)
 - Nutrition/Supplements (Anti-inflammatory 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)
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5. Autologous whole blood injection (ABI)
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8. Perineural Injection Techniques (PIT)





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
 - Zylflamend (Botanical COX-2 inhibitor)
 - SAME (400mg/D)



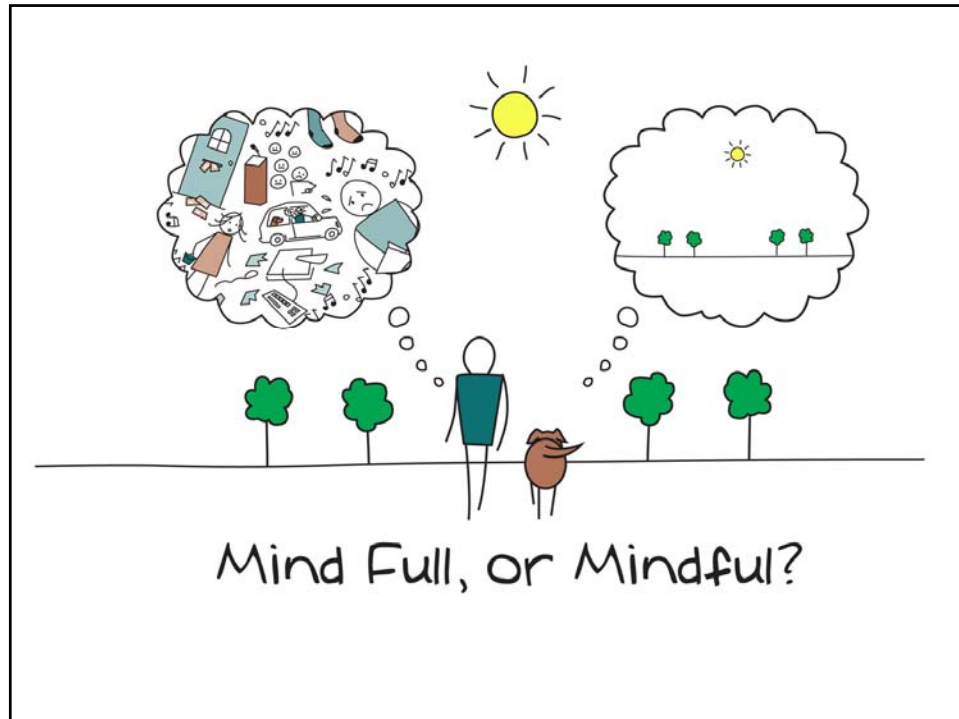
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Dr. Jon Kabat-Zinn

- “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

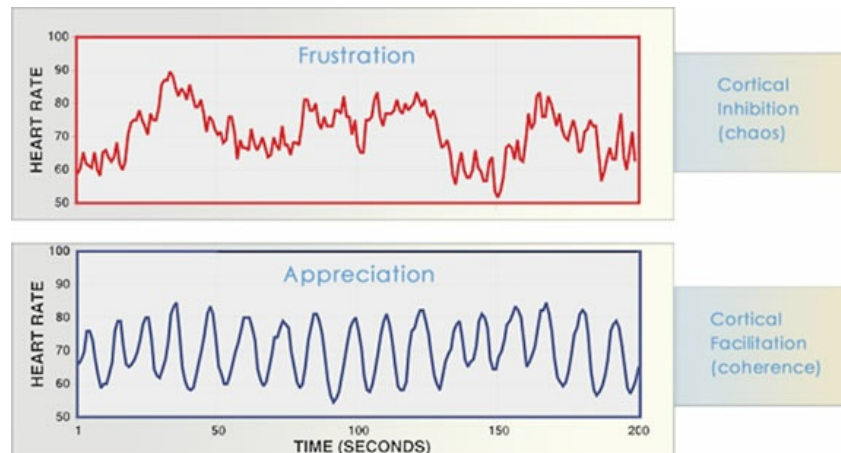


Mindfulness Can Improve Well Being

- 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.

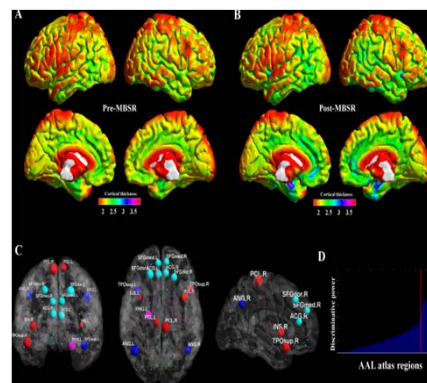


Heart Rate Variability



Meditation

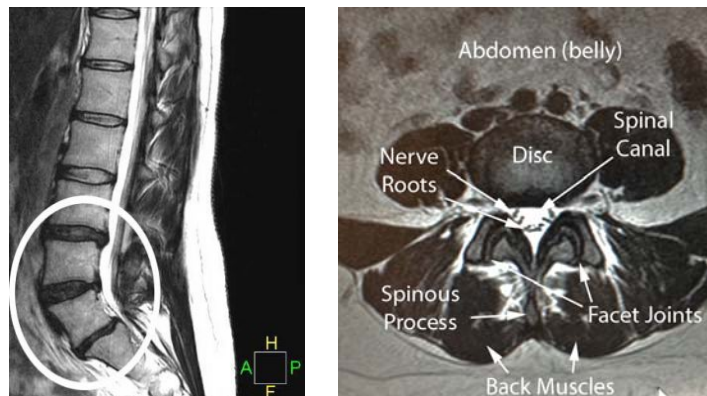
- Research conducted at the University of Wisconsin-Madison suggests a positive correlation between meditation practice and left-sided prefrontal cortex activity, which is associated with positive affective mental states. In this study, meditation was associated with increases in antibody titers to influenza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



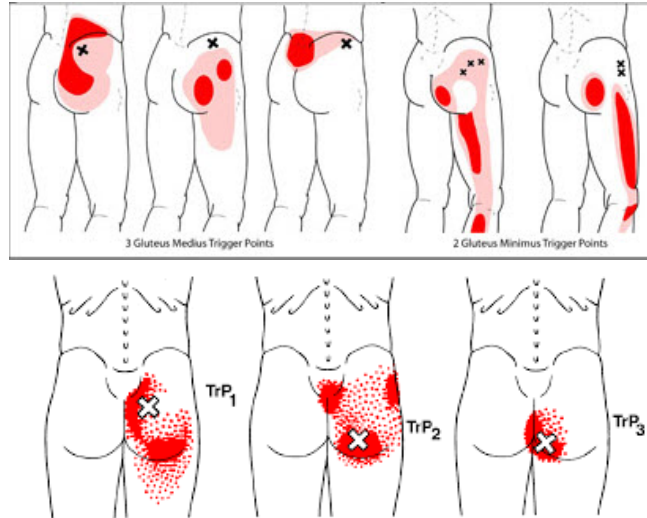
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Symptomatic Lumbar Spondylosis

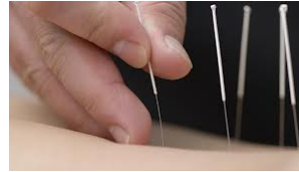


Common Trigger Points



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

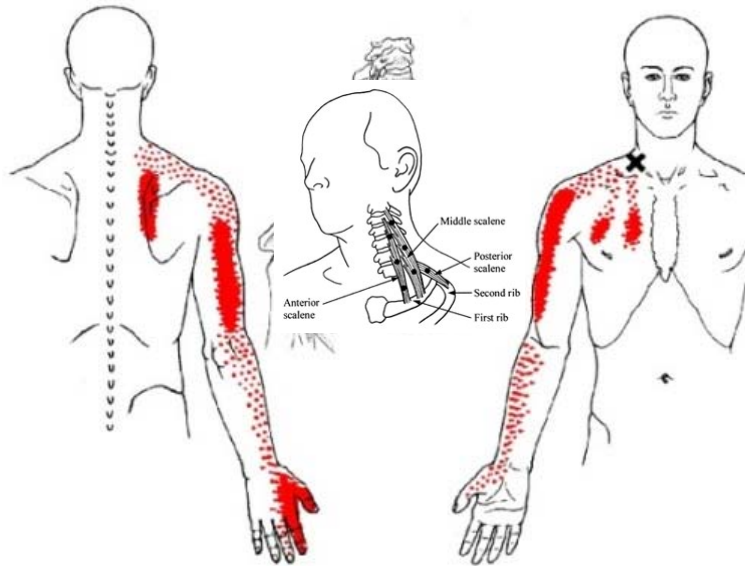


Battlefield Acupuncture

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



Common Trigger Points



Gua Sha & Cupping



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Common Pain Patterns

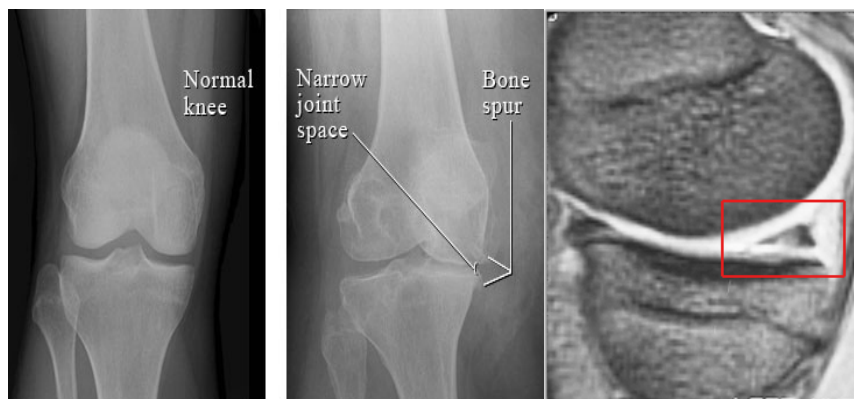
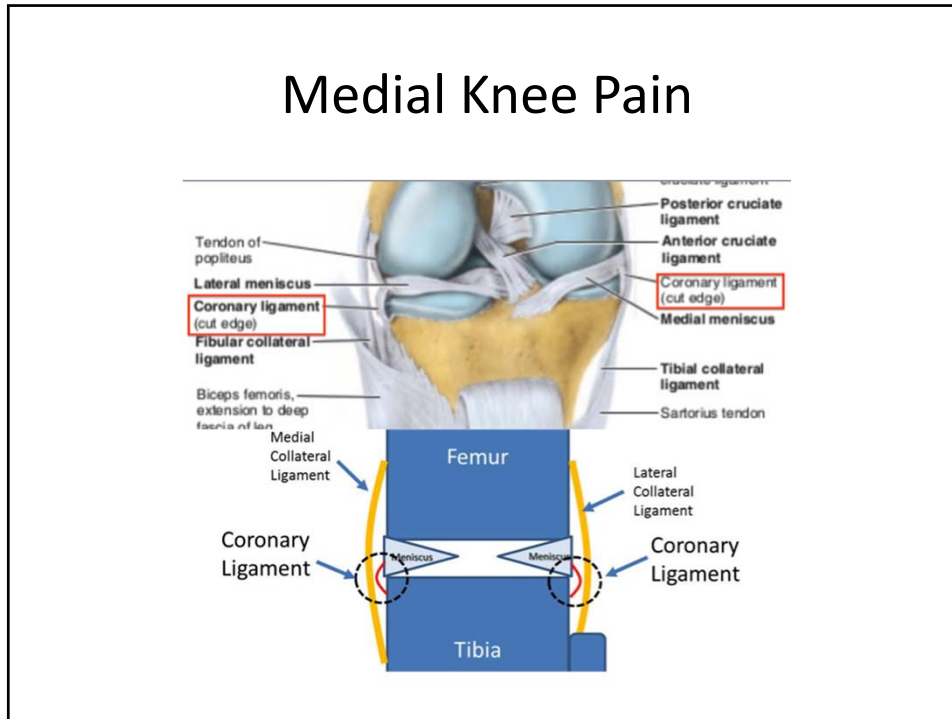


Figure 1

Figure 2

Medial Knee Pain



Fundamentals of Ligaments

- All are richly innervated (Pacinian corpuscles, muscle spindle apparatus, 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 Caamaño^{1,3} and Jorge L Rosado^{1,3*}

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 6mo 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 ($-16.9, -12.4$) 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 ($-10.4, -14.2$) and SBCG2 decreased -11.9 ($-13.8, -10.0$), representing 66 and 69% of improvement. Both mean scores were maintained after intervention discontinued. SBCG2 improved the knees' 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.

Trial registration: Clinicaltrials.gov NCT00977444 September 11, 2009.

Keyword: Osteoarthritis therapy, Joint, Knee, Sodium bicarbonate and 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.



What Is Platelet-rich Plasma (PRP)?

Blood is a liquid (plasma) that contains red and white blood cells, and platelets. Platelets help clot blood and also contain hundreds of proteins called growth factors important in the healing of injuries.

Platelet-rich plasma (PRP) has 5 to 10 times more platelets than what is typically found in blood. The concentration of platelets—and growth factors—has important implications in healing, and can potentially regenerate tissue and cartilage.

How Does PRP Work?

Blood is drawn from a patient into a test tube, and then placed in a centrifuge for a "spin."

Plasma and platelets
White blood cells
Red blood cells

Low gravitational force separates the plasma and platelets from the red and white blood cells. The increased concentration of platelets is then combined with the remaining blood.

PRP can be carefully injected into the injured area or inflamed tissue, or by preparing the PRP in a way that allows it to be stitched into torn tissues.

What Conditions Can Be Treated With PRP?

Some cases of anterior cruciate ligament (ACL) tears and injuries, tennis elbow, and rotator cuff injuries.

What You Should Know

While more clinical research is needed, the risks associated with PRP therapy are minimal: There may be increased pain at the injection site, but the incidence of other problems appears to be no different from that associated with cortisone injections.

Considering PRP treatment? Be sure to check your eligibility with your orthopaedic surgeon and health insurance carrier.

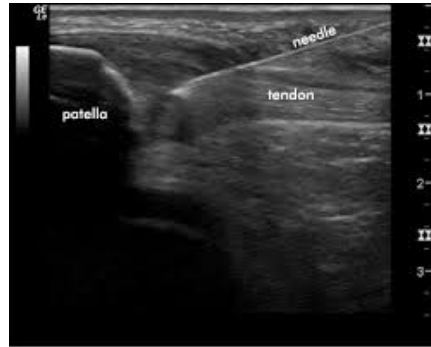
For more information, visit OrthoInfo.org.

Infographic courtesy of the **AAOS**
American Academy of Orthopaedic Surgeons

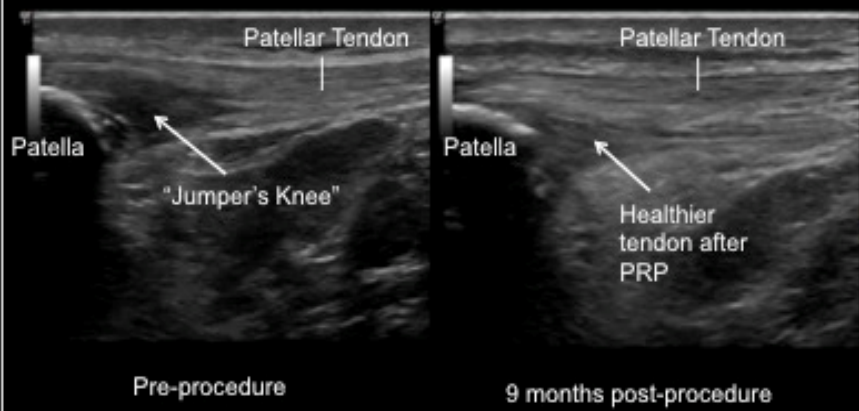
Important Growth Factors in PRP

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

Infrapatellar tendinosis



PRP-Before and After



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. Kazmerchak](#), BSN, [Michael G. Heckman](#), MS, [Abba C. Zubair](#), MD, PhD, [Mary I. 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**


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Warnings
 Weight Loss Supplement Found to Contain DMAA Recalled
 FDA Warns Puerto Rico Supplement Seller

In the News

 • The article "Cocoa Powders Found to Contain a Toxic Metal" in Prevention featured ConsumerLab.com's test findings.

 • The Yahoo Health article "Fish Oil Boosts Brain Power" discusses an apparent benefit of fish oil supplements and recommends ConsumerLab.com as a resource for choosing the best fish oil supplement.

Clinical Updates: Up To a Point, Alzheimer's Risk Falls with Vitamin D

Recent ConsumerLab.com Reviews
Your Cocoa May Be Contaminated! Full Review

 Photo: ConsumerLab.com
See What's Really in Cocoa and Chocolate Powders, Foods, and Supplements
Fish Oil, Krill, Algal, Calamari, and Green-lipped Mussel Supplements Reviewed
Some Supplements Can Help Lower Cholesterol and Reduce the Risk of Heart Disease


Dr. Walt Larimore, Award-Winning Medical Journalist - Monument, CO
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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-inflammatories. Different type of regenerative injections may be helpful for arthritic, tendon and ligament pain. Consider a referral for acupuncture or regenerative injection therapies.

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