



Evidence Based Review Alternative Pain Management

December 9, 2020 | 2:00-3:00 p.m. ET

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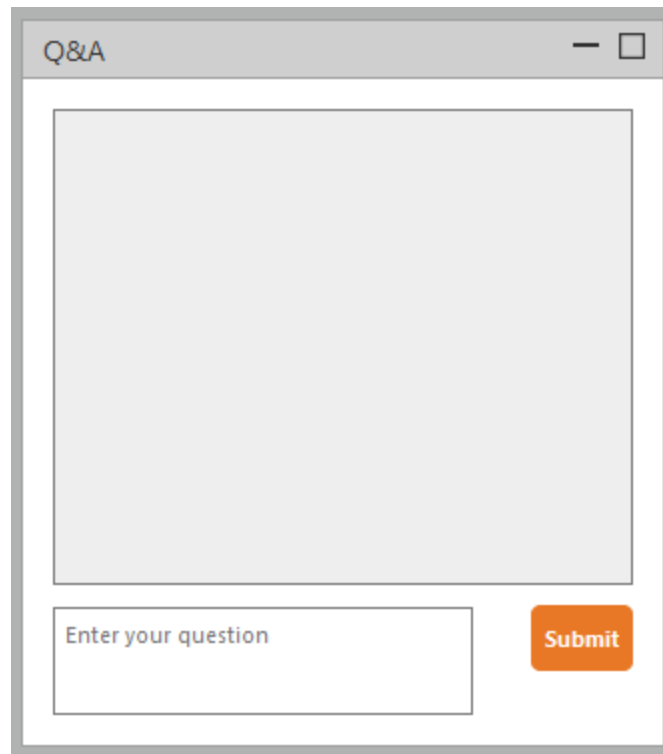
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Presenter



Dr. Kathleen Fink
Consulting Physician
Optum Workers' Comp and
Auto No-fault Solutions

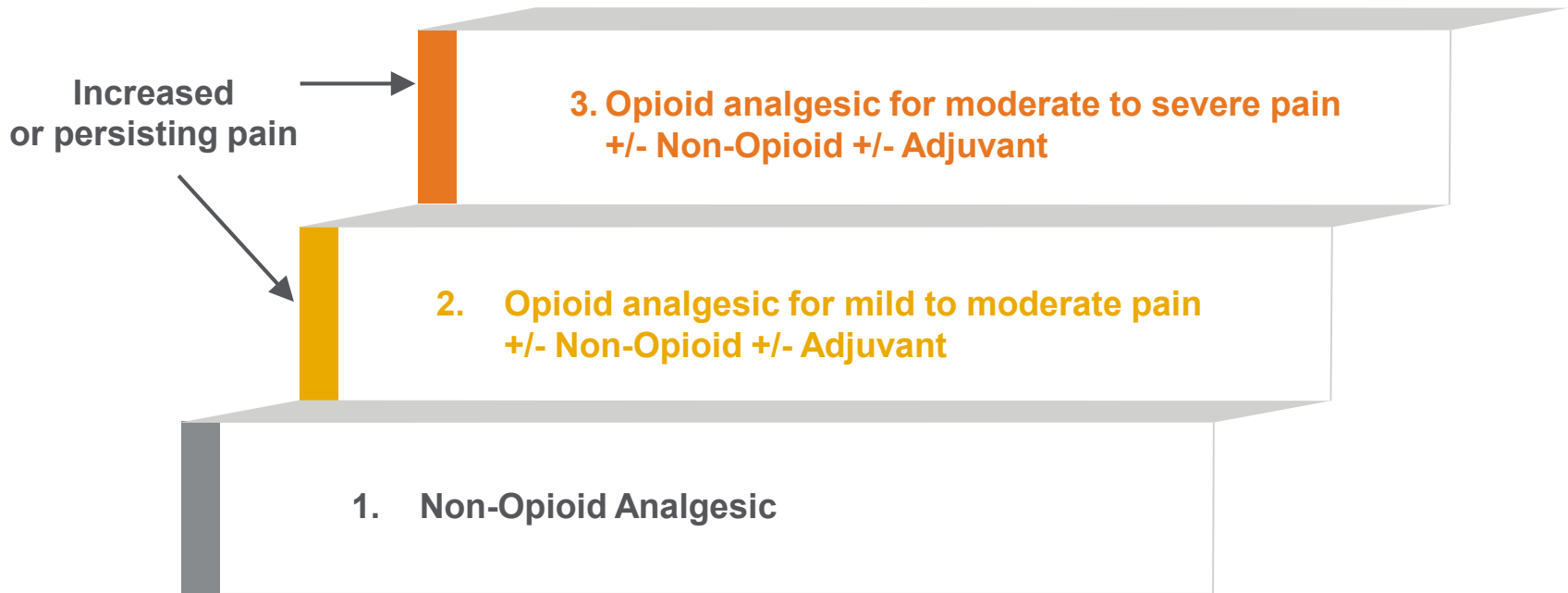
Kathleen Fink, MD, is board certified in physical medicine and rehabilitation and pain management. Her clinical practice is based in McLean, Virginia where she specializes in pain, musculoskeletal/sports medicine, performing arts medicine, fluoroscopic spine injection techniques, and occupational medicine. She has extensive experience in occupational medicine including Independent Medical Evaluations, utilization review, peer discussions, and directing specialty workers compensation programs with pharmacists, nurses and claims professionals.

Dr. Fink completed her postgraduate training and fellowship at the Rehabilitation Institute of Chicago. Her continuing education has expanded to include acupuncture training through the UCLA Medical Acupuncture Course for Physicians. Dr. Fink is active in the education and training of future physicians and professionals within the community regarding musculoskeletal conditions and treatment. Dr. Fink has been named one of the top doctors in her specialty by Washingtonian magazine.

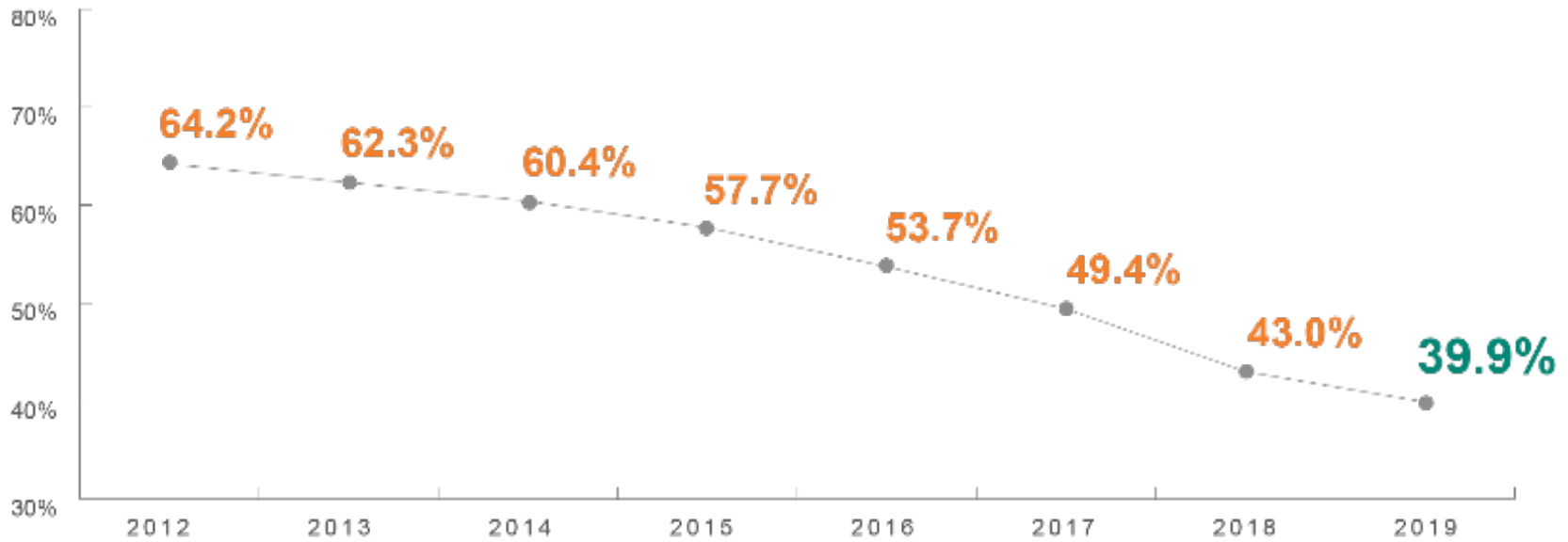
Agenda

- The importance of opioid alternatives
- Physical medicine
- Complimentary and alternative medicine
- Behavioral health
- Electromedical devices
- Injection therapy

World Health Organization pain ladder



With proper management there is a downward trend in opioid utilization



Source: Optum Workers' Comp and Auto No-Fault 2019 trend report

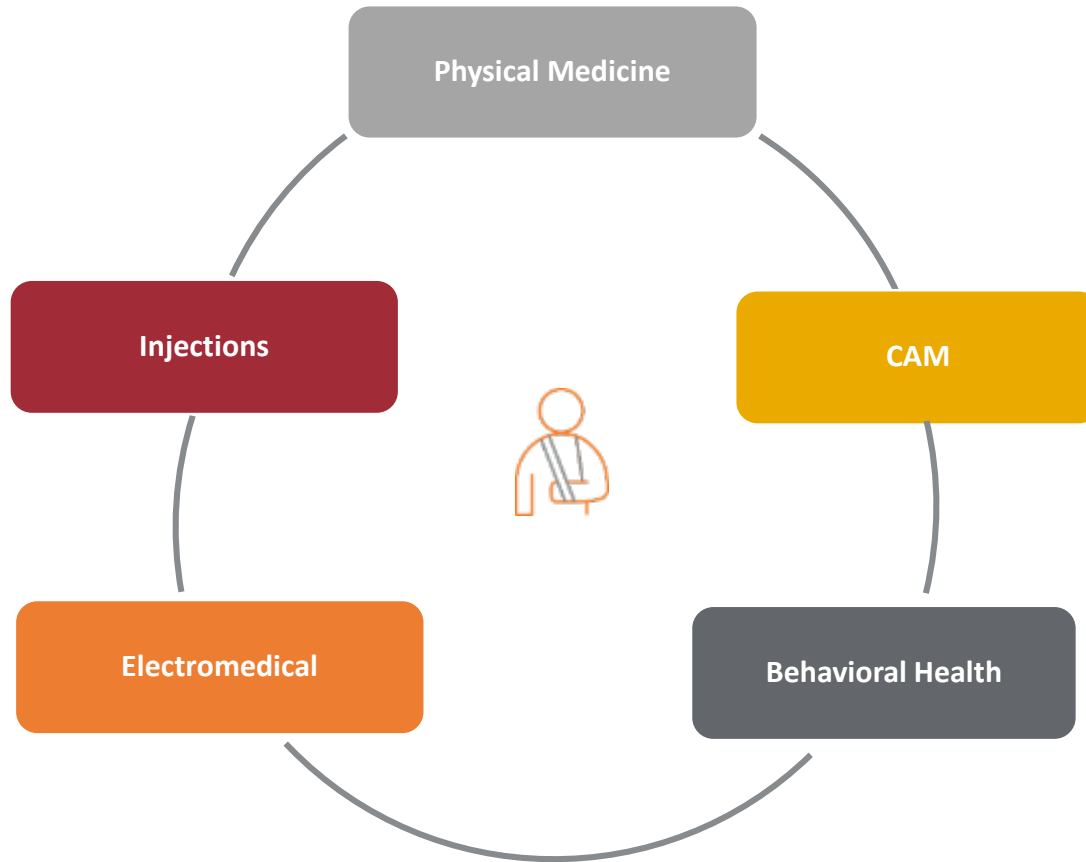
How do we continue that trend?

Importance of alternatives

- Empowering wellness
- Promoting self management
- Reducing cost
- Most Importantly: SAFETY



Alternatives to treat pain





Physical medicine

Therapy

- Most commonly used modality
- Should be time limited with objective gains

TREATMENT PATHWAYS

- Active vs. passive
- Directional preference
- Early intervention
- Fear avoidance
- Resistance training
- Spinal manipulation

Active vs. Passive therapy

ACTIVE THERAPY	PASSIVE THERAPY
The patient is “actively” participating in a directed exercise program that may include mind/body awareness, ergonomics, conditioning, stretching strengthening	The patient is “passive” in the treatment. The therapist applies hot/cold treatment, electrical stimulation, passive range of motion, myofascial release or massage

OUTCOMES:

- Patients receiving active care had fewer visits and lower charges ($P < 0.05$), and showed more improvement in disability (Fritz et al. 2004)
- Studies identified in this systematic review indicate that adherence to an active treatment approach as recommended by clinical practice guidelines may result in improved patient outcomes (Luna et al. 2017)

Directional preference

STUDY – LONG 2004

- Multicenter randomized controlled trial
- 312 patients with acute, sub acute and chronic
- Directional preference elicited in 74%
- Three groups – “matching” “opposite” “nondirectional”

*Approximately 1/3 in each group withdrew within two weeks

OUTCOMES:

- Matching exercises resulted in better outcomes
- Significantly greater improvements occurred in matched subjects compared with both other treatment groups in every outcome (P values <0.001), including a threefold decrease in medication use.

Long A, Donelson R, Fung T. Does it matter which exercise? A randomized control trial of exercise for low back pain. *Spine (Phila Pa 1976)*. 2004;29(23):2593-2602.

Early intervention

Randomized Controlled Trial, LBP < 6 months, Two groups:

1. Early Intervention - Education and four sessions of PT

2. Control Group – Education alone

- Significant difference was noted in ODS score at four weeks
- Pain Catastrophizing Scale (PCS) reduced at four weeks and three months
- No change in pain intensity
- No change in overall at one year
- No difference in utilization over time

CONCLUSION:

Early physical therapy resulted in statistically significant improvement in disability, but the improvement was modest. More research is needed

Fritz JM, Magel JS, McFadden M, et al. Early Physical Therapy vs Usual Care in Patients With Recent-Onset Low Back Pain: A Randomized Clinical Trial. *JAMA*. 2015;314(14):1459-1467.

Fear Avoidance Belief (FAB)

WERTI, SPINE 2014

Research on treatment outcome prognostic factors - FABs are associated with poor treatment outcome in patients with LBP of less than 6 months, and thus early treatment, including interventions to reduce FABs, may avoid delayed recovery and chronicity.

GEORGE, SPINE 2003

RCT; Outcomes - Disability, pain intensity, and fear-avoidance beliefs

Fear Avoidance Treatment group versus Standard Care. Treatment resulted in less fear avoidance behaviors than the standard care group.

FRITZ, PHYS THER 2002

All subjects had physical therapy. Work status assessed at 4 weeks

The work subscale of the Fear-Avoidance Beliefs Questionnaire was the strongest predictor of work status and correlated with both successful and not successful return to work outcomes.

Resistance training

A comparison of two forms of exercise rehabilitation programs in the management of chronic nonspecific low-back pain.

- Chronic nonspecific LBP (≥ 3 months; ≥ 3 days a week)
- Three groups
 - #1 Resistance training, #2 Aerobic training, #3 Control

OUTCOMES

- Body composition
- Pain
- Disability
- Quality of life in chronic nonspecific LBP

SUMMARY

The primary finding was that resisted training was successful at improving fitness, pain, disability, and QOL outcome measures, whereas aerobic training was not.

Kell, Robert T1; Asmundson, Gordon J G2 A Comparison of Two Forms of Periodized Exercise Rehabilitation Programs in the Management of Chronic Nonspecific Low-Back Pain, Journal of Strength and Conditioning Research: March 2009 - Volume 23 - Issue 2 - p 513-523

Spinal manipulation

STUDIES ON EFFECTIVENESS	STUDIES ON DURATION
<ul style="list-style-type: none">• Systematic review of 6 RCTs• The studies appear to favor spinal manipulation with minimal adverse events.• One of the trials also reported statistically less medication use, healthcare utilization and lost work time.	<ul style="list-style-type: none">• Found that shorter durations of treatment (<30d) were associated with lower likelihood of work disability recurrence and shorter work disability duration.• Reinforces focused, time limited treatments

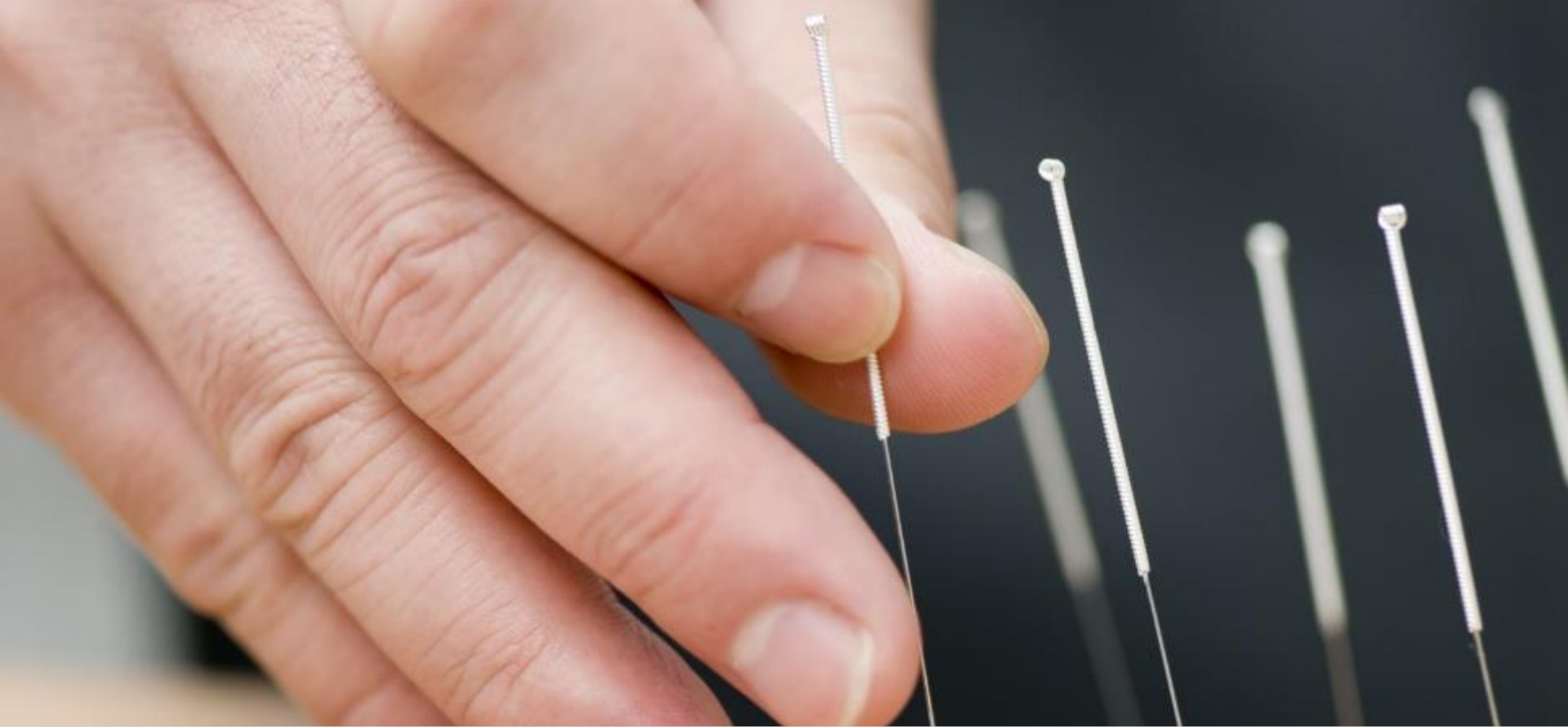
Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. *Int J Sports Phys Ther.* 2012;7(6):647-662.

Wasiak R, Kim J, Pransky GS. The association between timing and duration of chiropractic care in work-related low back pain and work-disability outcomes. *J Occup Environ Med.* 2007;49(10):1124-1134.

Traction

- Mechanical versus Manual Traction
- Supine versus Upright Units

CERVICAL	LUMBAR
<p>Several studies have demonstrated that home cervical traction can provide symptomatic relief in over 80% of patients with mild to moderately severe (Grade 3) cervical spinal syndromes with radiculopathy.</p> <p>Cochrane review found no evidence from RCTs that clearly supports or refutes the use of traction for neck disorders</p>	<p>A Cochrane systematic review of traction for low back pain with or without sciatica concluded that traction, either alone or in combination with other treatments, had little or no impact on pain intensity, functional status, global improvement, and return to work.</p>



Complementary and Alternative Medicine

Acupuncture

1997 NIH Consensus statement

Adult postoperative pain and chemotherapy nausea and vomiting

Other diagnosis can be considered when part of a comprehensive management program

- Addiction
- Headache
- Tennis elbow
- Fibromyalgia
- Myofascial pain
- Osteoarthritis
- Low back pain
- Carpal tunnel syndrome

Since then there have been multiple studies

- ODG support use for myofascial pain, migraines and chronic low back pain
- 3-4 visit trial with 4-8 additional sessions if improvement noted
- Outcomes in literature better when combined with other treatments

Liu L, Skinner M, McDonough S, Mabire L, Baxter GD. Acupuncture for low back pain: an overview of systematic reviews. *Evid Based Complement Alternat Med*.

Massage

EFFECTIVENESS

- Massage is effective in adults for chronic low back pain and chronic neck pain.
- The evidence is inconclusive for knee osteoarthritis, fibromyalgia, myofascial pain syndrome and migraine headache.

Bronfort G, Haas M, Evans R, Leininger B, Triano J. Effectiveness of manual therapies: the UK evidence report. *Chiropr Osteopat.* 2010;18:3. Published 2010 Feb 25. doi:10.1186/1746-1340-18-3

RANDOMIZED COMPARATIVE TRIAL

Some support for early deep frictional massage and mobilization in early adhesive capsulitis.

Guler-Uysal F, Kozanoglu E. Comparison of the early response to two methods of rehabilitation in adhesive capsulitis. *Swiss Med Wkly.* 2004;134(23-24):353-358.

Complementary movement therapy

Tai Chi

Yoga

Pilates

Feldenkrais

Alexander



Primary intervention for balance training and fall prevention

At least equal and some better outcomes than traditional interventions and cost effective

Complementary movement therapy

Tai Chi

Yoga

Pilates

Feldenkrais

Alexander



Studies for LBP

- Improved pain and function
- The effects of yoga were similar to those of exercise.

Studies for Neck

- Improved pain intensity, disability and ROM

Complementary movement therapy

Tai Chi

Yoga

Pilates

Feldenkrais

Alexander



Systematic review suggests it improves flexibility, dynamic balance and muscular endurance in healthy subjects

No superiority over other exercises or interventions for LBP

Complementary movement therapy

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Alexander



Use supported for improving balance in aging populations
Additional studies are needed for other outcome indicators

<https://feldenkrais.com/beginners-guide-to-feldenkrais-method-lessons/>

Complementary movement therapy

Tai Chi

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Alexander



Reports strong evidence for CLBP

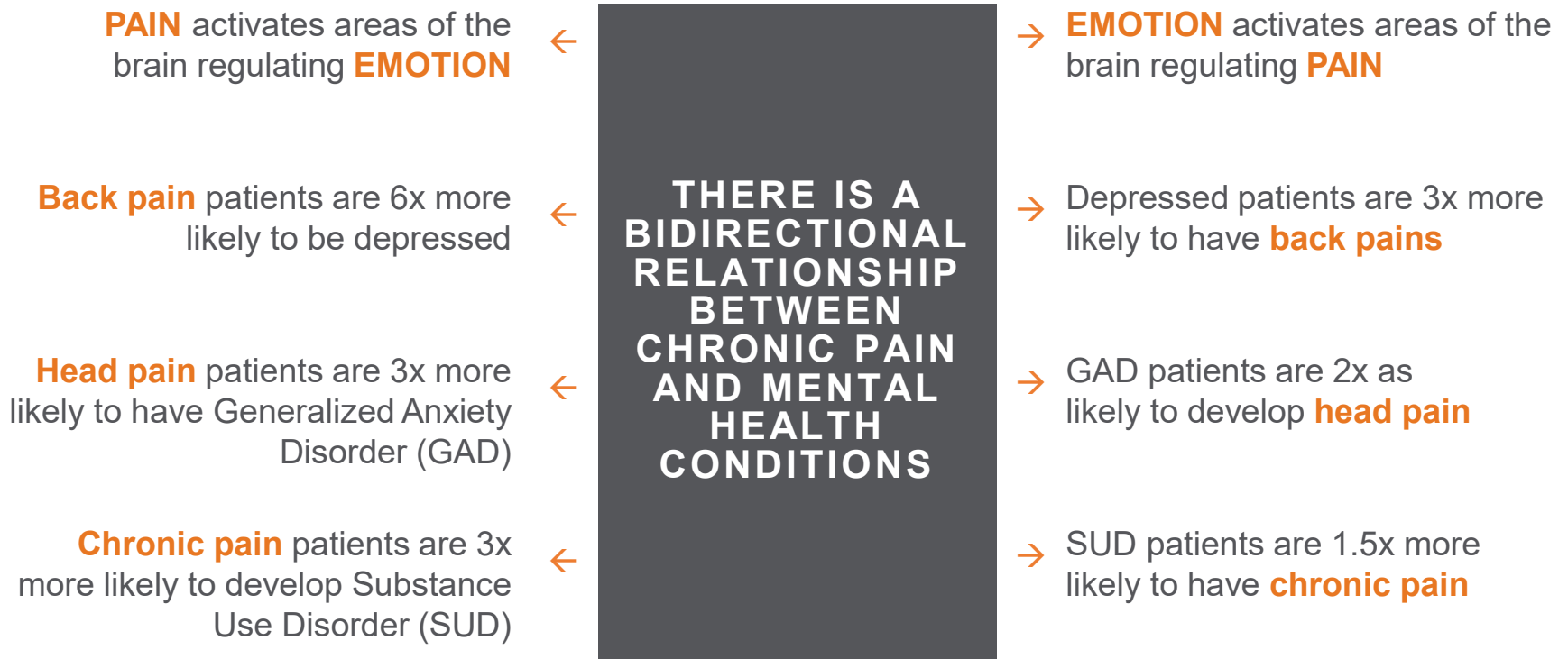
More research needed for general chronic pain and posture

<https://www.spineuniverse.com/conditions/chronic-pain/could-alexander-technique-relieve-your-chronic-back-neck-pain>



Behavioral health

The relationship between chronic pain and mental health conditions



PSYCHOLOGICAL ISSUES ARE THE **#1 BARRIER** TO SUCCESSFUL RETURN TO FUNCTION AND WORK OUTCOMES

Cognitive Behavioral Therapy (CBT)

- ODG 13-20 visits
- CBT treatment model has three stages:



- Systematic research studies confirm that psychological interventions are efficacious in the treatment chronic musculoskeletal pain, especially back pain
- CBT should be coordinated with physical therapy
- Biofeedback is not recommended unless it is combined with CBT

Acceptance and Commitment Therapy (ACT)

- Similar effectiveness to CBT
- Initially known as Comprehensive Distancing
- Goal to increase psychological flexibility
- Invites people to open up to unpleasant feelings, learn not to overreact to them and not avoid situations where they are invoked.
- *Lack of psychological flexibility may predict psychopathology*

Mindfulness Meditation

- New “buzz” word
- Meditation and mindfulness are parts of CBT and ACT
- Study showed both mindfulness-based stress reduction (MBSR) training and cognitive behavioral therapy (CBT) show improvements over usual care for chronic low back pain.

Cherkin DC, Sherman KJ, Balderson BH, et al. Effect of Mindfulness-Based Stress Reduction vs Cognitive Behavioral Therapy or Usual Care on Back Pain and Functional Limitations in Adults With Chronic Low Back Pain: A Randomized Clinical Trial. *JAMA*.



Electromedical Devices

Transcutaneous Electrical Nerve Stimulation (TENS)

- Recommended post-stroke to improve passive humeral lateral rotation.
- Moderate evidence suggesting superiority to placebo for reducing post operative analgesic consumption.
- TENS for chronic low back pain, found that efficacy was similar to control treatments and less effective than other nerve stimulation therapies.



SUMMARY

- Not reasonable or necessary for acute or chronic back pain
- Better than placebo on disability at six weeks
- Not better than other forms of neurostimulation

<http://www.odg-twc.com/>

Other Neurostimulation Treatments (NST)

Electro acupuncture	Uses electrical stimulation to reinforce treatment
Percutaneous electrical nerve stimulation (PENS)	Similar to TENS, except PENS requires electrodes to be inserted into the skin.
Percutaneous neuromodulation therapy (PNT)	Similar to PENS, but PNT is an electrical stimulation therapy using very thin needle electrodes that are inserted directly into the deep tissues in the area causing pain.

SUMMARY

Meta-analysis revealed that NSTs are more effective than TENS on reducing CLBP at less than six weeks.

Wu LC, Weng PW, Chen CH, Huang YY, Tsuang YH, Chiang CJ. Literature Review and Meta-Analysis of Transcutaneous Electrical Nerve Stimulation in Treating Chronic Back Pain. *Reg Anesth Pain Med.* 2018;43(4):425-433.

Scrambler - AKA “Calmare”

- Stimulation of C fibers versus A-Beta fibers (TENS)
- Goal is to not inhibit but to transform pain to “non-pain” signals
- Target treatment population chronic pain and cancer pain resistant to other treatments and opioid medications
- Study 2019 – over 2000 cases of resistant chronic pain were treated with 10-12 sessions over two weeks

OUTCOME

80% of patients had over 50% for over two months. RCT are still needed to evaluate outcomes appropriately.

Marineo G. Inside the Scrambler Therapy, a Noninvasive Treatment of Chronic Neuropathic and Cancer Pain: From the Gate Control Theory to the Active Principle of Information. *Integr Cancer Ther.* 2019;18:1534735419845143.



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Neuromuscular Electrical Stimulation (NMES)

- Stimulates muscle contraction
- Used in rehabilitation to strengthen weakened muscles; better when combined with active strengthening
- Not recommended in the treatment of pain
- Quadriceps strengthening after TKA showed improved outcomes in early strength and function (Bistolfi 2018)



Lee JH, Baker LL, Johnson RE, Tilson JK. Effectiveness of neuromuscular electrical stimulation for management of shoulder subluxation post-stroke: a systematic review with meta-analysis. *Clin Rehabil.* 2017;31(11):1431-1444

Bistolfi A, Zanovello J, Ferracini R, et al. Evaluation of the Effectiveness of Neuromuscular Electrical Stimulation After Total Knee Arthroplasty: A Meta-Analysis. *Am J Phys Med Rehabil.* 2018;97(2):123-130

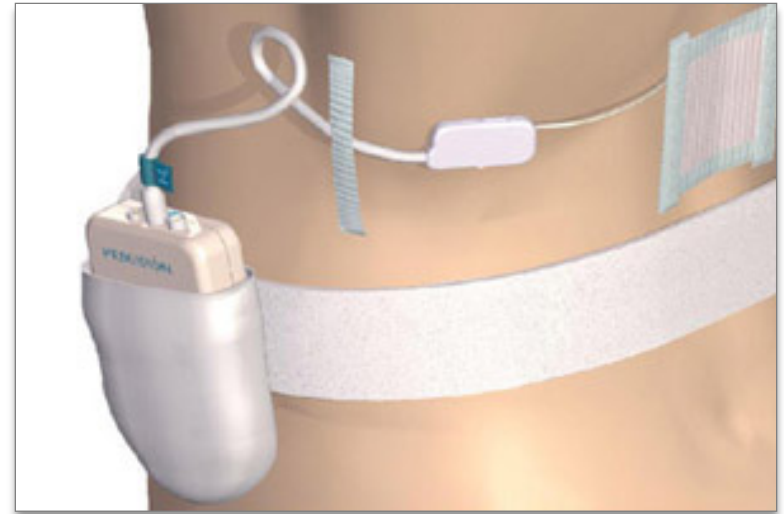
Spinal Cord Stimulator guidelines

- Pain is chronic, intractable and neuropathic
- Treatment of last resort
- Documented failure of other treatments
- Additional surgery is not indicated
- Over 18 years of age
- Psychological screening has been completed
- Successful spinal cord stimulator trial

Spinal Cord Stimulators

CONVENTIONAL (TONIC 40-60HZ) SCS

- Success 50% and decline in efficacy over time
- Challenges with placement, coverage and lead migration



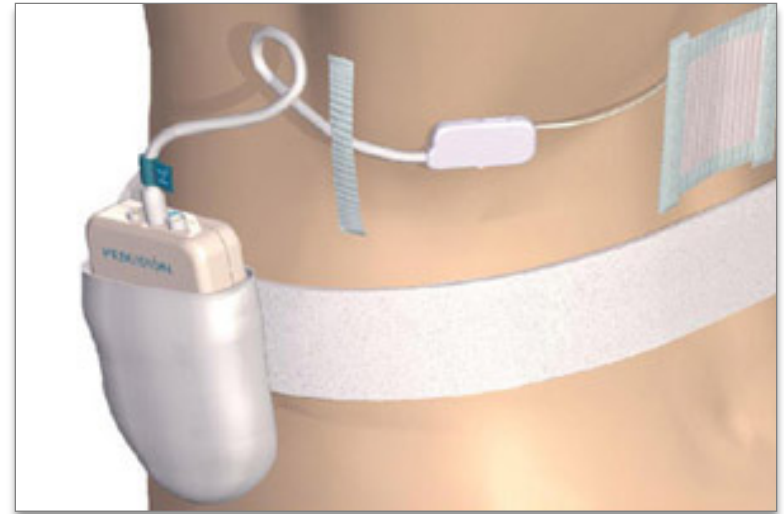
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HIGH FREQUENCY SCS (10KHZ AKA HF 10 THERAPY)

- Multicenter RCT with success 80% for back and leg pain
- Dropped to 70% after two years
- Opioid consumption, disability, and satisfaction rates improved at 12 months



Spinal Cord Stimulators

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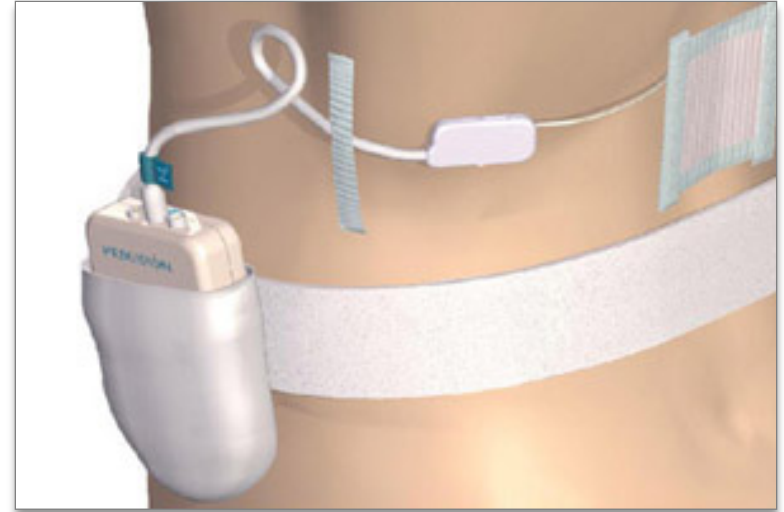
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BURST SCS

- Large, multicenter RCT (the SUNBURST trial)
- Approximately 70% preferred burst to tonic



Spinal Cord Stimulators

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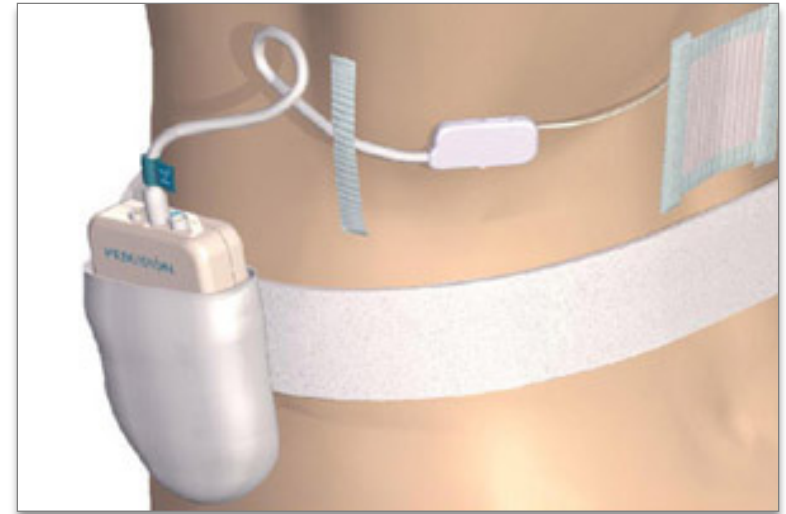
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DRG SCS

- RCT (ACCURATE Trial™) for CRPS
- Success 80% v 55 % conventional SCS
- Less habituation at 12 months versus Tonic SCS

Spinal Cord Stimulators summary

PATIENT SELECTION

- BMI, smoking, substance abuse, and psychiatric illness correlate with less favorable outcomes (Simopoulos, 2019)
- Weaning of opioids as a justification not supported; MED \leq 30 mg/day may wean completely
- One study of Conventional SCS in WC population without significant benefit

COMPLICATIONS/REVISIONS

- Loss of coverage 7-10%, infection or skin breakdown 8-10%, migration lead 14%
- Revision rates for SCS therapy are generally reported to be 23.9% to 37%.
- Harvard Study showed explantation rate at 15 years for 30%

WAVEFORM SELECTION

- Evidence is unclear
- Newer devices that can provide multiple waveforms may help to address this issue in the future.



Injection Therapy

Injection Therapy common procedures

SPINE	JOINT
<ul style="list-style-type: none">• Epidural Injections• Medial branch block (MBB)• Radiofrequency ablation (RFA)• Sacroiliac Joint Injections• Discogram	<ul style="list-style-type: none">• Shoulder• Elbow• Hand/wrist• Hip• Knee

Alternative injections

- Trigger point injections
- Dry needling
- Botulinum toxin
- Prolotherapy
- Platelet rich plasma (PRP)



Trigger point injections (TPIs)

- ODG
 - No more than 3-4 per session, no repeat if relief is not >50% for six weeks
 - TPIs are generally considered an adjunct
 - Advantage may be to allow short term relief to facilitate participation in active rehab program. *Scott A, Guo B Edmonton: Institute of Health Economics 2005.*
- Cochrane Review: No strong evidence for or against any type of injection therapy for CLBP
- TPIs with local anesthetic vs. Botulinum Toxin-A for myofascial pain disorders found inconsistent effectiveness for both (Ahmed et al. 2019)

Dry Needling Injections

NECK / SHOULDER REGION

Improved pain at 12 weeks, not sustained. ([Gattie, 2017](#))

Improved pain, ROM, and quality of life measures, but evidence was insufficient regarding disability, analgesic medication use, or sleep quality. ([Espejo, 2017](#))

LOW BACK REGION

There might be a temporary effect when combined with other therapies, but improvement of functional disability remains unproven. ([Liu, 2018](#))

SUMMARY

The studies generally show either no difference or short term effects without significant differences in outcomes. So may have use to address short term restrictions. There is clearly a need for further well-constructed, evidence-based research.

Botox injections

- Botox is FDA approved and recommended for prevention of chronic migraine
 - Not supported for treatment of episodic migraine or chronic tension-type headaches
- May have a role in peripheral neuropathic pain
- Conflicting evidence on myofascial pain
- AAN Evidence based review in 2008, indicated Level C for LBP

Prolotherapy injections

- Concentrated dextrose solution injected to promote collagen formation
- Superior to controls in Osgood-Schlatter disease, lateral epicondylitis of the elbow, traumatic rotator cuff injury, knee OA, finger OA. (Hauser 2016)
- Cochrane Study (Dagenais 2007) – Mixed results
 - Some studies, no more effective than control for chronic low-back pain and disability.

Two studies, when given with spinal manipulation, exercise, and other therapies, are more effective than control injections for chronic low-back pain and disability. Initial reduction in pain and disability but only one study showed sustained benefit at 6 months.

SUMMARY

Prolotherapy alone is not an effective treatment for CLBP. However, when combined with spinal manipulation, exercise, and other co-interventions, prolotherapy might have a subtle effect.

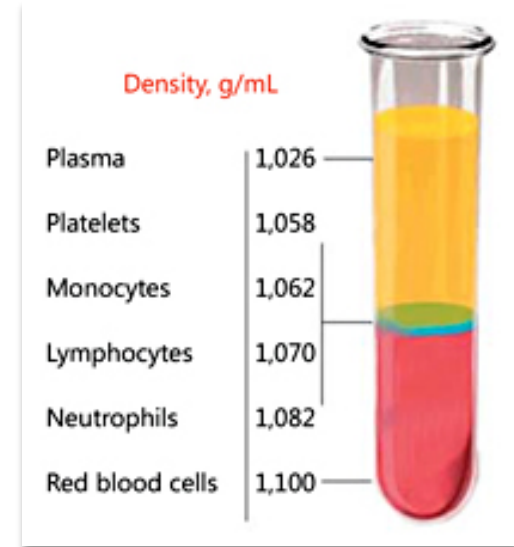
Platelet Rich Plasma (PRP)

Separation of blood components

- PRP platelet rich plasma
- PPP platelet-poor plasma
- RBCs at bottom

Growth factors and cytokines

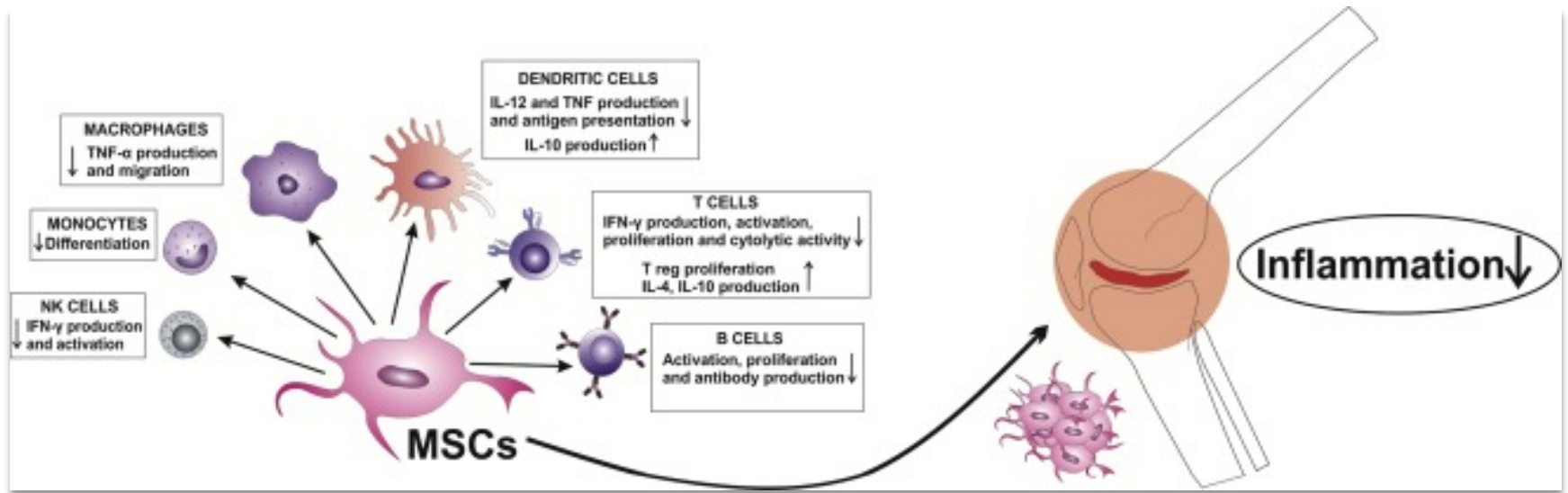
- Increase vascularization
- Promote stem cell migration
- Promote cell proliferation



Studies support use for knee OA and lateral epicondylitis. More research needed on other diagnoses, including use in the spine.

Alves R, Grimalt R: A Review of Platelet-Rich Plasma: History, Biology, Mechanism of Action, and Classification. Skin Appendage Disord 2018;4:18-24.

Stem Cells | Mesenchymal Stem Cells (MSC)



- Multipotent cells with high capacity for self renewal
- Being explored as an alternative to Autologous chondrocyte implantation in OA
- Effects seem to include cell differentiation and overall suppression of cells that are pathogenic in OA
- NIH small study currently for DDD Lumbar spine projected to be completed by 2022
- More research needed

<https://doi.org/10.1016/j.biopha.2018.11.099> Open Access

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