Game Changers: Practical Research for Improving Clinical Outcomes

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\[ \text{\( V = \frac{\text{Results}}{\text{Price} \times \text{Time}} \)} \]

Clinical Effectiveness
“Patients with acute and chronic back pain reported statistically significant improvements in patient-reported outcomes four weeks after initiating chiropractic care.”


“The mechanical stimuli provided through a cervical spinal manipulation may modify neuropeptide expression by immediately increasing the serum concentration of nociception-related (inhibiting) biomarkers.”


“In patients with cervical radiculopathy, one session of thoracic manipulation may result in improvements in pain disability, cervical ROM, and deep neck flexor endurance.”


“The use of chiropractors increased from 9.1% in 2012 to 10.3% in 2017. Women were more likely than men to see a chiropractor (11.1% versus 9.4%).”

Safety

“...no evidence of excess risk for acute lumbar disc herniation associated with chiropractic compared with primary medical care.”


Perceived Risk of Disk Herniation via Manipulation

- **Chiropractor**: 66% reduced incidence
- **Family Physician**: Neutral
- **Orthopedic Surgeon**: 30% increased risk

Of the 25 studies (that evaluated adverse events), either no or minor events occurred. According to the published trials reviewed, manipulation and mobilization appear safe.


“Manual therapy does not result in an increased risk of cervical artery dissection”


Does Neck Manipulation Cause Stroke?

Media outlets have highlighted a published estimate that 1 in 5.7 million chiropractic patients suffer a stroke in the days following treatment; and some individual question if neck manipulation could be the cause.

Research Answers the Question

Four major studies have answered this question after examining the relationship of stroke and neck manipulation.

1. 100 MILLION PERSON YEARS
   “No evidence of excess risk of stroke associated chiropractic care compared to primary care.” (1)

2. 39 MILLION PATIENTS
   “No significant association between stroke and chiropractic visits. Manipulation is an unlikely cause of stroke.” (2)

3. ALL PUBLISHED DATA
   “No causal link between chiropractic manipulation and Cervical Artery Dissection (stroke).” (3)

4. 15, 523 CASES
   “No excess risk of stroke after chiropractic care.” (4)

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**Problems Trigger Doctor Visits, Not Vice Versa**

Each study has concluded that chiropractic spinal manipulation does not cause stroke, however, patients with symptoms of an impending stroke have a higher likelihood to seek care from a variety of providers, including chiropractors. Chiropractic or medical treatment is not the cause of the stroke, but rather a non-contributory mid-point of a developing crisis.
“Treatment with fluoroquinolones was associated with 2.5 times increased risk of Achilles tendon rupture, 3.95 times increased risk of Achilles tendinopathy. Older age and concomitant use of corticosteroids seem to be additional risk factors for tendinopathy.”


“(Fluoroquinolone) antibiotics was associated with a more than twofold increased risk of CAD. …and may represent a novel contributing factor involved in the pathogenesis of CAD.”

Migraine Headache

- 30 million Americans
- 18% of females and 6% of males
- 1 in 6 American women
- Over 80% of migraineurs miss work
- 13 billion dollars per year in the US

“In this study, we demonstrated a significant association between hypocalcemia and vitamin D deficiency with migraine attacks.”

Differentiating Migraine from Stroke

- Motor and sensory complaints, including paresthesia and numbness rarely occur in isolation.
- Aura symptoms develop slowly, over 5-20 minutes and can last up to an hour.

“The present findings show that supplementation with vitamin D in a dose of 1000-4000 IU/d could reduce the frequency of attacks in migraineurs.”


“We found that 2000 IU/day vitamin D3 supplementation for 12 weeks could improve headache characteristics and might reduce neuro-inflammation in episodic migraine.”

“We observed that spinal manipulation reduced migraine days as well as migraine pain intensity.”


“Maladaptive postures can activate C1-C3 nociceptors. Convergence with trigeminal afferents at the trigeminocervical nucleus could explain spinal headache.”


“Cervicogenic Headache”

“The obliquus capitis inferior remains relatively immobile during traumatic events, like whiplash injuries, placing strain as a tethering point on the greater occipital nerve.”

Suboccipital Nerve Flossing

Begin with the patient lying supine, headpiece slightly extended. Have the patient bring their fingertips to their clavicles. Firmly grasp the patient's head and move their neck into full flexion, while maintaining a chin tuck. Ask the patient to fully extend their arms, wrists, and fingers while you simultaneously move their head and neck into full extension. Return to the start position and slowly repeat 10 flossing cycles. Stop if there is reproduction of pain or neurologic symptoms. To improve available ROM, this maneuver may be preceded contract-relax stretching of the suboccipitals.

“A linear dose-response was observed for all follow-ups, a reduction of approximately 1 CGH day/month for each additional 6 SMT visits. Cervicogenic headache days/month were reduced from about 16 to 8 for the highest and most effective dose of 18 SMT visits.”

“Dry needling should be considered for the treatment of headache [cervicogenic, tension-type, and migraine], and may be applied either alone or in combination with pharmacological treatments.”


“Women with TMD, regardless of self-reported headaches, showed limited flexion/extension ROM, limited upper cervical spine (C1-C2) mobility, and poor deep cervical flexor performance.”


“Our study suggests that HVLA manipulation of the upper cervical spine with neck exercise can be effective for treatment of pain and dysfunction in patients with chronic TMD.”

“Fifty individuals with TMD were randomly assigned to receive cervical HVLAT or sham manipulation for four visits over 4-weeks. Significant interactions were noted in [pain & functional disability]... with significant differences in successful outcomes noted immediately after baseline treatment and at 4-weeks.”


“Substance P-positive nerve fibers were obviously increased in number and deeply ingrown into the inner annulus fibrosus and even into the nucleus pulposus in the degenerative cervical discs of patients with severe neck pain”

"In the group with moderate facet joint degeneration, 69.6% reported non-recovery compared with 23.6% among patients without any signs of degeneration. We hypothesize that whiplash trauma can be a trigger for painful manifestation of previously asymptomatic facet joint degeneration."


The Shoulder Dysfunction Continuum

- Scapular Dyskinesis
- Anterior Impingement Syndrome
- Rotator Cuff Tear
- Rotator Cuff Rupture

Rotator Cuff Tendinopathy
Rotator Cuff

Scapular Stabilizers

Shoulder Anterior Impingement Syndrome

INFLAMMATION & HEALING → INSULT → TEAR
Tension vs. Compression

Tendon...
“35% of the patient with shoulder anterior impingement syndrome (SAIS) had cervical nerve root compression on the same side.”

The clinician stands behind the patient and uses both hands to clasp and squeeze the middle third of the upper arm with enough force to create moderate compression of the underlying muscle. Reproduction of arm pain (rated at least VAS 3 on a 0-10 scale) during compression suggests a cervical origin. The rationale is that compression provokes a response from the relatively superficial peripheral nerves (musculocutaneous, radial, ulnar and median) that arise from hypersensitized lower cervical nerve roots (C5-T1). The Arm Squeeze test shows high sensitivity (97%), specificity (>91%) and inter/intraobserver reliability for differentiation of shoulder vs. radicular pain.

“Over 90.2% of [rotator cuff] patients had premature MRI. The use of MRI before a trial of conservative management in patients with: atraumatic shoulder pain minimal to no strength deficits on physical examination, and suspected cuff tendinopathy other than full-thickness tears provides negative value in the management of these patients, at both the individual and population level.”

“43.5% of extremity pain originates from the (asymptomatic) spine.

Shoulder pain – 47%
Elbow pain – 44%
Wrist/Hand pain – 38%
Hip pain – 71%
Knee – 25%
Ankle/Foot – 29%
"The use of MRI before a trial of conservative management in patients with atraumatic shoulder pain, minimal to no strength deficits on physical examination, and suspected cuff tendinopathy other than full-thickness tears provides negative value.”


"Individuals with shoulder impingement had a greater thoracic kyphosis and less extension ROM than healthy controls. These results suggest that clinicians could consider addressing the thoracic spine in patients with shoulder impingement.”


"Active shoulder flexion and abduction mobility increase after manipulation of thoracic spine in (rotator cuff) patients. Subacromial space increases significantly after manipulation.”


“A single rotator cuff corticosteroid injection (in the year before surgery) is associated with 1.3-2.8 times increased risk of needing revision rotator cuff repair.”

Lateral Epicondylopathy

• Affects between 1 and 3% of the population each year.
• Occurs predominantly in the fourth or fifth decade
• Affects men and women equally.
• Strikes the dominant arm in 75% of cases.
• Average of 12 weeks disability in up to 30% of those workers affected
“The counterforce brace provides significant reduction in the frequency and severity of pain in the short term (2-12 weeks), as well as overall elbow function at 26 weeks.”


“Using wrist joint splinting for a short duration is effective for improving pain intensity… [and] may also be effective for improving wrist ROM and grip strength in the treatment of patients with lateral epicondylitis.”


“Soft tissue calcification is likely iatrogenic complication of steroid injection for lateral epicondylitis patients.”


“The surgical excision of the degenerative portion of the extensor carpi radialis brevis (ECRB) offers no additional benefit over and above placebo surgery for the management of chronic tennis elbow.”

“Pitching to the age-restricted pitch count limit did not result in altered pitching mechanics or muscle activations, and no differences occurred between the 3 pitches (fastball, curveball, and change-up). These results support previous research that indicate the curveball pitch is no more dangerous for youth than the other pitches commonly thrown.”


Carpal Tunnel Syndrome

• Affects 3-5% of the general population
• More common in dominant hand
• Female to male ratio of at least 2 or 3:1
• Adults age 45-60
• White adults are affected 2-3 times more commonly than black adults
Sensitivity

- Paresthesia in a median nerve distribution with nocturnal awakening - 77.4%
- Phalen sign - 52.8%
- Hoffman-Tinel sign - 37.7%


“A significant positive correlation was observed between CAD and a previous diagnosis of carpal tunnel syndrome.”

“Intraneural blood flow velocity is dependent on median nerve function and wrist posture such that patients with mild CTS are more susceptible to the effects of non-neutral wrist postures. This study stresses the importance of limiting exposure to non-neutral wrist postures in patients with early signs of the condition.”


“Manual therapy, including desensitization maneuvers of the central nervous system, has been found to be equally effective but less costly (i.e., more cost-effective) than surgery for women with CTS.”


“The use of manual therapy based on neurodynamic techniques maintains the beneficial effects 6 months after therapy in CTS patients.” (With regards to pain reduction, symptom severity, and strength improvement)

Median Nerve Floss

Begin with your elbow, wrist, and fingers bent with your hand at chest level, palm up. Your head should be leaning toward the side of the arm that you are flossing. As you simultaneously move your head toward the opposite shoulder, also move your arm down across the front of your chest out to the side of your hip. As your wrist and fingers move into extension, follow your hands motion with your eyes. Return to the start position and repeat three sets of 10 repetitions twice per day or as directed.

Median Nerve Glide

Begin by making a fist. First, flex your fist downward, then bring your wrist back to a neutral position. Straighten your fingers and thumb so that all five tips are pointing forward. Bend your wrist back/up as to make a “stop” motion and move your thumb away from your palm. Turn your wrist palm up. Use your opposite hand to pull your thumb further away from your palm. Perform 20 repetitions twice per day or as directed.
“For both symptom relief and function improvement, manual acupuncture is superior to ibuprofen.”


“We found no clinically significant benefit from ultrasound treatment for CTS”


Lumbar Spine
Iliotibial Band Syndrome

- ITBS
  - 2nd most common cause of knee pain after PFPS
  - Up to 12% of runners
  - 2-25% in active people
  - 22% in military recruits
  - 24% of cyclists
    - 50% of cyclists have knee pain issues
Risk Factors

- Weakness of the knee extensors, flexors, or hip abductors
- High arches
- TFL hypertonicity
- High mileage running
- Running on a circular track
“We conclude that relatively small decreases in step width can substantially increase ITB strain as well as strain rates. Increasing step width during running, especially in persons whose running style is characterized by a narrow step width, may be beneficial in the treatment and prevention of running-related ITB syndrome.”


“A single session of gait retraining using a 10% increase in step rate resulted in significant improvements in running kinematics, pain, and function in runners with patellofemoral pain. These improvements were maintained at 3-month follow-up

• Most common cause of plantar heel pain
• Effects approximately 10% of the population
• Majority of plantar fascia patients are over the age of 40
• Bilateral in 20-30% of those affected

“The results of this study indicate that cross friction massage of the plantar fascia and stretching of the gastroc/soleus complex showed the greatest overall improvement in terms of reducing the pain and disability and ankle dorsiflexion ROM.”

“Extracorporeal shockwave therapy (ESW) was found to be more effective than cortisone injections for plantar fasciitis.”


“Our study results suggest that both shock wave therapy (ESWT) and low-level laser therapy (LLLT) seem to be effective on pain, foot functions, and fascia thickness in the treatment of plantar fasciitis.”

Dry needling seems to be a reliable procedure for treating plantar fasciitis, with better outcomes than corticosteroid injection.