



# The Cost of Chronic Pain: How Complementary and Alternative Medicine Can Provide Relief

a white paper by The CHP Group



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## The Problem

The cost of chronic pain is staggering – an estimate by the Institute of Medicine (IOM) put cost of medical treatment for chronic pain at \$261 to \$300 billion in the US. Even greater than the cost of medical care, the costs due to lost productivity because of chronic pain – including loss due to the disabling side effects of drug treatment – adds an estimated \$297-336 billion to the economic burden of chronic pain.<sup>1</sup>

The cost of chronic pain in terms of suffering, both by those afflicted and those around them, cannot be measured in dollars. The IOM estimates that upward of 100 million Americans have chronic pain. This is more people than all of those patients with diabetes, heart disease and cancer combined. Yet despite the prevalence of chronic pain and the high costs associated with pain treatment, outcomes in terms of pain relief and disability fall short of producing good value.

## The Biology of Chronic Pain

The biological mechanisms of acute pain are well understood scientifically. The ability to sense and react to pain has obvious survival value for almost all animals, including humans. Pain provides important information about harmful circumstances in the environment. Avoidance of pain seems to be hard wired into all of us.

Specialized nerve cells, called nociceptors, are located in many tissues throughout the body. They detect a variety of painful stimuli from sources of thermal (heat/cold), mechanical (pressure, stretch, sharp point), and chemical irritation (inflammation, injury, hot pepper). These nerve cells transmit signals to the rest of the nervous system through the spinal cord to the brain. As one textbook notes, “Nature has made sure that pain is a signal that we cannot ignore.”<sup>2</sup> Some reactions to pain are automatic – a hand quickly removed from a hot surface. Other reactions are longer lasting – such as avoidance of weight bearing, for example, by limping on a sprained ankle. But in most people once the painful stimulus is removed – the hand is

removed from the heat, the sprained ankle is healed – the pain goes away.

However, in some circumstances, in some patients, the pain does not go away once the painful stimulus is removed. Researchers are beginning to understand the biology of pain that persists when, ostensibly, the source of the pain is no longer present. The nerves that carry pain signals can become sensitized and over react to minimal or no further stimulus. Neuroplasticity is the term used to describe the changes in the nerves, spinal cord, and in the brain that can cause the sensation of pain to persist.<sup>3</sup> After several months, clinicians consider the pain to have become chronic, although it can sometimes last for months, years, even a lifetime.

## Trends in Chronic Pain Treatment

Current conventional medical treatments for chronic pain include a variety of approaches involving medication, surgery, and other interventions. And yet despite the cost of these treatments – up to \$300 billion worth – the outcomes are often disappointing. Treatment for chronic low back pain, for example, has seen a dramatic increase in resource use. Deyo et al reviewed experience in Medicare over the past decade and found, “...a 629% increase in Medicare expenditures for epidural steroid injections; a 423% increase in expenditures for opioids for back pain; a 307% increase in the number of lumbar MRIs among Medicare beneficiaries; and a

### Resource Usage for Chronic Low Back Pain

- 629% increase in Medicare expenditures for epidural steroid injections
- 423% increase in expenditures for opioids for back pain
- 307% increase in the number of lumbar MRIs among Medicare beneficiaries
- 220% increase in spinal fusion surgery rate

220% increase in spinal fusion surgery rates... [however] the studies available suggest that these increases **have not been accompanied by population-level improvements in patient outcomes or disability rates.**"<sup>4</sup> As disturbing as it seems for adults suffering chronic pain, new research has disclosed an alarming increase in hospitalization of children for pain. An article in the July 2013 issue of the journal *Pediatrics* found an **831%** increase in hospital admissions from 2004 through 2010.<sup>5</sup>

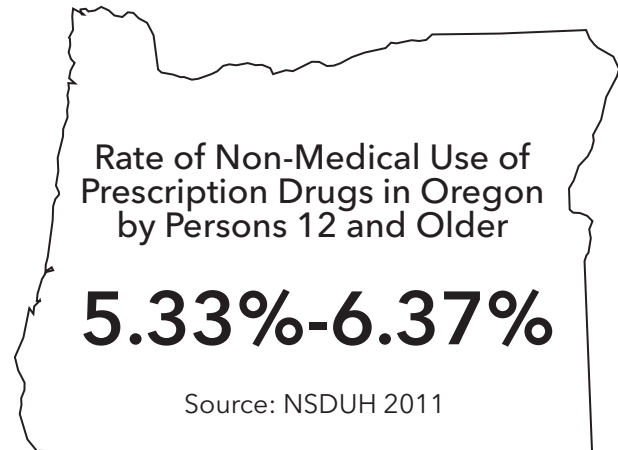
## Pharmaceuticals for Chronic Pain

### Opioids

The American Pain Foundation 2006 survey titled "Voices of Chronic Pain", found that just 23% of patients using opioid treatment found them "very effective."<sup>6</sup> A summary of three systematic reviews of the effectiveness of opioids in the treatment of non-cancer pain concluded that there is only unclear and weak evidence that opioids are effective for chronic pain.<sup>7</sup> Trescot and her colleagues also found only limited or an outright lack of evidence for all other drugs such as oxycodone (Oxycontin) and hydrocodone (Vicodin). Scientific clinical studies of opioids often note that many patients drop out because of a lack of effectiveness at relieving pain and also because of intolerable side-effects of the drugs.

A recent editorial in the *Journal of the American Medical Association* highlighted this lack of evidence of effectiveness. "Despite widely held views about the efficacy of opioids for pain control, systematic reviews have not found sufficient evidence that long-term opioid use controls non-cancer pain more effectively than other treatments." More worrisome still is that this ineffectiveness is in the context of a four-fold increase of patient deaths by opioid overdose from **4,030** in 1999 to **16,651** in 2010.<sup>8</sup>

Despite the weak evidence for opioid treatment of chronic pain, they are widely prescribed, widely used and, unfortunately, abused.



The Cochrane Collaboration review of another opioid – methadone – for chronic pain found a "...lack of high quality evidence investigating the use of methadone for chronic non-cancer pain." This review also highlighted that "...safety issues such as respiratory depression, cardiac arrhythmias and addiction have not been adequately addressed."<sup>9</sup>

Despite the weak evidence for opioid treatment of chronic pain, they are widely prescribed, widely used and, unfortunately, abused. The Center for Disease Control and Prevention (CDC) published some alarming evidence about the rampant use of prescription opioids, calling the problem "a public health epidemic."

- Prescription painkiller overdoses killed nearly **15,000** people in the US in 2008. This is more than three times the 4,000 people killed by these drugs in 1999.
- In 2010, about **12 million** Americans (age 12 or older) reported nonmedical use of prescription painkillers in the past year.
- Nearly half a million emergency department visits in 2009 were due to people misusing or abusing prescription painkillers.
- Nonmedical use of prescription painkillers costs health insurers up to **\$72.5 billion** annually in direct health care costs.<sup>10</sup>

More recently the CDC reported that deaths among women from prescription opioids increased 400% since 1999.<sup>11</sup> (See Figure 1 below).

### NSAIDs and Analgesics

Non-narcotic pain relievers include non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen, naproxen, and COX-2 inhibitors (e.g. Vioxx, Celebrex) and analgesics such as acetaminophen (e.g. Tylenol). The scientific evidence for these drug therapies is weak. The Cochrane Collaboration review of NSAIDs for both acute and chronic low back pain concluded that “NSAIDs are slightly effective for **short-term** symptomatic relief in patients with acute and chronic low-back pain.”<sup>12</sup>

### Surgery for Chronic Neck and Back Pain

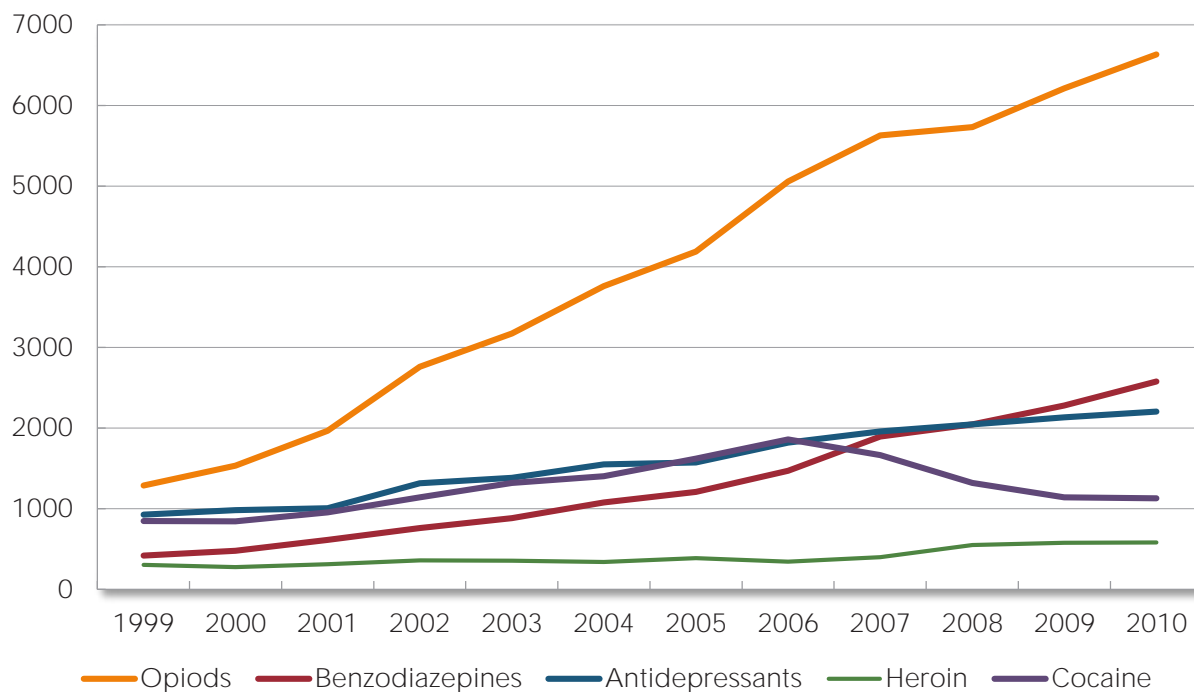
Surgical solutions for chronically painful conditions have a rich and varied history. Take low back pain for example. The work by Mixer and Barr in the 1930’s ushered in the “dynasty of the disc.” Surgeries for low back

“Overall there is very low quality of evidence available on the effectiveness of surgery compared to conservative care in neck pain patients showing overall no differences.”<sup>xiv</sup>

pain and sciatica account for up to **\$50 billion** in annual health care cost. Yet while surgical correction can be curative in carefully selected patients, the evidence that supports spine surgery is limited.

It is increasingly apparent that surgical treatment for some low back pain conditions is no better than non-surgical approaches such as spinal manipulation, exercises, massage. One of the largest trials of surgery vs. non-surgery treatment for lumbar disc problems concluded that both treatments provided relief over a two year period. Surgery proved helpful more quickly, but in the out-years, there was little difference between the surgical and non-surgical groups.<sup>13</sup>

**Figure 1 - Drug Overdose Deaths Among Women, by select drug class, United States, 2004 - 2010. Data from National Vital Statistics System.**



Similarly, the evidence supporting surgery for neck and arm pain is weak. A recent systematic review has shown that, "Overall there is very low quality of evidence available on the effectiveness of surgery compared to conservative care in neck pain patients showing overall no differences."<sup>14</sup>

### Patients in Pain

There are numerous effects of chronic pain on health. Pain triggers the stress response and when this occurs over prolonged periods, emotional and behavioral responses may appear including sleeplessness, anxiety, depression and physical inactivity. These effects in turn can cause even more pain and a vicious cycle starts.

The norm in health care is to look for objective evidence of disease.<sup>15</sup> An x-ray of a broken bone explains the pain of a fracture. A sutured surgical incision demonstrates the reasons a post-surgical patient has pain. The presence of a tumor may tell a clinician that the patient is in pain. Chronic pain on the other hand frequently has no observable cause. The fracture has healed, the surgery was a success, the tumor has shrunk, but the patient is still in pain. Many patients and even some clinicians fail to recognize the onset of chronic pain and conclude that "it's all in your head."

However as the understanding of chronic pain improves, this painful condition has become to be seen as a very real, important, and treatable condition.

### CAM and Chronic Pain: The Evidence

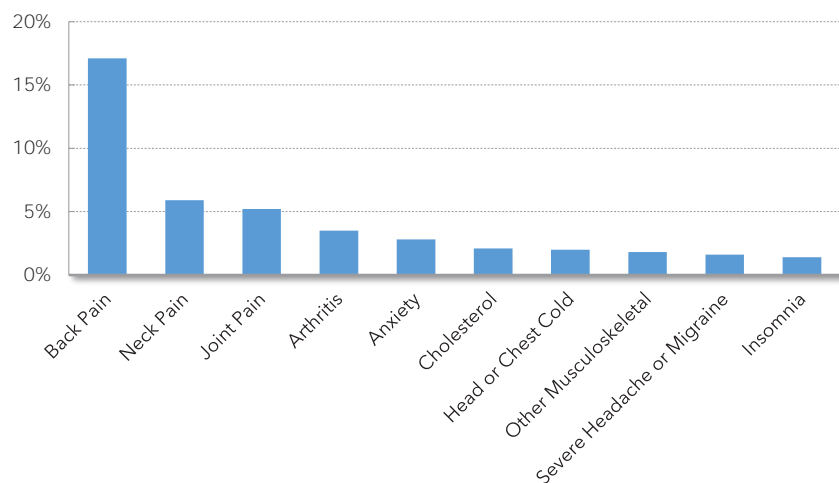
The National Center for Complementary and Alternative Medicine (NCCAM) is one of the 27 institutes and centers that make up the National Institutes of Health (NIH). NCCAM is the federal government's lead agency for scientific

research on complementary and alternative medicine (CAM). Early in her tenure as NCCAM's Director, Josephine P. Briggs, MD, announced an integrated research program at NCCAM "that will focus on the role of the brain in perceiving, modifying, and managing pain." In her announcement, Dr. Briggs noted further that, "...evidence suggests that some complementary health practices may be helpful in managing pain and that, in some cases, they engage certain processes in the body that are involved in pain and emotion. Research to better understand how such complementary health practices can produce beneficial effects is very important and, I believe, will ultimately advance the science and practice of pain management."<sup>16</sup>

### Trends in CAM Use by Chronic Pain Patients

CAM use by chronic pain patients is frequently a result of the failure of conventional medical treatment to provide relief or unwillingness to tolerate undesirable side-effects of drugs and surgery. A 2007 National Health Interview Survey identified the conditions that drove patients to see CAM providers (see Figure 2 below). First among them are back and neck pain, joint pain and arthritis followed in short order by severe headache and

**Figure 2 - Diseases/Conditions for Which CAM is Most Frequently Used Among Adults - 2007<sup>17</sup>**



migraine. Reviewing the clinical evidence that supports commonly used CAM interventions for these high-frequency, high-cost conditions shows the extent to which the science has caught up with what CAM users already know: CAM interventions are helpful. (See sidebar: The Cochrane Collaboration.)

### Low Back Pain

Low back pain is the most common chronic pain problem that causes patients to seek out CAM providers. One study of primary care patients with chronic low back pain found chiropractic and massage therapy to be the most widely used followed by acupuncture, meditation and t'ai chi.<sup>18</sup> Summaries of the evidence that supports chiropractic, acupuncture and massage therapy is of the same quality as that which backs up conventional medicine.

### Neck Pain

Neck pain is very common. At any point in time about 15% of people have it.<sup>19</sup> Of these patients, most have pain that is chronic.<sup>20</sup> It is estimated that in 2006, over 13 million patient visits were for this problem.<sup>21</sup> The CDC's 2007 National Health Interview Survey found about 6% of CAM users sought help for neck pain.

### Joint Pain and Arthritis

A 2009 Cochrane review found some limited evidence for herbal treatment of common osteoarthritis.<sup>22</sup>

Research studies of several herbal treatments were evaluated and this review concluded that while the evidence is still thin, some of these herbal treatments were found to be effective and at least as effective as ultrasound, a common physical therapy treatment. Side effects of herbal medicines were minimal and, significantly, use of herbs decreased the use of conventional medication such as NSAIDs.

In 2010 a Cochrane review of acupuncture for joint pain found small but significant benefits. Head-to-head comparisons of acupuncture and standard medical treatments found at least similar, and sometimes superior, improvements in joint pain and function.<sup>23</sup>

A recent review of studies of CAM use among headache and migraine patients showed that up to 50% of adult headache sufferers in the US use at least one form of CAM.

A long term study of glucosamine and chondroitin, two dietary supplements commonly used for arthritis, found that patients with moderate-to-severe disease who used supplements did as well as those who used the NSAID celecoxib (Celebrex). The study also reported that, curiously, placebo pills also did equally well compared to the supplements and the prescription medication.<sup>24</sup>

The evidence for chiropractic treatment of non-spinal pain is beginning to accumulate. A 2008 review of the clinical literature found limited to fair evidence that chiropractic manipulation when combined with exercise and other therapies can be helpful for hip and knee arthritis, patellofemoral pain, foot pain and ankle sprain.<sup>25</sup>

### Headache

A recent review of studies of CAM use among headache and migraine patients showed that up to **50%** of adult headache sufferers in the US use at least one form of CAM. The most common modalities are acupuncture, massage, chiropractic, and homeopathy followed by mind-body therapies such as meditation,

The Cochrane Collaboration is a worldwide, independent, non-profit, non-governmental organization with more than 31,000 volunteers from over 120 countries. The group conducts systematic reviews of randomized controlled trials of health-care interventions, which it publishes in the Cochrane Library. The collaboration was formed to organize medical research information in a systematic way to facilitate the choices that health professionals, patients, policy makers and others face in health interventions according to the principles of evidence-based medicine.

breathing exercises, and yoga. Significantly, this review also discovered that headache patients do not abandon their conventional medical providers but rather use CAM along with conventional medicine interventions.<sup>26</sup> CAM users integrate CAM with their regular medical care.

### **Does CAM Use Increase Cost?**

Evidence about the value that CAM brings to the health care system is beginning to accumulate. Recent estimates based on the 2002-2008 Medical Expenditure Panel Survey found 35-40% of the 12,036 respondents with spine problems use CAM. These respondents had "significantly better self-reported health, education, and comorbidity compared with non-CAM users." CAM users had \$424 lower spine-related costs and \$796 lower total health care cost than those who do not use CAM. Expenditure differences were primarily due to lower hospital costs among CAM users.

### **The CAM Solution**

While the answer to chronic pain remains elusive, it is increasingly clear that CAM has a valuable role to play. The US military is often at the epicenter of medical innovation. The US Army's Surgeon General, LTG Eric B. Schoomaker, chartered the Army Pain

Management Taskforce in August 2009. The Taskforce published its "Approach" which includes "Complementary and Integrative Pain Treatment Medicine". This is important because of challenges unique to the military:

- The nation expects the military health system to provide the highest level of care to those carrying wars' heaviest burdens.
- Pain management challenges associated with combat poly-trauma patients require integrated approaches to clinical care that cross traditional medical specialties.<sup>27</sup>

Another challenge is that of treating pain while mitigating risks associated with the use of prescription pain medicine - i.e. abuse and dependence. It is significant that the US Army recognizes the role of CAM in alleviating pain in a way that does not engender the use or abuse of narcotic pain relievers.

Chronic pain will continue to be studied. The use of CAM in the treatment of chronic pain will become more prevalent. As this progression takes place it is important to partner with an expert in CAM disciplines to ensure the care rendered to chronic pain patients is of the highest quality from the most trusted providers. The CHP Group will be that partner.



## Endnotes

- 1 Institute of Medicine Report from the Committee on Advancing Pain Research, Care, and Education: Relieving Pain in America, A Blueprint for Transforming Prevention, Care, Education and Research. The National Academies Press, 2011. [http://books.nap.edu/openbook.php?record\\_id=13172&page=1](http://books.nap.edu/openbook.php?record_id=13172&page=1).
- 2 Dafney N. Neuroscience Online, Chap. 6. <http://neuroscience.uth.tmc.edu/s2/chapter06.html>
- 3 Voscopoulos C, Lema M. When does acute pain become chronic? Br. J. Anaesth. (2010) 105 (suppl 1): i69-i85. [http://bjaoxfordjournals.org/content/105/suppl\\_1/i69.full](http://bjaoxfordjournals.org/content/105/suppl_1/i69.full)
- 4 Deyo RA, Mirza SK, Turner JA, Martin BI: Overtreating chronic back pain: Time to back off? J Am Board Fam Med 2009, 22:62-68.
- 5 Thomas A. Coffelt, Benjamin D. Bauer, and Aaron E. Carroll. Inpatient Characteristics of the Child Admitted With Chronic Pain. Pediatrics peds.2012-1739; published ahead of print July 1, 2013, doi:10.1542/peds.2012-1739
- 6 2006 Voices of Chronic Pain Survey. (American Pain Foundation)
- 7 Trescot A, et al. Effectiveness of opioids in the treatment of chronic non-cancer pain. Pain Physician 2008; 11:S181-S200.
- 8 Dowell D, et al. Opioid Analgesics—Risky Drugs, Not Risky Patients. JAMA. 2013;309(21):2219-2220. doi:10.1001/jama.2013.5794
- 9 Haroutiunian, Simon, McNicol, Ewan D, Lipman, Arthur G. Methadone for chronic non-cancer pain in adults. Cochrane Database of Systematic Reviews 2012, Issue 11. Art. No.: CD008025. DOI: 10.1002/14651858.CD008025.pub2.
- 10 CDC Vital Signs. Nov. 4, 2011. <http://www.cdc.gov/vitalsigns/PainkillerOverdoses/>
- 11 CDC. Vital Signs, July 2013. <http://www.cdc.gov/vitalsigns/PrescriptionPainkillerOverdoses/index.html>
- 12 Deyo RA, Koes BW, Scholten RJPM, van Tulder MW. Non-steroidal anti-inflammatory drugs for low back pain. Cochrane Database of Systematic Reviews 2008, Issue 1. Art. No.: CD000396. <http://summaries.cochrane.org/CD000396/non-steroidal-anti-inflammatory-drugs-for-low-back-pain>
- 13 Weinstein J, et al. Surgical vs Nonoperative Treatment for Lumbar Disk Herniation: The Spine Patient Outcomes Research Trial (SPORT): A Randomized Trial JAMA. 2006;296(20):2441-2450. doi:10.1001/jama.296.20.2441.
- 14 Van Middelkoop M. Surgery versus conservative care for neck pain: a systematic review., Eur Spine J. 22(1):87-95, 2013
- 15 Monsivais,D. Decreasing the stigma burden of chronic pain. JAANP. 27 FEB 2013.
- 16 <http://nccam.nih.gov/about/offices/od/2012-07?nav=gsa>
- 17 Source: Barnes PM, Bloom B, Nahin R. CDC National Health Statistics Report #12. Complementary and Alternative Medicine Use Among Adults and Children: United States, 2007, December 2008.
- 18 Sherman KJ, Cherkin DC, Connelly MT, Erro J, Savetsky JB, Davis RB, Eisenberg DM. Complementary and alternative medical therapies for chronic low back pain: What treatments are patients willing to try? BMC Complement Altern Med. 2004 Jul 19;4:9. <http://www.biomedcentral.com/1472-6882/4/9>
- 19 Hellmann DB, Stone JH. Arthritis and Musculoskeletal Disorders. In: Tierney Jr LM, editor. Current Medical Diagnosis and Treatment. New York: McGraw-Hill; 2007. p. 826-86.
- 20 Hush JM, PhD, et al. Prognosis of Acute Idiopathic Neck Pain is Poor: A systematic review and meta-analysis. Arch Phys Med Rehabil 92:824-9, 2011
- 21 United States Bone and Joint Initiative. Spine: Low Back and Neck Pain. In The Burden of Musculoskeletal Diseases in the United States. Rosemont, IL: American Academy of Orthopaedic Surgeons. 2011;21-56.
- 22 Little, Christine V, Parsons, Tessa, Logan, Stuart. Herbal therapy for treating osteoarthritis. Cochrane Database of Systematic Reviews, 2000, Issue 4. Art. No.: CD002947. DOI: 10.1002/14651858.CD002947.
- 23 Manheimer, Eric, Cheng, Ke, Linde, Klaus, Lao, Lixing, Yoo, Junghee, Wieland, Susan, van der Windt, Daniëlle AWM, Berman, Brian M, Bouter, Lex M. Acupuncture for peripheral joint osteoarthritis. Cochrane Database of Systematic Reviews 2010, Issue 1. Art. No.: CD001977. DOI: 10.1002/14651858.CD001977.pub2.
- 24 Sawitzke AD, Shi H, Finco MF, et al. Clinical efficacy and safety of glucosamine, chondroitin sulphate, their combination, celecoxib or placebo taken to treat osteoarthritis of the knee: 2-year results from GAIT. Annals of the Rheumatic Diseases. 2010; 69(8):1459-1464.
- 25 James W. Brantingham, Gary Globe, Henry Pollard, Marian Hicks, Charmaine Korporaal, Wayne Hoskins. Manipulative Therapy for Lower Extremity Conditions: Expansion of Literature Review. Journal of Manipulative and Physiological Therapeutics - January 2009 (Vol. 32, Issue 1, Pages 53-71, DOI: 10.1016/j.jmpt.2008.09.013)
- 26 Jon Adams, PhD, Gaery Barbery, MPH, Chi-Wai Lui, PhD. Complementary and Alternative Medicine Use for Headache and Migraine: A Critical Review of the Literature. Headache. 2013;53(3):459-473.
- 27 [http://www.regenesisbio.com/pdfs/journal/Pain\\_Management\\_Task\\_Force\\_Report.pdf](http://www.regenesisbio.com/pdfs/journal/Pain_Management_Task_Force_Report.pdf)

## About The CHP Group

The CHP Group (CHP) is a complementary and alternative health care organization built on a network of credentialed CAM providers. CHP partners with health plans and employers to increase access to high quality CAM care. With over 20 years of industry experience, CHP provides clinical insight into the disciplines

plus outstanding business expertise. CHP manages the provider network and provides administrative services in ways that enable health plans and employers to control costs while increasing overall quality.