

Benefits and Risks of Neck Pain Treatments

Neck pain will affect about 70% of the population at some point in their lives and is a common reason many individuals seek help from a health care professional. A particular episode of neck-related problems can be mildly irritating, or it could be seriously debilitating.

While recent scientific studies have found that there are useful treatments for many neck-related problems, no one treatment has been shown to be effective in all cases. Commonly used physical treatments for neck pain include spinal manipulation, mobilization, massage, and therapeutic exercises. Common pharmaceutical treatments include acetaminophen, non-steroidal anti-inflammatory drugs (NSAIDs), muscle relaxant medications, and narcotic (opioid) pain medications.

All of the commonly used neck pain treatments carry some risk. Most of these risks are mild, but some can be serious.

To outline the benefits and relative risks of these therapies, the American Chiropractic Association (ACA) has prepared this summary of recent scientific findings. This review includes information from a report of the *Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders* (1). This international, multi-disciplinary team of researchers examined available research studies to determine the best treatments for neck pain. This summary also includes another recent review of the scientific evidence on the potential harms and efficacy of commonly used therapies for neck pain (2). Additional research that describes the efficacy and risks (serious and non-serious) related to these therapies is also reviewed.

Physical Treatments: Manipulation, Mobilization, Massage and Exercise

Manipulation is a therapy in which a trained professional uses his/her hands to gently and quickly move abnormally stiff joints into their normal functional range of motion. Mobilization technique is similar, but it is usually performed more slowly.

Evidence from numerous clinical studies has shown that both manipulation and mobilization of the cervical spine (the neck) result in short-term improvements in pain and physical function, as well as lasting, long-term pain relief. The report by the *Bone and Joint Decade Task Force on Neck Pain and Its Associated Disorders*, referenced above, found 17 studies that looked at various manual therapies. It found overall positive evidence for both mobilization and manipulation, particularly when combined with exercise. This led the authors to include mobilization, manipulation and other manual therapies among the “likely helpful” treatments for simple neck pain.

A variety of minor side effects are commonly reported with all manual treatments for neck pain. These include temporary aggravations in symptoms or mild/moderate soreness following manipulation, mobilization, massage, or therapeutic exercises of the cervical spine.

The relation between manual treatments and serious complications is controversial. Numerous case reports have associated cervical spine manipulation with a rare type of stroke that results from a dissection (tear) of the vertebral artery, a blood vessel in the neck. These dissections are likely due to an underlying abnormality of the vascular system that usually can't be identified in advance, and are probably not directly caused by the manipulation. Unfortunately, the only early sign of an evolving dissection is neck pain and headache, symptoms that may lead people to seek treatment from a doctor of chiropractic or other professional.

The largest study performed to date looked at the medical records of 11 million people in the Canadian Province of Ontario over a nine year period and found that patients who went to a doctor of chiropractic for neck pain were no more likely to have a stroke following a chiropractic visit than patients who went to their primary care medical physician for neck pain (3).

That study concluded that any observed association between a stroke and a patient's visit to either a chiropractic physician or a family medical physician was not directly caused by any treatment performed. Instead, any association was likely due to patients with an evolving vertebral artery dissection seeking care for symptoms such as neck pain or headache that sometimes take place before the stroke occurs.

The likelihood of a person having one of these rare vertebral artery strokes is about 1 to 3 per 100,000 people and is similar among both chiropractic patients and the general population.

Pharmaceutical Treatments: Acetaminophen, NSAIDs, Muscle Relaxant Medications and Narcotics

Simple analgesics such as acetaminophen (paracetamol) are commonly used to treat neck-related conditions. While generally safe at recommended doses, acetaminophen is the largest cause of drug overdoses in the United States because of the narrow range between therapeutic dose and toxic dose (4). Every year in the United States, acetaminophen overdoses are responsible for 56,000 emergency room visits, 2,600 hospitalizations, and 458 deaths due to acute liver failure.

NSAIDs are often used to treat neck-related conditions. Common side-effects include nausea, vomiting, and abdominal pain. NSAID use has been associated with a variety of serious adverse effects including bleeding and ulcers in the stomach and intestine, stroke, kidney failure, life-threatening allergic reactions, and liver failure. One study published in *The New England Journal of Medicine* (5) estimated that at least 103,000 patients are hospitalized per year in the United States for serious gastrointestinal complications due to NSAID use. These authors also estimated that there are 16,500 NSAID-related deaths annually in the United States, making this the 15th most common cause of death. This figure is similar to the annual number of deaths from AIDS, and is considerably greater than the number of deaths from multiple myeloma, asthma, or cervical cancer.

NSAIDs also can have significant cardiovascular side effects. One recent review (6) found that major vascular complications were increased by about a third in patients taking one of the "new generation" coxib NSAIDs. It also found that ibuprofen significantly increased major coronary events. This study found that among 1,000 patients taking a coxib or diclofenac for a year, one would expect three more major vascular events and one additional fatality, compared with placebo.

Skeletal muscle relaxant drugs including benzodiazepines such as Diazepam (Valium®) are often used for treatment of neck pain. The most commonly reported side effects are drowsiness, fatigue, and muscle weakness. Less common side effects include confusion, depression, vertigo, constipation, blurred vision, and amnesia (7).

The use of narcotic (opioid) pain medications frequently leads to nausea, vomiting, constipation, and dizziness. Both muscle relaxants and narcotic pain medications produce drowsiness that may impair working or driving in about 1 in 3 patients. Muscle relaxants and narcotics are associated with significant risk of abuse, addiction, dependence, withdrawal, seizures, potentially fatal injuries to the liver, and potentially fatal overdoses. Overdoses of opioid painkillers are responsible for some 15,000 deaths per year, more than the number of deaths from cocaine and heroin combined (8).

Comparative Effectiveness of Common Treatments

One review article concluded that there is moderate- to high-quality evidence that patients with some types of chronic neck pain have clinically important short-term and long-term improvements from a course of spinal manipulation or mobilization, but similar benefits were not seen from massage (9).

One recent study (10) compared three groups of neck pain patients who were treated with 1) spinal manipulation, 2) an exercise program, or 3) medications, including NSAIDs, acetaminophen, or (in non-responsive patients) narcotic medications and/or muscle relaxants. This study found that the patients who were treated with either spinal manipulation or the exercise program had significantly greater relief of pain in the short term and in the long term (up to one year after treatment ended).

The *Bone and Joint Decade Task Force* review (1) concluded that therapies that were "likely helpful" for non-traumatic neck pain included manipulation, mobilization, and exercises. They concluded that there was "not enough evidence to make a determination" about the helpfulness of NSAIDs and other drugs.

Relative Effectiveness and Risks of Commonly Used Treatments for Non-traumatic Neck Pain:

| Treatment | Effectiveness | Risks |
|---|---|--|
| Manipulation, mobilization | Likely Helpful (Worth Considering) | Common: Minor, temporary discomfort or soreness * |
| Manual therapy (manipulation, Mobilization and/or massage) together with exercises | Likely Helpful (Worth Considering) | Common: Temporary discomfort or soreness, dizziness |
| NSAIDS | Not Enough Evidence to Make Determination | Occasional: GI bleeding Rare: Heart attacks, kidney failure, life-threatening allergic reactions, liver failure |
| Acetaminophen | Not Enough Evidence to Make Determination | Rare: Liver failure from overdose |
| Skeletal muscle relaxant drugs including benzodiazepines | Not Enough Evidence to Make Determination | Common: Drowsiness, fatigue, and muscle weakness Occasional: Confusion, depression, vertigo, constipation, blurred vision Rare: Abuse, addiction, dependence, potentially fatal overdoses |
| Narcotic (opioid) pain medications | Not Enough Evidence to Make Determination | Common: Drowsiness, fatigue, and muscle weakness Occasional: Confusion, depression, vertigo, constipation Rare: Abuse, addiction, dependence, seizures, potentially fatal injuries to the liver, potentially fatal overdoses |

Notes:

* Research and scientific evidence does not establish a cause and effect relation between cervical manipulation and stroke. Studies suggest patients may consult MDs and DCs when they are in the early stages of a stroke (i.e. there is a stroke already in progress). The possibility of such injuries occurring in association with upper cervical adjustment is extremely remote.

Conclusion

The current scientific evidence indicates that all commonly used treatments for neck pain have limited evidence of effectiveness. All treatments come with fairly common but mild side effects, and some have rare but potentially serious side effects. In general, the physical treatments (including manipulation, mobilization, massage and exercise) have fairly good evidence of effectiveness and are very rarely associated with any serious complications. Pharmaceutical treatments, although commonly used, have limited evidence of effectiveness for treatment of neck pain, and infrequent but potentially serious complications.

In conclusion, there is good epidemiological evidence that the odds of having a stroke following a visit to a doctor of chiropractic are no greater than the odds of having a stroke following a visit to a primary care doctor (3). In addition, there is biomechanical evidence that cervical manipulation stretches the vertebral arteries less than routine examination procedures (11), making it unlikely that a cervical manipulation can physically cause an arterial dissection. There is evidence that a manual approach to neck pain including manipulation is at least as effective as a conventional approach using NSAIDs and/or opiates (9) with no greater risk of complications.

Neck pain patients who do not present with signs or symptoms of serious underlying disease should be given the choice of whether to pursue manual treatments, pharmaceutical treatments or a combination of both. Shared decision making should be based on complete and unbiased information, and patient preference should be respected.

Further research is needed to provide high-quality information that can be shared with patients to help them make well-informed health decisions.

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