

# Back Pain

## *in the* Rotary-Wing Community

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Eliminate or reduce back pain and you get:

1. Decreased time lost from work
2. Increased combat readiness
3. Decreased attrition rates, based on chronic pain and injury
4. Decreased healthcare costs
5. Overall improvement in your health, quality of life, and operational effectiveness

**W**hile most aviators and aircrew complain that back pain is an occupational hazard, the truth is that it's an overwhelming problem for aviators and non-aviators, alike. Back pain is the fifth most common reason for a visit to a physician and is the second most common cause of work absenteeism.

Back pain is a problem across all aviation communities, but, by many accounts, it's worse in the rotary-wing community. Long hours in the cockpit, ineffective seat padding, poor posture, NVG use, and constant vibration all may contribute to strain and fatigue in the lumbar muscles. For aviators involved in a mishap, the sudden deceleration can create overloading stresses, resulting in an acute back injury, causing chronic pain for the rest of their career and beyond. The pain can be a mild, intermittent annoyance, or may be so debilitating it affects the safety of flight. Besides being a problem for aviators, back pain also can affect squadron operations.

### Types of Back Pain

Back pain can be classified into three categories:

- localized, which is confined to just the back,
- radicular, which can originate in the back but radiate to the limbs, or
- referred, which comes to the back from another area, typically caused by a problem with one of the internal organs.

Most back pain is caused by strain and fatigue, rather than a specific medical illness. All helicopter aviators are familiar with the term "helo hunch," which



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refers to the bent-forward posture most pilots assume while flying. In the lower back, this posture converts the spine's normal S-shaped curvature to more of a C-shape, which is unstable and results in excessive fatigue. The front edges of the vertebrae are forced together, pulling the posterior edges apart and putting uneven pressure on the intervertebral disks. The pilot is forced to hyperextend the neck (nose up) to see out the windscreen. Both of these unnatural positions lead to fatigue, overload and pain.

When the helo's vibrations are factored in, the situation becomes more complex. Injury leads to inflammation, and chronic inflammation can lead to changes in the shape of the bones and more chronic low-back pain.

The most common effects of back pain on flight operations are decreased concentration, shortened or hurried missions, and, to a lesser degree, cancelled flights.

### Treatment Options

See your flight surgeon whenever you have back pain. The flight doc will carefully interview you, checking intensity, frequency, timing, and neurologic involve-

ment. If the pain is relatively new, without neurologic symptoms or a history of significant trauma, the physician often will treat the symptoms with non-steroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen or naproxen. Bed rest also may be prescribed for a time not greater than 24 hours. The aviator should be able to resume flight and may not require a waiver.

If the pain is persistent for several weeks, without relief, the physician often will obtain X-rays to rule out underlying medical causes. If neurologic symptoms are present (radicular pain, numbness, or weakness), the physician may order more advanced radiologic studies, like a CT or MRI scan. If more severe nerve damage is suspected, the flight surgeon even may request an electromyogram (EMG) study to identify the extent of the injury.

Ongoing, nonradicular back pain may be treated with occasional NSAIDs, massage therapy, physical therapy, chiropractic manipulation, and, if necessary, steroid injections or surgery. If the pain is persistent enough to merit invasive treatment, the flight surgeon will need to take the aviator off flight status to complete treatment.

### The NAMI Whammy

The Naval Aerospace Medical Institute (NAMI) in Pensacola, Fla., provides guidelines that naval flight surgeons are expected to follow in returning ill or injured aviators to flight status. If the pain is not alleviated within 10 days of treatment with NSAIDs, the aviator will require a waiver to remain on flight status.

If the pain is caused by a more serious, underlying condition, the requirements are more stringent. While

a bulging disk or other nerve problem may ground you for six weeks, a surgical treatment may result in a six-month grounding. A return to flight status also requires passing the physical-fitness test. Again, consult your flight surgeon for more details.

### The Price of Safety

Modifying the cockpit can improve the ergonomics and reduce back pain, but modifying cockpits often is not economically feasible for operational aircraft. However, many new airframes (AH-1Z, UH-1Y, MV-22) present an opportunity to look at ergonomic changes to improve aviator posture, reduce the risk of pain, and improve the overall safety of these aircraft. Doing nothing costs nothing, but allowing most helicopter aviators to suffer from back pain does have very real costs.

The Marine Corps has around 3,000 rotary-wing aviators, and, if 80 percent of them suffer with back pain, the annual cost has been estimated to be \$3.6 million. This cost does not even take into account back pain among Navy rotary-wing aviators. Consider the high cost of replacing an aviator who is permanently grounded by pain. Also, consider the loss of an aircraft because of a pilot's fatigue or distraction from back pain.

### Prevention

Prevention is the best approach to most back pain. Engineering modifications to the aircraft may prevent many back problems, but the costs involved make this option unlikely. However, several actions can prevent or decrease the amount of back pain suffered by rotary-wing aviators: posture modification, strength and stretching regimens, and personal-equipment modifications.

Good posture reduces the stress applied to the soft tissue surrounding the spine. Maintaining the normal "S" curve of the spine would reduce the probability for low-back pain. We do not have a formal training program to teach aviators the benefits of good posture while flying.

Some experts have suggested a flight-specific stretching and strengthening regimen for the muscles of the trunk as a way to stabilize the spine, increase

flexibility and prevent back pain. Specific exercises are complicated and should be taught by a physical therapist. However, spending five minutes before and after each flight stretching the lower back should help. Go to the gym, and slowly and progressively strengthen your abdominals, hip flexors, and back extenders to prevent or alleviate some pain.

Personal-equipment modifications, such as lighter helmets, lighter NVG gear, and seat pads, also may decrease back pain. Some communities already have experimented with lumbar-support cushions. Many different commercial products are available, several of which have been granted flight clearances by NAVAIR.

### Conclusion

Though back pain among rotary-wing aviators is a well-known problem, not enough has been done to alleviate it. The problem affects not only aircrew but also squadron operations, combat readiness, and safety of flight.

Because of the need to maintain high physical standards, the treatment options available to aviators are more limited than those available to the general population, so prevention is a paramount concern. Ideally, cockpits would be redesigned for better ergonomic performance. Seat-cushion modification, to include lumbar support, is a high priority. Aftermarket lumbar supports and seat pads issued by squadrons have proven to be an inexpensive way to reduce back pain. A flight-specific training program, or back school, involving physical therapists to instruct proper posture, strengthening and stretching exercises, may be another low-cost way to address this problem.

There is no quick and easy way to eliminate a problem that has plagued rotary-wing aviators for so many years, but with careful attention, sustained focus, and further research, much progress still can be made. 

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*Consult with your local aeromedical safety officer (AMSO) for all medications, equipment or flight gear. A more detailed article by the authors on back pain can be viewed at: [http://www.safetycenter.navy.mil/aviation/articles/back\\_pain.htm](http://www.safetycenter.navy.mil/aviation/articles/back_pain.htm)—Ed.*