

Night Time Discomfort

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The question, 'Why does my pain often feel worse at night?' has been asked several times in various clinical settings and especially at LaserHealth Solutions where pain is the most commonly reported symptom. The pain pathway is triggered by chemical mediators such as bradykinin and prostaglandins as a result of cellular damage and inflammation.¹ In some musculoskeletal conditions such as rotator cuff injuries, tendonitis and osteoarthritis, pain often intensifies at night without any physical exacerbation. Two main reasons exist for this:

- 1) Circulation impingement;
- 2) Hormonal activity.

Studies show that sleeping on the side or back with an injured shoulder actually causes more cellular damage than regeneration on the rotator cuff tendons.² The supraspinatus tendon is an example of this (Figure 1 below). The muscle belly is supplied by two arteries yet the tendon lacks direct blood supply.³ This tendon relies heavily on the wellbeing of surrounding tissue. This region that has no blood vessels supplying it directly is known as a critical zone.³ It varies between adults and increases with age.³

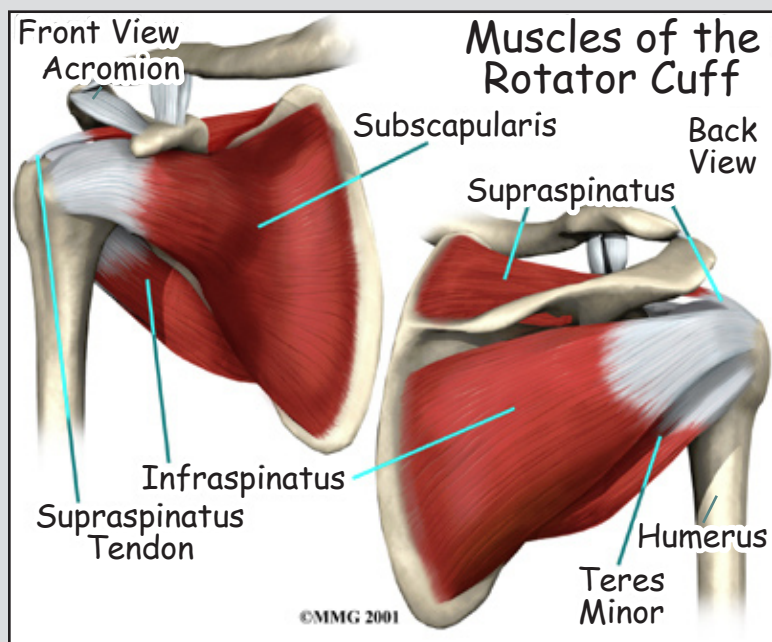


Figure 1 : Front and Back View of the rotator cuff muscles (Note: Supraspinatus tendon under the acromion inserting on the humerus bone of the arm.)⁴

In an upright position, gravitational pull on the shoulder allows more space between the acromion and humerus.³ There is therefore continued communication between the supraspinatus muscle belly and the tendon.³ When sleeping, that communication between the muscle and tendon is compromised as gravity is

eliminated.³ Furthermore, having the arm close to the body when lying down puts pressure on the arteries around the humeral head.³ This impinges the supply of nutrients and oxygen to the supraspinatus tendon resulting in cellular damage and an increase in pain.³ Putting a pillow under the arm pit when sleeping opens the shoulder joint up by about 30 degrees which is enough to alleviate pressure on the arteries as well as the tendon.

Little research has been done to investigate the effect of day and night on the pain pathway. The studies done were focused on rats, mice and hamsters and showed that these animals have a higher sensitivity to pain in the dark.⁵ Since rodents and humans have some similarity in their endocrine systems, these results maybe used to explain pain sensitivity in humans. Results showed that endogenous opioids or the natural pain relieving substances in humans and rodents reach their maximal levels before sunset; consequently in the dark, pain seems worse.⁶

When pain disrupts sleep, pro-inflammatory markers such as C-reactive protein, Nuclear factor –kB, Tumor Necrosis Factor –alpha and Interleukin -6 are released.⁷ Less than 4 hours of rested sleep will trigger the release of these mediators increasing pain.⁷ In cases where patients develop insomnia due to chronic pain, sedatives can help but it is important to have a qualified physician prescribe the dosage because inducing prolonged periods of sleep can have similar effects as being sleep deprived.⁸ Melatonin can also be of help as a sleep inducer hormone as well as a pain modulator.^{9,10} Studies show that when natural melatonin binds on the spine it inhibits the pain pathway hence one can sleep pain free.^{9,10}

Low level intensity laser treatments resolve pain fairly quickly by stimulating the release of endorphins: the body's natural pain relievers while inhibiting pain promoting substances such as bradykinin.¹ Less pain means uninterrupted rest which gives the body a chance to repair damaged tissues. If facing painful nights, visit a LaserHealth Solutions clinic near you. It may be the quickest way to a good night sleep again.

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