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## **Running and Low Back Pain**

- Controversy continues as to whether intense running is a weak risk factor for low back pain
- Changes in the disc are observed after 1 hour of running, but these changes are most likely the normal biomechanical response of healthy disc tissue
- Running has not been associated with accelerated disc or facet joint degeneration
- People with low back pain can initiate a running program with low risk of worsening their back pain symptoms
- Injuries are more common in those with no prior running experience
- Starting slow and gradually increasing the duration and intensity of running appears to help reduce the risks of running injuries
- The impact of footwear selection and running mechanics on back pain symptoms and back pain risk remains undetermined
- Sacral stress fractures are an uncommon but potentially dangerous cause of back pain in runners

The popularity of running is high and continues to increase. Running involves repetitive movements with little variation. As a result, the vast majority of running-related injuries are chronic overuse injuries, mostly involving the lower limbs. It is estimated that between 27-70% of recreational and competitive runners will sustain some type of overuse injury,<sup>1</sup> yet the spine is involved in only around 10% of all running-related injuries.<sup>2</sup>

Running involves repeated impacts on the lower limbs and spine. The compression load on the lumbar spine at heel strike is between 2.7 and 5.7 times bodyweight.<sup>3</sup> Not surprisingly, after <sup>1</sup> hour of running reductions in lumbar disc height and fluid signal intensity are observed by MRI.<sup>4</sup> Some have mistakenly labeled this finding as running-related “disc degeneration” when it is just as likely that this reflects the normal biomechanical response of disc tissue to the cyclic loading of running. In support of this more favorable view, epidemiologic studies have failed to find an association between running and disc degeneration.<sup>5</sup> Additionally, an analysis of the CT scans

from the Framingham Heart Study found that heavy physical activity was associated with the presence of severe lumbar facet joint osteoarthritis, however this association was not observed with running.<sup>6</sup> Also, running is not a risk factor for herniated discs.<sup>7</sup>

Whether or not running is a risk factor for low back pain is a topic of continued controversy. In competitive and elite runners some claim a weak association,<sup>8</sup> while others do not.<sup>9</sup> The lifetime prevalence of LBP in runners is similar to that of the general population.<sup>10</sup> Excluding elite runners, who have unique characteristics, and focusing on the general population, physical activity is known to mitigate the risk of back pain, so there is reason to believe running can be helpful.<sup>11</sup> Furthermore, running has been safely implemented in the rehabilitation of patients with chronic low back pain.<sup>8,12</sup> Importantly, running does not appear to worsen low back pain for most who report having symptoms before initiating a running program. Evidence of this comes from a survey of elite middle and long distance runners, where nearly 75% of those who had back pain prior to initiating training did not think their symptoms worsened with running.<sup>5</sup> In groups who take-up training for a running event, lack of prior experience running is the most important risk factor for injury.<sup>13</sup> Plus, starting out at longer distances appears to increase the risk of injury for novice runners, especially those who are overweight.<sup>14</sup>

Multiple studies have examined the biomechanics of heel verses forefoot strike and various other running mechanics, however none have established a link to back pain symptoms or specific spine injuries. Footwear has a potential protective effect by decreasing shock transmission to the spine.<sup>15</sup> While shoe selection is known to impact the overall risk of injury during running, it's impact on back pain in particular is not defined.

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