

Pain Medicine for Runners: Before, During or After Exercise?

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Late fall and early winter are “peak” training periods for thousands of runners. As mileage and intensity increase to the point that many find themselves limping around on sore legs, quite a few runners increase their use of over-the-counter pain medications, especially non-steroidal anti-inflammatory drugs (NSAIDs).

The use of NSAIDs *after* running is quite common. Ibuprofen (Advil, Nuprin, Motrin, and generics) is especially good for alleviating the soreness and stiffness from workouts.

What is less common is the use of NSAIDs *before* or even *during* workouts. Indeed, this practice is generally not recommended. Why? First, it helps to understand how these drugs work.

What are NSAIDs and how do they work?

The general term “NSAIDs” includes ibuprofen, aspirin, naproxen (Aleve) and several lesser-known over-the-counter derivatives that are used to reduce inflammation and pain.

There are some fairly complex chemical processes at work when you take these drugs, but basically what is relevant is that NSAIDs work by inhibiting formation of molecules that cause pain, inflammation and fever. These molecules are called **prostaglandins**, which are formed by the synthesis of enzymes called cyclooxygenase.

NSAIDs are very efficient at inhibiting cyclooxygenase, which in turn suppresses the production of prostaglandins. But prostaglandins are not necessarily “bad” for you. Prostaglandins also:

- protect the lining of the stomach and intestines by inhibiting the secretion of acid;
- maintain secretion of mucous in the digestive tract; and
- regulate blood flow to the kidneys.

When NSAIDs alter this balance of acid, blood flow and mucous, they can also upset your stomach and intestinal tract. The resulting side effects can include nausea, stomach cramps and other gastric niceties that you would rather not endure several miles into your long run. On the more severe end of the spectrum, prolonged or excessive use of NSAIDs can cause stomach ulcers and, some argue, can impair healing of injured tissue.

So what happens when you take NSAIDs before running?

First, you risk an upset stomach or serious gastrointestinal problems while running. Not fun. Remember also that when you run, blood is diverted to the leg muscles and away from other organs, including the stomach and intestines. Digestion slows, causing some runners to experience stomach pain, cramps and the famous “runner’s trots.” By inhibiting prostaglandins

with use of ibuprofen or other NSAIDs, this problem worsens.

Second, when NSAIDs inhibit the formation of prostaglandins, the prostaglandins are less able to regulate and maintain blood flow to the kidneys. When kidney function is already compromised by dehydration, serious consequences can result. Thus, instances occur like that which happened to an Austin runner who, at the 2005 Freescale Half Marathon, took “lots of Advil” before the race, ran it fast (under 90 minutes), and then after the race passed blood in his urine. The first question the EMT asked him in the medical tent was “did you take ibuprofen before the race?”

Third, you are masking pain by taking any kind of pain medication before a run. While that is not a huge concern (compared to narcotic pain-relievers like codeine and other opiates; i.e., if you sprain your ankle or cut yourself while taking NSAIDs, you will still feel pain), you are inhibiting prostaglandins which are your body’s way of telling you “Hey...we’re injured.”

The risks are not proven, but why take a chance?

There are no medical studies that prove or disprove any severe risks associated with the use of NSAIDs during strenuous exercise. Still, the science behind it points to logical conclusions that the use of NSAIDs produces side effects that outweigh the benefits of taking the medications *before* and *during* exercise.

Moreover, aside from the simple unpleasantness of having gastrointestinal distress during or after a run, the risk of serious kidney damage is enough to discourage the regular usage of NSAIDs during prolonged exercise. “Kidney damage,” you ask?

Yes. Acute renal (kidney) failure (acute meaning sudden onset, as opposed to chronic, long-term) occurs when the kidneys are unable to maintain fluid and electrolyte balance and excrete waste products. Renal prostaglandins protect the kidneys during exercise by maintaining blood flow to the kidneys. NSAIDs work by inhibiting prostaglandin synthesis, including renal (kidney) prostaglandins. Thus, renal prostaglandin inhibition with an NSAID during exercise leads to decreased blood flow to the kidneys, which in turn can lead to renal failure (kidney failure), especially when exercise is combined with severe heat and/or dehydration.

All that being said, the incidence of renal failure associated with exercise is very low, even in athletes who habitually use NSAIDs.

Be sure to check the label of any pain medication before you run, and understand the potential side effects associated with use of that drug. Earlier this year, the Food and Drug Administration requested NSAID sponsors (drug companies) to make labeling changes for all of their NSAIDs except aspirin. Manufacturers of non-prescription (over-the-counter) NSAIDs were asked to revise their labeling to provide more specific information about the potential gastrointestinal risks of their individual products and to remind patients of the limited dose and duration of treatment of these products in accordance with package instructions.

The FDA further requested all sponsors of *prescription* NSAIDs to revise the labeling for their products to include a boxed warning, highlighting the potential for increased risk of cardiovascular events and serious, potential life-threatening gastrointestinal bleeding associated with their use. On that same day, April 7, 2005, the drug company Pfizer withdrew its prescription NSAID, Bextra, from the market. This came only months after Merck withdrew its drug, Vioxx (another prescription NSAID) from the market following reports that the drug caused fatal heart damage.

While you probably are not at risk of accidentally ingesting a prescription NSAID like Celebrex, there is some possibility that you will take non-prescription pain medication before a run without realizing that it is an NSAID. Remember, NSAIDs include many different non-prescription drugs, including Aleve, Motrin, Advil, Nuprin, some Midol products, and many others.

Bottom line: Read the labels. Enough said (or “nsaid” ...ha).