

## A New "Bent" on Bicycling

Nearly everyone is familiar with conventional bicycles and the many joys (and pains) of bicycle riding. Most of us learned to ride as small children, but as we age, bicycles represent more than just a fun form of recreation. They can offer a viable method of aerobic exercise that may often be pursued well into our senior years.

In many parts of the world, bicycles still represent the chief means of transportation. Riding a bicycle is a non-jarring, measured and deliberate form of active motion that fosters a sense of physical and mental being, while getting you from place to place. It can be done almost anytime and anywhere, alone or with a group of friends. You don't have to contend with traveling to and from your local gym or hiring a personal trainer. Unlike many other recreational sports such as tennis or golf, there are no expensive lessons or frustrating "learning curves." And there is something about the peace and serenity one can experience on a quiet ride through the country that will never be duplicated in a noisy, crowded aerobics class. Yet when riding a "conventional" bicycle, the pursuit of improved levels of physical fitness and cerebral euphoria do not come without a price.

Caution should be taken when recommending any form of exercise to a patient. You need to be cognizant of certain health risks which may be encountered by riders of conventional bicycles. Some are clearly evident, while others are far less obvious. For the purpose of clarification, a "conventional" bicycle will be defined as one upon which the rider's torso assumes a position somewhere between nearly upright (perpendicular to the ground) and extreme anterior flexion over the handlebars.

This forward leaning position raises numerous orthopedic and neurologic concerns for the rider. The farther forward the rider leans while in the seated position, the higher the intradiscal pressure climbs in the lumbar spine. For patients who have pre-existing disc lesions, this position creates additional stresses upon already compromised annular fibers. The result is often exacerbation of back and/or leg symptomatology. To make matters worse, in an exaggerated position of forward flexion, the bicyclist is forced to place the cervical spine into hyperextension to be able to view the road ahead. The rider must also rotate the neck while in hyperextension to look behind. This contributes to neck stiffness and cervical facet irritation.

Conventional bicycles also place the rider's arms in a position which predisposes the upper extremities to injury, a result of unnatural and prolonged periods of compression and muscle contraction. To support the upper body, the rider must maintain a secure grip on the handlebars while often bearing weight almost directly on the median nerve. This hyperextended wrist position can lead to numbness in the fingers and hands. It could certainly compromise the carpal tunnel and/or aggravate any pre-existing carpal tunnel syndrome. The constant contraction of the muscles of the forearm can also occasionally lead to chronic problems with tendinitis and fascial irritation. And in long standing forward flexed posture, compression forces are also transmitted to both shoulder joints, leaving some avid riders open to bursitis. Note: Although some conventional bicycles do not place the rider into extremes of forward flexion, they still exact a toll on the lower back by virtue of weightbearing on the lumbar discs.

Perhaps the darkest cloud over traditional bicycle riding is the conventional bicycle seat. Instead of displacing the upper body weight evenly over the relatively broad surface of the buttocks, most bicycle seats are not even wide enough to provide direct support to the ischial tuberosities. The weight of the rider is placed directly upon the delicate anatomical structures of the perineum. Many urological specialists are convinced that chronic pressure upon these nerves and arteries may lead to penile numbness and male impotency. Some male riders have also experienced prostate irritation. The discomfort level related to pressure from the bicycle seat is often enough to discourage the rider from regular bicycle riding. The support of the lumbar spine is virtually nonexistent. The seat is nothing more than a very narrow weightbearing surface. There is no "back" against which to lean for postural support. Prolonged rides are typically accompanied by fatigue and soreness of lower back muscles.

Finally, there is the issue of rider safety. When a conventional bicycle "wipes out," there is very little in front of the rider to offer any protection. If the bicycle collides with another object or stops abruptly, the rider's momentum is carried forward, sometimes catapulting the rider head first over the handlebars. This can be catastrophic, and certainly points to the value of wearing a well-constructed bicycle helmet.

Nevertheless, severe injury too often results from such a spill. Since the rider's head is naturally somewhat downturned toward the road ahead (in the case of a forward flexed torso), it is often tiring and uncomfortable to maintain the degree of neck extension necessary to stay aware of the traffic around you. Consider too that the rider sits well above the road surface, regardless of the direction in which the rider is thrown from the bike, there are several feet of downward travel before striking the ground.

If you've ever seriously pursued bicycling, you may have experienced some of these problems. Maybe you've just accepted the aches and pains. Well, I want to take this opportunity to educate you and your patients about a better way to bicycle. As an avid bicyclist for many years, I've personally experienced a number of the drawbacks to an otherwise ideal form of exercise. Recently, however, I discovered the world of "recumbent" bicycling. After trying a recumbent bicycle, I can tell you that the experience is exhilarating, pain-free, and most of all, "spine friendly."

A recumbent bicycle is just what it sounds like. You've probably seen stationary recumbent exercycles in gyms. Just imagine sitting in the same semi-recumbent position with legs outstretched in front of you while pedaling through the streets of your town. Although I've had the opportunity to evaluate a number of different recumbent bicycles for comparison to a conventional road bike.

Recumbent bicycles (aka "bents") are available in "short" or "long wheel base" formats (the long wheel base is pictured). The long wheel base design is a bit easier to control and offers more protection for the rider in the event of a frontal impact. Most "bents" are built to last and utilize only high-end components to ensure maximum performance and durability. Production costs exceed those of mass-produced conventional bicycles, so expect to pay more for these bicycles. However, this should be weighed against the many years of trouble free (and pain free) use that a well-made recumbent bicycle will provide.

Examine the body position of the rider in the photo. The problems plaguing conventional bicycle riders have been eliminated. The wide, padded seat and ergonomically designed seat-back support and cushion the spine while distributing the rider's upper body weight evenly across the buttocks without irritating the perineal structures. The arms are held comfortably in front of the body with hands gently resting on chest-high handlebars. There is no weightbearing through the upper extremities. The head and neck are held comfortably in a position of anatomic rest, allowing the

rider a stress free panorama all around him.

The semi-recumbent body position can reduce wind resistance by up to 30% (compared to a conventional bike). Since the center of gravity is lowered, the "bent" is very stable when navigating curves and turning. In the event of a crash, it is often possible to avoid any serious injury due to the rider's proximity to the ground. The legs do not dangle in a dependent posture. Rather, they are positioned more in line with the horizontal level of the heart. This allows for riding greater distances with less fatigue and leg discomfort.

Recumbents are equipped with multiple gears to allow even weak riders to participate and take an active role in maintaining health. What's more, these machines are capable of moving very quickly and negotiating hilly terrain with relative ease.

As chiropractors, we stress the importance of "things natural." One ride on a recumbent bicycle should convince you that "conventional" bicycle designs are completely ignorant of natural ergonomics. Whether your focus is "wellness and prevention" or "rehabilitation," you now have an opportunity to offer your patients something better! They'll thank you for years to come.

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