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In Motion

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Be Safe and Jump on the Trampoline

By Michael J. Leddy, MD

Trampolines have evolved over two decades. They are used to help practice gymnastics, tumbling, and cheerleading moves, and are often found in backyards across America. They have even found their way into the Olympics, becoming an official event at the 2000 Sydney games. Recently, trampoline parks have opened in many cities. These parks offer a variety of equipment like basketball nets, foam pits, and warrior courses. Their purpose is to entertain thrill seekers of all ages.

Unfortunately, with the fun comes a significant risk of injury. Researchers documented one million emergency room visits during a 10-year period. Of the documented injuries, 29% were fractures and almost 93% were under the age of 16.¹

It is important to know the risks when using a trampoline. Parents should frequently inspect the trampoline for damage and always supervise their children when they use a trampoline. It is recommended that children under the age of six not be allowed to use a trampoline. It is also important that only one individual uses the trampoline at a time

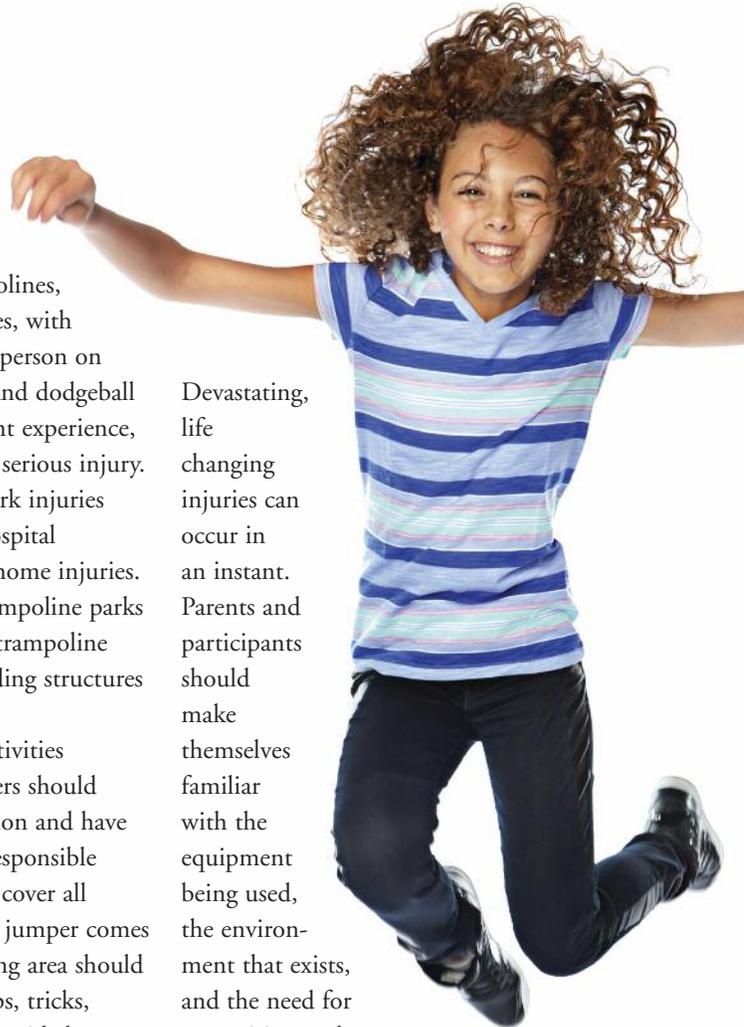
and somersaults and flips should not be allowed.

Trampoline parks offer other risks. They incorporate multiple trampolines, positioned at different angles, with many times more than one person on them at a time. Basketball and dodgeball games give players a different experience, but also increase the risk of serious injury. Patients with trampoline park injuries were more likely to need hospital admission than those with home injuries. Several severe injuries at trampoline parks resulted from contact with trampoline frames, springs, or surrounding structures such as poles.²

When participating in activities at a trampoline park, jumpers should receive appropriate instruction and have significant supervision by responsible attendants. Padding should cover all springs and objects that the jumper comes in contact with. The jumping area should not be overcrowded and flips, tricks, and somersaults should be avoided.

It is important to stress the risk of injury when using a trampoline.

Devastating, life changing injuries can occur in an instant. Parents and participants should make themselves familiar with the equipment being used, the environment that exists, and the need for supervision and responsible jumping when participating in this activity.



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Hit the Trail Safely on a Bike

By Ashley Anderson, MD, and Jon F. Dickens, MD

Mountain biking is a growing trend across the country with even an international push to increase participation.¹ There are so many health and environmental benefits of cycling^{1,2,3} that there is no end in sight for its popularity and growth. However, with this increase in ridership, injury types and rates are also increasing.

Overuse

Overuse injuries are reported in 45% to 90% of mountain bikers due¹ to how individuals ride and handle the vibrations and motions of going up and down mountains. Classically, overuse injuries are related to the bicycle fit or improper training techniques. The most common lower extremity injury includes knee pain, which is often due to factors such as the bicycle saddle being too low or in a forward position. The most common upper extremity injuries include wrist pain or hand numbness due to poor weight distribution across the handlebars. Other overuse injuries include low back pain and neck due to poor cycling position and mechanics.^{1,5}

Improper position can contribute to overuse injuries. Small adjustments, particularly how the body is aligned with the bicycle at the seat, handlebars, and pedals can improve comfort, efficiency, and power generation.

Trauma

Although, non-traumatic injuries are most common with recreational cyclists, many riders who travel at high speeds, in large groups, over technical terrain, or in traffic are at risk for a traumatic injury. In 2011 Nelson et al. noted that mountain biking injuries had decreased significantly from 1994 to 2007.³ However, there still are approximately 15,000 bicycle related injuries each year. The most common injuries include upper extremity fractures (10.6%) and shoulder fractures (including clavicle, 8.3%).³ Overall, fractures accounted for 26.5% of mountain bike-related injuries, followed by soft tissue injuries (24.0%), and cuts (20.5%).³ The majority of mountain bike-related injuries were attributed to falls (69.9%) or being thrown from the bike (14.1%).³

Injury Prevention

Historically, overuse injury management in cyclists has emphasized features of bicycle geometry such as seat height and seat position, seat to handle bars distance, as well as cleat alignment and position.

Bicycles are designed for specific demands, from racing performance, to comfort and stability in traffic, to carrying heavy loads or children. The frame geometry, handlebar shape, saddle, and pedal system are selected based on the cyclist's anatomical measurements and the desired body position and function. Improper body position on the bicycle can contribute to a number of overuse injuries.⁶ Small adjustments by a professional, particularly how the body is aligned with the bicycle at the seat, handlebars, and pedals, can improve comfort, efficiency, and power generation.^{1,6}

Conclusion

The evaluation and management of cycling injury should be a collaborative process involving athletes, physicians, physical therapists, bike fitters, and, for some cyclists, a coach. Correction of bike fit, cycling technique errors, and training habits can all improve comfort and enjoyment on the bicycle as well as avoid preventable injuries.

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Lacrosse Injuries on the Rise

By Amber Parker, BS, and Arun J. Ramappa, MD

Lacrosse is considered one of the fastest growing team sports in the United States in both youth and collegiate athletics. While youth enrollment in other popular sports such as football has declined, lacrosse participation has nearly doubled between 2006 and 2015.¹ Similarly, the National Collegiate Athletic Association (NCAA) varsity men's lacrosse programs have experienced a steady increase, with the number of student athletes nearly doubling from the years 2003 to 2015.²

Lacrosse is a physically demanding sport requiring endurance, speed, strength, and agility.³ The combination of the sport's booming popularity and these highly physical demands can lead to injuries.³

The most common injuries for both male and female athletes are ankle sprains, knee ligament injuries, and concussions. Ankle injuries mainly occur during motions such as cutting, dodging, or twisting activities that put extra strain on the joint. Fortunately, these injuries do not typically result in ongoing complications or cause a severe loss in time from play.³ On the other hand, knee injuries, which also result from noncontact and pivoting actions, can be more serious and result in significant playing time loss and can even cause players to miss the remainder of their season. An example of this type of injury is an anterior cruciate ligament (ACL) tear, which may cause knee instability.³

To help prevent injuries, appropriate training practices should be followed. During pre-season and in-season

practices, training that involves stretching and strengthening, balance, control, and plyometrics (jump training) is recommended to prepare the body. Coaches and athletic trainers can help identify areas of weakness and instability in the knee and ankle before participation to ensure that players work to adequately achieve proper strength and agility before peak in-season play.³

Concussions, another common injury, can range in severity from cognitive impairments that can last for months to the more commonly observed headaches, concentration problems, and dizziness that resolve within weeks.⁴ Concussions typically occur between men during player-to-player contact and between women during stick contact.

Unlike ankle and knee injuries where physical preparation is necessary to prevent injury, player education on rules of play and proper equipment use are vital to avoid these head injuries. For this reason, women's lacrosse, which was previously played without any facial protection, has adopted the use of eyewear to help prevent injury.³ Modifications to collegiate level rules that make illegal hits to the head and promote fair play are examples of policy changes made to protect the players.³

Lacrosse is a great sport for young athletes, as there are diverse physical components of the game. Handling of the stick makes use of the upper body and hand-eye coordination, while the running demands of the sport highlight the speed and agility of quick athletes.



However, when approaching any new sport it is important to be physically prepared and well educated on its rules to avoid injury whenever possible.

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Youth Baseball Injury Prevention Made Simple

By Seth L. Sherman, MD, and Daniel Deasis, MD

Each year in the United States, approximately three million children play baseball, and many continue to play into their adolescent and high school years. About 25,000 of these kids will go on to play at the NCAA level, with a select few ending up in the major or minor leagues.¹ Trends such as earlier sport specialization and year-round involvement place athletes at higher risk of overuse injury.

Baseball is a non-contact sport, but serious injuries are most likely due to contact from a ball or bat, or collision with another player.² Overuse injuries are also very common in the shoulders and elbows of pitchers and catchers. Due to repetitive throwing, these injuries have increased exponentially as players participate year-round on multiple teams, often without appropriate rest, recovery, or cross training activities.

There are several ways to help prevent baseball injuries in youth athletes:

- **Have an annual physical exam**
Physicals can help rule out underlying health conditions, ranging from minor orthopaedic injuries to more serious heart or lung issues. Physicals also give an opportunity for early intervention regarding overuse injuries before they become serious or debilitating.
- **Wear proper safety equipment**
The safety gear should fit and be worn correctly before stepping onto the field. Coaches can also consider using softer baseballs in youth leagues, as well as face guards to prevent facial trauma and breakaway bases to reduce sliding injuries to the foot and ankle.³
- **Consistently stretch and warm up**
A proper baseball stretching and strengthening program must involve not only the upper body (i.e., shoulder and arms), but must also emphasize the core and lower body to minimize injury.

- **Teach proper technique**

Coaches should teach proper pitching mechanics and allow young players to develop consistent motion with their fastball before developing other pitches.



- **Follow pitch count rules**

Pitch volume has been found to be the strongest predictor of injury in younger players.⁴ In addition to single game restrictions, players should not pitch more than eight months competitively per year and should avoid playing on multiple teams in the same year. It is also recommended to avoid playing the catcher position after pitching, due to the repetitive throwing back to the mound. Avoiding the use of a radar gun is also recommended.

Old mantras such as “no pain, no gain” have no role in youth sports. If a player complains of arm pain, the coaches and parents should pull them from throwing activity immediately and initiate rest, gentle stretching, and nonsteroidal anti-inflammatory medication, if necessary.^{1,4} Supervised return to play should be at the discretion of a trained sports medicine professional. Just a few simple strategies can help keep kids on the field and out of the doctor’s office.

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