

# » THE BONE DOCTOR

## CHILDREN ARE NOT SMALL ADULTS

The adult skeleton differs in several ways from a growing one. A mature skeleton consists of hard, heavy, calcified bone. It allows a minimum of flex before it will crack or fracture. It is a strong but brittle material, which I would compare to a one litre glass cool drink bottle. The joints are supported by strong ligaments, but as age takes its toll, these become less flexible. This influences the injury patterns seen in adults.

The immature growing bone has less calcium and is therefore lighter, more flexible and less brittle; much like a branch of a growing tree. The skeleton grows in zones at the ends of the long bones, where new bone is produced. These are called "growth plates", and are weak points in the skeleton as the bone immediately adjacent to them is relatively new and less resistant to injury. Children are generally more flexible than adults, although their ligaments may be stronger in relative terms than their skeleton. The growing skeleton also has the ability to correct a deformity through growth, with younger children having a greater correction potential than adolescents or young teens.

In practical terms, the mechanical properties of the child's skeleton coupled with their lower body weight mean that if they fall, they are less likely to do serious harm than an adult. Kids fall off skateboards and bounce back up; when you do it you are likely to stay on the ground moaning and groaning!

### SNAP LIKE A TWIG ...

Although "greenstick fractures" are a very specific fracture occurring in kids, a growing branch or sapling forms an excellent analogy for how a child's bone fails during a fall. If you bend the branch, it will deform/flex without breaking. Apply a further force

and you will get a buckle in the branch with some tearing of the bark (creatively labelled buckle fractures). If you bend the branch further it will tear in half, however, the bark will still be intact (this is the true "greenstick fracture"). Finally, if you bend it with enough force you will snap it into two pieces. This represents the spectrum of injuries seen in children, particularly when the rider puts their arm out to break the fall. To be clear, these injuries are all fractures, just of different severity. The nature of the break, the child's age and the amount of angulation will determine the required treatment.

In keeping with this month's focus on young riders, DR MIKE MULDER sheds some light on the injuries which are unique to this age group.

## INJURIES TO YOUNG RIDERS

### WIPE-OUT... TEARS... NOW WHAT?

Kids will fall off their bikes, you can bet your house on that fact, so best be prepared for what to do next. As with adults, arms and collarbones are the usual victims during a fall.

If there is an obvious deformity, fashion a splint and/or sling, give an appropriate dose of painkillers (paracetamol and an anti-inflammatory like neurofen) and head for the emergency unit for assessment. The x-ray will quantify the break and any deformity; a buckle or minor growth plate injury is likely to only need a cast, while a more severe deformation of the bone will need to be corrected by an orthopaedic surgeon under anaesthetic.

The time spent in a cast is affected by the age of the child, location and severity of the break. There is a common misconception that three weeks is enough for a bone

to heal. This is unfortunately not the case. It is important to remember that the bone will remain weak for several weeks after the cast is removed. Unfortunately, returning to sports too soon after removal of the cast frequently ends with a repeat fracture.

As a rule, children very seldom "sprain" a joint. They are far more likely to injure the bone or growth plate, than the ligaments. That means if junior fell and is still moaning about a sore arm the next day, he may have broken something. Don't pass it off as a sprain, rather get it assessed. That also does not mean rushing every bruised arm to the x-ray department. Give it a day or two, but if the child remains reluctant to use the limb, get it assessed. Often the x-ray may not show any obvious break, but if there is a strong enough suspicion, it is best to treat it as a break.

### THE COLLARBONE

Due to the impressive healing and remodelling potential of the clavicle, it is very rare that a fractured collarbone in a child would need surgery. They are treated in a sling and although there may be a bump, this will mostly correct itself.

The situation is less clear in teenagers where surgery may be required depending on the age and degree of deformity.

### HEAD INJURIES

Because of the relatively large size and weight of the child's

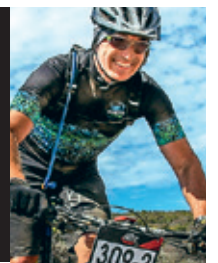
head, it is more likely to be injured in a child than in an adult. It is therefore crucial that they wear a helmet. The developing brain is vulnerable to injury through less force than an adult and permanent injury can result. Instil the culture of "no helmet, no ride" early!

### THE GOOD NEWS

Fortunately very few falls end in disaster. Children are resilient and heal very well, so long as they receive the correct treatment. **ts**



**Dr Mike Mulder** is an orthopaedic surgeon specialising in the treatment of shoulder, elbow and hand disorders and injuries. He is based at Constantiaberg Mediclinic, and is a member of The Cape Shoulder and Elbow Unit. He has a wealth of experience in fixing injured cyclists and is an avid mountain biker. He rides as often as his wife and family let him.



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