



Bracing for Polio Survivors

A Bruno Byte

From Dr. Richard L. Bruno, HD, PhD
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Question: The knee on my polio leg kept bending further backward over the years. I was told to get a brace but didn't want one until I absolutely had to have it. After a while my knee hurt so much I've finally got a brace. But my knee bends so far back now that the brace bites into my skin and is so painful I can't wear it. Even if I could wear the brace, it is so heavy I can't lift my leg. What can I do?

Dr. Bruno's Response: Unfortunately, it's too late for a brace to help. Braces are designed to support a weak leg, not to fix mechanical problems like [recurvatum](#) ("back knee"). We have seen many braces that hurt too much to wear because they were intended to "fix" recurvatum or to straighten a foot that has turned outward for 40 years. All braces should be designed to fit your leg just as it is, not to make it look the way other peoples' legs do, which leads to a Post-Polio Precept: *never brace to fix a deformity!*

Many polio survivors have come to The Post-Polio Institute with braces that are unusable because they are too heavy, made with the 1940's vintage steel, aluminum metal uprights, contain way too much plastic or have ankle joints. The Post-Polio Institute patients do very well with the new lightweight braces that use plastic molded to the shape of your foot and leg to replace the metal uprights. The most common brace worn by polio survivors is the short leg brace, the molded ankle-foot orthosis (MAFO). It is made of a relatively thin plastic that slips into your shoe and goes up the back or front of your lower leg to stop foot drop, give a spring to your step if you have weak calf muscles, and even support a weakened thigh muscle to help prevent the knee from buckling.

The brace you were prescribed, the long leg brace or knee-ankle-foot orthosis (KAFO), usually replaces the metal uprights with molded plastic that slips into your shoe, goes up the back of your lower leg and is attached to a plastic cuff behind your thigh with a metal hinge and lock at the knee. Uprights can be used in place of plastic but are now made of graphite -- a super-strong, ultra-lightweight but very expensive composite material used in airplanes -- if you need extra support or if your leg twists too much to be comfortable in a molded brace.

There are now two types of KAFO knee joints: the old, familiar joint with drop-locks ("Bale" locks) or a spring-loaded latch that prevents the knee from bending when you stand and walk. A newer development, the offset joint, can be used by those who have some strength in their quadriceps and whose knees bend backward at least a little. The offset joint doesn't lock, but it still prevents the knee from bending when your leg is straight. With the offset joint you can swing your leg normally when you walk but be secure when you're standing.

However, polio survivors should avoid ankle joints, be they plastic or metal, which prevent your foot from dropping but allow your ankle to bend upward. Hinged ankles add weight to the brace, take away support for weakened thigh muscles and prevent the brace from helping your leg to spring forward.

I'm sorry a brace can't help you. We have unsuccessfully tried to brace other polio survivors with severe recurvatum. They, too, couldn't wear a KAFO because it hurt too much. Instead, they needed to use crutches or a wheelchair, which raises two important points: waiting until you're ready" or until

you "have to" before using an assistive device is waiting too long; and, even if you are willing and able to use a brace, you will also need to use a cane or crutches. How do you know which to use?

The rule of thumb is: if you use a MAFO, you also need a cane; if you use a KAFO, you need two forearm crutches.

If you have a brace on one leg, a cane in the hand on the opposite side shifts your weight away from the weaker, braced leg. Using two forearm crutches with a KAFO takes the load off your stronger leg as well as overused hip and lower back muscles on both sides. But there's a problem. Canes and crutches put a strain on your hands, arms and shoulders and can cause carpal tunnel syndrome and upper body pain and muscle weakness.

How do you save your arms? By using a wheelchair, especially outside the house.

To walk is painful, to roll divine.

The Encyclopedia of Polio and Post-Polio Sequelae

contains all of [Dr. Richard Bruno's](#) articles, monographs, commentaries and "Bruno Bytes"
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