

Flat feet (pes planus), also referred to as 'fallen arches', is a condition in which the foot does not have normal arches. In other words, the arch or instep partially or totally collapses, when coming into contact with the ground. It may affect one or both feet. In babies, the foot looks flat because the arches have not yet formed. By the age of 2 or 3, your child should have developed arches. Flat feet, even in older children, generally do not cause any problems and will not limit your child's activities (American Academy of Family Physicians, 2006-2011).

Causes:

Flat feet are normal in infancy, because young infants have 'fat pads' everywhere, including the arch of the foot which obscures any visible arch. As the infant grows, this fat pad tends to disappear and an arch emerges at around 2 years of age. On standing however, this previously visible arch may disappear, as weight is placed on the foot. This phenomenon occurs because the lax ligaments that normally bind the bones of the arch together, cannot support the weight of the child and the arch collapses. With increasing age, these ligaments strengthen enough to support the child's weight and flat feet usually resolve naturally by the age of 3 or 4. Ligament elasticity tends to be a familial trait and children who have lax ligaments (fingers, wrists, knees) in general, are more prone to developing flat feet. Most cases of persistent flat feet are considered to be variations of normal. In general, people's feet are flexible and when they stand on their toes, an arch appears (A.D.A.M., 2011; Leary, 1990).

Stiff, inflexible or painful flat feet, may be associated with other conditions and require medical attention. In children, painful flat feet may be caused by a condition called tarsal coalition. This condition occurs when 2 or more of the bones in the foot fuse together, therefore limiting mobility and often result in flat feet (A.D.A.M., 2011).

Flat feet may also be caused by pronation. This occurs when the ankle bones lean inwards towards the middle line (A.D.A.M., 2011).

Fallen arches can be a result of wear and tear. During this process, the tendon that is responsible for shaping the arch weakens, resulting in flat feet. An injury, such as the inflammation of the tendons in the foot, can also cause collapsed arches (MamasHealth, Inc., 2000-2011).

Symptoms:

Flexible flat feet are asymptomatic and do not cause any disabilities, provided that the foot is supple and the heel cord or Achilles tendon isn't too tight. In contrast, pathological flat feet, may result in some of the following symptoms;

- The absence of a foot arch when standing flat or on tip toes.
- Pain, tenderness or cramping in the foot, leg, and knee.
- Swelling along the inside of the ankle.
- Callouses or redness.
- Heel that tilts away from the body more than usual.
- Difficulty or awkwardness with walking.
- Uneven shoe wear, indicated by the collapsing of the shoe towards the inside of the flat foot.
- Reduced energy when participating in or voluntary withdrawal from physical activities (ACFAS, 2010; A.D.A.M., 2011; MamasHealth, Inc., 2000-2011).

Diagnosis:

There are 2 types of flat feet;

Physiological (normal) flat feet are due to imbalances in growth. This type of pes planus may result in transient symptoms of pain and swelling, but it is self-limiting. This means that it generally resolves itself, over a few months or years. Physiological flat feet, also known as flexible flat feet, is the most common type and generally does not require any treatment. A supple flat foot, looks flat when the child stands on it ('loaded position') but an arch develops in the 'unloaded position' or when they stand on their toes. If a heel cord is able to bend up at the ankle, more than 15 degrees from the perpendicular to the leg, it is not regarded as tight.

Pathological (diseased) flat feet are a result of abnormalities in the bones and muscles of the foot, are fixed, and are not self-correcting. There are 2 types of pathological flat foot, namely rigid flat foot and flat foot with a tight heel cord, that do cause symptoms and require surgery. In the case of rigid flat foot, the foot looks flat in all positions-loaded, unloaded or when the child

stands on their toes. If the child has a tight heel cord, the foot is unable to bend back at the ankle, more than 15 degrees due to the calf muscles, that form part of the Achilles tendon being contracted (healthhype.com; UCSF Benioff Children's Hospital, 2010).

If your child continues to have flat feet beyond age 10, your doctor will perform a physical examination to establish what type of flat feet your child has. This will involve examining your child while they stand on their whole foot (the 'loaded position') and on their toes, as well as checking the shape of the foot when your child gets off the foot (the 'unloaded position') and how far they are able to bend the foot at the ankle (UCSF Benioff Children's Hospital, 2010).

To assist in the diagnosis, establish the severity of the condition and devise an effective treatment plan, your doctor may ask for x-rays. X-rays are done in a standing position, in order to pinpoint if the flat foot is associated with an underlying medical condition (healthhype.com).

Treatment:

Treatment of flat feet depends on the underlying cause, the severity of the condition and the associated pain.

Insoles are frequently used in the treatment of flat feet. Several different insoles are available or they can be custom made. Insoles are designed to protect and support the arch of the foot, therefore alleviating the pain associated with collapsed arches and improving function.

Pain relief may also be provided for, on a short term basis, through the use of anti-inflammatory drugs or steroids.

Many doctors recommend therapy, such as prolotherapy, which is designed to naturally strengthen the damaged ligaments or tendons over time. Stretching exercises with a physical therapist or supervised by the foot and ankle surgeon, may provide some relief to flat foot sufferers.

Your child may need to temporarily decrease their activities that cause pain and avoid prolonged walking or standing.

Your doctor will also advise you on what characteristics to look for in a shoe, these shoe modifications are important for children with flat foot.

Surgery can be a successful option for people who are in severe pain. Usually this involves cleaning and repairing the damaged tendons. In extreme cases, fusion is required, to correct the position of the joints within the feet and ankle area (ACFAS, 2010; Wisegeek, 2003-2011).

Complications:

Common complications of flat feet include;

- Inflammation and pain in the ligaments of the soles of the feet
- Achilles and posterior tibial tendonitis
- Stress fractures in the lower leg
- Bunions
- Callouses (MamasHealth, Inc., 2000-2011).