

## **FOOT TYPES AND ASSOCIATED CONDITIONS**

There are many shapes and sizes of feet. When examining feet, it is important to evaluate the patient's gait for a comprehensive understanding of how the foot moves during the gait cycle. In order to propel normally, feet need to have normal amounts of pronation and supination. Additionally, different foot types will affect an individual's gait, changing when certain movements occur and causing a number of different symptoms or conditions. Conditions and symptoms associated with the most typically identified foot types include:

### **PES PLANUS**

#### **Symptoms/Conditions**

- Hallux valgus and/or bunions
- Heel pain
- Patellofemoral knee pain
- Low back pain
- Excessive pronation
- Stress fractures
- Shin splints

#### **What is it?**

Pes planus is a foot type commonly referred to as a "flat foot" because of its low medial longitudinal arch structure. It is a very common condition or deformity in which a larger than normal area of the plantar aspect of the foot is in contact with the ground. While generally this foot type is hypermobile, there are cases where the planus foot structure is rigid. Pes planus is often characterized by excessive pronation, a low medial longitudinal arch, calcaneal valgus and forefoot abduction in standing and forefoot varus in non-weight-bearing.

#### **Pedorthic Treatment**

Treatment for a pes planus foot depends on the specific condition or mechanical fault related to the planus foot. Since many conditions are characterized by excessive pronation, heel valgus in standing and forefoot varus in non-weight-bearing, a Canadian Certified Pedorthist can construct an orthosis to help compensate for the specific mechanical fault identified. In decreasing the mechanical stressors to the affected tissues, healing can occur and pain can be reduced.

With a prescribing physician's recommendation, Canadian Certified Pedorthists may use over-the-counter devices or may create functional, biomechanical custom-made orthoses to control the abnormal and potentially harmful motion of the subtalar and other joints of the foot. Using posting materials to reposition and control motion, the orthosis will control the abnormal motions by supporting the subtalar joint in a more neutral position, reducing compensatory motions that allow for abnormal pronation, and encouraging a normal sequence of subtalar joint motion during gait.

## **PES CAVUS**

### **Symptoms/Conditions**

- Clawed toes
- Metatarsalgia
- Iliotibial band friction syndrome (lateral knee pain)
- Osteoarthritis of the midfoot
- Ankle sprains
- Difficulty finding shoes to fit high instep and/or clawed toe
- Stress fractures
- Shin splints

### **What is it?**

Pes cavus is a foot type commonly referred to as a "high arch" because of its abnormally high medial longitudinal arch structure that does not flatten with weight-bearing. There is often a varus heel position when weight-bearing, a plantarflexed first ray, reduced pronation during the gait cycle and the foot may be in an equinus position. Callusing is common under the first and 5<sup>th</sup> metatarsal heads. While standing, weight distribution in a pes cavus foot is predominantly under the heel and metatarsal heads, with limited to no weight distribution under the lateral border of the midfoot. Cavus feet can be flexible or inflexible/rigid; inflexible cavus feet tend to be more prone to injuries that result from poor shock absorption, while flexible cavus feet tend to be more prone to overuse injuries similar to a flexible planus foot.

### **Pedorthic Treatment**

Treatment for a pes cavus foot depends on the specific condition or mechanical fault related to the cavus foot. Since many conditions of the cavus foot are characterized by restricted pronation, heel varus (or restricted eversion of the calcaneus) and forefoot valgus when

non-weight-bearing, Canadian Certified Pedorthists may use over-the-counter devices or may create custom-made orthoses to help compensate for the specific mechanical fault identified. In decreasing the mechanical stressors to the affected tissues, healing can occur and pain can be reduced. With a prescribing physician's recommendation, Canadian Certified Pedorthists may use over-the-counter devices or may create functional, biomechanical custom-made orthoses to accommodate and compensate for the reduced motion of the subtalar and other joints commonly seen in the cavus foot. Using posting materials, the orthosis can accommodate and control the abnormal motions of the foot by supporting the foot joints in a more neutral position, reducing compensatory motions, and encouraging a normal sequence of subtalar joint motion during gait. Use of appropriate materials can help aid in shock absorption that is often lacking in the cavus foot or the foot with reduced pronation capabilities.

## **PEDORTHIC POINTERS FOR PATIENTS**

Pes planus and pes cavus describe general foot types. These terms do not necessarily describe a particular problem with a foot. For example, you can have a pes planus foot and not have any problems or symptoms at all. It is important to have your foot structure and symptoms adequately assessed by your prescribing physician and a qualified practitioner such as a Canadian Certified Pedorthist. Once the underlying conditions and mechanical faults are assessed, an appropriate treatment plan including possible orthosis and footwear recommendations can be made. Adequate footwear can often help with conditions related to pes planus or pes cavus feet. Canadian Certified Pedorthists recommend selecting shoes featuring:

- Heel counters that make the heel of the shoe stronger to help resist/reduce excessive rearfoot motions. The heel counter is the hard piece in the back of the shoe that helps control the foot's motion from side-to-side. You can quickly test the effectiveness of a shoe's heel counter by placing the shoe in the palm of your hand and putting your thumb in the mid-portion of the heel, trying to bend the back of the shoe. A heel counter that does not bend very much will provide superior motion control
- Wide base of support through the midfoot, to provide more support under a foot that is overpronated or collapsed inward