Clinical Practice Guideline: **Tendon Transfer or Transplant to the Foot**

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Product: **Specialty**

GUIDELINES

American Specialty Health – Specialty (ASH) considers services consisting of CPT Code 27690, 27691, and 27692 to be medically necessary for the transfer or transplant of a single tendon to the foot for **a patient that requires at least 1 of the following procedures:**

- Split anterior tibial tendon transfer for the equinovarus foot (ICD-10 codes Q66.00-Q66.02, M21.171- M21.179, M21.541 - M21.549)
- Posterior tibial tendon (PTT) transfer through the interosseous membrane for foot drop (ICD-10 codes M21.371 - M21.379)
- Flexor digitorum longus or flexor hallucis longus transfer through interosseous membrane for foot drop (often used to augment PTT transfer)
- Flexor hallucis longus transfer to calcaneus for chronic Achilles rupture or insertional Achilles tendonitis (ICD-10 codes S86.011A - S86.019S, M76.60 - M76.62)
- Flexor digitorum longus tendon to navicular for flatfoot correction
- Flexor digitorum longus tendon transfer to base of fifth metatarsal for loss of both lateral tendons
- Painful flexible flat foot (ICD-10 codes M21.40 - M21.42)

Conservative care for these conditions includes bracing, orthotics, and physical therapy.

CPT CODES AND DESCRIPTIONS

CPT® Code	CPT® Code Description
27690	Transfer or transplant of single tendon (with muscle redirection or rerouting); superficial (e.g., anterior tibial extensors into midfoot)
27691	Transfer or transplant of single tendon (with muscle redirection or rerouting); deep (e.g., anterior tibial or posterior tibial through interosseous space, flexor digitorum longus, flexor hallucis longus, or peroneal tendon to midfoot or hindfoot)
27692	Transfer or transplant of single tendon (with muscle redirection or rerouting); each additional tendon (List separately in addition to code for primary procedure)

BACKGROUND

Tendons are typically transferred or implanted in order to restore more normal movement to a foot and ankle that has lost function. The primary goal of tendon transfer is to place the ankle and foot into proper alignment. This can allow the ankle and/or foot to be successfully braced for walking and standing. A tendon transfer may eliminate the need for a brace altogether. This realignment can also decrease pain by more evenly distributing pressure across the foot.

There are two common indications for tendon transfer in the foot and ankle. One is a painful, flexible flatfoot which develops when the posterior tibial tendon stretches and becomes nonfunctional or ruptures. The other indication is the loss of function of muscles in the lower leg and foot due to a neurological problem. This can include weakness after a stroke, nerve damage after a surgery or accident, or a systemic disease-causing weakness of the muscles. There is also a flexor hallucis longus tendon transfer procedure to address Achilles tendon issues.

Split Anterior Tibial Tendon Transfer for Equinovarus Foot

Patients with an upper motor neuron lesion, such as in stroke and traumatic brain injury, often experience disruption of the functional balance between agonistic and antagonistic muscle activity. This muscular imbalance often causes deformities of the ankle and foot. Although different types of acquired ankle and foot deformity following stroke and traumatic brain injury have been described, equinovarus deformity is most characteristic and most frequently seen. Involuntary activity of the plantar flexors and invertors of the ankle and foot, combined with paresis of the dorsiflexors and evertors, may explain the dynamics in the development of equinovarus foot deformity. Current evidence suggests that surgical correction (e.g., muscle and tendon lengthening, release and/or transfer) of equinovarus foot deformity following stroke or traumatic brain injury is a safe treatment option with a good chance of improving walking capacity and of diminishing the need for orthotic use (Renzenbrink et al., 2012).

Tibialis anterior tendon transfer is part of the Ponseti management for congenital talipes equinovarus, which, when indicated, seeks to decrease the likelihood of future recurrence of the deformity. The decision to recommend surgery is made by observation of dynamic supination during gait and a manually tested imbalance between inversion and eversion strength. Gray et al. (2014) assessed strength, plantar loading, range-of-motion (ROM), foot alignment, function, satisfaction, and quality of life in patients with clubfoot that recurred after Ponseti casting who met indications for tibialis anterior tendon transfer surgery and compared them with a group of patients with clubfoot treated with casting but whose deformity did not require tendon transfer surgery (N=32). At baseline, the tibialis anterior tendon transfer group had a significantly worse eversion-to-inversion strength ratio, plantar loading, ROM, foot alignment, and function and satisfaction. At three months after surgery, eversion-to-inversion strength, plantar loading, and function and satisfaction

were no longer different between groups. Improvements were maintained at 12 months after surgery. The results suggested that tibialis anterior tendon transfer surgery was an effective procedure, which at 12-month follow-up restored the balance of eversion-to-inversion strength and resulted in plantar loading and function and satisfaction outcomes similar to those of age-matched children within the trial control group.

Posterior Tibial Tendon (PTT), Flexor Digitorum Longus, or Flexor Hallucis Longus Transfer Through the Interosseous Membrane for Foot Drop

Drop foot deformity is a weakness of ankle dorsiflexion frequently accompanied by weakness of the extensor hallucis longus and extensor digitorum longus muscles, causing difficulty with dorsiflexion of the toes. It can be caused by central or peripheral neurogenic lesions, oncologic resectional defects of the limb and/or posttraumatic damage to the muscles or tendons of the anterior tibial and the peroneal compartment. It is a common deformity with severe restrictions in quality of life and impairment of daily activities. Bracing with an ankle-foot orthosis (AFO) and physical therapy can assist in ambulation and prevent contracture of the ankle plantar flexors. AFOs support ankle dorsiflexion during swing phase, provide medial and lateral stability at stance, and may increase pushoff stimulation at the late phase of stance (Romansky et al., 2012). However, AFOs do not correct the drop foot deformity. Surgery may be indicated for the correction of foot drop deformity. The need would be determined on a case-by-case basis.

A technique of posterior tibial tendon transfer through the interosseus membrane and fixation to the anterior tibial and the long peroneal tendon or "Bridle procedure" (stirrup-plasty) offers a suitable alternative to other surgical corrections. Steinau et al. (2011) conducted a retrospective study of patients (*N*=53) treated by stirrup-plasty. The results indicated that in cases of drop foot deformity, stirrup-plasty will provide an evenly spread pull for midfoot and forefoot; clawing of the toes is prevented by tenodesis of the retinaculum extensorum or the fibula. Tendon transfer also reduces damage to the tarsal bones and joints that may be caused by altered biomechanics. The pull via the insertions of the anterior tibial and the peroneus longus tendon prevents a flatfoot deformity to a sufficient extent. The authors further concluded that marked improvements of quality of life parameters justify the risk of the operative procedure for the patient as well as the surgeon’s efforts.

Flexor Hallucis Longus Transfer to Calcaneus for Chronic Achilles Rupture or Insertional Achilles Tendonitis

Achilles tendon ruptures are the most common tendon ruptures of the lower extremity. They can occur at any age but are most common in the third to fifth decade. A relatively hypovascular area exists approximately 2-6 cm above the insertion into the calcaneus. This hypovascularity has been implicated in disorders of the tendon. Mechanisms associated with ruptures include sudden forced dorsiflexion of the ankle (eccentric contraction of the

gastrocnemius and soleus), pushing off with the weight-bearing forefoot while extending the knee, and laceration or direct blow to the contracted tendon.

Patients with increased risk factors for postoperative complications (diabetes, obesity, cigarette smoking) have special considerations with regard to deciding operative versus nonoperative management of the acute Achilles tendon rupture. Acute partial Achilles tendon ruptures can often be treated nonoperatively (Naldo et al., 2021). Conservative treatment of Achilles tendon rupture varies and may include a rigorous functional rehabilitation program for well-trained athletes or immobilization using a plantarflexion short leg cast or a functional brace with a heel lift for six to eight weeks for non-athletes and older patients (Maughan & Boggess, 2023; Ochen et al., 2019). Early weightbearing and progressive physical therapy should be used after repair or at initiation of nonoperative management. However, non-operative treatment has a higher rate or re-rupture. Tendon transfer as part of a multimodal intervention utilizing open techniques is a surgical option for the treatment of Achilles tendon rupture. Limited open techniques use hybrid elements of open and percutaneous techniques to minimize tissue disruption. The principles of stable fixation, appropriate tendon length, careful soft tissue handling, and protection of nervous structures must be kept in mind with any approach. Repair of neglected Achilles ruptures typically involves removing intervening scar tissue, lengthening the proximal portion of the tendon, and supplementation with soft-tissue advancement and/or tendon transfer.

In patients with non-insertional Achilles tendinopathies, conservative treatment may consist of calcaneal tendon eccentric exercise protocols. Recalcitrant non-insertional and insertional tendinopathies often require surgical management (Mansur et al., 2020). Achilles tendon debridement can be supplemented with flexor hallucis longus tendon transfer. Schon et al. (2013) carried out a study to determine the outcomes of flexor hallucis longus tendon transfer in a group of relatively inactive, older, overweight patients (*N*=48) with Achilles tendinosis. The study concluded that surgical debridement of the Achilles tendon with flexor hallucis longus tendon transfer was associated with significant improvement in terms of Achilles tendon function, physical function, and pain intensity.

Flexor Digitorum Longus Tendon to Navicular Bone for Flatfoot Correction

Multiple factors are associated with the development of AAFD, but the most common is posterior tibial tendon dysfunction (PTTD). The tendon is an important dynamic arch stabilizer and a powerful invertor of the foot. It acts to stabilize the talonavicular joint and allows the triceps surae to exert over a longer rigid lever arm to promote efficient toe-off. Dysfunction of the tendon results in unlocking of the talonavicular joint, allowing the triceps surae to act more proximally at the transverse tarsal joints. Abnormal loading of these joints creates excessive biomechanical stresses that lead to midfoot collapse and forefoot abduction with lateral peritalar subluxation of the navicular. Stage I PTTD consists of a painful synovitis but no deformity, as the tendon length and function are normal. Stage

II describes progressive failure of the tendon with a flexible flatfoot deformity, which is passively correctable.

Non-operative treatments include bracing, orthotics, non-steroidal anti-inflammatories, and physical therapy. Surgical treatment may be indicated for cases in which non-operative treatment has not relieved pain and dysfunction. Flexor digitorum longus (FDL) tendon transfer may be a viable surgical option. The goals of the procedure are to relieve pain and to help restore the arch in patients who have acquired painful flat foot. Patients undergoing an FDL transfer should have symptomatic PTTD with no or mild flatfoot deformity (stage I or early II) (Zaw & Calder, 2010). If the deformity has become rigid (stiff) or arthritis has developed, more advanced surgery is needed. This typically includes joint arthrodesis procedures.

Flexor Digitorum Longus Tendon Transfer to Base of Fifth Metatarsal for Loss Of Both Peroneal Tendons

Rupture of the tendons of both peroneus longus and peroneus brevis results in considerable disability. Surgical reconstruction by transfer of the flexor digitorum longus tendon may help to relieve pain and restore function. Flexor digitorum longus transfer to the peroneal tendon has resulted in positive outcomes for treatment of peroneal tendon tears and ruptures (Squires et al., 2007; Cerrato & Campbell, 2009).

PRACTITIONER SCOPE AND TRAINING

Practitioners should practice only in the areas in which they are competent based on their education, training and experience. Levels of education, experience, and proficiency may vary among individual practitioners. It is ethically and legally incumbent on a practitioner to determine where they have the knowledge and skills necessary to perform such services and whether the services are within their scope of practice.

It is best practice for the practitioner to appropriately render services to a member only if they are trained, equally skilled, and adequately competent to deliver a service compared to others trained to perform the same procedure. If the service would be most competently delivered by another health care practitioner who has more skill and training, it would be best practice to refer the member to the more expert practitioner.

Best practice can be defined as a clinical, scientific, or professional technique, method, or process that is typically evidence-based and consensus driven and is recognized by a majority of professionals in a particular field as more effective at delivering a particular outcome than any other practice (Joint Commission International Accreditation Standards for Hospitals, 2020).

Depending on the practitioner's scope of practice, training, and experience, a member's condition and/or symptoms during examination or the course of treatment may indicate the

need for referral to another practitioner or even emergency care. In such cases it is prudent for the practitioner to refer the member for appropriate co-management (e.g., to their primary care physician) or if immediate emergency care is warranted, to contact 911 as appropriate. See the *Managing Medical Emergencies (CPG 159 – S)* clinical practice guideline for information.

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