



A Device to Treat Achilles Tendinopathy

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Background

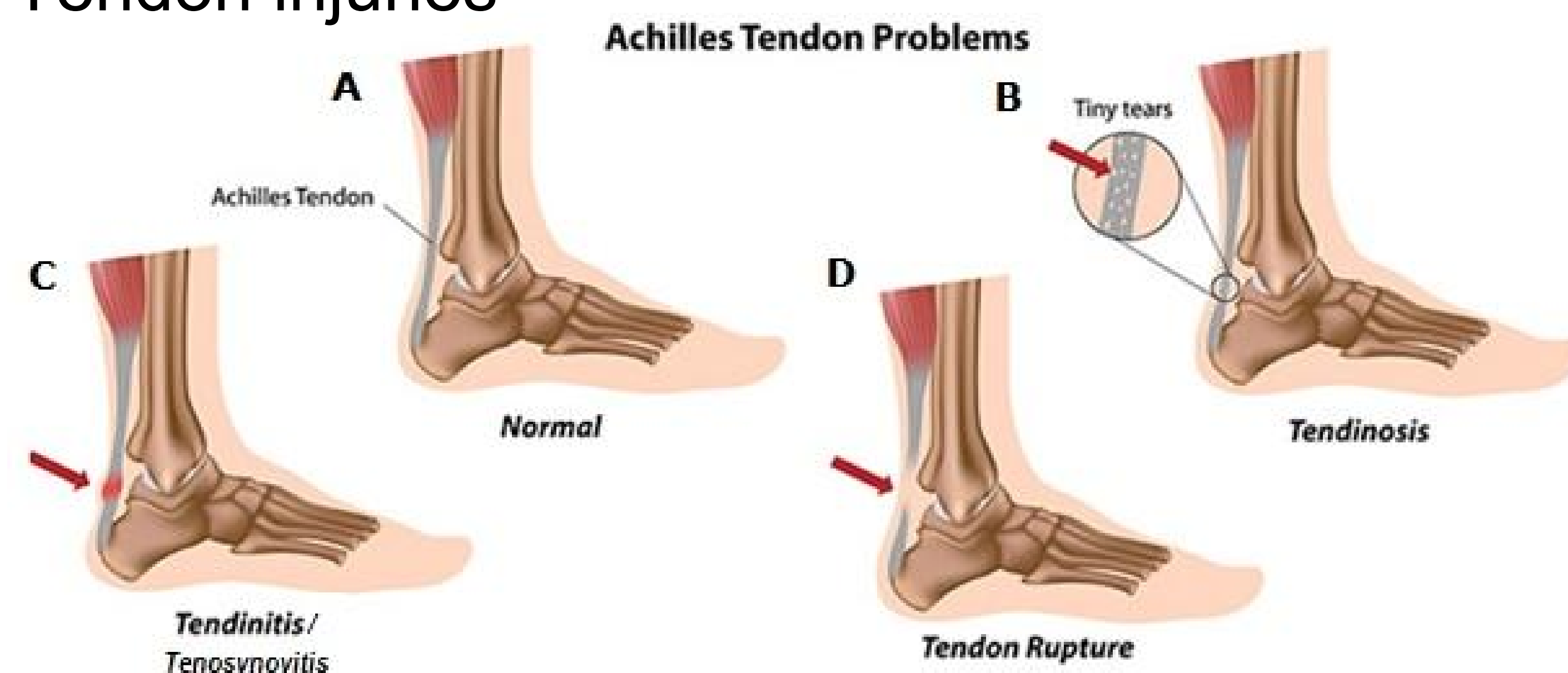
- Achilles tendinopathy affects active and aging populations
- Current braces correct underlying symptoms through immobilization

The Scotty Sock:

- is discrete and comfortable
- made from spandex and neoprene
- promotes rehabilitation
- allows for natural movement
- no known risks

The Injury

There are four main classifications of Achilles Tendon injuries



The four main types of Achilles Tendon Problems [1]

Injury leads to heel pain, tenderness & stiffness of Achilles, trouble walking, running, and jumping

Current Approaches

Night Splints:

- stretch the Achilles tendon while sleeping
- some allow for walking but immobilize the ankle



Strassburg Sock:

- strap that pulls on the toes
- not easily worn within a shoe
- can apply unnatural force
- sock length can lead to discomfort
- current "gold standard"



Current products on the market [5] [6]

The Design

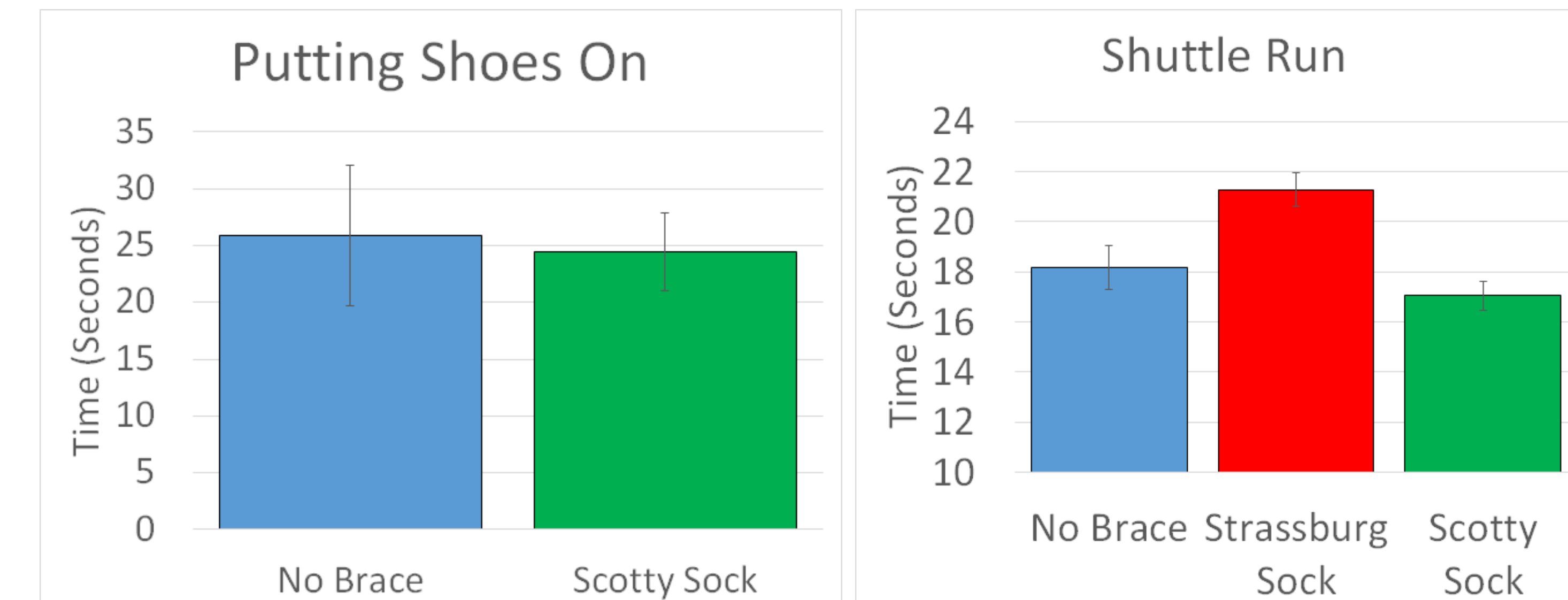


Various design components. Side view (above) and front views (below) of the Scotty Sock. Also pictured are the tension bands (bottom of page).

The Scotty Sock exhibits a sleek, sock like profile that slips over the foot. Tension bands wrap around the foot pulling the foot into an appropriate position: dorsiflexion for daily rehabilitation and wear, plantarflexion for active use. Tension bands are fashioned from Velcro and standard physical therapy Thera-bands. Bands vary in stiffness, which is indicated by band color.



Preliminary Results



The Market

- 25% competitive athletes and 50% competitive runners affected by Achilles injuries^[2]
- Elderly have increased risk of Achilles injury
- About 300,000 injuries annually in the USA^[7]
- 29% of surgeries result from mismanaged or unmanaged Achilles tendon injuries^[9]

Estimation of Product Cost

- Neoprene - \$15-50 per sock
- Spandex - \$10/yard
- Velcro - \$1/yard
- Therabands - \$2/yard
- Sewing Equipment - \$200 initial, \$10-15 per week

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References

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- [4]Jeanne. *Strassburg Sock.* Digital image. *Nighttime Immobilization of the Achilles Tendon.* Runningforthechupboard.com, 14 Jan. 2013. Web. 4 May 2014.
- [5]*Corflex Adjustable Foot Night Splint for Plantar Flexion Contractures.* Digital image. [6] Braceability, n.d. Web. 4 May 2014. <<http://www.braceability.com/corflex-adjustable-foot-splint-plantar-fasciitis-stretching>>
- [7]"The Achilles' Heel of Tendons." *ScienceDaily.* ScienceDaily, n.d. Web. 06 May 2014.
- [8] Canale, S. T., and James H. Beaty. "Rupture of Muscles and Tendons." *Inkling.* Elsevier, n.d. Web. 06 May 2014.
- [9] "3 Achilles Tendinosis, Non-insertional." *OrthopaedicsOne Articles.* N.p., n.d. Web. 6 May 2014.