

# Incrementally Length Adjustable Pylon for Lower Limb Pediatric Prosthetics

**Incrementally length-adjustable lower limb prosthetic pylon reducing costs and replacements as children grow.**

Lower limb amputations are some of the most common traumatic injuries in the United States with around 150,000 patients each year. Nearly 50,000 children in the U.S. require lower limb prosthetics. Researchers at Purdue University developed a length adjustable pylon for lower limb pediatric prosthetics to help children with transtibial prosthetics. Existing solutions require frequent replacements, making it difficult for families to keep up with the cost of replacement and reduces accessibility to proper fitting prosthetics. Many similar devices are time-consuming and complex to adjust, creating a delay in care in pediatric hospital settings and lack of stability or robustness. This invention offers significant improvements by addressing limitations in adjustability, cost, and usage. The stackable design accommodates precise height adjustments to help children adjust their prosthesis's length as they grow, eliminating the need and expenses for continual pylon replacements. Additionally, the discrete adjustment method prevents shrinkage over use time and reduces health complications by maintaining its length throughout use.

## **Technology Validation:**

Preliminary testing determined the technology to be manufactured in Aluminum 7075. The final iteration, iteration six, was strong enough to handle the 50 Nm torsional force needed to pass ISO 10328 standards. The size of the locking mechanism was increased to 8.2 mm wide, increasing the FEA safety factor for aluminum torsion from 0.51 to 0.69.

## **Advantages:**

- Cost-effective
- Precise adjustments
- Long-lasting

**Technology ID**  
2025-SHEE-70984

**Category**  
Medtech & Digital  
Health/Assistive Robotics &  
Accessibility Systems

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-Accessible

**Applications:**

-Lower limb loss

-Orthopedic prosthetics

-Pediatric prosthetics

**TRL:** 2

**Intellectual Property:**

Provisional-Patent, 2024-12-31, United States

**Keywords:** Biomedical Engineering, lower limb loss, Medical/Health, Pediatric, Prosthetics, pylon