

Development of a Custom 3D Printed Plantarflexion Stop for Foot Drop

(Technical Paper)

A Stakeholder Analysis of Patient Reported Outcomes Measures(PROM) in Healthcare

(STS Paper)

An Undergraduate Thesis Portfolio
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On my honor as a University student, I have neither given nor received
unauthorized aid on this assignment as defined by the Honor Guidelines for
Thesis-Related Assignments.

Table of Contents

1. Sociotechnical Synthesis

2. Technical Report: Development of a Custom 3D Printed Plantarflexion Stop for Foot Drop

3. STS Research Paper: A Stakeholder Analysis of Patient Reported Outcomes Measures(PROM) in Healthcare

4. Thesis Prospectus

Sociotechnical Synthesis

My first introduction to Patient-Reported Outcome Measures (PROMs) began with the Hermes Ankle-Foot Orthosis (AFO), a device developed by Icarus Medical to treat foot drop. Numerous clinical studies incorporate PROMs as a measure to assess treatment effectiveness; yet, I had never witnessed or experienced these tools in daily clinical practice. As a biomedical engineering undergraduate, this seemed counterintuitive and contradictory to the point of healthcare — putting patients' welfare first. When I learned about the theory of the Social Construction of Technology (SCOT), it occurred to me that the lack of PROM implementation must be rooted in the stakeholders of healthcare.

Thus, this paper focuses on examining the implementation of PROMs through a sociotechnical framework that prioritizes interdisciplinary collaboration and the SCOT framework. The analysis highlights the distinct values and needs each stakeholder group brings to the design and implementation of PROMs. Clinicians seek usability and clinical relevance; patients value accessibility and clarity, and policymakers aim for standardization and measurable outcomes. Designing PROM systems, therefore, demands interdisciplinary coordination to balance these technical, clinical, and social priorities, ensuring that the systems are not only functionally robust but also human-centered and user-friendly.

The study concludes that technological innovation alone cannot overcome the barriers to PROM adoption without equal investment in human-centered strategies. Effective implementation requires co-designing digital interfaces with patients, reengineering clinical workflows to support new survey data streams, and shaping policies that promote patient engagement and clinician usability. Through stakeholder analysis focused on upholding patient-centered design principles, PROMs can move beyond technical deployment to become truly integrated tools for advancing patient-centered care.