Moulding a New Prosthetic Service Delivery System with the Amparo Confidence Socket

ABSTRACT

Background
Lower limb amputation is a major surgical procedure that can completely change a person’s life. Thanks to lower limbs prosthesis, amputees often regain their independence, resuming their desired roles in family and social life. Unfortunately, many amputees who live in low and middle income countries do not have access to the prosthetic services that they need. Without an appropriate prosthesis, amputees often remain dependant on family and community and are unable to access basic rights such as food, shelter, education and work. One of the main factors responsible for the difficulty of providing appropriate lower limb prosthetics is the high cost associated with their fabrication. In turn, this is mainly linked to the need to rely on specialized health care workers called Certified Prosthetists Orthotists and expensive workshop equipment for most of the manufacturing process. Generally, making a lower limb prosthetic is a highly individualised process and requires on average 8 hours of work time from the healthcare professional with two of these hours spent with the patient on two separate visits.

Method used
Amparo Gmbh has developed a new thermoplastic pre-assembled socket that can be molded directly on the residual limb of the amputee, thus drastically reducing the time, tools and expertise needed to manufacture lower limb prosthesis. The pre-assembled socket is also fitted with the attachment point, allowing the technicians to easily connect the socket with the terminal part of the prosthesis. The thermoplastic moulding temperature is between 60-70°C but the silicone liner between the plastic and the limb ensure the complete safety and comfort of the patient. The low-temperature thermoplastic allows the socket to be remolded several times to accommodate changes in the residual limb which are common after amputation. Finally, the equipment needed to manufacture a lower limb prosthetic with the Amparo socket can easily be packed in a standard suitcase, making possible to adequately fit lower limb prosthesis within the context of a mobile clinic without access to a workshop.

Key results
The Amparo thermoplastic socket has been successfully fitted to approximately 50 patients around Europe who are currently using the product. The socket has received positive reviews from both amputees and healthcare professionals. Technicians particularly appreciated the ease of use and how quickly they could fit the socket and test the prosthesis with their patients. Amputees praised the comfort of the socket and were impressed with the fact that the socket eliminates the need for multiple visits and the waiting time when modifications have to be made. Amparo is currently working with the Global Disability Innovation Hub and local partners to trial the thermoplastic socket in Kenya to assess the feasibility and acceptability of the new technology with the local workforce.
Conclusion
The Amparo thermoplastic socket could disrupt the current prosthetic service delivery system by reducing the cost, time and skills required to fit lower limb prosthetics. Its impact is potentially greater in low and middle income countries where shortage of human and material resources make providing appropriate prosthesis a particularly complex issue.

Tweetable abstract
The @amparo_pros mouldable socket could revolutionise how lower limb #prosthesis are delivered to #amputees. @GDIHub is evaluating the impact of this new #technology in Kenya to ensure that we #LeaveNoOneBehind. #AT2030 #DisabilityInnovation