

## Case Study: Psychosocial Impact of Regaining Hand Function Through Use of Naked Prosthetics' Devices

Age:	39 y/o male
Cause:	Amputation secondary to gangrene
Vocation:	Concrete Finisher
Interventions:	PIPDriver™, MCPDriver™, ThumbDriver™

### Purpose

To understand the psychosocial impact of regaining hand function following multidigit finger amputation through the use of three Naked Prosthetics' body-powered digits.

### Background

Many studies note the powerful psychological impact of limb loss, often equating the event to the loss of one's perception of wholeness<sup>1</sup>, emasculation, and even death<sup>2</sup>. This sudden anatomic loss further represents role limitation and is frequently the catalyst for an involuntary lifestyle adjustment. Feelings of loss, self-stigma, and difficulty in coping with the impairment can be emotionally devastating and may lead to the development of depressive disorders.<sup>3</sup>

### Patient History

Matt, a 36-year-old male, presented with vascular occlusion in his right arm, ultimately leading to gangrene and the resultant proximal phalanx amputation of digits R1 and R2, middle phalanx amputation of R4, and PIP disarticulation of R3.

Following amputation, Matt was denied prosthetic intervention by his insurance company. Though he attempted to return to work, he was unable to grasp with his right hand, and was forced to work exclusively with his left. Due to the heavy manual labor requirements of concrete finishing, this quickly led to compensation injuries of his left shoulder and the ultimate loss of his job.



At home, Matt was unable to dress himself or cut his own food; he was also unable to change diapers or even pick up his 3-month-old son. With the inability to support himself and his family, and debilitated both physically and psychologically by his amputation, Matt fell into a deep depression and back to a previously-overcome and harmful addiction to drugs.

### Patient Objectives

Due to the intense psychological impact of his amputation, Matt's primary goal for prosthetic intervention was to regain economic and personal independence and be able to provide for his family again, noting specifically, "to be able to change diapers and open jars of baby food" for his new son.

### Prosthetic Intervention

Matt was the first user to wear each of the three partial-finger Naked Prosthetic devices – one PIPDriver™, one MCPDriver™, and one ThumbDriver™. Each digit was custom-designed to his unique residual for an intimate fit and robust ability to provide intuitive articulation.

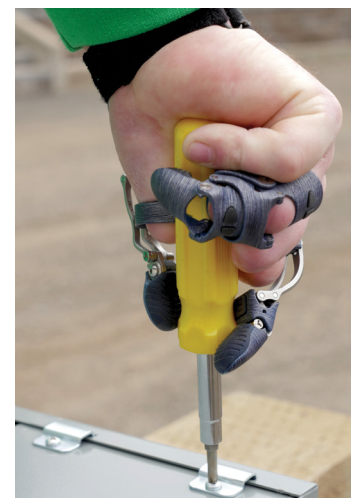


Each device is driven off the intact joint proximal to the amputation and actuates artificial distal joints and phalanges to mimic the natural motion of each digit. The ThumbDriver™ is uniquely driven off both the intact CMC and MCP joints, providing IP flexion and real-time

tracking of the complex, multi-axial motion of the thumb. Each device helps restore length, dexterity, and power to Matt's hand, while leaving his palm exposed for tactile sensation and overall breathability.

### Outcome

Matt has been wearing his Naked Prosthetics' devices for almost two years, as of early 2019. He reports wearing the devices from the moment he "opens his eyes in the morning" until he goes to bed at night. Since receiving his devices in late 2017, he has been able to return to work as a newly self-employed concrete finisher and has regained both his economic and social independence, reporting that he is now dressing himself independently and cutting his own food. Significantly, the positive psychological impact of his prosthetic intervention has allowed Matt to get clean from his drug addiction and he now is refocusing on his health and happiness. Matt is thrilled to report that since receiving his devices he is able to both change his son's diapers and open jars of baby food. He says of Naked Prosthetics, "You all aren't changing lives, you're saving them!"



<sup>1</sup> Kingdon D, Pearce T. In: Psychological assessment and management of amputee. In: Rehabilitation of Management of the Amputees. Banarjee S, editor. Baltimore, MD: Williams Wilkins; 1982. pp. 350-71.

<sup>2</sup> Goldberg RT. New trends in the rehabilitation of lower extremity amputees. Rehabil Lit. 1984 Jan-Feb; 45(1-2):2-11.

<sup>3</sup> Sahu A, Sagar R, Sarkar S, Sagar S. Psychological effects of amputation: A review of studies from India. Ind Psychiatry J. 2016;25(1):4-10.