Semi Active Hand Orthosis

R. Itzel Flores-Luna
Ruben Valenzuela-Montes
David De-Jesus-Cruz
Hanna Garcia-Guerra
Alvaro Ayala Ruiz
Mariano Garcia del Gállego

National Autonomous University of Mexico
UNAM
Outline

• Problem statement
• Device design
• Pilot test
• Results
• Conclusions
Introduction

• There have been many advances in peripheral nerve injury research, the treatment continues to be challenging. These injuries can be devastating to patients, who have to suffer for months or even years waiting for an uncertain recovery, that may never come.

• The patient should be educated to protect and maximize their hand capabilities, since the presence of an aftermath is high.
Peripheral nerve injury

• 68% is associated with penetrating wounds.
• 67% with amputees.
• 58% with fractures.
  – Median 18% of all injuries.
  – Ulnar nerve injury represent the 16%.
  – Radial nerve injury is in a 12%.
Hand of the patients
Device design

• The user’s hand was modeled

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<th>Finger</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D1</th>
<th>D2</th>
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<td>43.9</td>
<td>31.4</td>
<td>22.1</td>
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Full model
Semiactive orthosis
Pilot test
Test

- Grasp
- Move
- Release
Simulated Assembly
Results

• A six bar mechanism with a circular slide was designed assisted patients to grasp, translate and release an object.
• The user can hold several objects and different shapes.
• The designed glove is easy to wear; the user needs only a couple of minutes to wear it in her hand.
• The device does not block the user palm, and lets the user grasp different kind of shapes.
Conclusions

• Patients had never used her hand since injury occurs. The orthotic devises was useful for them.

• According to the rehab doctor, patients can use the device almost all the time, and not only for rehabilitation therapy.

• The device let the user to hold many thinks, but it is important not to exceed 1kg in weigh, because the mechanism will fail, that was a design parameter.
Team work

- Rosa Itzel Flores Luna
- Rubén Valenzuela Montes
- Patricia Acosta Carrazco
- Vanessa Sattele Gunther
- Irene Mujica Morales
- Hanna Garcia-Guerra
- Ruth Mora-González
- Francisco Cuenca-Jiménez
- Julio César-Cosbert

- Cristina Flores Ortíz
- Álvaro Ayala Ruiz
- Mariano García del Gállego
- Jonathan Ramírez Díaz de León
Students team work

- David De Jesús-Cruz
- Andrés Velázquez Laguna
- Casandra Mendez Martinez
- Jorge Pablo Gómez Sánchez
- Erick Manuel Cruz Sosa
- Iván Godínez Borja
- Alejandro Garcés Jurado
- María del Carmen Hernández Valencia
- Germán Rodríguez y Cos Betancourt
- Gabriela Rosalba Perez Bautista
- José Antonio Maldonado Cruz
- Jorge Antonio Díaz Alvarez
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R. Itzel Flores-Luna
iitzel.flores@comunidad.unam.mx

Ruben Valenzuela-Montes
ruben.valenzuela@comunidad.unam.mx