Return To Duty After Integrated Orthotic And Rehabilitation Initiative

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Return To Duty

- RTD following amputation: 16.5%
- RTD following Type III open tibia fracture: 20.5%
- Solution = aggressive rehab protocol + custom orthosis


Return To Run Clinical Pathway

- Poor outcomes after limb salvage or amputation
  - 2 and 7 years


- Return To Run Clinical Pathway (RTR)
  - Multidisciplinary
  - Aggressive rehab while in circular fixation

Intrepid Dynamic Exoskeletal Orthosis

• **IDEO**
  – Potentially energy-storing
  – Modular design

• **RTR while still in circular fixation**
  – Custom IDEO after frame removal

Hypothesis

Return to duty rates in servicemembers sustaining lower extremity limb-threatening injuries will be higher after participating in specialized rehabilitation with an IDEO compared to those that receive the IDEO alone.
Patients

- HELET and IDEO
  - October 2009 to May 2012
  - Considered amputation

- Exclusion
  - Non limb-threatening injury
  - No IDEO
  - Unknown RTD status
Patients

235 Enrolled in RTR

EXCLUDED
17 without IDEO
28 unknown RTD status
44 still in rehab

146 INCLUDED
Patients

- **146 patients included**
  - Multiple hospitals
  - Multiple surgeons
  - Same physical therapist
  - Same orthotist
Patients

- **Group 1**
  - RTR
  - IDEO

- **Group 2**
  - IDEO only
Results

• **Group 1** – 115 servicemembers
  – Higher average age and rank

• **Group 2** – 31 servicemembers
Group 1 – RTRCP + IDEO

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>RTD</th>
<th>non-RTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of servicemembers</td>
<td>115</td>
<td>59</td>
<td>31</td>
</tr>
<tr>
<td>Average age</td>
<td>31.45</td>
<td>32.18</td>
<td>30.67</td>
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<tr>
<td>Average enlisted rank</td>
<td>5.37</td>
<td>5.76</td>
<td>5.00</td>
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</table>

Group 1 Return To Duty rate: 51.3%
## Group 2 – IDEO only

<table>
<thead>
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<tbody>
<tr>
<td>Number of servicemembers</td>
<td>31</td>
<td>4</td>
<td>27</td>
</tr>
<tr>
<td>Average age</td>
<td>30.37</td>
<td>32.25</td>
<td>30.37</td>
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<tr>
<td>Average enlisted rank</td>
<td>5.00</td>
<td>6.00</td>
<td>4.89</td>
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Group 2 Return To Duty rate: **12.9%**

Group 1 Return To Duty rate: **51.3%**

\[ p = 0.0001 \]
# Mechanisms Of Injury – Group 1

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>All</th>
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<tbody>
<tr>
<td>Explosion</td>
<td>55</td>
<td>22</td>
<td>33</td>
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<tr>
<td>Gunshot wound</td>
<td>18</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Motor vehicle collision</td>
<td>14</td>
<td>7</td>
<td>7</td>
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<tr>
<td>Fall</td>
<td>11</td>
<td>10</td>
<td>1</td>
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<tr>
<td>Unknown</td>
<td>4</td>
<td>3</td>
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<tr>
<td>Miscellaneous</td>
<td>13</td>
<td>8</td>
<td>5</td>
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\[ p = 0.0478 \]
## Mechanisms Of Injury – Group 2

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<tbody>
<tr>
<td>Explosion</td>
<td>16</td>
<td>1</td>
<td>15</td>
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<tr>
<td>Gunshot wound</td>
<td>5</td>
<td>0</td>
<td>5</td>
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<tr>
<td>Motor vehicle collision</td>
<td>2</td>
<td>2</td>
<td>0</td>
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<tr>
<td>Fall</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
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<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Miscellaneous</td>
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<td>1</td>
<td>7</td>
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\[ p = 0.0019 \]
## Mechanisms of Injury - Combined

<table>
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<tbody>
<tr>
<td>Explosion</td>
<td>71</td>
<td>23</td>
<td>48</td>
<td>0.011</td>
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<tr>
<td>Gunshot wound</td>
<td>23</td>
<td>9</td>
<td>14</td>
<td>0.043</td>
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</table>
RTR Clinical Pathway

• Demanded by limb salvage patients
  – Obtain high functional levels

• Utilizing RTR clinical pathway = higher RTD rates
  – Age and rank not statistically significant
Therapy seems to be a factor
Mechanisms Of Injury

• Significant RTD factor

• Explosive mechanisms are worst
  – >93% did not RTD when declining RTRCP clinical pathway
  – Only 32.4% able to RTD with RTRCP
  – RTRCP may be SM’s best chance


Literature Comparison

• RTD after Type III open tibia or amputation = 16-21%
  – Similar to Group 2
  – Higher age and rank → more admin or leadership roles?

• LEAP study return to work rate
  – 51% at 24 months, 58% at 7 years


Limitations

• Retrospective study

• Inconsistent data for MOS change

• Inherent selection bias
Conclusion

Return to duty rates in servicemembers sustaining lower extremity limb-threatening injuries are higher after participating in specialized rehabilitation with an IDEO compared to those that receive the IDEO alone.
Thank You