For the model using 50 mg of losartan as the target dose, 33.3% of candesartan patients received 76% or more of the target dose vs 78.0% of losartan patients. For the model using 150 mg of losartan as the target dose, 33.3% of candesartan patients received 25% or more of the target dose vs 0.2% of losartan patients. The actual mean (SD) dose of candesartan was 18 (11) mg (56% [36%] of the target dose of 32 mg) and of losartan, 53 (26) mg (100% [52%] of the target dose of 50 mg and 35% [17%] of the target dose of 150 mg). Candesartan was associated with less mortality than losartan in all models, with adjustment for dose with a target of 50 mg or 150 mg, and in multivariate models with and without propensity scores. There was no interaction with dose, regardless of whether the target losartan dose was 50 mg or 150 mg. This was a retrospective analysis and not a trial, but we agree that patients were likely titrated toward 50 mg prior to the HEAAL study and 150 mg after, if it was tolerated. Our findings should be confirmed in other studies, but the suggestion that candesartan is associated with lower mortality than losartan in HF remains.

Lars H. Lund, MD, PhD
lars.lund@alumni.duke.edu
Department of Cardiology
Karolinska University Hospital
Stockholm, Sweden
Lina Benson, MSc
Department of Clinical Science and Education
Karolinska Institutet
Stockholm
Maria Eklind-Cervenka, MD
Department of Cardiology
South Hospital
Stockholm

Conflict of Interest Disclosures: All authors have completed and submitted the ICMAE Form for Disclosure of Potential Conflicts of Interest. Dr Lund reported receiving consulting fees and speakers’ fees from Astra-Zeneca and research grants from Karolinska Institutet, Stockholm County Council, Swedish Heart-Lung Foundation, Astra-Zeneca, and Orion Pharma. Dr Eklind-Cervenka reported receiving speakers’ fees from Astra-Zeneca. Ms Benson reported no disclosures.

the trial until the virtual limb moved through the complete range of motion. Motion completion percentage is the number of successfully completed motions divided by the total number of trials.

**Results.** All participants could control both the knee and ankle in the presence of real-time feedback during the 2-DOF test (FIGURE). All participants also demonstrated 4-DOF control, but with lower performance met-

![Figure](http://www.jama.com)

**Table.** Performance Metrics for Virtual Prosthesis Testing

<table>
<thead>
<tr>
<th></th>
<th>Amputee Participants</th>
<th>Control Participants</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Mean (SD)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Classification accuracy, %</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>97.0</td>
<td>92.0</td>
<td>89.0</td>
<td>86.0</td>
<td>91.0</td>
<td>4 (7)</td>
<td>94.0</td>
<td>92.0</td>
<td>86.0</td>
<td>84.0</td>
<td>89.0</td>
<td>4 (8)</td>
</tr>
<tr>
<td>Hip/knee</td>
<td>93.5</td>
<td>93.5</td>
<td>86.5</td>
<td>93.5</td>
<td>91.8</td>
<td>3 (5)</td>
<td>95.0</td>
<td>100.0</td>
<td>100.0</td>
<td>99.5</td>
<td>98.6</td>
<td>2 (4)</td>
</tr>
<tr>
<td>Ankle</td>
<td>98.5</td>
<td>85.5</td>
<td>85.5</td>
<td>70.5</td>
<td>85.0</td>
<td>11 (4)</td>
<td>96.0</td>
<td>80.0</td>
<td>70.5</td>
<td>50.5</td>
<td>74.3</td>
<td>19 (0)</td>
</tr>
<tr>
<td><strong>Motion completion time, s</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>1.84</td>
<td>3.48</td>
<td>2.58</td>
<td>2.22</td>
<td>2.53</td>
<td>0.70</td>
<td>1.59</td>
<td>1.61</td>
<td>2.73</td>
<td>1.85</td>
<td>1.94</td>
<td>0.64</td>
</tr>
<tr>
<td>Hip/knee</td>
<td>1.77</td>
<td>1.68</td>
<td>2.10</td>
<td>1.50</td>
<td>1.76</td>
<td>0.25</td>
<td>1.54</td>
<td>1.13</td>
<td>1.29</td>
<td>1.36</td>
<td>1.33</td>
<td>0.17</td>
</tr>
<tr>
<td>Ankle</td>
<td>1.91</td>
<td>5.28</td>
<td>3.06</td>
<td>3.07</td>
<td>3.33</td>
<td>1.41</td>
<td>1.63</td>
<td>2.09</td>
<td>4.17</td>
<td>2.65</td>
<td>2.63</td>
<td>1.10</td>
</tr>
<tr>
<td><strong>Motion completion percentage, %</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>97.2</td>
<td>100.0</td>
<td>100.0</td>
<td>91.7</td>
<td>97.2</td>
<td>3 (9)</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>80.6</td>
<td>95.1</td>
<td>9 (7)</td>
</tr>
<tr>
<td>Hip/knee</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>0 (0)</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Ankle</td>
<td>94.4</td>
<td>100.0</td>
<td>100.0</td>
<td>83.3</td>
<td>94.4</td>
<td>7 (9)</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>61.1</td>
<td>90.3</td>
<td>19 (4)</td>
</tr>
</tbody>
</table>

(continued)
rics, particularly for overall motion completion percentage for amputees (Table). Comment. Although neural control of a single DOF at the knee during non–weight-bearing situations has been shown previously, this is to our knowledge the first demonstration of neural control of a knee and ankle. Real-time ankle control was unexpected using only EMG signals measured from thigh muscles. These results suggest that targeted muscle reinnervation may not be required to achieve non–weight-bearing control of sagittal plane knee and ankle movements. This is a preliminary study with few participants, and testing was completed in a virtual environment. We are currently modifying powered knee and ankle prostheses to implement our neural control algorithms. Whether these findings will apply when tested on physical prostheses remains to be tested.

Levi J. Hargrove, PhD lhargrove@northwestern.edu
Ann M. Simon, PhD
Robert D. Lipschutz, CP
Suzanne B. Finucane, MS, PTA
Todd A. Kuiken, MD, PhD
Center for Bionic Medicine
Rehabilitation Institute of Chicago
Chicago, Illinois

Author Contributions: Dr Hargrove had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Hargrove, Simon, Lipschutz, Finucane, Kuiken.

Acquisition of data: Hargrove, Simon, Lipschutz, Finucane.

Analysis and interpretation of data: Hargrove, Simon.

Drafting of the manuscript: Hargrove, Simon.

Critical revision of the manuscript for important intellectual content: Lipschutz, Finucane, Kuiken.

Statistical analysis: Hargrove.

Obtained funding: Kuiken.

Conflict of Interest Disclosures: All authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none were reported.

Funding/Support: This work was supported by the Telemedicine and Advanced Technology Research Center (TATRC) under award W81XWH-09-2-0020. The TATRC is an office at the headquarters of the US Army Medical Research and Materiel Command; fosters research on health informatics, telemedicine and mobile health, medical training systems, and computational biology; and promotes and manages science and engineering in other key portfolios.

Role of the Sponsor: The sponsor had no role in the design and conduct of the study; in the collection, analysis, and interpretation of the data; or in the preparation, review, or approval of the manuscript.


CORRECTION

Table Error: In the Commentary entitled “Terminology for Preparations of Botulinum Neurotoxins: What a Difference a Name Makes,” published in the January 5, 2011, issue of JAMA (2011;305[1]:89-90), in the table, in column 4, under “AbobotulinumtoxinA,” the second to last line of the table should be “2°C–8°C” instead of “Room temperature.” This article has been corrected online.