DETERMINANTS OF DISCHARGE TO LONG-TERM CARE AFTER A LOWER LIMB AMPUTATION
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Determinants of Discharge to Long-Term Care After a Lower Limb Amputation

To the Editor: Rehabilitation after lower limb amputation (LLA) in long-term care (LTC) has many positive outcomes, with up to 57% of the population successfully discharged within 12 months.1 After LLA, it is important that rehabilitation begins without delay, particularly for older adults, who experience a rapid decline in physical conditioning.2 Knowing who will be discharged to a LTC setting enables planning to begin immediately, even before surgery. Research from the United States and Finland has shown that being older, being female, living alone, and having a transfemoral amputation increases the chance of discharge to LTC.3-5 The aim of this study was to investigate determinants of discharge to LTC after LLA in a Dutch setting.

Methods
Medical records of all people who underwent a first transfemoral (TTA), knee disarticulation (KD), or transfemoral (TFA) amputation due to vascular disease, infection, or diabetes mellitus between January 1, 2003, and December 31, 2004, were reviewed as part of a study on incidence of amputation. The primary dependent variable was discharge destination, recorded as LTC or other (home, inpatient rehabilitation, supported residential home, other hospital). Independent variables included were age, sex, level (TTA, unilateral proximal (KD or TFA), or multiple major amputations), living alone (includes single, widowed, divorced) or with a partner, living situation before amputation (care or home), and comorbidities (yes, no: diabetes mellitus, cardiac (myocardial infarction, cerebrovascular disease, or coronary artery bypass graft), lung disease, or renal disease). Variables with P < .1 in bivariate analyses were included in a logistic regression analysis (backward stepwise logistic regression).

Results
Two hundred ninety-nine people with a first amputation were initially included. Fifty-six (19%) died before discharge from hospital and were excluded from further analyses. The mean age of the population discharged (n = 243) was 74.0 ± 11.4, 146 (60%) were male, and 114 (47%) were initially included. Fifty-six (19%) died before discharge from hospital and were excluded from further analyses. The mean age of the population discharged (n = 243) was 74.0 ± 11.4, 146 (60%) were male, and 114 (47%) were male, and 114 (47%) were female. The goal is to discharge younger adults, who experience a rapid decline in physical conditioning, as quickly as possible.2 Knowing who will be discharged to a LTC setting enables planning to begin immediately, even before surgery. Research from the United States and Finland has shown that being older, being female, living alone, and having a transfemoral amputation increases the chance of discharge to LTC.3-5 The aim of this study was to investigate determinants of discharge to LTC after LLA in a Dutch setting.

Differences in discharge location were found. For example, Table 1 shows that sex, age, and living with a partner were significantly associated with discharge location. Older people were more likely to be discharged to LTC (P < .001), whereas younger people were more likely to be discharged to home (P = .015). The logistic regression analyses showed that older people were more likely to be discharged to LTC (P < .001; constant (standard error) −0.078 (0.157)).

Discussion
Older age was the sole factor associated with discharge to LTC. Rehabilitation after LLA can take place in a number of settings, but most previous research has focused on inpatient rehabilitation programs. This setting yields the best outcomes in terms of longer survival, greater chance of receiving a prosthetic, greater mobility, being more likely to return to independent living, greater medical stability, fewer subsequent amputations, and better quality of life,4,6-8 but inpatient rehabilitation programs operate with

References
Table 1. Determinants of Discharge to Long-Term Care

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Long-Term Care</th>
<th>Other, n = 108</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 130, 55%</td>
<td>n = 70, 45%</td>
<td></td>
</tr>
<tr>
<td>Sex, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>60 (25)</td>
<td>35 (15)</td>
<td>.03</td>
</tr>
<tr>
<td>Male</td>
<td>70 (29)</td>
<td>73 (31)</td>
<td></td>
</tr>
<tr>
<td>Age, mean ± standard deviation</td>
<td>76.5 ± 9.4</td>
<td>70.8 ± 12.6</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Before amputation lived, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With partner</td>
<td>48 (25)</td>
<td>58 (30)</td>
<td>.04</td>
</tr>
<tr>
<td>Alone</td>
<td>53 (27)</td>
<td>35 (18)</td>
<td></td>
</tr>
<tr>
<td>Level, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unilateral transfibial</td>
<td>57 (24)</td>
<td>54 (23)</td>
<td>.14</td>
</tr>
<tr>
<td>Unilateral transfemoral</td>
<td>44 (19)</td>
<td>24 (10)</td>
<td></td>
</tr>
<tr>
<td>or knee disarticulation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple major</td>
<td>27 (12)</td>
<td>28 (12)</td>
<td></td>
</tr>
<tr>
<td>Admitted from, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home</td>
<td>70 (31)</td>
<td>71 (31)</td>
<td>.24</td>
</tr>
<tr>
<td>Care</td>
<td>49 (22)</td>
<td>36 (16)</td>
<td></td>
</tr>
<tr>
<td>Comorbidities, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>73 (31)</td>
<td>52 (22)</td>
<td>.22</td>
</tr>
<tr>
<td>Cardiac</td>
<td>55 (23)</td>
<td>35 (15)</td>
<td>.12</td>
</tr>
<tr>
<td>Lung disease</td>
<td>34 (14)</td>
<td>23 (10)</td>
<td>.38</td>
</tr>
<tr>
<td>Kidney disease</td>
<td>27 (11)</td>
<td>17 (7)</td>
<td>.32</td>
</tr>
</tbody>
</table>

Characteristics were compared according to discharge location (LTC or other) using chi-square analysis for categorical variables and t-tests for age (normal distribution). Variables with P < .10 were included in a logistic regression model (stepwise backward logistic regression) with discharge location as the dependent variable. Statistical significance was set at P < .05, and analyses were performed in SPSS Statistics 20 (SPSS Inc., Chicago, IL).

Not all categories sum to their respective totals because of missing data.

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Author Contributions: Fortington L. V.: Designed the study, collected all data, analyzed results, and wrote the manuscript. Dijkstra P. U. and Geertzen J. H. B.: Designed the study, analyzed the results, and provided critical review of manuscript.

Sponsor’s Role: None.

REFERENCES