sessions over 12-18 weeks) have better survival than those who leave the program prematurely.³

Balady et al⁴ have outlined several strategies to increase completion of cardiac rehabilitation programs, including policy initiatives to support alternative delivery models that center on the patient. Such patient-centered approaches include selective use of home-based exercise programs coupled with smartphone applications to track heart rate, blood pressure, glucose, lipids, body weight, and daily activity levels, along with Internet or mobile phone and/or text-based coaching and motivational strategies. Social media adds another layer of communication to optimize patient adherence and may provide a platform for friendly competition among participants who keep track of their weekly step counts outside of the program. In contrast to intensive rehabilitation programs at centers supervised by physicians, nurses, exercise physiologists, and case managers can oversee many aspects of personalized rehabilitation programs, thus lowering costs. Although discussed, it is unlikely in our view that cardiac rehabilitation can be offered to patients with a qualifying diagnosis free of charge, as some have recommended for the provision of essential medications following AMI. Current reimbursement policies do not account for the potential downstream cost savings associated with reduced readmissions. Current reimbursement policies are also generally inadequate to cover expenses associated with the infrastructural requirements of a center-based program and require direct hospital or health system support. Whether new payment mechanisms in the era of Accountable Care Organizations will alter this dynamic remains to be seen.

Several early lines of evidence point to the success of home-based and digital and/or e-health strategies. For example, a Cochrane review of 12 randomized clinical trials comprising 1938 patients found no difference in short- or intermediate-term outcomes (including death, recurrent AMI, QOL, and cost) between center- and home-based cardiac rehabilitation.⁵ A meta-analysis of 9 trials that compared telehealth and center-based cardiac rehabilitation showed no significant differences between groups in body weight, blood pressure, smoking, lipid profiles, QOL, or mortality.⁶ Blasco et al⁷ reported improved risk factor, blood pressure, hemoglobin A₁c, and body mass index outcomes for patients randomized to lifestyle counseling plus mobile phone-enabled messaging compared with patients who received lifestyle counseling alone. Varnfield et al⁸ randomized patients after AMI to traditional cardiac rehabilitation or a smartphone-based home delivery program including exercise monitoring, motivational and educational material delivery, and weekly monitoring consultations. The smartphone-based program had significantly higher rates of participation and completion, and was associated with significant improvements in patient emotional status and QOL. Several ongoing trials are evaluating the effectiveness of web- or smartphone-based interactive tools and comprehensive cardiac telerehabilitation.⁹

Cardiac rehabilitation is a tremendously important component of the care of patients after AMI and/or coronary revascularization. The path forward to improve utilization involves novel approaches that center on the patient. We have seen only glimpses of what can be accomplished with digital and e-health strategies. Wide-scale change will require patients, clinicians, insurers, and health systems to adopt and catch up with what is already digitally achievable.

Donna M. Polk, MD, MPH
Patrick T. O’Gara, MD

Author Affiliations: Cardiovascular Division, Brigham and Women’s Hospital, Harvard Medical School, Boston, Massachusetts.

Corresponding Author: Patrick T. O’Gara, MD, CV Division, Brigham and Women’s Hospital, 75 Francis St, Boston, MA 02115 (pogara@partners.org).


Conflict of Interest Disclosures: None reported.


Comparison of the Expression and Granting of Requests for Euthanasia in Belgium in 2007 vs 2013

Belgium legalized euthanasia in 2002.¹ Between 2007 and 2013, the prevalence of euthanasia in Flanders, the Dutch-speaking part of Belgium, increased from 1.9% to 4.6% of all deaths.² Here we describe the shifts (overall and in specific groups of patients) in the expression and granting of euthanasia requests during this period and the reasons that physicians granted or denied these requests.

Methods | Approval was obtained from the Ethical Review Board of the University Hospital of the Vrije Universiteit

Letters


Page 1703

JAMA Internal Medicine October 2015 Volume 175, Number 10

page 1633

Invited Commentary page 1640

Related article page 1633

Downloaded From: by a Non-Human Traffic (NHT) User on 11/16/2018
Brussel, the Belgian Privacy Commission, and the Belgian National Disciplinary Board of Physicians. Patients were deceased, so no consent could be obtained. Physicians’ participation was regarded as implicit consent.

We conducted a nationwide postal questionnaire survey in 2013 that was identical to a survey conducted in 2007 of physicians who certified a random sample of 6871 deaths that occurred from January 1 through June 30, 2013, in Flanders; details of the study design have been published elsewhere.2 The survey was conducted from March 1 through December 31, 2013. Data analysis was conducted from March 1 through March 31, 2015. The questionnaire asked whether physicians had administered drugs with the intention of hastening death at the explicit request of the patient (euthanasia), whether the patient had formed a euthanasia request that was not granted, and the most important reasons for granting or not granting the request. The physicians could choose several reasons.

Results | Questionnaires were returned for 3751 of the 6871 deaths (55%). For 683 deaths, we determined that a response was impossible because of issues with access to the patient’s medical records or patient identification. Therefore, the response rate was 60.6% (3751 of 6188 eligible cases) compared with 58.4% (3623 of 6202 eligible cases) in 2007.

The prevalence of euthanasia increased in all patient groups and in all health care settings (Table 1). There were significant increases in the number of requests (from 3.4% to 5.9%; P < .001) and the proportion of requests granted (from 55.4% to 76.7%; P < .001). The most pronounced increases in the frequency of requests were in those who were 80 years or older (2.0% to 4.6%; P < .001), those with a college or university education (4.5% to 12.9%; P = .008), or those with a diagnosis of cardiovascular disease (0.8% to 3.0%; P < .001).

The largest increases in the rates of granting requests were among women (45.7% to 76.4%; P < .001) and those who were 80 years or older (38.1% to 75.4%; P < .001), had less

---

**Table 1. Euthanasia Requests and Granted Requests in Flanders, Belgium, 2007 vs 2013**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Deaths With Euthanasia Requests, %a</th>
<th>Deaths by Euthanasia, %</th>
<th>Euthanasia Requests Granted, %a</th>
<th>Relative Risk (95% CI)b</th>
<th>Relative Risk (95% CI)b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>3.4 5.9 &lt;.001</td>
<td>1.9 4.6</td>
<td>55.4 76.7 &lt;.001</td>
<td>1.4 (1.2-1.6)</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>3.6 5.9 .001</td>
<td>1.6 (1.2-2.2)</td>
<td>64.1 76.9 .006</td>
<td>1.2 (1.0-1.5)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>3.2 6.0 &lt;.001</td>
<td>1.9 (1.4-2.5)</td>
<td>45.7 76.4 &lt;.001</td>
<td>1.7 (1.3-2.2)</td>
<td></td>
</tr>
<tr>
<td>Age, y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-64</td>
<td>6.4 8.2 .23</td>
<td>1.3 (0.9-1.8)</td>
<td>61.9 68.1 .02</td>
<td>1.1 (0.8-1.4)</td>
<td></td>
</tr>
<tr>
<td>65-79</td>
<td>4.0 7.5 &lt;.001</td>
<td>1.9 (1.4-2.6)</td>
<td>63.6 83.6 &lt;.001</td>
<td>1.3 (1.0-1.7)</td>
<td></td>
</tr>
<tr>
<td>≥80</td>
<td>2.0 4.6 &lt;.001</td>
<td>2.2 (1.5-3.3)</td>
<td>38.1 75.4 &lt;.001</td>
<td>2.0 (1.3-3.1)</td>
<td></td>
</tr>
<tr>
<td>Educational attainment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None or primary</td>
<td>2.2 3.6 .05</td>
<td>1.7 (1.0-2.8)</td>
<td>35.1 65.9 &lt;.001</td>
<td>2.0 (1.1-3.6)</td>
<td></td>
</tr>
<tr>
<td>Lower secondary</td>
<td>4.5 5.4 .52</td>
<td>1.2 (0.8-1.8)</td>
<td>65.7 69.7 .14</td>
<td>1.1 (0.8-1.4)</td>
<td></td>
</tr>
<tr>
<td>Higher secondary</td>
<td>4.4 7.5 .04</td>
<td>1.7 (1.1-2.7)</td>
<td>59.0 74.2 .17</td>
<td>1.3 (0.9-1.8)</td>
<td></td>
</tr>
<tr>
<td>College or university</td>
<td>4.5 12.9 .008</td>
<td>2.9 (1.4-6.1)</td>
<td>68.9 86.3 .11</td>
<td>1.3 (0.8-1.9)</td>
<td></td>
</tr>
<tr>
<td>Cause of death</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiovascular disease, including CVA</td>
<td>0.8 3.0 &lt;.001</td>
<td>3.9 (1.4-10.9)</td>
<td>29.6 73.2 .04</td>
<td>2.5 (0.5-11.3)</td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td>8.6 13.4 .001</td>
<td>1.6 (1.3-1.9)</td>
<td>64.4 77.5 &lt;.001</td>
<td>1.2 (1.0-1.4)</td>
<td></td>
</tr>
<tr>
<td>Respiratory disease</td>
<td>1.6 2.4 .46</td>
<td>1.5 (0.5-4.4)</td>
<td>47.1 72.7 .28</td>
<td>1.5 (0.6-4.1)</td>
<td></td>
</tr>
<tr>
<td>Disease of the nervous system</td>
<td>4.2 6.3 .46</td>
<td>1.5 (0.6-3.9)</td>
<td>69.5 100 .05</td>
<td>1.4 (0.9-2.4)</td>
<td></td>
</tr>
<tr>
<td>Other disease</td>
<td>1.8 3.9 .009</td>
<td>2.1 (1.0-4.4)</td>
<td>18.8 70.7 &lt;.001</td>
<td>3.8 (0.9-16.0)</td>
<td></td>
</tr>
<tr>
<td>Place of death</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At home</td>
<td>5.8 10.7 &lt;.001</td>
<td>1.9 (1.4-2.4)</td>
<td>65.4 75.3 &lt;.001</td>
<td>1.2 (1.0-1.4)</td>
<td></td>
</tr>
<tr>
<td>In hospital</td>
<td>2.8 5.0 .001</td>
<td>1.8 (1.2-2.5)</td>
<td>59.1 82.4 .009</td>
<td>1.4 (1.1-1.8)</td>
<td></td>
</tr>
<tr>
<td>In nursing home</td>
<td>2.1 3.9 .02</td>
<td>1.8 (1.1-3.2)</td>
<td>22.9 68.2 &lt;.001</td>
<td>3.0 (1.3-6.9)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>3.4 1.1 .62</td>
<td>0.3 (0.0-3.1)</td>
<td>0.0 0.2</td>
<td>20.1 .40</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: CVA, cerebrovascular accident; NA, not applicable.

a Weighted percentages.
b Bivariate P values based on Fisher exact test.
c Relative risk was calculated using the complex-samples function in SPSS, version 22.0 (IBM).
d Relative risk could not be calculated for requests granted in another place of death.
In 2013, physicians reported that the most important reasons for granting a euthanasia request were the patient’s request (88.3%; 95% CI, 82.5%-92.4%), physical and/or mental suffering (87.1%; 95% CI, 81.7%-91.1%), and the lack of prospects for improvement of their condition (77.7%; 95% CI, 71.6%-82.8%) (Table 2). The most important reasons for not granting the request were that the patient died before the decision (58.5%; 95% CI, 44.8%-71.0), the request was revoked (17.9%; 95% CI, 9.9%-30.2%), and legal criteria were not met (19.6%; 95% CI, 10.8%-33.0).

The percentage of cases in which the physician reported denying the request for reasons external to the patient (restrictive institutional policy, personal objections, or fear of legal consequences) decreased from 23.4% in 2007 to 2.0% in 2013 (P = .003).

**Discussion** | Previous research³ has suggested that the euthanasia law in Belgium created a context of increased openness about end-of-life care and decision making in which patients could more freely discuss their wishes. Between 2007 and 2013, there were substantial increases in the proportion of euthanasia requests across various patient groups in Flanders, including groups whose requests were formerly less prevalent. These increases reflect continuing attitudinal and cultural shifts; values of autonomy and self-determination have become more prominent, and acceptance of euthanasia continues to increase in the population at large.⁴ In our opinion, physicians, as part of the overall society, share this overarching perspective, which may in part explain their greater willingness to grant euthanasia requests. Additional reasons are growing familiarity with the practice, reassurance of nonprosecution when legal criteria are met, and the diminished reluctance of some health care institutions to allow euthanasia. Moreover, euthanasia is perceived as part of the palliative care continuum, as formally expressed in a position statement from the Federation of Palliative Care Flanders.⁵ Although the prevalence of euthanasia remains highest in patients with cancer, those with a college or university education, and those who die before 80 years of age, there are increasing numbers of requests and granted requests in patients with diseases other than cancer, such as dementia, heart disease, and chronic obstructive pulmonary disease.
those who die after 80 years of age, and those who reside in nursing homes.

Sigrid Dierickx, MSc
Luc Deliens, PhD
Joachim Cohen, PhD
Kenneth Chambaere, PhD

Author Affiliations: End-of-Life Care Research Group, Vrije Universiteit Brussel and Ghent University, Belgium (Dierickx, Deliens, Cohen, Chambaere); Department of Medical Oncology, Ghent University Hospital, Ghent, Belgium (Deliens).

Corresponding Author: Sigrid Dierickx, MSc, End-of-Life Care Research Group, Vrije Universiteit Brussel and Ghent University, Laarbeeklaan 103, 1090 Brussels, Belgium (sigrid.dierickx@vub.ac.be).


Author Contributions: Ms Dierickx had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Drs Cohen and Chambaere contributed equally as last author. Study concept and design: All authors. Acquisition, analysis, or interpretation of data: All authors. Drafting of the manuscript: Dierickx, Cohen, Chambaere. Critical revision of the manuscript for important intellectual content: All authors. Statistical analysis: Dierickx, Chambaere. Obtained funding: Deliens, Cohen. Administrative, technical, or material support: Deliens. Study supervision: Deliens, Cohen, Chambaere.

Conflict of Interest Disclosures: None reported.

Funding/Support: This study was supported by Strategic Basic Research (Strategisch Basis Onderzoek) grant 100036 from the Agency for Innovation by Science and Technology (Agentschap voor Innovatie door Wetenschap en Technologie).

Role of the Funder/Sponsor: The funding source had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Additional Information: This study is part of the Flanders Study to Improve End-of-Life Care and Evaluation Tools (FILECET) project, a collaboration between the Vrije Universiteit Brussel, Ghent University, and the Katholieke Universiteit Leuven in Belgium, and VU University Medical Centre Amsterdam in the Netherlands. Kenneth Chambaere and Joachim Cohen are Postdoctoral Fellows of the Research Foundation Flanders. Additional Contributions: The Flemish Agency for Care and Health; Jef Deyaert, MSc, and Lenzo Robijn, MSc, End-of-Life Care Research Group, Vrije Universiteit Brussel and Ghent University; Brecht Haex, MSc, Agency for Care and Health; and Wim De Brock, LLM, an independent attorney, contributed to the data collection. The Belgian Medical Disciplinary Board recommended the study to the investigators. Jane Ruthven, PhD, End-of-Life Care Research Group, provided critical and language review of the manuscript. We are also deeply indebted to the thousands of Flemish physicians participating in the survey. Messrs Haex and De Brock and Ms Ruthven received financial compensation for their contributions.


Diversity in Graduate Medical Education in the United States by Race, Ethnicity, and Sex, 2012

Diversification of the physician workforce in the United States remains an ongoing goal,1,2 yet assessments of graduate medical education (GME) diversity, overall and across specialties are lacking. We assessed GME diversity by race, ethnicity, and sex in 2012.

Methods | Our study used publicly reported data to assess differences in representation by female and racially and ethnically underrepresented minority groups in medicine (URMs) for the total GME pool3 compared with the US population,4 US practicing physicians,5 medical school graduates,6 and 20 largest residency training specialties4 (excluding transitional year). Categories evaluated were race, Hispanic ethnicity, and sex, defined as consistent with the US Census.4 American Indians, Alaska Natives, Native Hawaiians, and Pacific Islanders (AI/AN/NH/PI) were grouped together. The University of Pennsylvania granted

Figure 1. Distribution in the 2010 US Population, 2012 Medical School Graduates, 2012 Practicing Physicians, and the 2012 Graduate Medical Education (GME) Trainee Pool

When comparing the total GME percentage representation for each demographic with the other groups, representation was significantly different for all groups (P < .001) for all comparisons, except for the Hispanic medical school graduates and trainees (P = .85). Not shown are the male sex, non-Hispanic ethnicity, “other” race, and white race categories. AI indicates American Indian; AN, Alaska Native, NH, Native Hawaiian; PI, Pacific Islander; URM, underrepresented minorities in medicine (non-URM category is not shown).