program. It is not clear how long these physicians had been using EHRs prior to the study period. Many meaningful users will be implementing EHRs for the first time because of this policy. Studies on applications for e-prescribing have shown that, even 2 years after implementation, physicians are still on a learning curve, improving their care. Thus, studies conducted too soon after implementation may not find an effect, even if one exists.

A third issue is the reliability of electronic reporting of quality measures. Previous studies have shown that automated electronic algorithms for extracting quality data from EHRs are not always accurate. Automated reporting can underestimate or overestimate rates of recommended care because it tends to capture only those elements that are structured fields (e.g., drop-down menus, check boxes, or other similar fields) and not those elements that are documented as free text. These challenges can be addressed, with both more nuanced specifications for automated reporting and more structured documentation of the care provided.

A fourth issue is the importance of understanding how physicians actually use EHRs to achieve MU and how that usage affects medical decision-making. The study by Samal et al examined, began in 2011 and involves attesting to the use of EHRs to capture clinical data electronically. For example, health care providers attest to measures such as recording vital signs in the EHR for at least 50% of patients. Stage 2 begins in 2014 and raises the thresholds for many measures (e.g., record vital signs for at least 80% of patients). Stage 2 also promotes electronic health information exchange and carries the option of reporting performance on quality measures electronically, among other goals. Stage 3 is expected to begin in 2017 and to reward providers for not only reporting the level of quality provided but for improving on that level as well. Thus, the full effects of MU on quality may not be measurable until stages 2 or 3.

In conclusion, the MU program is unprecedented, both in terms of the magnitude of the financial incentives and in the degree to which it is shaping day-to-day clinical care. It is not clear whether MU will improve quality, but it is also not clear that quality would be improved without adoption and use of EHRs. Electronic health records are powerful tools with which to manage populations of patients, and there are few ways to manage populations of patients with paper records. Quality is also only 1 relevant outcome; measuring the value of health care, which incorporates both quality and cost, is extremely important. The need to adopt and use EHRs is also leading to many secondary effects in health care delivery, including the merging of small practices that do not have enough resources to adopt EHRs on their own. Ongoing evaluation is critical to understanding the effects of the transformative MU program, not only on patients but also on the health care system.

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Use of Mechanical Ventilation by Patients With and Without Dementia, 2001 Through 2011

Increasing demand for US critical care resources, including beds, intensivists, and invasive mechanical ventilation (IMV), has placed substantial strain on the critical care system. Since 2000, elderly patients treated in the intensive care unit have received higher intensity care (and have experienced lower mortality rates) than historical cohorts. Yet certain populations of elderly patients exposed to intensive care experience substantial long-term adverse effects, including functional decline and excess mortality. Patients with dementia receiving IMV, for example, are at high risk for delirium, which confers a 3.2-fold increased risk of 6-month mortality.

The increasing use of aggressive therapies suggests that demand for IMV in elderly populations will increase in the future, both among patients that are likely to benefit and among those with terminal illness. We examined temporal trends in IMV use by older patients with and without dementia and projected future use.
Table. Trends in Use of Invasive Mechanical Ventilation (IMV) by Age, Sex, and Dementia Diagnosis, 2001 Through 2015

<table>
<thead>
<tr>
<th>Group, Sex/Age, y</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2015a</th>
<th>2020a</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMV Total</td>
<td>386.364</td>
<td>410.413</td>
<td>416.146</td>
<td>413.924</td>
<td>418.964</td>
<td>433.022</td>
<td>437.959</td>
<td>475.519</td>
<td>478.019</td>
<td>487.034</td>
<td>497.049</td>
<td>572.647</td>
<td>671.986</td>
</tr>
<tr>
<td>F/65-84</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
</tr>
<tr>
<td>F/≥85</td>
<td>(41.5)</td>
<td>(41.5)</td>
<td>(41.5)</td>
<td>(41.4)</td>
<td>(40.6)</td>
<td>(40.9)</td>
<td>(40.3)</td>
<td>(40.2)</td>
<td>(40.0)</td>
<td>(39.8)</td>
<td>(39.7)</td>
<td>(40.4)</td>
<td>(41.8)</td>
</tr>
<tr>
<td>M/≥85</td>
<td>50.126</td>
<td>51.210</td>
<td>51.653</td>
<td>50.970</td>
<td>49.279</td>
<td>52.610</td>
<td>54.534</td>
<td>54.931</td>
<td>54.769</td>
<td>54.812</td>
<td>51.014</td>
<td>46.319</td>
<td>38.164</td>
</tr>
<tr>
<td>IMV with dementia</td>
<td>Total</td>
<td>24.630</td>
<td>26.495</td>
<td>27.100</td>
<td>26.753</td>
<td>29.090</td>
<td>30.119</td>
<td>31.146</td>
<td>34.739</td>
<td>34.373</td>
<td>36.237</td>
<td>36.650</td>
<td>38.421</td>
</tr>
<tr>
<td>F/65-84</td>
<td>(6.4)</td>
<td>(6.5)</td>
<td>(6.5)</td>
<td>(6.7)</td>
<td>(7.1)</td>
<td>(7.0)</td>
<td>(7.0)</td>
<td>(7.3)</td>
<td>(7.3)</td>
<td>(7.2)</td>
<td>(7.4)</td>
<td>(7.4)</td>
<td>(6.7)</td>
</tr>
<tr>
<td>F/≥85</td>
<td>(1.5)</td>
<td>(1.6)</td>
<td>(1.7)</td>
<td>(1.6)</td>
<td>(1.6)</td>
<td>(1.6)</td>
<td>(1.8)</td>
<td>(1.9)</td>
<td>(2.1)</td>
<td>(2.6)</td>
<td>(2.7)</td>
<td>(2.7)</td>
<td>(2.7)</td>
</tr>
</tbody>
</table>

* Projection.

Methods | Data for this investigation came from the US Nationwide Inpatient Sample (NIS). Because the NIS is a public, de-identified data set, the Baystate Medical Center institutional review board has declared that research using the NIS does not meet regulatory criteria for human subjects research. Using data from 2001 through 2011, we included hospitalizations for patients 65 years or older who required IMV (International Classification of Diseases, Ninth Revision, Clinical Modification [ICD-9-CM] procedure codes 96.70, 96.71, 96.72) with and without a diagnosis code for dementia. Primary outcomes included changes in the number of hospitalizations involving IMV over time. Using population estimates obtained from the US Census, we calculated age-specific and sex-specific rates of IMV for 2001 through 2011. We used linear regression analysis to estimate a trend for each age-sex group and then used population estimates for 2015 and 2020 to estimate the number of patients receiving IMV per year nationally to 2020. Analyses accounted for sampling weights and were carried out using SAS, version 9.3.

Results | We identified 4,854,860 (SD, 81,249) hospitalizations in patients 65 years or older who received IMV; of these, 4,523,388 (SD, 953,454) had a code indicating a diagnosis of dementia. We observed a steady increase of approximately 30% in the number of hospitalizations of older patients who received IMV, from 386,364 (SD, 807,930) in 2001 to 497,496 (SD, 12,929) in 2011 at an annual growth rate of 2.9% per year (Table). The prevalence of dementia diagnoses increased significantly (P < .001), ex-
panding from 6.4% of patients receiving IMV in 2001 to 13.8% in 2011 at an annual growth rate of 11.4% per year (Figure). By 2020, we estimate that there will be 671,986 (SD, 19,922) hospitalizations of patients 65 years or older requiring IMV, of which 19.0% will have a diagnosis of dementia.

Discussion | The use of IMV by populations 65 years or older is expected to double between 2001 and 2020, and growth in hospitalizations for patients receiving IMV with an ICD-9-CM diagnosis of dementia is outpacing, by a factor of 4, those for patients receiving IMV without this diagnosis. These projected IMV numbers are consistent with published data.5,6

The use of ICD-9-CM codes to identify patients with dementia may be limited by poor sensitivity and lack of information about disease severity. Although better recognition of dementia among hospital providers may have contributed to some of the increase that we observed, the results of this study still have important implications for critical care resource planning. Given projected demand for IMV in the next 10 years, physicians and hospital administrators, already working in a strained system, face a potential crisis unless the critical care system is expanded or changes are made to temper current trends.

Efforts should therefore be made to promote earlier discussions about goals of care in elderly patients with end-stage terminal illnesses. This is most important for the subpopulations of patients (eg, frail elders older than 85 years, patients with end-stage dementia) who are least likely to benefit from IMV and at highest risk for worsening cognitive impairment and death.

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Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: Lagu, Tjia.

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: Pekow.

Obtained funding: Lagu.

Administrative, technical, or material support: Lagu, Lindenauer.

Study supervision: Lagu, Pekow.

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Left Anterior Fascicular Block and the Risk of Cardiovascular Outcomes

Left anterior fascicular block (LAFB) is considered a failure or delay of conduction in the left anterior fascicle.1 Despite the fact that little is known about the long-term prognosis associated with LAFB, it has generally been thought of as a benign electrocardiographic (ECG) finding.2 This view was recently challenged in an article by Mandyam et al,3 which reported an association between LAFB and an increased risk of atrial fibrillation (AF), heart failure (HF), and all-cause and cardiovascular death in individuals free of overt cardiovascular disease. However, the findings by Mandyam et al were limited by the fact that only 39 individuals with LAFB were eligible for inclusion. Using a large contemporary primary care population, we aimed to validate the findings of Mandyam et al by replicating their analyses in our population.

Methods | The study population consisted of all patients who underwent ECG recording at the Copenhagen General Practitioners’ Laboratory at the request of their general practitioners from 2001 to 2011.4 All ECGs were recorded and analyzed digitally. We defined LAFB as a QRS axis between −45° and −90° and QRS duration of less than 120 milliseconds in the absence of ventricular hypertrophy, inferior myocardial infarction, and ventricular preexcitation on the baseline ECG in accordance with the definition established by Mandyam et al.5 Data on drug use, comorbidity, and outcomes were collected from administrative Danish registries.6 We excluded individuals younger than 25 years and individuals with a history of AF, hypertension, myocardial infarction, valvular heart disease, congeni-