Discussion | The present study found socioeconomic differences in the treatment of severe obesity using bariatric surgery among Australian adults. These findings are supported by a previous study in the United States. It is likely that these treatment inequalities will further increase the already large number of socioeconomic inequalities in the prevalence and consequences of severe obesity. A limitation of the present analysis is that the severely obese population potentially eligible for surgery will include a small number of people with class II obesity and no associated morbidity who are currently ineligible.

This analysis relates to Australia, where bariatric surgery is primarily available through the private hospital system (89% of episodes in 2011-2012); eligible patients must have private health insurance and pay an out-of-pocket fee. In the public hospital setting (11% of 2011-2012 episodes), no fees are incurred by patients; however, long wait times are common. Affordability is likely to be a key contributor to the observed socioeconomic inequalities. Other factors, such as geographical access to services and health literacy, may also play a role.

Access to bariatric surgery for disadvantaged groups should be improved so that all members in society can benefit from this treatment. In Australia, this will most likely be achieved by increasing the funding allocated to bariatric surgery in public hospitals. Future research should examine the costs and benefits of bariatric surgery according to socioeconomic strata.

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Population-Based Estimates of the Prevalence of Uterine Sarcoma Among Patients With Leiomyomata Undergoing Surgical Treatment

Uterine leiomyomata are one of the most common gynecologic problems among women in the United States, with an annual diagnosis range from 2.0 to 12.8 per 1000 reproductive-age women. Intervention is a standard management for symptomatic patients, and various procedures include open and laparoscopic hysterectomy, myomectomy, uterine artery embolization, and magnetic resonance-guided focused ultrasonographic surgery.

The practice of electric morcellation has been used by gynecologic surgeons during laparoscopic and robotic-assisted hysterectomies and myomectomies as a less invasive alternative to open surgery. In April 2014, the US Food and Drug Administration (FDA) stated that they discouraged the use of this technique over concern that morcellation may spread unsuspected sarcoma tissue. Based on the literature, the FDA reported that 1 in 352 women have unsuspected uterine sarcoma while undergoing surgery for presumed benign leiomyoma. A recent study using an all-payer database found that 1 in 368 women who underwent morcellation had uterine cancer. However, the estimates in this study were limi-
ited by the selective participation of hospitals and by the lack of pathologic confirmation. The literature estimates used by the FDA are prone to referral and reporting bias. We sought to determine the population-based estimates of the prevalence of uterine sarcoma, as well as the risks of major complications following open surgery.

**Methods** | We used the Surveillance, Epidemiology, and End Results (SEER) data. We identified uterine sarcoma cases recorded between 2008 and 2011 from all California registries. Patients with multiple malignant tumors in the uterus were excluded. Population denominators were obtained by selecting patients undergoing a hysterectomy or a myomectomy from the California State Inpatient Database and the State Ambulatory Surgery Database between 2008 and 2011 (http://www.hcup-us.ahrq.gov/databases.jsp). These are de-identified, publicly available databases. Data analysis protocols were reviewed by the institutional review board of Cornell University and were granted exempt status.

A diagnosis of uterine leiomyomata and surgical procedures were identified using International Classification of Diseases, Ninth Revision (ICD-9) codes and Current Procedural Terminology, Fourth Edition codes. We calculated 2 estimates to provide a reasonable range of uterine sarcoma prevalences. Estimate 1 was obtained by using as population denominator the patients who received a diagnosis of leiomyomata and who underwent a hysterectomy or a myomectomy, which overestimates the prevalence of uterine sarcoma. Estimate 2 included in the denominator all patients who underwent a hysterectomy or a myomectomy (any diagnosis), leading to a possible underestimation of uterine sarcoma prevalence. Age- and race-stratified prevalence was calculated. Major complications following surgery were identified using ICD-9 codes.

**Results** | The sarcoma prevalence estimates were highly dependent on age, with the lowest prevalence for women younger than 50 years of age (0.08%-0.13%) and the highest prevalence for women older than 60 years of age (between 0.36% and 1.53%). Using conservative estimates for surgical treatment of leiomyomata (0.13%-1.53%), these rates translate into 1 in 769 women younger than 50 years of age having sarcomas and 1 in 65 women older than 60 year of age having sarcomas (Table 1). Race stratification showed a higher prevalence among white and black women than among women of other races. Stratified by 3 age groups, open surgery was associated with a 0.01% to 0.33% in-hospital mortality and a 0.32% to 0.92% risk of acute myocardial infarction (Table 2).

**Discussion** | Using stratified analyses, we found a more than 10-fold higher prevalence of uterine sarcoma among women older than 60 years of age compared with women younger than 50 years of age. The wide, patient-centered variability in the estimates of the prevalence of uterine sarcoma requires that stakeholders reflect on this and come up with more patient-centered recommendations.

In the panel discussion at the FDA, there was an agreement that morcellation should not be used for patients with known or suspected malignant tumors and that the risks of

### Table 1. Estimates of the Prevalence of Uterine Sarcoma in California Between 2008 and 2011

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sarcoma Cases</th>
<th>Patients With Leiomyomata Who Underwent Resection</th>
<th>All Patients Who Underwent Resection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cases, No.</td>
<td>Prevalence, %</td>
</tr>
<tr>
<td>Total</td>
<td>412</td>
<td>137 717</td>
<td>0.30</td>
</tr>
<tr>
<td>Age, y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;50</td>
<td>127</td>
<td>101 104</td>
<td>0.13</td>
</tr>
<tr>
<td>50-59</td>
<td>155</td>
<td>26 770</td>
<td>0.58</td>
</tr>
<tr>
<td>≥60</td>
<td>130</td>
<td>8492</td>
<td>1.53</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>296</td>
<td>58 477</td>
<td>0.51</td>
</tr>
<tr>
<td>Black</td>
<td>51</td>
<td>16 013</td>
<td>0.32</td>
</tr>
<tr>
<td>Other</td>
<td>61</td>
<td>47 565</td>
<td>0.13</td>
</tr>
</tbody>
</table>

### Table 2. In-Hospital Mortality and Complications Among Patients Who Underwent Open Surgery for Uterine Fibroids

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patients, No. (%)</th>
<th>&lt;50 y (n = 66 319)</th>
<th>50-59 y (n = 16 323)</th>
<th>≥60 y (n = 5215)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>8 (0.01)</td>
<td>3 (0.02)</td>
<td>17 (0.33)</td>
<td></td>
</tr>
<tr>
<td>Complications</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMI</td>
<td>210 (0.32)</td>
<td>43 (0.26)</td>
<td>48 (0.92)</td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>4 (0.01)</td>
<td>4 (0.02)</td>
<td>2 (0.04)</td>
<td></td>
</tr>
<tr>
<td>DVT</td>
<td>76 (0.11)</td>
<td>28 (0.17)</td>
<td>18 (0.35)</td>
<td></td>
</tr>
<tr>
<td>PE</td>
<td>69 (0.10)</td>
<td>31 (0.19)</td>
<td>20 (0.38)</td>
<td></td>
</tr>
<tr>
<td>Respiratory</td>
<td>761 (1.15)</td>
<td>292 (1.79)</td>
<td>187 (3.59)</td>
<td></td>
</tr>
<tr>
<td>Shock</td>
<td>34 (0.05)</td>
<td>11 (0.07)</td>
<td>7 (0.13)</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: AMI, acute myocardial infarction; DVT, deep venous thrombosis; PE, pulmonary embolism.
morcellation should be included in the labeling. However, there is no reliable method to diagnose uterine leiomyosarcoma pre-operatively. Our results should help update these recommendations. The risk of cancer dissemination should be weighted against the possible reduced risk of complications following open surgery. For example, morcellation for patients younger than 50 years of age is associated with 1 in 769 patients having sarcoma and with the risk of dissemination. But can morcellation prevent 1 death in 10,000 patients or 1 myocardial infarction in 1,000 patients undergoing surgery?

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Administrative, technical, or material support: Sedrakyan.

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COMMENT & RESPONSE

Growth Assessment of Hepatic Venous Malformations

To the Editor With regard to the recent publication in JAMA Surgery of the article entitled “Assessing Normal Growth of Hepatic Hemangiomas During Long-term Follow-up” by Hasan et al, some discussion is pertinent. Hepatic venous malformations are common in adults and are often incorrectly called hepatic hemangiomas. In 2007, Christison-Lagay et al2 from the Vascular Anomalies Clinic at Children’s Hospital Boston in Boston, Massachusetts, classified hepatic hemangiomas into 3 categories (focal, multifocal, and diffuse) based on clinical presentation, radiographic appearance, pathologic features, and natural history and following the guidelines of the International Society for the Study of Vascular Anomalies. Focal tumors are the hepatic form of the cutaneous, rapidly involuting congenital hemangioma, a hypervascular lesion that does not demonstrate GLUT1 immunoreactivity, a marker of infantile hemangioma. Multifocal hepatic hemangiomas are GLUT1-positive lesions and undergo the typical course of involution of cutaneous infantile hemangioma. Extensive hepatic involvement is seen in diffuse (GLUT1-positive) infantile hepatic hemangiomas with a more serious clinical course that are potentially complicated by severe hypothyroidism secondary to the overproduction of type III iodothyronine deiodinase within the tumors. The natural history of infantile hemangioma is characterized by rapid postnatal growth and slow regression during childhood, whereas the natural history of rapidly involuting congenital hemangioma is characterized by a fully formed tumor at birth that involutes in the first 12 to 18 months after birth. The International Society for the Study of Vascular Anomalies accepted the classification of vascular anomalies by Mulliken and Glowacki,2 who divided these lesions into 2 distinct categories: vascular tumors and vascular malformations.

Although hemangiomas are tumors of infancy that exhibit features of true neoplasms, such as cell turnover and endothelial cells proliferation, venous malformations comprise abnormally formed channels that are lined by quiescent endothelium representing a vasculogenesis disorder rather than a neoplastic process. Venous malformations are reported to increase in size secondary to local trauma, infection, and hormonal influence, particularly during adolescence and pregnancy.4,5 With regard to the management of hemangiomas and venous malformations, there are significant differences in treatment. Propranolol hydrochloride is currently the mainstay of hemangioma therapy but is ineffective in the treatment of venous malformations. Sclerotherapy and surgery are considered the best options for their control. In conclusion, after a careful review of this article,1 we conclude that there is still a wide variety of vascular anomalies that are incorrectly referred to as hemangiomas in the current medical literature, including the term hepatic hemangioma of the adult that represents a venous malformation.

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