Preoperative Evaluation of Senior Cardiac Patients

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Preoperative Evaluation of Senior Cardiac Patients

What is Age??

AS
ACHD
Desflurane
Guideline
What is Age ??

AS
Sclerotic
depending on age

Bicuspid
HD
Aging
others ?
Aortic stenosis: comparative evaluation of 16-detector row CT and echocardiography.  •Alkadhi H,

To prospectively evaluate whether planimetric measurements of aortic valve area (AVA) with 16-detector row computed tomography (CT) allow classification of aortic stenosis (AS).

MATERIALS AND METHODS: Twenty patients with AS and 20 patients without underwent transthoracic echocardiography (TTE), transesophageal echocardiography (TEE), and retrospectively electrocardiographically gated 16-detector row CT.

Maximum AVA in systole planimetrically measured with CT (AVA(CT)) was compared with AVA planimetrically measured with TEE (AVA(TEE)), AVA calculated with the continuity equation and TTE (AVA(TTE)), and transvalvular pressure gradients determined with the Bernoulli equation and TTE.

RESULTS: In patients without AS, mean AVA(CT) was 3.56 cm² +/- 0.66 and mean AVA(TEE) was 3.43 cm² +/- 0.69. In patients with AS, mean AVA(CT) was 0.89 cm² +/- 0.35; mean AVA(TEE), 0.86 cm² +/- 0.35; and mean AVA(TTE), 0.83 cm² +/- 0.33. Mean transvalvular pressure gradient was 51 mm Hg +/- 22. Significant correlations were present between AVA(CT) and AVA(TEE) (r = 0.99, P < .001), AVA(CT) and AVA(TTE) (r = 0.95, P < .001), and AVA(CT) and transvalvular pressure gradients (r = -0.74, P < .01). Mean differences were -0.08 cm² (limits of agreement: -0.32, 0.16) for AVA(CT) versus AVA(TEE) and 0.06 cm² (limits of agreement: -0.15, 0.26) for AVA(CT) versus AVA(TTE).

CONCLUSION: Planimetric measurements of AVA with retrospectively electrocardiographically gated 16-detector row CT allow classification of AS that is similar to that achieved with measurements by using echocardiographic methods.


RESULT:
There was high correlation between the prosthetic valve size in supravalvular implantation cases (n=7) and 3D-valvular longitudinal diameter (r=0.77, p<0.05), valsalva diameter (r=0.77, p<0.05) 3D-horizontal valve diameter (r=0.89, p<0.007), and 3D-ST junction diameter (r=0.80, p<0.03). On the other hand no correlation was found between a valve size and 3D variables in conventional valve implantation cases (n=7). A correlation of preoperative doppler peak systolic transvalvular pressure gradient transthoracic echocardiography (Echo AVA) with 3D AVA was described in Fig.1(r=0.82,p<0.012).

Discussion and Conclusions:
Geometric data obtained by the planimetry of the AVA using intraoperative 3D-TEE showed close correlation with the data derived from the pressure gradient estimated by Echo AVA (1, 2). Planimetry using 3D-TEE was able to reliably predict the required size for supravalvular aortic valve prosthesis. Multi-analysis of aortic valve measurement using 3D-TEE in supravalvular position may be a feasible and reliable method to provide critical information in choosing the proper size of prosthetic aortic valve for supravalvular implantation.

**Introduction**

TEE can provide an immediate gauge of surgical results and help to avoid suboptimal surgical outcomes.

However, the planimetry of aortic valve area (AVA) using a conventional Two-dimensional transesophageal echocardiography (2D-TEE) to estimate an appropriate size of the prosthetic valve can be technically challenging due to the complex three-dimensional geometry of pathological aortic valves.
# Patients profile

<table>
<thead>
<tr>
<th></th>
<th>supravalvular implantation</th>
<th>conventional valve implantation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Case</strong></td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td><strong>Male : Female</strong></td>
<td>1 : 6</td>
<td>2 : 5</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>$56 \pm 6.5$</td>
<td>$65 \pm 10$</td>
</tr>
<tr>
<td><strong>LV EF(%)</strong></td>
<td>$56.7 \pm 6.9$</td>
<td>$66.8 \pm 8.2$</td>
</tr>
</tbody>
</table>

(mean ± SD)
Process of 3D-TEE examination

**Import**

2D-TEE examination

3D-TEE reconstruction

3D-TEE A-valve

**Process:**
- TEE (HDI 5000™ ATL Inc)
- 4D surgical view software (TOMTEC Inc)

**Software:**
- 2D-TEE examination software
- 3D-TEE reconstruction software
- 3D-TEE A-valve software
Aortic valve diameter

① longitudinal diameter
② valsalva diameter
③ ST junction diameter
Aortic valve diameter

① longitudinal diameter
② valsalva diameter
③ ST junction diameter
Trace of AVA

1. longitudinal diameter
2. horizontal diameter
3. trace of AVA (3D AVA)
Results

Supravalvular implantation cases (n=7)

- 3D-valvular longitudinal diameter
  \( r=0.77, \ p<0.05 \)
- 3D-valsalva diameter
  \( r=0.77, \ p<0.05 \)
- 3D-horizontal valve diameter
  \( r=0.89, \ p<0.007 \)
- 3D-ST junction diameter
  \( r=0.80, \ p<0.03 \)

In conventional valve implantation cases (n=7), no correlation was found.
Conclusion

Multi-analysis of aortic valve measurement using 3D-TEE in supravalvular position may be a feasible and reliable method to provide critical information in choosing the proper size of prosthetic aortic valve for supravalvular implantation.
Check the Aorta

1. The extent of Aorta enlargement and dissection?
2. AR and/or AS valve size?
3. Other modality M valve T valve?
4. How and where to cannulate?
5. Is he or she necessary and useful for a cardiac surgery?

Second opinion with well TEE trained anesthesiologists
Another TEE aging
Atheroma of the Aorta
Asc Aorta thrombus
Asc Aorta thrombus
### Table 11-7 Significant Independent Risk Factors for In-Hospital Mortality for Isolated Mitral Valve Replacement and for Mitral Valve Replacement Plus CABG

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Isolated Mitral Valve Replacement (C = 0.823)</th>
<th>Mitral Valve Replacement Plus CABG (C = 0.718)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds Ratio</td>
<td>95% CI for Odds Ratio</td>
</tr>
<tr>
<td>Age ≥55yr</td>
<td>1.08</td>
<td>1.06, 1.11</td>
</tr>
<tr>
<td>Carotid disease</td>
<td>2.98</td>
<td>1.65, 5.39</td>
</tr>
<tr>
<td>Shock</td>
<td>9.17</td>
<td>4.17, 20.16</td>
</tr>
<tr>
<td>CHF in same admission</td>
<td>3.03</td>
<td>2.01, 4.56</td>
</tr>
<tr>
<td>Dialysis-dependent renal failure</td>
<td>5.07</td>
<td>1.98, 12.97</td>
</tr>
<tr>
<td>Endocarditis</td>
<td>4.28</td>
<td>2.49, 7.36</td>
</tr>
<tr>
<td>Ejection fraction &lt;30%</td>
<td>NS</td>
<td>...</td>
</tr>
<tr>
<td>Hemodynamic instability</td>
<td>NS</td>
<td>...</td>
</tr>
<tr>
<td>Extensively calcified ascending aorta</td>
<td>NS</td>
<td>...</td>
</tr>
</tbody>
</table>

# Valve surgery

## Table 11–8

Significant Independent Risk Factors for In-Hospital Mortality for Multiple Valvuloplasty or Valve Replacement and for Multiple Valvuloplasty or Valve Replacement Plus CABG

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Multiple Valvuloplasty or Valve Replacement (C = 0.764)</th>
<th>Multiple Valvuloplasty or Valve Replacement Plus CABG (C = 0.750)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds Ratio</td>
<td>95% CI for Odds Ratio</td>
</tr>
<tr>
<td>Age ≥55yr</td>
<td>1.05</td>
<td>1.03, 1.07</td>
</tr>
<tr>
<td>Aortoiliac disease</td>
<td>3.55</td>
<td>1.17, 10.72</td>
</tr>
<tr>
<td>CHF in same admission</td>
<td>2.18</td>
<td>1.44, 3.29</td>
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<tr>
<td>Malignant ventricular arrhythmia</td>
<td>2.62</td>
<td>1.19, 5.78</td>
</tr>
<tr>
<td>Extensively calcified ascending aorta</td>
<td>2.13</td>
<td>1.13, 4.00</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1.87</td>
<td>1.13, 3.10</td>
</tr>
<tr>
<td>Renal failure without dialysis</td>
<td>3.55</td>
<td>1.88, 6.72</td>
</tr>
<tr>
<td>Dialysis-dependent renal failure</td>
<td>9.37</td>
<td>4.10, 21.40</td>
</tr>
<tr>
<td>Female gender</td>
<td>NS</td>
<td>...</td>
</tr>
<tr>
<td>Hemodynamic instability</td>
<td>NS</td>
<td>...</td>
</tr>
<tr>
<td>Shock</td>
<td>NS</td>
<td>...</td>
</tr>
<tr>
<td>Hepatic failure</td>
<td>NS</td>
<td>...</td>
</tr>
<tr>
<td>Endocarditis</td>
<td>NS</td>
<td>...</td>
</tr>
</tbody>
</table>

In their editorial, Wijeysundera and Beattie suggest that outcomes research such as provided by Glance et al. can help us distinguish the characteristics of the high-quality anesthesiologists (e.g., “hemodynamic management strategies, transfusion triggers, nature of team interaction”) as part of our ongoing professional efforts to improve perioperative care. Dutton follows up in his editorial: “Making a Difference: The Anesthesia Quality Institute.” Anesthesiologists make a difference by rigorously examining outcomes. Yes, it is uncomfortable, although probably expected, that anesthesiologists at the lowest end of the performance spectrum have twice the risk of death or major morbidity as anesthesiologists at the highest end. However, anesthesiologists advance patient care by asking, and answering, tough questions. We know from the analysis of Glance et al. that it is possible to link providers to perioperative outcomes. The data from the AQI should permit identification of the optimal distribution of anesthesiologists, certified registered nurse anesthetists, and other anesthesia providers to achieve the best outcomes for patients. The AQI is another way anesthesiologists make a difference.
Perioperative medicine is rapidly evolving. To practitioners who worked in the early 1990s, current surgical technologies border on the realm of science fiction. Anesthesia practice is safer and more sophisticated. Transesophageal or transthoracic perioperative echocardiography is now routine, allowing us a much clearer window on our patients’ cardiac condition. Cardiac pathologies are generally better managed, often using evidenced-based guidelines. Newer clinical entities including stress-related cardiomyopathies,26 damage related to chemotherapy (engendering a new specialty of cardio-oncology),27 and HIV-induced atherosclerosis28,29 are increasingly appreciated as potential risk factors. Complex multivariate relations among cardiovascular risk factors, race, gender, and long-term outcome have evolved.30 However, as evidenced by the recent firestorm over the new American Heart Association cholesterol management guidelines (and their very liberal statin recommendations),31 precise delineation of cardiovascular risk factors continues to challenge our diagnostic and therapeutic acumen. Most recently, evidence points to substantially elevated long-term risk of the nonobstructive coronary artery disease, raising new management concerns for cardiologists,32 complicating our perioperative risk assessment.
The Revised Cardiac Risk Index (RCRI) was incorporated into the American College of Cardiology/American Heart Association (ACC/AHA) recommendations for the preoperative evaluation of the cardiac patient for noncardiac surgery. The purpose of this review was to analyze studies on cardiovascular clinical risk prediction that had used the previous “standard best” model, the RCRI, as a comparator. This review aims to determine whether modification of the current risk factors or adoption of other risk factors or other risk indices would improve upon the discrimination of cardiac risk prediction when compared with the RCRI. This is necessary because recent risk prediction models have shown better discrimination for major adverse cardiac events, and the pre-eminence of the RCRI is now in question. There is now a need for a new “best standard” cardiovascular risk prediction model to supersede the RCRI. This is desirable because it would: (1) allow for a global standard of cardiovascular risk assessment; (2) provide a standard comparator in all risk prediction research; (3) result in comparable data collection; and (4) allow for individual patient data meta-analyses.
This should lead to continued progress in cardiovascular clinical risk prediction. A review of the current evidence suggests that to improve the preoperative clinical risk stratification for adverse cardiac events, a new risk stratification model be built that maintains the clinical risk factors identified in the RCRI, with the following modifications: (1) additional glomerular filtration rate cut points (as opposed to a single creatinine cut point); (2) age; (3) a history of peripheral vascular disease; (4) functional capacity; and (5) a specific surgical procedural category.

One would expect a substantial improvement in the discrimination of the RCRI with this approach. Although most noncardiac surgeries will benefit from a standard “generic” cardiovascular risk prediction model, there are data to suggest that patients with human immunodeficiency virus disease who are undergoing vascular surgery may benefit from specific cardiovascular risk prediction models.
Physiologic Changes Relevant to Perioperative Care

The most important generalization from physiologic studies of aging is that the basal function of the various organ systems is relatively uncompromised by the aging process per se.

However, functional reserve and the ability to compensate for physiologic stress are reduced (Fig. 1).
Age vs FEV 1.0

The graph above illustrates the relationship between age and forced expiratory volume in one second (FEV1) for males, categorized by race. The data points indicate the following:

- **Caucasians** are represented by black circles.
- **African-Americans** are represented by black triangles.
- **Mexican-Americans** are represented by white squares.

The graph shows a general decrease in FEV1 with age, with variations across different racial groups. The values are plotted on a logarithmic scale, indicating the exponential changes in FEV1 as age increases.
Physiologic Changes Relevant to Perioperative Care

1 Cardiovascular Changes

From the standpoint of perioperative hemodynamic stability, age-related changes

*the autonomic control of heart rate*

*cardiac output*

*peripheral vascular resistance,*

*the baroreceptor response*

Age-related changes in the cardiovascular system involve alterations in both mechanics and control mechanisms; the same can be said of the pulmonary system.
2 Pulmonary System

Residual volume and functional residual capacity (FRC) both increase with age—5%–10% and 1%–3% per decade, respectively. The forced expiratory volume in 1 s is reduced approximately 6% to 8% per decade (Fig. 2).

Because of reduced elastic recoil, the closing volume increases such that it exceeds FRC by age 65.

In the supine position, closing capacity may reach FRC by 44 yr of age. Inspiratory and expiratory functional reserve decrease with aging, and the normal matching of ventilation and perfusion decreases. The respiratory response to hypoxia also diminishes with aging; there is a decrease in ciliary function, and cough is reduced. Finally, pharyngeal sensation and the motor function required for swallowing are diminished in the elderly.
3 Neurologic Changes with Aging

- There is a decrease in cortical gray matter through middle age, resulting in cerebral atrophy. **The ratio of gray to white matter decreases from 1.28 at 20 yr to a low of 1.13 at 50 yr, followed by an increase of this ratio to 1.55 at 100 yr of age.** The latter increase appears to reflect a disproportionate loss of white matter in the latest decades. For the cortical gray matter, a decrease in neuronal volume appears more important than neuronal loss.

- Aging is also associated with **neuronal loss in the autonomic nervous system.**

- Huge *interpatient variability in nervous system function and in the experience of pain,* alterations in subtypes of pain perception do not *translate* into a decreased need for analgesia in the elderly.
Aging is accompanied by a progressive decrease in renal blood flow (approximately 10% per decade after age 50) and loss of renal parenchyma. Furthermore, by the eighth decade, 10%–30% of remaining nephrons are sclerotic, reducing the functional capacity of the reduced nephronal number.

- Reductions in basal renal blood flow and a diminished response to vasodilatory stimuli render the elderly kidney particularly susceptible to the deleterious effects of low cardiac output, hypotension, hypovolemia, and hemorrhage.

Anesthetics, surgical stress, pain, sympathetic stimulation, and renal vasoconstrictive drugs may all compound subclinical renal insufficiency.
In a study of population pharmacokinetics for propofol, elimination clearance of the anesthetic was found to decrease linearly with age $>60$ yr, even correcting for changes in body weight. Furthermore, even though age-related changes in plasma proteins make generalizations about the pharmacokinetics complex, decreased protein binding and increased free fraction have the potential to increase the pharmacologic effect of drugs used perioperatively.

Pharmacokinetic and pharmacodynamic changes, together with drug interactions and polypharmacy, conspire to make the elderly prone to adverse drug effects. There is an almost linear increase in adverse drug reactions with age, and the likelihood of adverse drug reactions increases with the number of drugs administered. The addition of several drugs, even short-acting ones, in the perioperative period makes adverse reactions likely.
The third area contributing to the preoperative preparation of the elderly surgical patient is preoperative testing. Although work in this area has been performed for large populations of mixed age groups, it is not clear whether preoperative screening tests have a different yield in the elderly or whether specific testing is indicated for elderly patient populations undergoing certain types of surgical procedures. In the general population, the bulk of routine tests are not indicated. Unfortunately, age-specific data are uncommon.

For the elderly surgical population, chest radiograph, electrocardiogram, and urinalysis may have a larger yield in patients undergoing certain types of procedures, even if these tests are not directly predictive of postoperative complications.

The most important finding in the screening battery was unknown urinary tract infections (16 of 50 patients; 32%). A different retrospective analysis of 86 hip arthroplasty patients also determined that routine urine analysis was cost-effective in reducing hip infections in the elderly.
Preoperative Testing.

- **Nutritional assessment** can also be useful in subpopulations. The 44-center Veteran’s Administration (VA) study found that albumin concentration was a predictor of surgical outcomes.

- First, routine, undirected screening in a general population of elderly patients does not add significantly to information obtained in the clinical history.
- Second, in a general population, the positive predictive value of abnormal findings on routine screening is limited.
- Third, with only a few exceptions, screening tests have relatively little effect on the course of patient care.

Despite those observations, further research is required to better define the circumstances under which certain tests should be ordered.
Delirium and Cognitive Decline.

- Postoperative delirium and/or cognitive decline affect 5%–50% of elderly patients.
- The onset of delirium, a fluctuating level of consciousness, typically presents on the first to third postoperative day, may be sustained for more than a week, and is associated with other medical complications, prolonged hospitalization, and decreased functional status on discharge. Much of the research has centered on the effect of regional versus general anesthesia in orthopedic surgery. Cognitive dysfunction, a deterioration of psychomotor capacities such as memory, central processing time, and acquisition of new information, is also common after surgery and has been well described in both cardiac and noncardiac surgical patients. The effect of anesthetics on postoperative delirium has been studied, and a leading hypothesis has been that offending drugs aggravate an age-associated central cholinergic insufficiency. However, review of the literature indicates that delirium is a syndrome that can be triggered by many different perioperative events, so no single cause is identifiable and no single intervention is likely to be successful.
Summary and Conclusions

- Outcome is determined by the interaction of patient factors and the challenges introduced by surgery. Surgical impact varies widely by type, so development of comprehensive care strategies for specific types of surgery common in the elderly is indicated. This focus is more likely to generate positive results and practical guidelines than pooling elderly patients undergoing differing types of surgery. Developing comprehensive clinical pathways specific to the care of the elderly patient undergoing specific types of surgeries is indicated. It is likely that these approaches would be defined and initiated by multidisciplinary care teams so that preoperative, intraoperative, and postoperative management could be integrated. This approach could serve as a foundation for developing comprehensive evidence-based geriatric perioperative care and might have particular value in including prevention of delirium and pneumonia, in pain management, and in improving functional status on discharge. In these investigations, the anesthesiologist has a unique role, because we contribute significantly to preoperative assessment and intraoperative and postoperative management for every patient undergoing every type of surgery.
Recovery Variables in Patients Over 65 Years

Discharge from PACU
- Sevoflurane
- Desflurane

Orientation (Provide date of birth)
- Sevoflurane
- Desflurane

Eyes open on command
- Sevoflurane
- Desflurane

Minutes after anesthesia (0.9 to 1.3 hours of anesthesia)

* P≤0.05


Department of Anesthesiology
Tokyo Women’s Medical University
Effect of Anesthetic Duration on P-Deletion Results

2 h, 1.25 MAC
Desflurane

4 h, 1.25 MAC
Desflurane

8 h, 1.25 MAC
Desflurane

Percent of Control P-Deletion Test Results

Min After Anesthesia

Mean, SD
Recovery Variables in Patients Over 65 Years

Minutes after anesthesia (0.9 to 1.3 hours of anesthesia)

- Discharge from PACU: Sevoflurane, Desflurane
- Orientation (Provide date of birth): Sevoflurane, Desflurane
- Eyes open on command: Sevoflurane, Desflurane

* P≤0.05

Airway Reflexes Return More Rapidly After Desflurane Anesthesia Than After Sevoflurane Anesthesia

Anesth Analg 2005;100:697–700
Time to Swallow* Shorter for Desflurane Than for Sevoflurane

* Regarding Swallowing: Administering water to patients after anesthetic discontinuation is not a standard of care.

Adapted from McKay RE et al. Br J Anaesth. 2010;104:175-182
Aging Affects Recovery of Swallowing More after Sevoflurane than Desflurane Anesthesia
1. Type of disease

- Disease risk of CHF pts.
- 1. SV physiology
- 2. TOF
- 3. systemic RV
- 4. cyanosis
- 5. PH

2. Exercise tolerance

• **1. Cardiopulmonary exercising testing**
  - ✔ peak VO2
  - ✔ VE/VCO2 slope (N<33)
  - ≥38 in non-cyanosis
  - ➪ 10-fold↑ in mortality

• **2. 6-min walk test**
  - approx. 600m (40y-N)
  - decreasing by 50m per 10y

2. Exercise tolerance

- peak VO₂
- VE/VCO₂ slope

2. Exercise tolerance

- peak VO$_2$-short-term mortality/hospitalization relationship

3. Neurohormonal Activation

4. Renal function

- Mortality: 5-fold↑ in mod-sev GFR↓ group

5. Anemia

6. Severity of illness scores

Preoperative precordial echocardiography was performed for patients undergoing noncardiac surgery, and intraoperative transesophageal echocardiography was performed for those undergoing cardiac surgery. LVEF and diastolic filling properties including E/A ratio and deceleration time were measured. Overall, 251 patients were enrolled. The mean age was 72 ± 7 yr. Multiple linear regression analyses showed that patients with a history of myocardial infarction ($P = 0.021$), angina pectoris ($\beta = -6.09, 95\% CI: -9.66, -2.52; P = 0.01$), and valvular heart disease ($\beta = -5.05, 95\% CI: -9.56, -0.55; P = 0.028$) had lower LVEF than those without such conditions. Of the patients with normal LVEF, 61.5% had diastolic filling abnormalities. Diastolic filling indices including E/A ratio ($\beta = -1.11, 95\% CI -6.02, 3.78; P = 0.65$) and deceleration times ($\beta = -3.42, 95\% CI -31.28, 24.45; P = 0.81$) contributed no additional predictive value for LVEF. These results suggest that evaluation of LV systolic function alone is not discriminatory in comprehensively characterizing LV function in geriatric surgical patients.
Conclusion

1. Age is not a good indicator to predict perioperative complication and mortality in the geriatric patients.
2. Sufficient preoperative testings seem to be important to understand geriatric patients.
3. Well-trained anesthesiologist is mandatory to take care of the sick geriatric patients with AS; TAVI.
4. Real Age™ might be considered in clinical settings.
Anesthesiologists Make a Difference
Anesthesia & Analgesia:
March 2015 - p 497–498
Steven L. MD

• In their editorial, Wijeysundera and Beattie suggest that outcomes research such as provided by Glance et al. can help us distinguish the characteristics of the high-quality anesthesiologists (e.g., “hemodynamic management strategies, transfusion triggers, nature of team interaction”) as part of our ongoing professional efforts to improve perioperative care. Dutton follows up in his editorial: “Making a Difference: The Anesthesia Quality Institute.” Anesthesiologists make a difference by rigorously examining outcomes. Yes, it is uncomfortable, although probably expected, that anesthesiologists at the lowest end of the performance spectrum have twice the risk of death or major morbidity as anesthesiologists at the highest end. However, anesthesiologists advance patient care by asking, and answering, tough questions. We know from the analysis of Glance et al. that it is possible to link providers to perioperative outcomes. The data from the AQI should permit identification of the optimal distribution of anesthesiologists, certified registered nurse anesthetists, and other anesthesia providers to achieve the best outcomes for patients. The AQI is another way anesthesiologists make a difference.