Cardiac Evaluation Criteria:

**ACC/AHA Criteria:**

- **Patient specific risk factors:**
  - **Major**
    - Acute or Recent MI (<1 month)
    - Decompensated heart failure
    - Unstable or severe angina (Canadian class III or IV)
    - Symptomatic arrhythmias
    - Symptomatic valvular heart disease
  - **Intermediate**
    - Diabetes
    - Mild angina (Canadian class I or II)
    - Renal insufficiency
    - Previous MI by history or pathologic Qs
    - Compensated or prior HF
  - **Minor**
    - Advanced age
    - Abnormal EKG (LVH, LBBB, ST-T abnormalities)
    - Rhythm other than sinus
    - Low functional capacity

- **Surgery Specific Risk Factors:** Cardiac risk stratification for non cardiac surgery
  - **High risk surgery (reported cardiac risk ≥5%)**
    - Emergency surgery
    - Aortic, major vascular and peripheral vascular surgery
    - Extensive operations with large volume shifts and/or blood loss
  - **Intermediate risk surgery (reported cardiac risk ≥1%and <5%)**
    - Intraperitoneal and intrathoracic
    - Carotid endarterectomy
    - Head and neck surgery
    - Orthopedic surgery
    - Prostate surgery
  - **Low risk surgery (reported cardiac risk <1%)**
    - Endoscopic procedures
    - Superficial biopsies
    - Cataract surgery
    - Breast surgery.


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- **Evaluate Functional Status**
  - Functional capacity assessment helps very much in making a decision whether noninvasive evaluation is necessary.
Table 3. Estimated Energy Requirements for Various Activities

<table>
<thead>
<tr>
<th>Can you...</th>
<th>Can you...</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MET</td>
<td>4 METs</td>
</tr>
<tr>
<td>Take care of yourself?</td>
<td>Climb a flight of stairs or walk up a hill?</td>
</tr>
<tr>
<td>Eat, dress, or use the toilet?</td>
<td>Walk on level ground at 4 mph (6.4 kph)?</td>
</tr>
<tr>
<td>Walk indoors around the house?</td>
<td>Ran a short distance?</td>
</tr>
<tr>
<td>Walk a block or 2 on level ground at 2 to 3 mph (3.2 to 4.8 kph)?</td>
<td>Do heavy work around the house like scrubbing floors or lifting or moving heavy furniture?</td>
</tr>
<tr>
<td>4 METs</td>
<td>Participate in moderate recreational activities like golf, bowling, dancing, doubles tennis, or throwing a baseball or football?</td>
</tr>
<tr>
<td>Do light work around the house like dusting or washing dishes?</td>
<td>Greater than 10 METs</td>
</tr>
<tr>
<td></td>
<td>Participate in strenuous sports like swimming, singles tennis, football, basketball, or skiing?</td>
</tr>
</tbody>
</table>

kph indicates kilometers per hour; MET, metabolic equivalent; and mph, miles per hour.

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- A general question that could be asked to ascertain adequate functional capacity is: Can you go up a flight of stairs carrying a grocery bag without stopping or can you walk on a level ground without stopping for 2 blocks. That is equivalent to 4 METS.
- Functional capacity >10 METS is excellent, 7-10 METS is good, 4-7 METS is moderate and <4 METS is poor.
- People with poor functional status have worse short and long term outcome after undergoing noncardiac surgery.

Lee’s Revised Cardiac Risk Index: (RCRI):

Predictors of risk:

- High risk surgery (intraperitoneal, intrathoracic, suprainguinal vascular surgery)
- History of ischemic heart disease
  - History of MI
  - History of a positive stress test
  - Current complaint of chest pain considered cardiac
  - Use of nitrates
  - ECG with pathological Qs
- History of heart failure
- History of CVA
- Preoperative treatment with insulin for Diabetes
- Preoperative serum creatinine > 2.0

Risk assessment:

- patient has no predictors the risk of perioperative cardiovascular complications is 0.4%
- patient has 1 predictor the risk of perioperative cardiovascular complications is 0.9%
- patient has 2 predictors the risk of perioperative cardiovascular complications is 7%
- patient has 3 or more predictors the risk of perioperative cardiovascular complications is 11%

Pulmonary risk assessment:

Stop-Bang Questionnaire:

1.) Do you SNORE loudly (Loud enough to be heard through closed doors)?
   □ Yes (1)  □ No (0)
2.) Do you often feel TIRED, fatigued, sleep during daytime?
   □ Yes (1)  □ No (0)
3.) Has anyone OBSERVED you stop breathing during your sleep?
   □ Yes (1)  □ No (0)
4.) Do you have or are you being treated for high blood pressure?
   □ Yes (1)  □ No (0)
5.) BMI more than 35 kg/m2?
   □ Yes (1)  □ No (0)
6.) AGE more than 50 yrs old?
   □ Yes (1)  □ No (0)
7.) NECK circumference greater than 40cm?
   □ Yes (1)  □ No (0)
8.) Gender: Male
   □ Yes (1)  □ No (0)

Total score possible:  8
Total score achieved:   __

Patient Score:

≥ 5 = High risk for Obstructive Sleep Apnea

< 5 = Low risk for Obstructive Sleep Apnea

**Arozullah respiratory failure index:**

<table>
<thead>
<tr>
<th>Preoperative predictor</th>
<th>Point value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of surgery</strong></td>
<td></td>
</tr>
<tr>
<td>Abdominal aortic aneurysm</td>
<td>27</td>
</tr>
<tr>
<td>Thoracic</td>
<td>21</td>
</tr>
<tr>
<td>Neurosurgery, upper abdominal, peripheral vascular</td>
<td>14</td>
</tr>
<tr>
<td>Neck</td>
<td>11</td>
</tr>
<tr>
<td><strong>Emergency surgery</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11</td>
</tr>
<tr>
<td><strong>Albumin &lt;3.0 g/dL</strong></td>
<td>9</td>
</tr>
<tr>
<td><strong>BUN &gt;30 mg/dL</strong></td>
<td>8</td>
</tr>
<tr>
<td><strong>Partially or fully dependent functional status</strong></td>
<td>7</td>
</tr>
<tr>
<td><strong>History of chronic obstructive pulmonary disease</strong></td>
<td>6</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>&gt;70 years</td>
<td>6</td>
</tr>
<tr>
<td>60 to 69 years</td>
<td>4</td>
</tr>
</tbody>
</table>

**Performance of the Arozullah respiratory failure index**

<table>
<thead>
<tr>
<th>Class</th>
<th>Point total</th>
<th>Percent respiratory failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>≤10</td>
<td>0.5</td>
</tr>
<tr>
<td>2</td>
<td>11 to 19</td>
<td>1.8</td>
</tr>
<tr>
<td>3</td>
<td>20 to 27</td>
<td>4.2</td>
</tr>
<tr>
<td>4</td>
<td>28 to 40</td>
<td>10.1</td>
</tr>
<tr>
<td>5</td>
<td>&gt;40</td>
<td>26.6</td>
</tr>
</tbody>
</table>