2016 myRESEARCH™
Science Internship Program: Respiratory Care

Civic Education
Office of Government and Community Relations
Katherine McGreal
Science Internship Program: Respiratory Care
Evaluating Pulmonary Function Testing Results and Their Impact on Postoperative Outcomes

Katherine McGreal
Louis Campiri, BSRT, RRT, RCP
Carla Encarnacion, BSRT, RRT, NPS, CPFT, RCP
Abstract

• Pulmonary function tests (PFTs) are used to learn more about a patient’s lung function. Forced expiratory volume (FEV₁) is one of the values acquired during pulmonary function testing. Many patients have PFTs done before open heart surgery.
Background

• Pulmonary function testing is important in the diagnosis and treatment of many respiratory disorders
• $\text{FEV}_1$ (forced expiratory volume) values are acquired during pulmonary function testing.
Background (cont.)

• During open-heart surgery patients are placed on invasive mechanical ventilation.

• Postoperatively the goal of healthcare providers is to extubate the patient within 24 hours after surgery.
Problem/Purpose

• How do results from pulmonary function testing relate to post-operative outcomes?
Hypothesis

• FEV₁ values from pulmonary function testing will not predict or show any correlation to post operative vent hours/days, length of Intensive Care Unit (ICU) stay or overall length of stay.
Methodology

• The patient's hours and days on invasive mechanical ventilation, length of stay in the ICU, and length of overall hospital stay after surgery were recorded.

• The patients FEV\(_1\) values from pulmonary function testing, were also recorded.
Methodology (cont.)

- The FEV$_1$ values percent predicted were then sorted based on these values:
  - Normal > 80%
  - Mild > 70%
  - Moderate 60-69%
  - Moderately Severe 50-59%
  - Severe- 35-49%
  - Very Severe <35%
<table>
<thead>
<tr>
<th>Patient</th>
<th>FEV Value</th>
<th>Days on Vent</th>
<th>Hours on Vent</th>
<th>Days in ICU</th>
<th>Overall Length of Stay</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>111%</td>
<td>1</td>
<td>10</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>62%</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>89%</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>83%</td>
<td>1</td>
<td>14</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>71%</td>
<td>7</td>
<td>130</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>6</td>
<td>67%</td>
<td>2</td>
<td>22</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>72%</td>
<td>1</td>
<td>9</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>63%</td>
<td>2</td>
<td>23</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>89%</td>
<td>1</td>
<td>9</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>98%</td>
<td>2</td>
<td>18</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>11</td>
<td>119%</td>
<td>1</td>
<td>10</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>93%</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>13</td>
<td>73%</td>
<td>1</td>
<td>10</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>14</td>
<td>85%</td>
<td>1</td>
<td>8</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>15</td>
<td>85%</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>
Results

Average Vent Hours by FEV Classifications

Hours

FeV Classifications

Normal
Mild
Moderate
Moderately Severe
Severe

Average Vent Days by FEV Classifications

Days

FeV Classifications

Normal
Mild
Moderate
Moderately Severe
Severe
Results (cont.)

Average Days in ICU by FEV Classifications

- Normal: 3 days
- Mild: 2 days
- Moderate: 4 days
- Moderately Severe: 5 days
- Severe: 6 days

Average Post-Op Length of Stay by FEV Classifications

- Normal: 7 days
- Mild: 6 days
- Moderate: 8 days
- Moderately Severe: 9 days
- Severe: 14 days
Conclusions

- The FEV$_1$ values in the severe and moderately severe categories had longer vent hours/days, length of stay and ICU stay.
- The hypothesis was disproved due to the correlation found between worse FEV$_1$ values and worse post-op results.
Conclusions (cont.)

• Overall, not counting the vent days results, the patients in the normal range had the lowest averages and the patients in the severe categories had the highest averages.
Recommendations

Further study and research is recommended that would:

- Focus on controlling more variables to attain more accurate results
- Eliminate counting by days
- Statistical analysis to determine if the data is statistically significant
References


References (cont.)


Special Thanks

- Louis Campiri BSRT, RRT, RCP
- Carla Encarnacion, BSRT, RRT, NPS, CPFT, RCP
- Sean Jorris, BSRT, RRT, RCP
- The Respiratory Therapy Department at Fairview Hospital
- My Peer Group
- Imanni Williams (My Peer Mentor)
- Nedra Starling MA, MPH, ABD/DrPH
- The Office of Government and Community Relations’ Civic Education Department