AO05 EUCAPNIC VOLUNTARY HYPERVENTILATION: ASSESSMENT OF UPPER AIRWAYS

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Introduction
Elite athletes undergoing Eucapnic Voluntary Hyperventilation (EVH) often complain of upper airway discomfort after 6-min single-dose hyperventilation. The aim of the current study is to assess the upper airway of elite athletes and determine if the soreness after hyperventilation alters post spirometry performance.

Methods
Forty consecutive elite athletes presenting for provocation tests for assessment of EIB performed a 6-minute single-dose EVH challenge test. FEF/FIF50 for each spirometry manouvre was used to assess upper airway function at each specified time post EVH provocations. The relationship between FEF/FIF50 and greatest fall in FEV1 post challenge was examined using regression correlations.

Results
Subjects: Forty elite athletes, 16 male and 24 females. Age = 24±4 years. Baseline measurements: FEV1 %Pred = 117±8, FVC %Pred = 126±10 (mean±SD). Fifteen subjects (38%) demonstrated a positive response to EVH challenge. There was no significant linear correlation between FIF/FEF50 and greatest fall in FEV1 (r = -0.209, p = 0.227).

Conclusion
There was no significant correlation between FEF/FIF50 and greatest fall in FEV1 in athletes with a positive response to EVH, therefore reported soreness of the upper airways does not affect post spirometry during EVH challenge.

Keywords
Upper Airways, EIB, EVH
Introduction The 2001 ATS/ERS Statement on Respiratory Muscle Testing suggests the variation in reported reference values indicates differences in the way Maximal Inspiratory Pressures (P_{I\text{max}}) and Maximal Expiratory Pressures (P_{E\text{max}}) are performed. The aim of this study was to determine the variation in methods used in P_{I\text{max}} and P_{E\text{max}} tests in adults across Australian and New Zealand respiratory labs.

Method An online survey was emailed to all ANZSRS members requesting details of methods used for P_{I\text{max}} and P_{E\text{max}} tests. Results were compared to the recommendations in the 2001 ATS/ERS Statement.

Results Responses were obtained from 68 ANZSRS members across 48 different laboratories with 82% (n=56) from laboratories that perform P_{I\text{max}} and P_{E\text{max}} tests on adults. Only the respondents that tested adults were compared to ATS/ERS guidelines.

<table>
<thead>
<tr>
<th>ATS/ERS Recommendations</th>
<th>% Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use a Flanged mouthpiece</td>
<td>11 (n = 6)</td>
</tr>
<tr>
<td>Leak in the measuring system</td>
<td>57 (n=32)</td>
</tr>
<tr>
<td>Maintain Maximum pressure for at least 1.5 seconds</td>
<td>68 (n=38)</td>
</tr>
<tr>
<td>Used recommended Reference values (Wilson &amp; Co.)</td>
<td>21 (n=12)</td>
</tr>
<tr>
<td>Report maximum of the 3 best values that vary less than 20%</td>
<td>14 (n=8)</td>
</tr>
</tbody>
</table>

Conclusion Only one response fulfilled all the ATS/ERS guidelines for respiratory muscle pressure testing. This poor compliance may have a significant effect on the interpretation of results and the utility of this test.

Keywords Muscle pressure, P_{I\text{max}}, P_{E\text{max}}, ATS/ERS guidelines
THE QUALITY OF SPIROMETRY PERFORMED IN THE COMMUNITY IS ENHANCED WITH ONGOING FEEDBACK

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Introduction Diagnostic spirometry performed in the community should meet the same quality criteria as tests performed in a tertiary pulmonary function laboratory.

Aim To investigate the effect of providing comprehensive training and giving continuous feedback on the quality of spirometry testing in the community.

Methods Following successful attendance at a two-day ANZSRS endorsed spirometry course and up to two days supervision in the hospital laboratory, we continuously evaluated and provided feedback on the quality of all spirometry tests performed by 14 community practitioners. Four quality criteria were evaluated by a certified scientist for up to five cycles. The quality criteria included: acceptable tests; repeatability between trials; relevant technical comments; and identification of the spirometric pattern. We also scored 30 tests from each of five scientists from the Physiology Laboratory to compare quality achievement between the two groups. The expected standard was to meet 90% in each of the four categories.

Results

<table>
<thead>
<tr>
<th>Feedback</th>
<th>First</th>
<th>Second</th>
<th>Third</th>
<th>Fourth</th>
<th>Fifth</th>
<th>Scientists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>14</td>
<td>12</td>
<td>9</td>
<td>6</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>No. tests</td>
<td>214</td>
<td>230</td>
<td>247</td>
<td>165</td>
<td>99</td>
<td>150</td>
</tr>
<tr>
<td>Acceptability %</td>
<td>69</td>
<td>73</td>
<td>75</td>
<td>78</td>
<td>86</td>
<td>78</td>
</tr>
<tr>
<td>Repeatability %</td>
<td>83</td>
<td>83</td>
<td>86</td>
<td>88</td>
<td>92</td>
<td>90</td>
</tr>
<tr>
<td>Comments %</td>
<td>75</td>
<td>77</td>
<td>81</td>
<td>83</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>Pattern %</td>
<td>81</td>
<td>89</td>
<td>91</td>
<td>97</td>
<td>99</td>
<td>100</td>
</tr>
</tbody>
</table>

Acceptability criteria included tests from patients unable to perform the required manoeuvre; but this should have been accounted for with the technical comment.

Conclusions Quality spirometry testing in this group of community practitioners achieved a similar standard as respiratory scientists, but only after significant input by scientific staff. There was a steady improvement in quality after each feedback session. The ability to meet this standard of quality was dependent on rigorous training and motivated practitioners.

Keywords Spirometry, Quality, Community testing, Spirometry training
**AO08 CHILDREN WITH BRONCHOPULMONARY DYSPLASIA HAVE ALTERED VENTILATORY RESPONSE TO EXERCISE**

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5 Telethon Institute for Child Health Research, Perth WA.
6 Cardiac Transplant and Advanced Heart Failure Service, Royal Perth Hospital, Perth, WA.

**Introduction** Evidence regarding the ventilatory response to exercise in children born preterm is limited and contradictory. The aim of this study was to determine the ventilatory response to exercise in term and preterm born children with and without a diagnosis of bronchopulmonary dysplasia (BPD).

**Methods** Children born pre-term (<32 w gestation) with/without a diagnosis of BPD (>28 d supplemental O2, assessed at 36 w post menstrual age), and term born healthy age-matched controls were studied. Subjects performed an incremental treadmill exercise test to volitional exhaustion including tidal flow volume loops.

**Results** Eighty-two children (29 BPD, 25 non BPD and 28 controls) performed exercise tests. Pre-term children with and without BPD (independently) had a significantly lower exercise capacity (peak VO2ml/kg/min) (mean ±SD) (44.4±7.4, 42.2±7.8, respectively) than the term born controls (50.3±5.9) (p<0.001). Children with BPD had a lower O2 pulse (p<0.01), tidal volume (p<0.05), V’E (p<0.05) and a higher respiratory rate (p<0.01) compared to the nonBPD and term controls. More children with BPD demonstrated dynamic flow limitation (52 %) when compared to children without BPD (8 %) and healthy controls (4 %).

**Conclusion** Children born preterm with and without BPD have a reduced exercise capacity compared to age-matched term born healthy controls. Children with BPD have a higher incidence of dynamic flow limitation and have an altered ventilatory response to exercise. This dynamic flow limitation may contribute to the altered ventilatory response.

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**Keywords** Bronchopulmonary dysplasia, Cardio-pulmonary exercise testing, V’O2