‘An investigation of Peak Cough Flow (PCF) rates post lung resection’

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Postoperative patients have an impaired airway clearance mechanism and the amount of mucus they produce in the post operative period is often increased (Smith and Ellis 2000).

Peak cough flow (PCF) rates $<160 \text{L/min}$ are considered inadequate to facilitate airway clearance (Bach 1996).
At **extreme airflow**, mucous may be peeled from the surface of the airways and blown away as in the case of a cough.

How big does PEF need to be to move secretions?
Adults: Peak Flow generated from cough

- Peak Cough Flow in Adults:
  - 487 - 720 L/min
  - 160 L/min - Adequate

- Peak Huff flow in adults: 466 L/min
Criteria for Extubation and Tracheostomy Tube Removal for Patients With Ventilatory Failure*

A Different Approach to Weaning

John R. Bach, MD, FCCP; and Lou R. Saporito, RRT, BS

“...We conclude that the ability to generate PCEF of at least 160L/min is necessary for the successful extubation or tracheostomy tube decannulation of patients with neuromuscular disease irrespective of ability to breathe...”

(CHEST 1996; 110:1566-71)
Objective

- To investigate whether reduced PCF (<160L/min) following lung resection surgery was predictive of:
  - Hospital length of stay (LOS)
  - High dependency unit (HDU) bed days
  - Days requiring non-invasive ventilation (NIV)
Methods

- PCF measurements were obtained preoperatively and day 1 – 3 postoperatively in 17 subjects following lung resection surgery.

- Descriptive statistic and ANOVA analysis was performed using SPSS.
Results

- 17 subjects met the inclusion criteria and consented for participation
- 14 subjects were analysed
## Baseline Data

<table>
<thead>
<tr>
<th>Male/Female</th>
<th>4/10</th>
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<tbody>
<tr>
<td>Age (years)</td>
<td>65.6 +/- 7.5</td>
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<tr>
<td>Pre-op FEV1/FVC ratio</td>
<td>70.4 +/- 9.1</td>
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<tr>
<td>HDU LOS (days)</td>
<td>2.1 +/- 1.2</td>
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<tr>
<td>Hospital LOS (days)</td>
<td>11.6 +/- 5.2</td>
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Reduction in PCF Day 1 Post Op

![Bar chart showing reduction in PCF from pre-op to Day 1 Post Op. The chart indicates a significant decrease marked by an asterisk (*) indicating statistical significance.]
Results

PCF variance following Lung resective Surgery

Pre-op CF | Day 1 CF | Day 2 CF | Day 3 CF

Time point

PCF (L/min)
## Patients with cough <160L/min

<table>
<thead>
<tr>
<th></th>
<th>% patients cough &lt; 160L/min</th>
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<tbody>
<tr>
<td>Pre-operatively</td>
<td>0%</td>
</tr>
<tr>
<td>Day 1 post-op</td>
<td>71%  n=10</td>
</tr>
<tr>
<td>Day 2 post-op</td>
<td>57%  n=8</td>
</tr>
<tr>
<td>Day 3 post-op</td>
<td>64%  n=9</td>
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Discussion

- Using <160L/min as a measure of ineffective cough, no difference was ascertained in requirement for NIV, HDU or hospital LOS at any time point.

- There was no correlation between PCF and reported pain scores
Limitations

- Small scale service development project
- Limited numbers
- A number of parameters were beyond the scope of the study (e.g. sputum production, PPCs not documented)
Conclusion

- PCF is a simple objective tool to assess cough efficiency.

- Its use in this patient group is novel, however the figure of <160L/min unit is not a useful tool for prediction of NIV requirement, HDU or hospital LOS.
References

Thank you

Mr Ryan (Consultant)
Advanced Nurse Practitioners