**Effects of Preoperative Intervention on Postoperative Pulmonary Complications in Patients Receiving CABG**

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**PICO Question**
What are the effects of preoperative physical therapy in patients awaiting coronary artery bypass graft surgery in regards to postoperative pulmonary complications?

**Physical Therapy Care for Patients with CABG**
- Postoperative cardiac rehabilitation programs decrease mortality of individuals with coronary heart disease.
- Preoperative (Pre-Op) rehabilitation found that patients reported:
  - Increased quality of life
  - Reduced anxiety
  - Decreased hospital length of stay

**Pulmonary Complications Associated with CABG**
- Pulmonary dysfunction and complications are a major cause of morbidity and mortality in patients post-CABG.
- Respiratory stress from surgical interventions include:
  - Decreased respiratory muscle strength
  - Altered ventilation patterns
  - Altered gas exchange
  - Changes in lung volume
  - Diaphragmatic dysfunction

**Level of Evidence**

<table>
<thead>
<tr>
<th>Study</th>
<th>Study Design</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hulzebos et al</td>
<td>Systematic Review 1a</td>
<td>Fair</td>
<td>Small systematic review, bias accounted for</td>
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<tr>
<td>Snowden et al</td>
<td>Systematic Review with Meta-Analysis 1a</td>
<td>Fair</td>
<td>Reviewed small RCT’s or Quasi RCT’s which may be too small to measure less frequent PO complications, lack of blinding throughout</td>
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<tr>
<td>Herdy et al</td>
<td>Randomized Control Trial 1b</td>
<td>Fair</td>
<td>No separation of CABG alone or CABG and valve surgery</td>
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</tbody>
</table>

**Summary of Research**
- 3 studies:
  - 1 meta-analysis of quasi-randomized trials (1a), 1 systematic review (1a) and 1 randomized control trials (1b).
  - Pre-op interventions included:
    - PT involving education
    - aerobic exercise training
    - inspiratory muscle training

**Preoperative Recommendations**
- Inspiratory muscle training
- Exercise training
- Education

**Clinical Bottom Line:**
- Pre-op PT:
  - Significantly reduces risks of postoperative complications in patients receiving CABG.
  - Reduced complications included:
    - atelectasis, pneumonia, pleural effusion, time to extubation, and hospital LOS.

**Future Research**
- What type of pre-op intervention is best?
- What length of intervention is sufficient to make a difference?
- Larger populations are needed in order to generalize results & observe more infrequent pulmonary complication

**References**