

# MANAGEMENT OF NON INTUBATED PATIENTS FOLLOWING ABDOMINAL SURGERY

## RECOMMENDATION

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### *Recommendation 1*

- Following upper abdominal surgery patients should be positioned upright. The patient should be assisted in effectively clearing any secretions through directed cough. Further management might include either targeted mobilization or breathing exercises. Mobilization might be the first choice (because of added benefits to minimize effect of bed rest) of intervention; however if targeted mobilization is not possible any of the breathing techniques (CPAP; IPPB; DBE; PEP; blow bottle) could be incorporated based on patient preference and performance.

**Post your  
comments**

**Weak recommendation:** *The cost benefit of post operative pulmonary physiotherapy is not clear largely due to the inconsistent and undefined clinical outcomes that have been measured.*

**Post your  
comments**

*based on **moderate quality evidence** : One updated systematic review of secondary research and a single primary research report (Conde et al 2006) concluded that there is sufficient evidence to recommend the routine application of post operative intervention for all patients following abdominal surgery. One systematic review of primary research (Pasquina et al 2006) was hesitant to make recommendations for clinical practice and recommended further high quality research. Due to poor primary quality primary studies; variable outcome measure; and imprecision of data there is not consistent evidence of benefit and thus the quality of the evidence is downgraded.*

**Post your  
comments**

**Review question:** *Is pulmonary physiotherapy effective in the prevention of pulmonary complications following abdominal surgery in non intubated patients?*

Following a systematic review of the literature; critical appraisal of identified studies; the following conclusions were reached:

## SEARCH RESULTS

Seven experimental studies and four systematic reviews were identified [all the experimental studies were included into the reviews and trials will thus not be considered].

- Three reviews evaluated the effect of any CPT intervention in the prevention of post operative pulmonary complications (Pasquina et al 2006; Lawrence et al 2006; Conde et al 2006) while one review focused on the effect of the routine use of IS in prevention of post operative complications (Overend et al 2001). *Refer to table 1 for summary*
- Overend et al (2001) specifically investigated the effect of IS on post operative complications. Eleven studies were included in the review. Three studies on physiological effect and eight studies on pulmonary complications. Two case studies; one cross over study and eight RCT's were included. However, the review was not limited to abdominal surgery patients and of the 656 patients included in the review, 336 patients following cardiac surgery was also included.
- Pasquina et al (2006) included 35 randomized trials (published between 1952 and 2005). . No trials were excluded based on the quality of study methodology and no sensitivity analysis was conducted. .
- Lawrence et al (2006) included trials and SR's (published 1980-2005) into any medical or PT post operative strategies that could reduce PPC's following non-cardiothoracic surgery. Two systematic reviews (Thomas et al 1994 and Overend et al 2001) and five randomized controlled trials (Fagevick-Olsen et al 1997; Fagevick-Olsen et al 1998; Hall et al 1991 and Hall et al 1996; Bohner et al 2002) were identified that specifically investigate the role of physiotherapy. The two reviews included were based on the results of 18 RCT's. This review is thus based on a total of 23 RCT's.

- The review published by Conde et al (2006) investigated the effect of physiotherapy on the development of post operative complications. The search was limited to Medline and included three systematic reviews (Thomas et al 1994; Overend et al 1991 and Lawrence et al 2006) and one RCT (MacKay et al 2005).

### SUMMARY OF EVIDENCE

- None of the studies reported significant harm (Conde et al 2006; Lawrence et al 2006; Pasquina et al 2006); although this could be due to small sample sizes or poor reporting rather than a clear indication of no harm.
- No difference in the management of patients in terms of risk profile is recommended (Conde et al 2006; Lawrence et al 2006; Pasquina et al 2006). Conde et al (2006) did comment on the observation that individual RCTs in low risk people often did not find the benefits of physiotherapy that were seen when all RCTs were pooled. Further research is recommended.
- Should include directive couch (Pasquina et al 2006)
- IS should not be used routinely (Overend et al 2001)
- Physiotherapeutic intervention is better than no intervention (Conde et al 2006; Lawrence et al 2006);
- No modality seems superior (mobilization; IS; IPPB; PEEP;DBE; PEP), and combined modalities do not seem to provide additional risk reduction (Conde et al 2006; Lawrence et al 2006)
- Goal directed and therapist driven early mobilization recommended (Pasquina et al 2006; MacKay et al 2005).

### Comments on primary research included in the SR's

- All reviewers commented on the poor quality of primary research;
- Outcomes were not well defined (Lawrence et al 2006; Pasquina et al 2006);
- Meta-analyses not possible due to heterogeneity (Lawrence et al 2006);
- Power of the majority of studies to low to produce a valid result (Pasquina et al 2006);

Table 1 Summary of reviews

Review	AMSTAR Score	Studies included	Population	Intervention and comparison	Outcome measured	Conclusion
Overend et al (2001)	7	2 Case series; 1 cross over design; 8 RCT	Surgical (Abdominal x and Cardiac)	Insentive Spirometry (IS)	Physiological AND clinical outcomes PPC's	Does not recommend the routine use of IS in pt following surgery. No harm was detected
Pasquina et al 2006	9	35 RCT	Abdominal surgery	All lung expansion modalities	Physiological AND clinical outcomes PPC's	Hesitant to draw any specific conclusions, an agenda of further research rather than of clinical recommend. Minimal harm reported related to technique application and included claustrophobia reported with BiPAP; CPAP Abdominal distension IPPB; incision hernia. 26 trials did not mention any adverse effects, and 4 trials reported that none had occurred
Lawrence et al 2006	7	2 Systematic Reviews; 5 RCT	Non cardiac surgery	All lung expansion modalities	Limited to clinical outcomes PPC's	Any type of lung expansion intervention is better than no prophylaxis. No modality seems superior, and combined modalities do not seem to provide additional risk reduction. Did not comment on harm
Conde et al 2006	7	3 Systematic Reviews; 1 RCT	Abdominal and cardiac surgery	All lung expansion modalities	Limited to clinical outcomes PPC's	Any type of lung expansion intervention was better than no prophylaxis - no evidence that any individual modality was superior to any other. Minimal harm limited to gastric distension; nausea; wound infections, feeling of bloating and abdominal distension with IPPB, nose ulcer with the use of prophylactic nasal CPAP, intolerant to prophylactic nasal CPAP.

## QUALITY OF EVIDENCE

- The reviews were well conducted and scored between 7 – 9 on AMSTAR (*refer to table 1*).
- Overend et al (2001) specifically investigated the effect of IS on post operative complications and scored 7/11 on AMSTAR.
- Lawrence et al (2006) scored 7/11 only searching one database (Medline) and not consulting grey literature. Studies which conducted in third world environments, had fewer than 25 participants per group and measured physiological variables were excluded from the review
- The review published by Conde et al (2006) also scored 7/11 on AMSTAR, limiting the search to Medline. This review is an update of secondary research and also included a single primary research report.
- Pasquina et al (2006) achieved the highest score 9/11 on AMSTAR including a search of relevant databases and unpublished results. However, all experimental studies were included despite methodological quality or sample size.

Table 2 Quality of evidence

Review	Methodological quality assessed	Directness of evidence		Heterogeneity	Precision
		Intervention investigated	Sample investigated	Publication Bias	Data Sample
Overend et al (2001)	Yes, with self developed form	Yes	No (abdominal and cardio thoracic surgery)	No	8 Trials comparing different breathing exercises or mobilization no effect on PPC's
Pasquina et al 2006	Yes	Yes	Yes	Yes	13 trials investigated Breathing exercises/ mobilization to no intervention control: 9 studies (n =883) no significant differences, and 4 studies (n =528) had improved outcomes
Conde et al 2006	Yes. Standardised BMJ protocol	Yes	No (abdominal and cardio thoracic surgery)	Yes	2 SR any modality more effective than none; 1SR no difference between modalities; 1 RCT no difference between DBE and mobilization
Lawrence et al 2006	Yes; Quality of Reporting of Meta-analyses (QUOROM); U.S. Preventive Services Task Force criteria for hierarchy of research design	Yes	Yes	Yes	1 SR trend favored fewer postoperative PPC's compared with controls OR, 0.85 CI, 0.59-1.2; one SR results could not be pooled; one good quality RCT reported IS; DBE; IPPB equally prevented PPC's compared to no intervention.