

Current Australian and New Zealand physiotherapy practice in the management of patients with bronchiectasis and chronic obstructive pulmonary disease

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ABSTRACT

Physiotherapy is an important component of the management of patients with non-cystic fibrosis bronchiectasis and chronic obstructive pulmonary disease (COPD), yet the types of interventions commonly utilised and measures of treatment efficacy are unclear. This study aimed to determine the current clinical practice of airway clearance therapy and exercise prescription in bronchiectasis and COPD. Two postal questionnaires were distributed to physiotherapists throughout Australia and New Zealand (n=120). Of the 120 questionnaires mailed in each study, 102 and 98 surveys were returned (a response rate of 85% and 82% respectively). The most commonly used airway clearance techniques for both conditions included active cycle of breathing technique, positioning, deep breathing exercises and positive expiratory pressure (PEP) therapy using Bottle PEP. Physical exercise was recommended by the majority of respondents for patients with bronchiectasis and COPD (98% and 100% respectively) with pulmonary rehabilitation 'always' prescribed (n=41, 39%). Respondents primarily used the Six-Minute Walk Test as a formal measure of exercise efficacy (n=71, 78%). This survey demonstrated that the most frequently employed airway clearance techniques were selected in similar proportions for both diseases. Assessment of exercise efficacy included measurements which are evaluation tools within pulmonary rehabilitation programs. **Lee A, Button B, Denehy L (2008); Current Australian and New Zealand physiotherapy practice in the management of patients with bronchiectasis and chronic obstructive pulmonary disease. New Zealand Physiotherapy 36(2): 49-58.**

Key words: Bronchiectasis, Chronic obstructive pulmonary disease, airway clearance techniques, exercise, survey

INTRODUCTION

COPD is well recognised as a leading cause of global morbidity, mortality and reduced quality of life (Pauwels et al 2001, Halbert et al 2006). In New Zealand (NZ) and Australia, it is the fourth and fifth leading cause of death respectively (Broad and Jackson 2003, Mathers et al 1999). Up to 15% of the adult population over the age of 45 years in NZ are afflicted with COPD to the cost of \$NZ192 million dollars in health care annually, while in Australia, the economic burden is estimated at approximately \$AUD818-898 million dollars (Broad and Jackson 2003, Mathers et al 1999). While the epidemiology of bronchiectasis not related to cystic fibrosis (CF) has declined significantly over the last 60 years, a high prevalence has continued to be reported amongst the indigenous populations of NZ and Australia (Kolbe and Wells 1996, Chang et al 2002, Edwards et al 2003, Twiss et al 2005). Of particular concern is the high incidence of non-CF bronchiectasis in the paediatric populations, with rates of 17.8 per 100000 in Pacific Island children, 4.8 per 100000 in Maori children and 14 per 10000

in central Australian indigenous children reported (Kolbe and Wells 1996, Chang et al 2002, Twiss et al 2005).

The clinical profile of bronchiectasis and COPD is similar, with chronic cough and mucus hypersecretion dominant in both conditions (Pauwels et al 2001, King et al 2006). Other key features include exertional breathlessness, reflected by a reduced exercise tolerance in COPD and dyspnoea secondary to tenacious secretions in up to 75% of patients with bronchiectasis (King et al 2006). These symptoms lend support for the role of physiotherapy in management. Several studies have investigated the efficacy of airway clearance techniques in COPD and bronchiectasis, with inconsistent findings (Sutton et al 1985, Mohsenifar et al 1985, Van der Schans et al 1986, Frischknecht Christensen et al 1990, Hasani et al 1994, Olseni et al 1994, Cecins et al 1999, Thompson et al 2002, Tsang and Jones 2003, Patterson et al 2005, Eaton et al 2007, Patterson et al 2007). A recent systematic review concluded that there was insufficient evidence to support

or refute the benefit of airway clearance therapy in these populations (Jones and Rowe 1998). In contrast, the role of exercise training in the form of pulmonary rehabilitation is recognised as one of the most effective interventions for COPD (Nici et al 2006, Ries et al 2007). While exercise training is also advocated for bronchiectasis (Nici et al 2006, Ries et al 2007), there is limited evidence outlining the benefits in these patients (Newall et al 2005).

Except for pulmonary rehabilitation and more specifically exercise training in COPD, there are no guidelines available to direct physiotherapy practice in bronchiectasis and COPD. Furthermore, with the exemption of three studies (Brooks et al 2003, O'Neill et al 2002, Yohannes and Connolly 2007), little is known about the approach of physiotherapists globally in relation to prescription of airway clearance and exercise therapies for these diseases or which techniques and clinical outcome measures are currently being employed. In light of the growing morbidity and mortality of bronchiectasis and COPD in NZ and Australia (Kolbe and Wells 1996, Mathers et al 1999, Broad and Jackson 2003), this information is imperative for the future development of clinical physiotherapy practice guidelines for these conditions.

Therefore, the primary aim of this study was to determine type and frequency of airway clearance techniques and exercise therapy applied in patients with bronchiectasis and COPD in hospitals in NZ and Australia. Secondary aims were to ascertain methods of assessment for interventions and identify those factors influencing the rationale for treatment technique selection.

METHODS

Subjects

Physiotherapists responsible for the management of patients with bronchiectasis and COPD throughout NZ and Australia formed the target population for these studies. The Australian hospitals selected for inclusion were 109 public hospitals classified as a tertiary hospital, large major city or large regional/rural institutions in the Public Hospital Database for each Australian state and territory according to the Australian Hospital Statistics report (Australian Institute of Health and Welfare 2006). In addition,

we selected eleven hospitals (public and private) which offered both primary and secondary services and represented the North and South Islands of NZ, from a search of the District Health Boards of NZ (Ministry of Health 2006). The questionnaires were addressed to a cardiorespiratory physiotherapist and were mailed to the physiotherapy departments of all hospitals. Postal addresses were obtained from the Australian Yellow Pages Directory and from the District Health Board of NZ internet site (Ministry of Health 2006). The University of Melbourne's HREC granted approval for these studies. Consent to participate in the studies was implied by completion and return of the questionnaires.

Procedure

As no nationally developed or validated tool currently exists to survey physiotherapy practice in COPD and bronchiectasis, a questionnaire was designed by the authors. A detailed electronic search was undertaken for English citations using the databases MEDLINE (1966 – 2006, week 28), CINAHL (1982 – 2006, week 28) and PubMed (1996 – 2006, week 28) to identify types of airway clearance techniques and exercise training applied in COPD and bronchiectasis. From this literature, a list of research questions was generated and two descriptive questionnaires developed, one for each disease. The selection of topics included was based on information gained from previous questionnaires as well as additional questions (O'Neill et al 2002, Yohannes and Connolly 2007). Each 6-page questionnaire was composed of 14 questions divided into five sections: demographic and general information, information specific to airway clearance therapy and exercise, treatment rationale for airway clearance therapy and assessment of treatment efficacy. The specific areas covered under each section are outlined in Table 1. For ease of completion, each questionnaire was composed of predominantly closed questions together with the use of five-point Likert scales for the frequency of technique selection and outcome measures (O'Neill et al 2002, Grimmer and Bialocerowski 2005, Yohannes and Connolly 2007). For treatment rationale, participants ranked factors influencing the selection of airway clearance

Table 1. Structure and content of the questionnaires

Section and subject	Topics covered
General information	Physiotherapy service provision for inpatients and outpatients with bronchiectasis/ COPD Years of cardiorespiratory experience
Airway clearance therapy	Type of airway clearance therapy selected Frequency of technique selection
Treatment rationale	Factors influencing selection of airway clearance techniques, with ranking of ten factors
Exercise therapy	Frequency of referral to pulmonary rehabilitation Type of physical exercise recommended*
Outcome measures	Selection of outcome measures to quantify efficacy of airway clearance therapy and exercise therapy

*Included in bronchiectasis questionnaire only

technique from 'most likely reason' to 'least likely reason'. A copy of both questionnaires is available on request.

A pilot of the questionnaires was conducted with groups of cardiorespiratory physiotherapists from two major Melbourne public hospitals. Comments regarding question design, ambiguities, the clarity and format of the questionnaires were sought with minor changes made. To minimise ambiguity, the term *bronchiectasis* was defined at the beginning of the questionnaire, referring to a diagnosis secondary to immunological disorders, post infection or idiopathic and was not related to CF. The term *COPD* referred to a broader diagnosis of emphysema and/or chronic bronchitis and specifically excluded patients with bronchiectasis, CF or asthma. Within the airway clearance therapy section, the term *positioning* referred to the use of positions to optimise ventilation and aid secretion removal.

The questionnaires, together with a covering letter outlining the purpose of the studies and a stamped reply envelope were then distributed by mail to the cardiorespiratory physiotherapist responsible for respiratory caseload at each hospital for completion. Respondents were encouraged to consult with colleagues as required. The questionnaires were anonymous, but coded for the purpose of tracking responses and to allow follow-up of non-returned questionnaires. Participants were given four weeks to complete the survey, after which a second survey was sent to non-respondents and a further four weeks allowed for the return of the questionnaires. If the hospital did not provide physiotherapy services to patients with bronchiectasis or COPD, respondents were asked to mark the provision of physiotherapy treatment for inpatients and outpatients in question one and two as 'no' and return the questionnaire. These questionnaires were excluded from the study.

Data analysis

All data of the nominal/ordinal form were analysed using SPSS 15.0 for Windows using descriptive frequency analyses.

RESULTS

Response rate

Of the 120 questionnaires distributed for each disease group, 102 were returned (response rate of 85%) relating to bronchiectasis while 98 were returned (response rate of 82%) relating to COPD. For practice in patients with bronchiectasis, five questionnaires were excluded from the study; all reporting that physiotherapy services were not provided for these patients at their hospital. In total 97 complete surveys were analysed. For practice in patients with COPD, seven questionnaires were excluded; five reported physiotherapy services were not provided to patients with COPD at their hospital and two questionnaires were returned incomplete. In total, 91 surveys were analysed.

Demographic data from the hospitals included are given in Table 2. Seventy-one (70%) of the hospitals surveyed offered physiotherapy services to inpatients and outpatients with bronchiectasis while seventy-seven (83%) offered physiotherapy services to inpatients and outpatients with COPD. The extent of the respondents' post-graduate clinical experience ranged from 2 to 42 years, with a median experience of 10 years.

Physiotherapy intervention

Common themes are apparent in the selection of airway clearance therapy. Four techniques were regularly applied in patients with bronchiectasis and patients with COPD. This included active cycle of breathing technique (ACBT), positioning, deep breathing exercises and Bottle Positive Expiratory Pressure (BPEP) therapy. Complete details of the frequency of technique selection are outlined in Table 3.

Table 2. Hospital demographics

	Reported responses	COPD n=91	Bronchiectasis n=97
State/Country	New Zealand	4	6
	Australian Capital Territory	2	2
	New South Wales	33	31
	Northern Territory	1	1
	Queensland	18	17
	South Australia	3	5
	Tasmania	1	2
	Victoria	23	26
	Western Australia	5	6
Hospital type	Public/private (New Zealand)	4	6
	Tertiary (Australia)	61	66
	Large major city (Australia)	11	14
	Large regional/rural (Australia)	15	16
Patient type treated	Inpatients	90	95
	Outpatients	77	71

COPD=Chronic obstructive pulmonary disease

Table 3. Frequency of selection of airway clearance techniques in patients with COPD (n=91) and bronchiectasis (n=97)

Airway clearance technique		Always n (%)	Often n (%)	Sometimes n (%)	Rarely n (%)	Never n (%)
GAD	COPD	0 (0)	4 (5)	25 (28)	40 (45)	20 (23)
	Bronchiectasis	6 (6)	29 (32)	23 (25)	23 (25)	10 (11)
MGAD	COPD	1 (1)	24 (27)	43 (48)	16 (18)	6 (7)
	Bronchiectasis	9 (10)	52 (55)	25 (27)	8 (9)	0 (0)
ACBT	COPD	21 (23)	57 (63)	11 (12)	1 (1)	0 (0)
	Bronchiectasis	45 (48)	39 (42)	6 (7)	3 (3)	0 (0)
Percussion	COPD	0 (0)	8 (9)	43 (48)	31 (34)	8 (9)
	Bronchiectasis	4 (4)	29 (31)	36 (39)	20 (22)	4 (4)
Manual vibrations	COPD	0 (0)	22 (24)	39 (43)	24 (27)	5 (6)
	Bronchiectasis	8 (9)	38 (42)	28 (30)	17 (18)	2 (2)
Positioning	COPD	24 (27)	38 (42)	23 (26)	3 (3)	2 (2)
	Bronchiectasis	24 (27)	31 (35)	23 (26)	8 (9)	3 (3)
DBE	COPD	26 (29)	33 (37)	14 (16)	12 (13)	5 (6)
	Bronchiectasis	31 (34)	35 (38)	15 (16)	8 (9)	3 (3)
PEP (mask)	COPD	0 (0)	1 (1)	11 (12)	23 (26)	55 (61)
	Bronchiectasis	2 (2)	4 (5)	14 (16)	17 (20)	50 (58)
PEP (mouthpiece)	COPD	1 (1)	5 (6)	19 (21)	27 (30)	38 (42)
	Bronchiectasis	3 (3)	13 (15)	27 (31)	11 (13)	34 (39)
Bottle PEP	COPD	2 (2)	31 (34)	28 (31)	7 (8)	22 (24)
	Bronchiectasis	5 (6)	29 (32)	26 (29)	9 (10)	21 (23)
Oscillating PEP (Flutter®)	COPD	0 (0)	4 (4)	24 (27)	30 (33)	32 (36)
	Bronchiectasis	2 (2)	18 (20)	32 (36)	11 (13)	26 (29)
Oscillating PEP (Acapella®)	COPD	0 (0)	3 (3)	18 (20)	22 (25)	46 (52)
	Bronchiectasis	3 (3)	6 (7)	26 (30)	11 (13)	42 (48)
Autogenic drainage	COPD	0 (0)	0 (0)	15 (17)	26 (29)	48 (54)
	Bronchiectasis	1 (1)	7 (8)	16 (19)	26 (31)	35 (41)
Walking	COPD	11 (12)	21 (23)	57 (63)	1 (1)	0 (0)
	Bronchiectasis	37 (41)	28 (31)	15 (17)	6 (7)	5 (6)

GAD=Gravity assisted drainage; MGAD=Modified gravity-assisted drainage, ACBT=Active Cycle of Breathing Technique; DBE=Deep breathing exercises, PEP=Positive Expiratory Pressure

For patients with bronchiectasis, walking with huffing was 'always' instituted by 37 respondents (41%), compared to 11 respondents (12%) in COPD. A greater number of respondents (61 respondents, 65%) favoured modified gravity-assisted drainage (MGAD) over gravity-assisted drainage (GAD) incorporating head down tilt positioning (35 respondents, 38%). Manual techniques in the form of vibrations and percussion were also recurrently applied. Of the other modalities of PEP therapy, both mouthpiece PEP and oscillating PEP using the Flutter® were customary practice in 16 respondents (18%) and 20 respondents (22%) respectively. Mask PEP therapy, the Acapella® and Autogenic drainage were seldom used.

In patients with COPD, MGAD was preferred by 25 respondents (28%) over GAD (4 respondents, 5%). Manual techniques were less frequently selected, with a preference of vibrations over percussion in these patients. All other modalities of PEP therapy (mask and mouthpiece PEP) and oscillating PEP using the Flutter® and Acapella® together with Autogenic drainage were rarely applied.

In exploring the clinical decision making in the treatment of bronchiectasis and COPD, the most influential factor for both disease groups was reported to be clinician's use of best evidence. This was followed by therapist experience, patient

capability and disease severity. Median rankings for each factor specified in the questionnaire are presented in Figure 1.

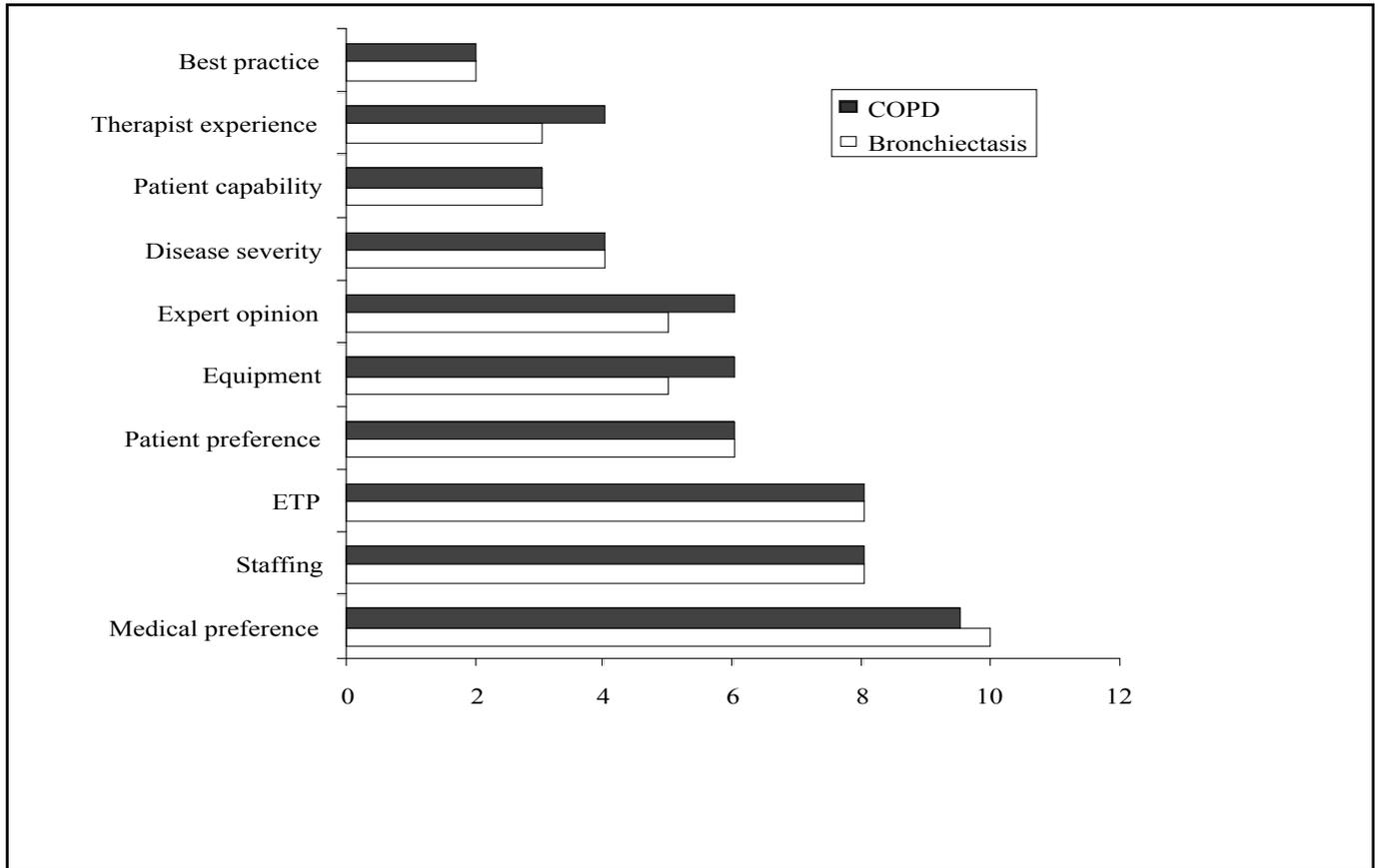
Outcomes measures for airway clearance therapy

In measuring the effectiveness of airway clearance techniques, several outcome measures were 'always' and 'often' selected, as demonstrated in Figure 2. The most routinely employed objective measurements in each patient population were approximate sputum volume, auscultation findings and pulse oximetry. Common subjective measures included ease of sputum expectoration, patient reported well-being and adherence to airway clearance therapy. The use of validated tools for assessing quality of life and exercise tests for determining efficacy of airway clearance therapy was rare for both patient populations.

Exercise therapy

Ninety-five respondents (98%) were in agreement that exercise therapy should be recommended for patients with bronchiectasis. The most recommended daily exercise by 21 respondents (22%) was physical activity three times per week. The most common types of physical activity for bronchiectasis suggested are presented in Figure 3. Pulmonary rehabilitation is

Figure 1. Factors influencing selection of airway clearance techniques (Items ranked from 1 [most likely reason] to 10 [least likely reason]).



ETP=established, traditional practice

'always' recommended for patients with bronchiectasis by 20 respondents (21%) or 'often' in 34 respondents (35%). All respondents were in agreement that exercise therapy should be recommended for patients with COPD, while pulmonary rehabilitation was 'always' recommended by 21 respondents (18%) or 'often' in 45 respondents (38%).

Outcome measures for exercise therapy

Several tools were identified as routinely employed measures quantifying the effectiveness of physical exercise in patients with COPD and bronchiectasis; these are given in Table 4. The most common objective measure of exercise capacity for both disease groups was the Six-Minute Walk Test (6MWT), selected 'always' and 'often' in 60 respondents (61%) for patients with bronchiectasis and by 60 respondents (69%) for patients with COPD. In contrast, the use of other formal measures, including the Incremental Shuttle Walk Test, Endurance Shuttle Walk Test or Cardiopulmonary exercise testing were scarce. Similarly, the Unsupported Upper Limb Exercise Test (UULXT) or the Grocery Shelving Task (GST) were rarely used measures of upper limb endurance and function for both conditions.

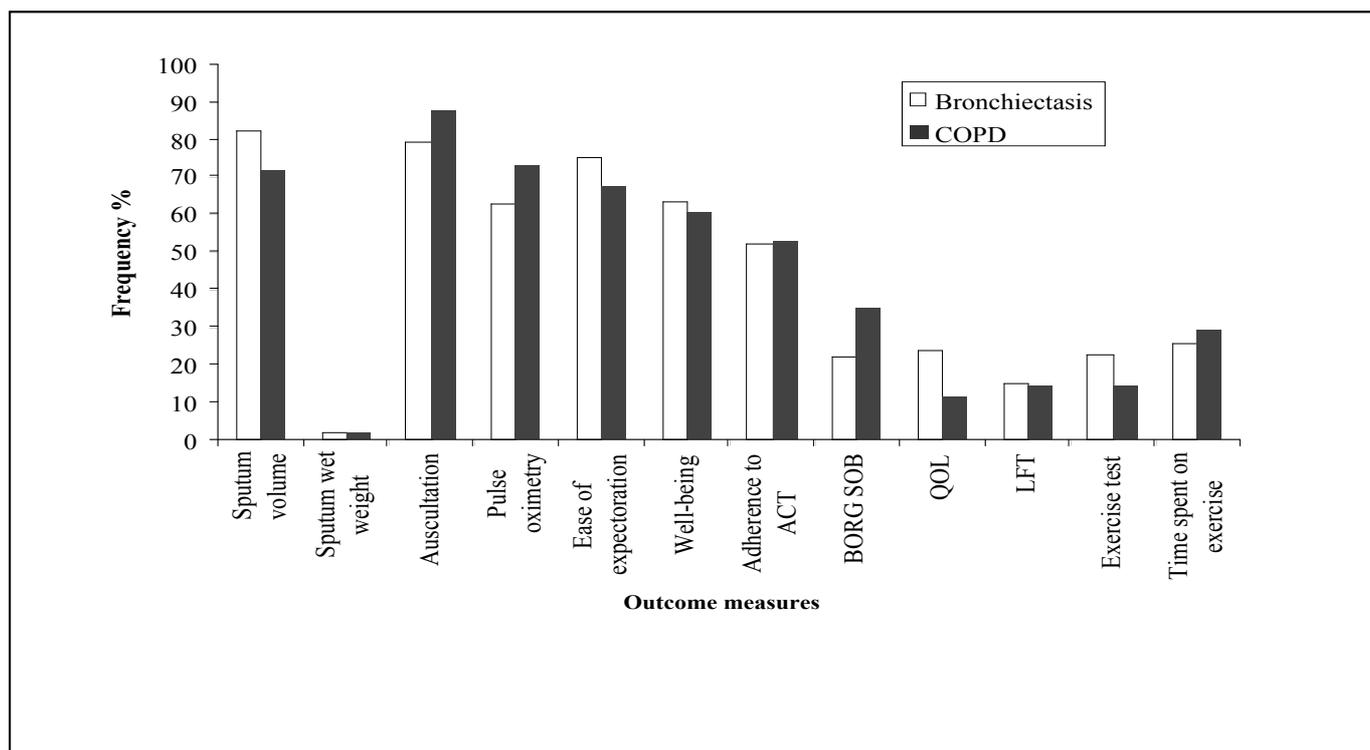
DISCUSSION

Each survey achieved a response rate of a minimum of 82%, which Portney and Watkins (1993) describe as excellent, as the expected response rate for mail administered surveys is between 30 and 60% (Portney and Watkins 1993). With such large responses, it is likely that the results of this survey reflect the current practice of the population studied. Respondents encompassed all Australian states from a diverse range of hospital settings together with a selection of public and private hospitals in NZ representing both North and South Islands. The present study will enable clinicians to compare their management of patients with bronchiectasis and COPD against that of similar service providers and thus reflect on differences in clinical practice.

Airway clearance therapy

This study identified that there is some consistency across clinical practice with respect to airway clearance with the majority of physiotherapists routinely prescribing traditional techniques, including ACBT, deep breathing exercises and positioning. This selection of techniques was comparable to previous surveys of clinical practice in these conditions with physiotherapists in the United Kingdom demonstrating a preference

Figure 2. Selection of outcome measures assessing efficacy of airway clearance therapy



ACT=Airway clearance therapy, BORG SOB=BORG scale for shortness of breath, QOL=Quality of life measures, LFT=Lung function test, COPD=Chronic obstructive pulmonary disease

for more conventional chest physiotherapy techniques, including ACBT, positioning, exercise and education for inhalation therapy for patients with bronchiectasis (O'Neill et al 2002). Similarly, a Canadian survey found that breathing exercises, positioning, mobilisation, GAD and manual techniques were amongst the most common techniques utilised for patients with acute bronchitis (Brooks et al 2003), while ACBT was favoured over manual techniques in managing acute exacerbations of COPD (Yohannes and Connolly 2007).

The preferential selection of more traditional forms of airway clearance techniques in this study is consistent with the current literature detailing their role in disease management. Although the majority of studies compared different combinations of techniques in mixed patient populations, short-term improvement in pulmonary clearance and sputum volume was consistently achieved (Sutton et al 1985, Van der Schans et al 1986, Van der Schans et al 1990, Hasani et al 1994, Cecins et al 1999, Savci et al 2000, Eaton et al 2007). While the overall quality of these studies is variable, this body of evidence of airway clearance therapy is the most comprehensive to date in both bronchiectasis and COPD. In addition, these treatment techniques are well suited to varying degrees of lung disease severity and patient capabilities.

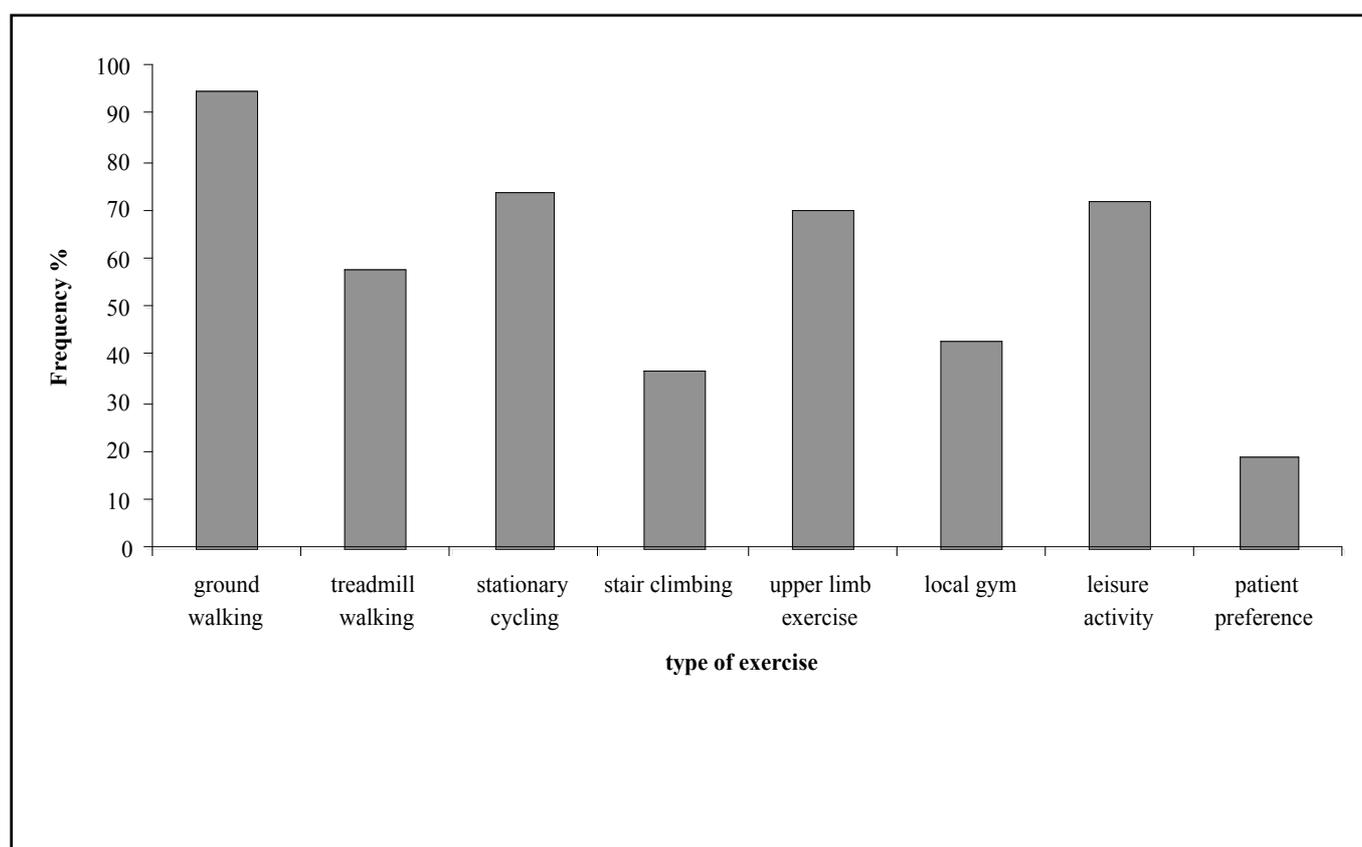
An inclination towards MGAD over GAD is apparent for both disease groups. The unpleasant side-effects associated with GAD with head down tilt, such as pain, musculoskeletal discomfort and

increased dyspnoea in patients with COPD may account for the clinical practice in the current study (Currie et al 1986). The use of MGAD is further justified by an equivalent sputum expectoration in up to 95% of patients with bronchiectasis when completing ACBT with MGAD compared to GAD with head down tilt (Cecins et al 1999). The greater application of MGAD in this study is in contrast to the work of O'Neill and colleagues (O'Neill et al 2002) who found that GAD is routinely applied by 76% of physiotherapists in the management of bronchiectasis.

The application of manual techniques differed between patient populations, with greater use in those with bronchiectasis. Percussion is associated with enhanced sputum production in patients with bronchiectasis (Gallon 1991) but not in COPD (Mohsenifar et al 1985, Wollmer et al 1985). The adverse effects in those with severe COPD highlights an element of precaution associated with the use of percussion (Wollmer et al 1985). Although not specifically evaluated, these adverse effects together with the differing pathophysiological profiles between bronchiectasis and COPD may account for the greater use of manual techniques in bronchiectasis in the current study.

The infrequent prescription of PEP therapy with the exception of BPEP in these studies is consistent with previous surveys (O'Neill et al 2002, Brooks et al 2003). While a patient preference for PEP therapy over other combinations of conventional techniques in COPD has been reported, this is not consistently supported by a superiority in mucus

Figure 3. Frequency of recommended types of exercise for patients with bronchiectasis



clearance (van Henstrum et al 1988, Olseni et al 1994). The reason for the frequent selection of BPEP therapy is unclear, particularly as the use of BPEP has only been described in patients following abdominal surgery (Campbell et al 1986). However, compared to other modalities of PEP therapy (mask and mouthpiece PEP), BPEP imposes minimal financial burden and may therefore be clinically appealing to both clinicians and patients with COPD and bronchiectasis. It has been suggested that mouthpiece forms of PEP therapy may be more tolerable compared to mask PEP, reducing the

sensation of claustrophobia and minimising dead space (Holland and Button 2006). BPEP is a form of mouthpiece PEP therapy and with the frequent clinical application amongst respondents in this study, further investigation of its effects in both COPD and bronchiectasis is warranted.

While both forms of oscillating PEP (Flutter® and Acapella®) were more likely to be applied in bronchiectasis, neither modality is a frequently selected technique. This clinical practice is not reflective of the beneficial effects associated with oscillating PEP and the greater patient preference

Table 4. Selection of formal measures of exercise capacity

Exercise measurement		Always n (%)	Often n (%)	Sometimes n (%)	Rarely n (%)	Never n (%)
6MWT	Bronchiectasis	31 (32)	29 (29)	20 (20)	5 (5)	16 (16)
	COPD	40 (46)	20 (23)	17 (20)	3 (3)	7 (8)
ISWT	Bronchiectasis	1 (1)	7 (7)	8 (8)	17 (17)	66 (67)
	COPD	1 (1)	3 (3)	12 (14)	18 (21)	53 (61)
ESWT	Bronchiectasis	0 (0)	0 (0)	8 (8)	12 (12)	(78) 80
	COPD	0 (0)	2 (2)	5 (7)	15 (17)	65 (75)
CPET	Bronchiectasis	0 (0)	1 (1)	4 (4)	7 (7)	86 (88)
	COPD	0 (0)	1 (1)	2 (2)	13 (15)	71 (82)
UULXT	Bronchiectasis	2 (2)	4 (4)	5 (5)	12 (12)	74 (76)
	COPD	3 (3)	2 (2)	8 (9)	12 (14)	62 (71)
GST	Bronchiectasis	0 (0)	0 (0)	4 (4)	6 (6)	88 (90)
	COPD	0 (0)	1 (1)	2 (2)	3 (3)	81 (93)

6MWT=Six Minute Walk Test, ISWT=Incremental Shuttle Walk Test, ESWT=Endurance Shuttle Walk Test, CPET=Cardiopulmonary Exercise Testing, UULXT=Unsupported Upper Limb Exercise Test, GST=Grocery Shelving Task

reported with its use compared to ACBT or GAD (Thompson et al 2002, Tsang and Jones 2003, Patterson et al 2005, Patterson et al 2007; Eaton et al 2007). However, both the financial burden of this equipment and the technical precision required for oscillating PEP therapy, particularly the Flutter® compared to other airway clearance techniques may limit its selection as a treatment modality in some patients.

Despite its frequent use in the current study as well as previous surveys (O'Neill et al 2002, Brooks et al 2003), the physiological benefit of walking or mobilisation as a form of airway clearance therapy has not been explored in COPD or bronchiectasis. Although the exact protocol for walking as an airway clearance technique was not defined in the current study, including the concurrent use of FET, the current clinical practice implies that further investigation regarding the effects of walking is required.

The rare application of AD is consistent with previous surveys (O'Neill et al 2002). While the reason for this is unclear, AD has been shown to be of similar benefit as ACBT (Savci et al 2000) and the complex training required for therapists to successfully teach AD may not be widely available in Australia and NZ. In addition, the complexity of the technique may limit the proportion of patients to whom it may be applied.

The airway clearance techniques frequently selected in this study have only demonstrated short-term benefits using predominantly sophisticated and complex measures reliant on specialist equipment which are inaccessible in the clinical environment. The preference for easily obtainable clinical measures, including sputum volume, auscultation and pulse oximetry to determine treatment efficacy in this study is consistent with previously described clinical practice (O'Neill et al 2002). No respondents reported the application of longer term outcome measures, including hospitalisation and exacerbation rates, despite their use in chronic bronchitis (Frischknecht-Christensen et al 1990) and other respiratory conditions, including CF. On this basis, the incorporation of both readily available clinical measures together with long-term assessment may enhance the clinical relevance of future studies of the benefits of airway clearance therapy in COPD and bronchiectasis.

It is not clear from this study whether a difference in technique selection for treating inpatients and outpatients is encountered in clinical practice. Inpatients are often more unwell and may be more therapist-dependent for airway clearance therapy compared to outpatients. With patient capability a key factor influencing the rationale for technique selection, the ability of older patients and those who are more unwell to effectively carry out independent forms of airway clearance techniques may be limited. Together with a higher proportion of respondents providing physiotherapy services

for inpatients compared to outpatients, this may account for preferences in technique selection.

Exercise therapy

In view of the strong evidence supporting the role of exercise training within pulmonary rehabilitation programs in COPD (Nici et al 2006, Ries et al 2007), a referral rate of only 56% in this study is suggestive that this type of therapy could be more frequently applied. Almost all respondents in the current study recommended exercise therapy for patients with bronchiectasis. An equivalent rate of referral (56%) for pulmonary rehabilitation is consistent with the current recommendations advocating the inclusion of patients with bronchiectasis (Nici et al 2006, Ries et al 2007) as well as the recently reported benefits following lower limb endurance, strength and inspiratory muscle training in this population (Newall et al 2005). However, in view of the additional recommendations, including upper limb exercise for patients with bronchiectasis in this study, further exploration of more comprehensive exercise training in bronchiectasis is required.

As the most well studied field walking test, the preferential selection of the 6MWT as a measure of exercise capacity for both disease groups was not unexpected. Compared to other formal objective measures of exercise tolerance, including the incremental and endurance shuttle walk test and cardiopulmonary exercise testing, the 6MWT requires little equipment and minimal training and is cost effective (American Thoracic Society 2002). In addition, it is widely accepted as a standardised measure of exercise capacity in pulmonary rehabilitation (Nici et al 2006). In contrast, measures of upper limb function are not widely employed, possibly due to the lack of consistent inclusion of measurement of upper limb function in pulmonary rehabilitation (Nici et al 2006, Ries et al 2007). Validated and reliable measures of upper limb function have only been recently developed (Takahashi et al 2003, Hill 2005) and a lack of widespread familiarity with each protocol may also account for their limited application in clinical practice.

Limitations

In spite of the high response rate to both surveys, physiotherapy practice may vary for those who did not reply to the survey. The highest proportion of responses was obtained from Australian hospitals, with a smaller response rate from the NZ institutions. The inclusion of a greater number of NZ hospitals may increase the scope of these results. While physiotherapists were encouraged to collaborate with colleagues regarding responses as appropriate, the frequency of liaison is unclear. Factors including the need and frequency of modification of airway clearance therapy were not addressed, which may impact on the selection of techniques.

CONCLUSIONS

This study demonstrated that the overall approach amongst NZ and Australian clinicians to airway clearance therapy in patients with bronchiectasis and COPD was similar with a preference for ACBT, deep breathing exercises, positioning including GAD and MGAD and walking. The application of various modalities of PEP therapy was greater in patients with bronchiectasis, with an inclination towards devices imposing minimal financial burden. The type of exercise therapy regularly recommended followed international guidelines for patients with COPD, including the use of measurement tools routinely employed in pulmonary rehabilitation. Further research is required to examine the long-term impact of airway clearance therapy in both populations together with the role of exercise training in bronchiectasis. These results will be useful in guiding clinical decision making regarding airway clearance and exercise for both patient populations.

Key points

In patients with COPD and bronchiectasis, ACBT, positioning, deep breathing exercises and walking are the most frequently applied airway clearance techniques.
PEP therapy is more frequently applied in patients with bronchiectasis.
Recommendations for exercise therapy follow current clinical practice guidelines for COPD for both disease groups.
Future research is required to examine the long-term effects of airway clearance therapy in COPD and bronchiectasis as well as the role of exercise in bronchiectasis.

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