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Which Assessments and Interventions do Physiotherapists Value in the Management of Adults with Cystic Fibrosis in Australia?

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ABSTRACT

Purpose: Evidence based practice involves the integration of three main components: best available research evidence, practitioner's clinical expertise, and patient's preferences. While the effectiveness of physiotherapy interventions for patients with cystic fibrosis (CF) has been extensively studied, no studies have explored physiotherapists' perceptions and values concerning their management of patients with CF. The aim of this study was to document the opinions and values that CF physiotherapists in Australia have regarding their management of patients with CF. Method: A purpose-designed questionnaire addressing these issues was mailed to all 38 physiotherapists working with adults with CF on a regular/frequent basis in major Australian healthcare units. Results: Thirty-three questionnaires were returned completed (87%). Subjective history was considered by respondents as the most valuable component of assessment, with personal experience being the primary factor influencing this response. Coughing/huffing was deemed one of the most valuable airway clearance techniques across five different clinical scenarios; non-invasive ventilation, postural drainage, percussion and vibrations were perceived as valuable techniques for unwell, hospitalised patients; and exercise, positive expiratory pressure and flutter therapy/Acapella were considered valuable for out-patients. Personal experience was the factor most often influencing respondents' opinions about treatment techniques. Conclusions: CF physiotherapists in Australia appear to mainly base their opinions about the value/usefulness of physiotherapy management of adults with CF on their past clinical experience. These data provide an initial insight into CF physiotherapists' clinical expertise and will give CF clinicians around the world the opportunity to compare their own clinical practice with that of their Australian peers.

INTRODUCTION

All health care professionals are encouraged to incorporate evidence based practice (EBP) into their daily clinical practice.¹⁻³ Evidence based practice requires the integration of three main components: the best available research evidence, each practitioner's clinical expertise, and each patient's preferences.⁴⁻⁶ In terms of practitioners' clinical expertise, Sackett et al) noted that clinical expertise means, "...the proficiency and judgment that individual clinicians acquire through clinical experience and clinical practice."^{4,p.71}

The use of EBP in the physiotherapy management of patients with cystic fibrosis (CF) is supported by a considerable amount of clinical research investigating the effectiveness of physiotherapy treatments.⁷⁻¹¹ However, no studies pertaining to CF were

identified that specifically investigated the other two components of EBP, namely practitioners' clinical expertise or patients' preferences. Indeed, the only publications we could find regarding clinical expertise as part of EBP were general discussions rather than primary research.¹²⁻¹⁵ This is an important oversight as "Without clinical expertise, practice risks becoming tyrannised by evidence, for even excellent external evidence may be inapplicable to or inappropriate for an individual patient."^{4,p.72} Patients' preferences are also a vital component of EBP as it is no longer tenable for clinicians alone to make decisions for the patient. Instead, patients expect to contribute to the decision-making process by communicating their experiences, preferences, and values.⁶ We were particularly interested in exploring physiotherapists' clinical expertise with respect to the management of patients with CF. Therefore, the aim of this study was to collect data from CF physiotherapists in Australia that reflected their clinical judgment, experience, practice, and decision-making with respect to the assessment and treatment of patients with CF, thus gaining insight into this neglected aspect of EBP.

METHODS

Design

Data for this study were obtained using a 22-question anonymous questionnaire to physiotherapists in Australia who worked with patients with CF on a regular/frequent basis.

Subjects

Inclusion criteria

All physiotherapists in Australia who currently worked with adult patients with CF on a regular/frequent basis.

Exclusion criteria

Physiotherapists who worked solely with paediatric patients with CF and physiotherapists who only saw patients with CF infrequently (e.g. for treatment of co-existing complications such as musculoskeletal disorders/incontinence, in-patient physiotherapists who treated patients with CF only on weekends) were excluded.

Procedure

To identify Australian health units where significant numbers of adults with CF were managed, the names, mail addresses, and phone numbers of all Australian Adult CF units/hospitals that contribute to the Australian CF Patient Data Registry were obtained from a list supplied by CF Australia. Phone calls were made to the senior CF physiotherapist in each unit/hospital to ascertain the number of potential participants in their unit/hospital who met the criteria outlined previously and also to ask them if they would be willing to participate in a study to assess the test-retest reliability of the questionnaire. The appropriate number of questionnaires was then mailed to senior CF physiotherapists with a letter inviting them to complete the questionnaire personally and distribute copies to eligible physiotherapists in their unit/hospital. A cover letter explained the purpose of the study and the questionnaire's format, and also informed physiotherapists that return of the completed questionnaire indicated consent to participate. Those who chose not to participate were asked to return the cover letter thus indicating their refusal. Prior to the mail out, CF physiotherapists were alerted about the upcoming study at the Seventh Australasian Cystic Fibrosis Conference in Sydney, August 2007 by one of the investigators (DW).

Questionnaires were coded according to destination, and as the number of questionnaires sent to each destination was known, the senior physiotherapist was re-contacted if all questionnaires had not been returned within three weeks. Anonymity and confidentiality were assured and a reply-paid envelope enclosed. Approval for this study was obtained from the Royal Adelaide Hospital Research Ethics Committee.

Survey instrument

The questionnaire was purpose-designed for this study, as a literature review did not identify any pre-existing questionnaires which could have been used or modified for our purposes. A draft questionnaire was developed by the authors who all have experience in treating patients with CF and experience in clinical research and questionnaire development. Numerous revisions were made to improve content, clarity, and thus, to some extent, the validity of the questionnaire. The final draft of the questionnaire was pilot tested on two experienced CF physiotherapists (both with clinical and research experience) for its clarity, ease of completion, and content. Further amendments were made based on their feedback.

The questionnaire had four sections: assessment, treatment, outcomes, and background information. In the first three sections, respondents were requested to indicate the relative value/usefulness of the various components of physiotherapy assessments, treatments, and outcomes using an ordinal scale (ranging from 1 = not at all valuable to 5 = extremely valuable, 6 = no opinion). In the section addressing physiotherapy treatment, respondents were requested to rate the value/usefulness of various airway clearance techniques in five clinical scenarios (2 in-patient and 3 out-patient scenarios covering a range of disease severity and

level of adherence). Additionally, for the main questions in the first three sections, respondents were requested to indicate what their responses were based on (options were: patient preference, past experience, best available evidence, advice/opinion of other staff).

Data Analysis

Most analyses were descriptive in nature. The effect of a physiotherapist's level of experience on responses was analysed using the independent samples t-test for ordinal data and the Chi Square test for categorical data. P values of < 0.05 were considered significant. All analyses were done using SPSS (v14).

Five senior CF physiotherapists from the Australian Adult CF units/hospitals contacted indicated that they were willing to be involved in the reliability study. Four of these subsequently completed the questionnaire on two occasions. For the ordinal data, scores were the same on 375 of 560 (67%) occasions, were 1 point different on 126 (23%) occasions, 2 points different on 37 (7%) occasions, and more than 2 points different on 22 (4%) occasions. A Wilcoxon Signed Ranks Test showed no significant difference between scores from the first to second occasion ($p = 0.26$; scores of 6 were removed for the purpose of this analysis). For the categorical data, where participants indicated the basis of their opinion, agreement was achieved on 233 (64%) of 363 occasions. Overall, this level of agreement suggests a moderate degree of consistency in responses.

RESULTS

Response rate

Thirty-eight physiotherapists in Australia were identified as being eligible to participate. Questionnaires were mailed out to these physiotherapists and 34 returned (90% response rate). One questionnaire was returned blank. Therefore, 33 of 38 questionnaires were completed (87% participation rate) and analysed. The majority of respondents were from Queensland and New South Wales, females, and classified as senior physiotherapists (Table 1). The physiotherapists' years of experience with patients with CF and the number of patients attending each hospital/unit were quite variable (Table 1).

Table 1: Background information from respondents (n = 33)

	Number (%)
HOSPITAL/UNIT INFORMATION	
State	
Queensland (4 units)	11 (33.3)
New South Wales (4 units)	12 (36.4)
Victoria (2 units)	3 (9.1)
Tasmania (3 units)	4 (12.1)
South Australia (1 unit)	1 (3.0)
Western Australia (1 unit)	2 (6.1)
Number of patients attending hospital/unit - mean $\pm$ SD (range)	125.4 $\pm$ 91.9 (3-250)
Composition of CF workload	
Adult only	25 (75.8)
Adult and paediatric	8 (24.2)
RESPONDENT INFORMATION	
Age	
21-30 years	17 (51.5)
31-40 years	10 (30.3)
41-50 years	2 (6.1)
> 50 years	4 (12.1)
Female	28 (84.8)
Post-graduate qualification (yes)	3 (9.1)
Years of experience with CF patients - mean $\pm$ SD (range)	6.3 $\pm$ 5.5 (0-22)
Management of CF patients a major part of job description (yes)	19 (57.6)
Job classification	
Senior	24 (72.7)
Basegrade	9 (27.3)
Permanency of position	
Permanent	19 (57.6)
Rotational	9 (27.3)
Semi-permanent	5 (15.2)

Assessment

Subjective history was rated as the most valuable component of cardiorespiratory, cardiovascular, musculoskeletal, and genitourinary assessments (Appendix 1). Patient appearance, sputum related information, and pulmonary function tests were also highly valued components of cardiorespiratory assessment, whereas respiratory rate/percutaneous oxygen saturation was highly valued in the cardiovascular assessment (Appendix 1). Inhalation therapy was the most highly valued additional component of physiotherapy assessment (Appendix 1). Past experience was the factor that most frequently influenced respondents' opinions about the value/usefulness of the components of physiotherapy assessments (Appendix 1).

Treatment

Coughing/huffing was consistently rated as one of the most valuable airway clearance techniques irrespective of the clinical scenario (Appendix 2). Non-invasive ventilation, postural drainage, percussion, and vibrations were perceived as valuable airway clearance techniques for very unwell, hospitalised patients but of less value in the three out-patient scenarios. Exercise was considered a valuable airway clearance technique in the three out-patient scenarios, and positive expiratory pressure (PEP) and flutter therapy/Acapella were considered valuable techniques for adherent out-patients. The factor that most often influenced respondents' opinions regarding the value of airway clearance techniques in all the clinical scenarios was their past experience, although patient preference was also an important influence in the terminally ill in-patient and non-adherent out-patient scenarios (Appendix 2).

In terms of factors that influenced overall physiotherapy practice (Question 10, Appendix 4), the factors rated as most important were clinical experience, best available evidence, and patient preference; however, none of the options provided were considered unimportant (Appendix 2). Of the additional roles and responsibilities of physiotherapists that were described (Question 11, Appendix 4), the majority were rated as being very or extremely important (Appendix 2). An awareness of infection control issues was considered to be the most important additional role, with 28 respondents (85%) rating it as extremely important. The options that were most valued to improve adherence to physiotherapy treatment (Question 12, Appendix 4) were a willingness of both the physiotherapist and the patient to compromise (rated by 100% of respondents as very or extremely valuable), sufficient time for physiotherapists to educate, supervise, and evaluate treatment (97%), and an awareness of patient's time constraints (94%, Appendix 2). The factor that most often influenced respondents' opinions about the relative value of the options to improve adherence was their past experience (Appendix 2).

Outcomes

Sputum colour/volume, subjective response, and exercise tests were rated as the most valuable outcomes used to assess the effectiveness of physiotherapy treatment, with past experience the factor most often influencing these choices (Appendix 3).

Effect of physiotherapists' level of experience

When investigating the effect of physiotherapists' level of experience on responses, the factor that generated the greatest number of significant differences was whether the physiotherapist was classified as senior or junior (Question 21, Appendix 4). However, significant differences were found according to level of experience in all questions where this was addressed (i.e. Questions 19-22, Appendix 4). Overall, the effect of level of experience was inconsistent and difficult to interpret across the questionnaire, mainly due to the complex nature of the questionnaire (i.e. multiple questions each of which had multiple components) and the disparity in sample size between experienced and less experienced physiotherapists.

DISCUSSION

The aim of this study was not to investigate the frequency with which CF physiotherapists in Australia used different assessment/treatment interventions, but instead to explore the value they placed on these interventions, and on what these values were based. By doing so, we hoped to glean information that would reflect CF physiotherapists' clinical judgement and decision-making. While we acknowledge that our study did not measure practitioners' clinical expertise, there is no simple method of doing so and we believe that our approach, albeit indirect, provides an initial insight into this neglected area of EBP.

In terms of our study design, we included both experienced and less experienced physiotherapists working with patients with CF as we hoped to ascertain whether less experienced physiotherapists responded differently than their more experienced colleagues. However, as noted earlier, these data proved difficult to interpret. We deliberately included only those physiotherapists who managed patients with CF on a regular/frequent basis, as the aim was to investigate the clinical judgement and decision-making of CF physiotherapists. We only included physiotherapists who worked with adult patients with CF as a questionnaire covering both adult and paediatric settings would have been too long and complex. For practical reasons, we also confined our sample to physiotherapists working in Australia, and recognise that physiotherapy practice with respect to the management of CF will vary considerably between countries. When designing the section of the questionnaire that addressed

physiotherapy treatment, we purposely presented five distinct clinical scenarios, rather than a single generic question, as the physiotherapy management of patients with CF varies considerably according to the patient's clinical presentation. A limitation of our study was the long and complex nature of the questionnaire, which is likely to explain the less than optimal degree of test-retest reliability demonstrated.

Our sample was comprised of 33 physiotherapists who worked on a regular basis with adults with CF in Australia, and were predominantly senior physiotherapists with considerable clinical experience in the management of patients with CF. Our participation rate of 87% was excellent and suggests that our sample is representative of the population we wished to study.¹⁶ Our high response rate may reflect that the Australian CF physiotherapy community is relatively small and therefore collegial in nature. Also, the Australian Chapter of the International Physiotherapy Group for CF recently formulated Australian Clinical Practice Guidelines for Physiotherapy in CF; hence, this topic is of particular and current relevance to our study population.¹⁷

It is not possible to directly compare our results to any previous data given the lack of research in this area. Overall, personal experience was the factor most often influencing participants' opinions regarding the value of the components of assessments. Best available evidence was considered the most influential factor in only three instances (i.e. pulmonary function tests, 6 minute walk test, shuttle walk/modified walk test), whereas for all the other components of assessment less than 50 per cent of respondents rated evidence as the most important influence. Nevertheless, best available evidence outranked both patient preference and the advice/opinion of other staff as an influential factor. The factor most frequently influencing respondents' opinions about treatment techniques was their past experience. However, this was not universal as best available evidence primarily influenced respondents' opinions for some treatment techniques (e.g. PEP therapy, exercise, and NIV), arguably those clinical scenarios where research is more robust. Patient preference was rated as an important influence in the terminally ill in-patient scenario which may reflect respondents' awareness that management for these patients usually focuses on comfort care in line with the patient's wishes. Similarly, patient preference was influential in the management of the non-adherent, stable out-patient which may indicate the respondents' awareness that negotiation with the patient regarding their treatment preferences can lead to improved adherence.

Do our findings suggest that physiotherapists rely on their own experience and expertise irrespective of the evidence that is available? In this era of EBP, the failure of best available evidence to be the primary influence on respondents' opinions regarding assessment, treatment, their overall physiotherapy practice, and the outcomes used to assess the effectiveness of treatment could be interpreted as disappointing. In attempting to tease out why best available evidence was not the major influence on respondents' opinions, the fact that our sample was mainly comprised of experienced physiotherapists is probably relevant, although as noted earlier, we were unable to draw any firm conclusions about the effect of experience on responses based on statistical analyses. Nevertheless, our sample demonstrated a substantial depth of clinical experience on which to draw (mean of 6.3 years physiotherapy experience with CF patients), despite being relatively young and few having post-graduate qualifications (Table 1).

In terms of the factors that influenced respondents' opinions concerning the value/usefulness of the assessment items, perhaps best available evidence was of secondary importance to personal experience because there is little high level evidence specifically evaluating the psychometric properties of these items as assessment tools. Similarly, maybe clinicians were unable to primarily base their decision-making regarding physiotherapy treatment for patients with CF on evidence because high level evidence (i.e. systematic reviews and/or randomised controlled trials) is not consistently available for all clinical presentations and treatment options. Also, as noted by Tonelli, evidence derived from clinical research provides information about a composite, average patient, but does not provide universal truths which can be used for the patient at hand.^{12,15} This is particularly relevant to the CF population, where patients demonstrate wide variability and idiosyncratic responses to different airway clearance techniques.¹² While it would have been interesting to have ascertained the frequency with which respondents searched for best available evidence concerning patients with CF, and their opinion of the clinical relevance of this research, this was beyond the scope of the current study. It could also be argued that best available evidence and personal experience are not mutually exclusive, in that a clinician's personal experience incorporates both his or her knowledge of evidence and his or her implementing that evidence into daily practice.

Finally, it is vital to remember that best available evidence is just one component of EBP, and that clinicians' expertise and patients' preference are also essential and equally important components.^{4,12-15} Indeed, as noted by Sackett et al, "External clinical evidence can inform, but can never replace, individual clinical expertise, and it is this expertise that decides whether the external evidence applies to the individual patient at all and, if so, how it should be integrated into a clinical decision."^{4,p.72} Interestingly, we found that the third component of EBP, namely patient preference, was rarely perceived as a primary influence on respondents' opinions/values. The reason why patient preference did not rate as being more influential in decision-making is

not clear, especially with the growing emphasis in healthcare on the effective involvement of “consumers” in decisions about their care. It may reflect that generally, in clinical practice, patients do not have sufficient knowledge to make informed decisions about their treatment choices. Hence, CF clinicians decide on a course of action based on their personal experience, and to a lesser extent, on best available evidence. Then, with the patient, they discuss treatment options and seek each patient’s input into decisions about his/her care. Thus, while patient preference may play a vital role, it is not necessarily the primary influence.

Our study has important clinical implications, both within Australia and internationally, in that it provides an opportunity for all physiotherapists who work with adults with CF to compare their own opinions/values regarding assessment, treatment, and outcome measures with those of their Australian peers and thus evaluate their own perceptions and values. This may be particularly helpful for physiotherapists who are geographically isolated, who operate as the sole physiotherapist in their CF unit, who are inexperienced, or who only treat patients with CF on an irregular/infrequent basis. Further research could be undertaken in other countries to allow comparison with our results and also with CF physiotherapists treating paediatric patients. We believe further research into the comparatively neglected components of EBP, namely exploring practitioners’ clinical expertise and patients’ preferences is necessary.

In conclusion, we found that CF physiotherapists in Australia predominantly based their opinions regarding the value/usefulness of physiotherapy assessments, treatments, and outcomes on their personal experience rather than best available evidence. These data, reflecting each clinician’s judgement, opinions, and decision-making provide an initial, albeit indirect, insight into CF physiotherapists’ clinical expertise and address a neglected area of EBP.

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Appendix 1. Frequency of responses regarding physiotherapy assessment

	Extremely valuable					No opinion	Advice/opinion of other staff			
	Very valuable		Somewhat valuable		Not at all valuable		Best available evidence		Past experience	
	Moderately valuable		Somewhat valuable		Not at all valuable		Patient preference		Past experience	
Cardiorespiratory assessment										
Subjective history										
Patient's appearance										
Auscultation										
SpO ₂										
Sputum colour / volume										
Haemoptysis										
Sputum culture										
Pulmonary function tests										
WCC, fever										
CXR										
Questionnaires (eg CRDQ)										
Cardiovascular assessment										
Subjective history										
BP, HR										
RR, SpO ₂										
6 minute walk test										
3 minute step test										
Shuttle walk / modified walk test										
Shuttle run test										
Musculoskeletal assessment										
Subjective history										
ROM										
Muscle strength										
Muscle length										
Posture										

Genitourinary assessment										
Subjective history										
Manual pelvic floor examination										
Ultrasound pelvic floor examination										
Other components of assessment										
Current physiotherapy management including adherence										
Inhalation therapy										
Work history / social life / hobbies										
Nutritional status										
Health related quality of life questionnaires										

SpO₂ – percutaneous oxygen saturation, WCC – white cell count, CXR – chest xray, CRDQ – chronic respiratory disease questionnaire, BP – blood pressure, HR – heart rate, RR – respiratory rate, ROM – range of motion.

■ >75% of respondents

■ 51-75% of respondents

■ 25-50% of respondents

■ < 25% of respondents

Appendix 2. Frequency of responses regarding physiotherapy treatment

Frequency of response regarding physiotherapy treatment						Advice/opinion of other staff			
Extremely valuable						Best available evidence			
Very valuable						Past experience			
Moderately valuable						Patient preference			
Somewhat valuable									
Not at all valuable									
A very unwell patient, hospitalised with a major exacerbation of their pulmonary disease									
ACBT									
PD / modified PD									
Coughing / huffing									
Percussion									
Vibrations									
PEP therapy									
Hi-PEP therapy									
Flutter therapy / Acapella									
Autogenic drainage									
Inspiratory muscle training									
Exercise									
Non-invasive ventilation									
A terminally ill patient, hospitalised									
ACBT									
PD / modified PD									
Coughing / huffing									
Percussion									
Vibrations									
PEP therapy									
Hi-PEP therapy									
Flutter therapy / Acapella									
Autogenic drainage									
Inspiratory muscle training									
Exercise									
Non-invasive ventilation									

A stable out-patient, very active work and social life (including sport), adherent with treatment										
ACBT										
PD / modified PD										
Coughing / huffing										
Percussion										
Vibrations										
PEP therapy										
Hi-PEP therapy										
Flutter therapy / Acapella										
Autogenic drainage										
Inspiratory muscle training										
Exercise										
Non-invasive ventilation										
A reasonably stable out-patient, somewhat restricted work and social life, adherent with treatment										
ACBT										
PD / modified PD										
Coughing / huffing										
Percussion										
Vibrations										
PEP therapy										
Hi-PEP therapy										
Flutter therapy / Acapella										
Autogenic drainage										
Inspiratory muscle training										
Exercise										
Non-invasive ventilation										
A reasonably stable out-patient, somewhat restricted work and social life, non-adherent with treatment										
ACBT										
PD / modified PD										
Coughing / huffing										

Percussion										
Vibrations										
PEP therapy										
Hi-PEP therapy										
Flutter therapy / Acapella										
Autogenic drainage										
Inspiratory muscle training										
Exercise										
Non-invasive ventilation										
Factors influencing overall physiotherapy practice										
Clinical experience										
Best available evidence										
Patient preference										
Medical staff preferences										
Advice / opinion of other staff										
Resource / financial considerations re patient equipment										
Resource / financial considerations re staffing										
Established practice										
Staffing numbers / caseload										
Availability of help from a caregiver										
Additional roles / responsibilities of physiotherapists										
Identifying 'red flags'										
Counselling										
Acting as patient's advocate with other members of CF team										
Provision of holistic care										
Awareness of role of all members of CF team										
Awareness of infection control										

issues										
Awareness of issues such as transition from paediatric to adult unit, pregnancy and transplant										
Options to improve adherence with physiotherapy treatment										
Patient education re aims of Rx										
Goal setting with patient										
Adequate explanation re how to do Rx										
Willingness of both physiotherapist and patient to compromise										
Provision of Rx supervision										
Awareness of patient's time constraints										
Sufficient time for physiotherapists to educate, supervise and evaluate Rx										

ACTB – active cycle of breathing techniques, PD – postural drainage, PEP – positive expiratory pressure, CF – cystic fibrosis, Rx – treatment.

■ >75% of respondents

■ 51-75% of respondents

■ 25-50% of respondents

■ < 25% of respondents

Appendix 3. Frequency of responses regarding physiotherapy outcomes

	Value of assessment/intervention					No opinion	Source of recommendation		
	Somewhat valuable		Moderately valuable	Very valuable	Extremely valuable		Advice/opinion of other staff		
	Not at all valuable						Patient preference	Best available evidence	Past experience
Subjective response									
Auscultation									
SpO ₂									
Sputum colour / volume									
Pulmonary function tests									
Exercise tests									
Questionnaires (eg CRDQ, SF-36)									

SpO₂ – percutaneous oxygen saturation, CRDQ – chronic respiratory disease questionnaire, SF-36 – Medical Outcomes Study 36-Item Short Form Health Survey

■ >75% of respondents

■ 51-75% of respondents

■ 25-50% of respondents

■ < 25% of respondents

Appendix 4. Questionnaire

SECTION 1: PHYSIOTHERAPY ASSESSMENT

In this section we are seeking information about YOUR expertise and opinions regarding YOUR assessment of patients with CF – what YOU value and why. We have intentionally focussed on the cardiorespiratory and cardiovascular assessments.

Cardiorespiratory assessment

NB exercise tests are listed later in the survey.

1. In the panels on the left, please give YOUR opinion about the **relative value / usefulness** of each component of cardiorespiratory assessment in terms of how it influences YOUR physiotherapy practice for patients with CF. Then, in the panels on the right, indicate what this opinion is primarily based on by ticking **one** box. For example, if I believe subjective history is extremely valuable, based mainly on my past experience, I would mark extremely valuable on the left and tick the past experience box on the right.

	No opinion						Advice/opinion of other staff		
	Extremely valuable						Best available evidence		
	Very valuable						Past experience		
	Moderately valuable						Patient preference		
	Somewhat valuable								
	Not at all valuable								
Subjective history	1	2	3	4	5	6			
Patient's appearance	1	2	3	4	5	6			
Auscultation	1	2	3	4	5	6			
SpO ₂	1	2	3	4	5	6			
Sputum colour / volume	1	2	3	4	5	6			
Haemoptysis	1	2	3	4	5	6			
Sputum culture	1	2	3	4	5	6			
Pulmonary function tests	1	2	3	4	5	6			
WCC, fever	1	2	3	4	5	6			
CXR	1	2	3	4	5	6			
Questionnaires (eg Chronic Respiratory Disease Questionnaire)	1	2	3	4	5	6			
Other – please specify	1	2	3	4	5	6			

2. Of these components of cardiorespiratory assessment, which 3 do you value the most?

Cardiovascular assessment

3. In the panels on the left, please give YOUR opinion about the **relative value / usefulness** of each component of cardiovascular assessment in terms of how it influences YOUR physiotherapy practice for patients with CF. Then, in the panels on the right, indicate what this opinion is primarily based on by ticking **one** box.

	No opinion						Advice/opinion of other staff		
	Extremely valuable						Best available evidence		
	Very valuable						Past experience		
	Moderately valuable						Patient preference		
	Somewhat valuable								
	Not at all valuable								
Subjective history	1	2	3	4	5	6			
BP, HR	1	2	3	4	5	6			
RR, SpO ₂	1	2	3	4	5	6			
6 minute walk test	1	2	3	4	5	6			
3 minute step test	1	2	3	4	5	6			
Shuttle walk / modified walk test	1	2	3	4	5	6			
Shuttle run test	1	2	3	4	5	6			
Other – please specify	1	2	3	4	5	6			

4. Of these components of cardiovascular assessment, which 3 do you value the most?

Musculoskeletal assessment

5. Please give YOUR opinion re the **relative value / usefulness** of each component of musculoskeletal assessment in terms of how it influences YOUR physiotherapy practice for patients with CF.

	Have no opinion					
	Extremely valuable					
	Very valuable					
	Moderately valuable					
	Somewhat valuable					
	Not at all valuable					
Subjective history	1	2	3	4	5	6
ROM	1	2	3	4	5	6
Muscle strength	1	2	3	4	5	6
Muscle length	1	2	3	4	5	6
Posture	1	2	3	4	5	6
Other – please specify	1	2	3	4	5	6

Genitourinary assessment

6. Please give YOUR opinion re the **relative value / usefulness** of each component of genitourinary assessment in terms of how it influences YOUR physiotherapy practice for patients with CF.

	Have no opinion					
	Extremely valuable					
	Very valuable					
	Moderately valuable					
	Somewhat valuable					
	Not at all valuable					
Subjective history	1	2	3	4	5	6
Manual pelvic floor examination	1	2	3	4	5	6
Ultrasound pelvic floor examination	1	2	3	4	5	6
Other – please specify	1	2	3	4	5	6

Other components of assessment

7. Please give YOUR opinion re the **value / usefulness** of each of these additional components of assessment in terms of how they influence YOUR physiotherapy practice for patients with CF.

	Have no opinion					
	Extremely valuable					
	Very valuable					
	Moderately valuable					
	Somewhat valuable					
	Not at all valuable					
Current physiotherapy management including level of adherence	1	2	3	4	5	6
Inhalation therapy (eg equipment, technique)	1	2	3	4	5	6
Work history / social life / hobbies	1	2	3	4	5	6
Nutritional status	1	2	3	4	5	6
Health related quality of life questionnaires (eg SF-36)	1	2	3	4	5	6
Other – please specify	1	2	3	4	5	6

SECTION 2: TREATMENT

In this section we are seeking information about YOUR expertise and opinions regarding the physiotherapy treatment techniques YOU use for patients with CF. We have intentionally focussed on airway clearance regimens.

Airway clearance regimens

8. As you know, the choice of airway clearance techniques varies according to each patient's current clinical condition and background. To cover this variability, we have given 5 broad clinical scenarios. For each scenario, in the panels on the left please give YOUR opinion about the **relative value / usefulness** of each airway clearance technique. Then, in the panels of the right, indicate what this opinion is primarily based on by ticking **one** box.

8.1 A very unwell patient with CF, hospitalised with a major exacerbation of their pulmonary disease.

	Your opinion about the relative value / usefulness of each airway clearance technique						Advice/opinion of other staff		
	No opinion Extremely valuable Very valuable Moderately valuable Somewhat valuable Not at all valuable						Best available evidence Past experience Patient preference		
ACBT	1	2	3	4	5	6			
PD / modified PD	1	2	3	4	5	6			
Coughing / huffing	1	2	3	4	5	6			
Percussion	1	2	3	4	5	6			
Vibrations	1	2	3	4	5	6			
PEP therapy	1	2	3	4	5	6			
Hi-PEP therapy	1	2	3	4	5	6			
Flutter therapy / Acapella	1	2	3	4	5	6			
Autogenic drainage	1	2	3	4	5	6			
Inspiratory muscle training	1	2	3	4	5	6			
Exercise	1	2	3	4	5	6			
Non-invasive ventilation	1	2	3	4	5	6			
Other – please specify	1	2	3	4	5	6			

8.2 A terminally ill patient with CF, hospitalised.

	Your opinion about the relative value / usefulness of each airway clearance technique						Advice/opinion of other staff		
	No opinion Extremely valuable Very valuable Moderately valuable Somewhat valuable Not at all valuable						Best available evidence Past experience Patient preference		
ACBT	1	2	3	4	5	6			
PD / modified PD	1	2	3	4	5	6			
Coughing / huffing	1	2	3	4	5	6			
Percussion	1	2	3	4	5	6			
Vibrations	1	2	3	4	5	6			
PEP therapy	1	2	3	4	5	6			
Hi-PEP therapy	1	2	3	4	5	6			
Flutter therapy / Acapella	1	2	3	4	5	6			
Autogenic drainage	1	2	3	4	5	6			
Inspiratory muscle training	1	2	3	4	5	6			
Exercise	1	2	3	4	5	6			
Non-invasive ventilation	1	2	3	4	5	6			
Other – please specify	1	2	3	4	5	6			

8.3 A stable out-patient with CF, very active work and social life (including sport), adherent with treatment.

No opinion							Advice/opinion of other staff			
Extremely valuable										
Very valuable										
Moderately valuable										
Somewhat valuable							Best available evidence			
Not at all valuable							Past experience			
							Patient preference			
ACBT	1	2	3	4	5	6				
PD / modified PD	1	2	3	4	5	6				
Coughing / huffing	1	2	3	4	5	6				
Percussion	1	2	3	4	5	6				
Vibrations	1	2	3	4	5	6				
PEP therapy	1	2	3	4	5	6				
Hi-PEP therapy	1	2	3	4	5	6				
Flutter therapy / Acapella	1	2	3	4	5	6				
Autogenic drainage	1	2	3	4	5	6				
Inspiratory muscle training	1	2	3	4	5	6				
Exercise	1	2	3	4	5	6				
Non-invasive ventilation	1	2	3	4	5	6				
Other – please specify	1	2	3	4	5	6				

8.4 A reasonably stable out-patient with CF, somewhat restricted work and social life, adherent with treatment.

b.4 A reasonably stable out-patient with CP, somewhat restricted work and social life, adherent with treatment.							No opinion			
Extremely valuable							Advice/opinion of other staff			
Very valuable							Best available evidence			
Moderately valuable							Past experience			
Somewhat valuable							Patient preference			
Not at all valuable										
ACBT	1	2	3	4	5	6				
PD / modified PD	1	2	3	4	5	6				
Coughing / huffing	1	2	3	4	5	6				
Percussion	1	2	3	4	5	6				
Vibrations	1	2	3	4	5	6				
PEP therapy	1	2	3	4	5	6				
Hi-PEP therapy	1	2	3	4	5	6				
Flutter therapy / Acapella	1	2	3	4	5	6				
Autogenic drainage	1	2	3	4	5	6				
Inspiratory muscle training	1	2	3	4	5	6				
Exercise	1	2	3	4	5	6				
Non-invasive ventilation	1	2	3	4	5	6				
Other – please specify	1	2	3	4	5	6				

8.5 A reasonably stable out-patient with CF, somewhat restricted work and social life, non-adherent with treatment.

No opinion							Advice/opinion of other staff			
Extremely valuable										
Very valuable										
Moderately valuable										
Somewhat valuable							Best available evidence			
Not at all valuable							Past experience			
							Patient preference			
ACBT	1	2	3	4	5	6				
PD / modified PD	1	2	3	4	5	6				
Coughing / huffing	1	2	3	4	5	6				
Percussion	1	2	3	4	5	6				
Vibrations	1	2	3	4	5	6				
PEP therapy	1	2	3	4	5	6				
Hi-PEP therapy	1	2	3	4	5	6				
Flutter therapy / Acapella	1	2	3	4	5	6				
Autogenic drainage	1	2	3	4	5	6				
Inspiratory muscle training	1	2	3	4	5	6				
Exercise	1	2	3	4	5	6				
Non-invasive ventilation	1	2	3	4	5	6				
Other – please specify	1	2	3	4	5	6				

Exercise regimens

9. Do you have an exercise modality YOU prefer and recommend to patients with CF?

No

Yes – please specify. On what is this preference based?

Overall physiotherapy practice

10. Please give YOUR opinion re how important the following factors are in influencing YOUR overall physiotherapy practice with respect to patients with CF.

	No opinion					
	Extremely important					
	Very important					
	Moderately important					
	Somewhat important					
	Not at all important					
	1	2	3	4	5	6
Clinical experience	1	2	3	4	5	6
Best available evidence	1	2	3	4	5	6
Patient preference	1	2	3	4	5	6
Medical staff preferences	1	2	3	4	5	6
Advice/opinion of other staff	1	2	3	4	5	6
Resource / financial considerations re patient equipment	1	2	3	4	5	6
Resource / financial considerations re staffing	1	2	3	4	5	6
Established practice	1	2	3	4	5	6
Staffing numbers / caseload	1	2	3	4	5	6
Availability of help from a caregiver	1	2	3	4	5	6
Other – please specify	1	2	3	4	5	6

11. Please give YOUR opinion re the relative importance YOU place on these additional roles / responsibilities that physiotherapists may fulfill for patients with CF.

	Have no opinion					
	Extremely important					
	Very important					
	Moderately important					
	Somewhat important					
	Not at all important					
	1	2	3	4	5	6
Identifying 'red flags'	1	2	3	4	5	6
Counselling	1	2	3	4	5	6
Acting as patient's advocate with other members of CF team	1	2	3	4	5	6
Provision of holistic care	1	2	3	4	5	6
Awareness of role of all members of CF team	1	2	3	4	5	6
Awareness of infection control issues	1	2	3	4	5	6
Awareness of issues such as transition from paediatric to adult unit, pregnancy and transplant	1	2	3	4	5	6
Other – please specify	1	2	3	4	5	6

12. As you know, adherence to physiotherapy treatment can be difficult for many patients with CF. In the panels on the left, please give YOUR opinion about the **relative value / usefulness** of each of the options that may be used to improve adherence. Then, in the panels on the right, indicate what this opinion is primarily based on by ticking one box.

	No opinion									
	Extremely valuable						Advice/opinion of other staff			
	Very valuable						Best available evidence			
	Moderately valuable						Past experience			
	Somewhat valuable						Patient preference			
	Not at all valuable									
	1	2	3	4	5	6				
Patient education re aims of Rx	1	2	3	4	5	6				
Goal setting with patient	1	2	3	4	5	6				
Adequate explanation re how to do Rx	1	2	3	4	5	6				
Willingness of both physiotherapist and patient to compromise	1	2	3	4	5	6				
Provision of Rx supervision	1	2	3	4	5	6				
Awareness of patient's time constraints	1	2	3	4	5	6				
Sufficient time for physiotherapist to educate, supervise and evaluate Rx	1	2	3	4	5	6				
Other – please specify	1	2	3	4	5	6				

SECTION 3: OUTCOMES

13. In this section we are seeking information about YOUR expertise and opinions regarding the outcomes that YOU use to assess the effectiveness of YOUR treatment for patients with CF. In the panels on the left, please give YOUR opinion about the relative value / usefulness of each outcome listed. Then, in the panels on the right, indicate what this opinion is primarily based on by ticking one box.

	Not at all valuable	Somewhat valuable	Moderately valuable	Very valuable	Extremely valuable	No opinion					
								Advice/opinion of other staff			
								Best available evidence			
								Past experience			
								Patient preference			
Subjective response	1	2	3	4	5	6					
Auscultation	1	2	3	4	5	6					
SpO ₂	1	2	3	4	5	6					
Sputum colour / volume	1	2	3	4	5	6					
Pulmonary function tests	1	2	3	4	5	6					
Exercise tests	1	2	3	4	5	6					
Questionnaires (eg CRDQ, SF-36)	1	2	3	4	5	6					
Other – please specify	1	2	3	4	5	6					

SECTION 4: BACKGROUND INFORMATION

This information will provide us with demographic data relating to you personally and your CF Unit. Although some data may seem irrelevant (eg age, sex) we need this information to be able to describe our study sample.

CF Unit

14. How many CF patients attend your Unit?

15. Is your CF Unit comprised of:

- Adult patients only
- Adult and paediatric patients

Personal details

16. Please tell us your age:

- 21-30 years
- 31-40 years
- 41-50 years
- 51-60 years
- > 60 years

20. Does the management of patients with CF form a major part of your job description?

- No
- Yes

17. Are you:

- Female
- Male

21. Please indicate if you are a:

- Senior physiotherapist
- Basegrade physiotherapist

18. Do you have any post-graduate qualifications?

- No
- Yes – please specify.

22. On what basis do you work with CF patients?

- Permanent
- Semi-permanent
- Rotational – please specify length of rotation.

19. How many years of physiotherapy experience with CF patients do you have?

Thank you for your participation in this survey

Survey of CF physiotherapists' opinions and expertise 2007