ACPRC

Journal of the Association of Chartered Physiotherapists in Respiratory Care

VOLUME 36 2003/04

VOLUME 36 2003/04

CONTENTS

Journal of the Association of Chartered Physiotherapists in Respiratory Care

INSTRUCTIONS TO AUTHORS

Articles should normally be no longer than 2000 words (editorials 1000). They should be submitted on 3.5" disk saved as a Microsoft Word document and accompanied by one hard copy to:

Clive Liles
Lecturer
School of Health Sciences
Physiotherapy
University of Birmingham
Edgbaston
Birmingham
B15 2TT

Articles may take the form of review papers, research reports, case reports, editorials and conference reports.

TITLE PAGE *(All submissions)*
The title page should carry:
Title of the article.
The names of the authors (with initials or christian names, whichever is preferred).
Institutional affiliation of each author.
Full details of each author's current appointment.
Name, address and contact telephone number of the author responsible for correspondence.

Summary *(Not for editorials or conference reports)*
This is typeset in bold at the beginning of the article and should be between 50 and 60 words in length. It is designed to develop the readers' interest in the article and tell them something about the way the review is handled.

Main introduction
The main introduction should state the main question that the paper sets out to answer.

Headings
Please use plenty of headings. Indicate clearly the 'importance' you attach to each one.

Conclusions
Your conclusions should be succinct and logically ordered. Identify gaps in present knowledge and suggest future initiatives.

Key points (Excepting conference reports)
Please supply 5-8 key phrases that summarise the major themes of your article. These will appear at the end of the article. An example is shown below.

TABLES AND ILLUSTRATIONS
Tables and illustrations are a help to readers. It is the author's responsibility to ensure that permission is received from the copyright holder for the reproduction of figures and tables before submission.

Illustrations
Each figure should have a label posted on its back indicating the number of the figures, author's name and top of the figure. Do not write on the back of figures or scratch or mark them by using paper clips.
If a figure has been published

previously, acknowledge the original source and submit written permission from the copyright holder to reproduce the material.
Figures should be numbered consecutively in order of their first citation in the text.

Tables

Hard copy to accompany tables submitted on disk.
Place references and explanatory matter in footnotes, not in the heading.
Explain in footnotes all abbreviations that are used in each table.
If you use data from author published or unpublished source, obtain permission and acknowledge fully.
Number tables consecutively in order of their first citation.
Ensure that each table is cited in the text.

CONCLUSIONS

The conclusions should be succinct and logically ordered summaries of data you have presented. Identify gaps in present knowledge and suggest future initiatives.

REFERENCES

In the text

Use the name and year (Harvard) system for references in the text:
As Black and White (1987) have shown…
As already reported (Black and White, 1987)…
For three or more authors print the first author's name followed by et al:
e.g. As Black et al (1987) have shown…
When several references are cited simultaneously, the order should be chronological.
The total number of references should not exceed 20.

In the reference list

Arrange references alphabetically by first author's name.
Print the names and initials of all authors for references with six or less authors; for seven or more authors print the first three and add 'et al'. As all references with three or more authors and the first same author will be cited in the text as 'et al', those references are arranged chronologically:
Black B (1987)…
Black B (1988)…
Black B, Green G (1965)…
Black B, White W (1963)…
Black B, White W, Green G, Brown B, Tan T (1973)…
Black B, Green G, Tan T (1974)…
Black B, Abel C, Tan T (1975)…
These references are in chronological order as they are all cited as Black et al in the text.
The sequence for a journal article is: author(s); year; title; journal; volume; first and last page numbers. The layout and punctuation are:
Smith B, Abel CH (1987) Sexual hypersensitivity. Br J Hosp Med 33: 40-6
The sequence, layout and punctuation for books are:

Personal author

Ellis H (1980) Lecture Notes on Psychiatry. 5th edn. Blackwell, Oxford

Editor

Scott H, Brown B, eds (1973) Histocompatability Testing. Vol 5. Raven Press, New York: 418-19

Chapter in Book

Samuels B (1979) Pulmonary complications of AIDS. In: Rand A, Long B, eds. Management of AIDS. Butterworths, London: 387-95
Papers that have been submitted for publication but not yet accepted are not acceptable as references. They should be cited in the text as 'unpublished observations' (XY Smith, unpublished observations, with or without a date). Similarly, 'personal communication' should be inserted in the text in a parenthesis.
Papers that have been accepted for publication but not yet published may be included in the reference list:
Abel HL (1988) Endometriosis. Br J Hosp Med (in press)

Abbreviations and units

Abbreviations should be defined at their first mention. SI units should always be used.

Introduction

On behalf of the publications sub group, it gives me great pleasure to thank all contributors to the Journal of the Association of Chartered Physiotherapists in Respiratory Care 2003. This time last year, I commented on the importance of individuals placing their activity and work within the public domain, largely so our initiatives can influence and change practice. This often reflects a response to both internal and external challenges that face us day by day and, in that, I imagine our professional capacity is in some measure judged by our ability to respond in this manner. What remains particularly significant for this edition is the contribution made by the authors across a widening spectrum. You will note that we include items from students, along with work from established practitioners. We will take a moment to thank the institutes in Higher Education who have encouraged and motivated their learners to consider presenting within the professional arena. Clearly, the future of our practice remains rooted in professional activity carrying the hallmark of both quality and effectiveness; if it becomes established during training and education then it can only serve our future professional development and growth.

Once again we hope you find the Journal both interesting and useful and would be glad to hear your comments and views.

Yours sincerely

Clive Liles
Journal Editor

Editor
CLIVE LILES
Lecturer
School of Health Sciences Physiotherapy
University of Birmingham
Edgbaston
Birmingham
B15 2TT
Tel: 0121 415 8606
Email: c.r.liles@bham.ac.uk

Design and layout
STEVENS DESIGN ASSOCIATES,
London
Tel: 020 8675 0255
www.stevens-design.com

Printing
SNOWDONIA PRESS

Information Consent and Intensive Care

Mr Andrew P Andrews
MA FHRIM

Director of the Medico Legal Group at Bond Solon Training and Health Services Legal Advisor.

In today's NHS, with its emphasis on the client's right to autonomy, self-determination and working in partnership with health professionals, the concept of consent becomes the cornerstone underpinning these principles. In order to reach a decision on future care, support and treatment, the client needs sufficient information to form a balanced view. The law requires the client to give effective or valid consent, the chartered society, on the other hand, requires its practitioners to obtain information consent. This article discusses some of the consequences that inevitably flow from this policy.

The legal position

In English law the requirement is for the patient to understand the nature, purpose and likely outcome of the proposed treatment or therapeutic intervention. American law has its own concept of information consent which in effect means that the patient must be advised of all possible outcomes, no matter how unlikely or how remote. The requirements of the legal duty to inform patients have been significantly developed in case law during the last decade. The courts have been persuaded that such an approach can be counter-productive and raise unnecessary fears. The current advice from the Department of Health in its 'Reference Guide to Consent for Examination of Treatment' (DOH, 2001) states at paragraph 5.3

In considering what information to provide, the health professional should try to ensure that the patient is able to make a balanced judgement on whether to give or withhold consent. Case law on this issue is evolving. It is therefore advisable to inform the patient of any "material" or "significant" risk in the proposed treatment, any alternatives to it, and the risks incurred by doing nothing. A recent Court of Appeal judgement stated that it will normally be the responsibility of the doctor to inform a patient of "a significant risk which would affect the judgement of reasonable patient"

English law provided the base-line and therefore sets a minimum standard. It is always open to regulatory bodies or health providers to set a higher standard for practitioners. Regardless of the standard to which practitioners are working, if the patient asks specific questions about the proposed treatment and associated risk, these must be answered truthfully. Correct use of terminology is important. If a decision is made that the standard to be applied is to be informed consent, then those requirements must be met in full, for example: local research and ethics committees invariably impose this requirement on researchers who seeks to enrol patients in

clinical trials. In the context of the therapeutic interventions, that rigorous approach may not be appropriate. However, if a regulatory body sets such a standard, the professional has no discretion to depart from that requirement, unless in the very rare and exceptional case that the health professional believes that to do so would have a deleterious effect upon the patient's health. This view and the reasons for it will need to be recorded in the patient's notes.

Magnitude of risk:

At its heart, consent is simply an agreement reached between client and practitioner. To enable the client to reach a balanced decision, the risk and benefits of what is proposed will need to be explained alongside the risks and benefits of non-intervention. The client is only in a position to do that if there is understanding of the magnitude of risk. Magnitude comprises two elements: first, the likelihood or probability of the adverse event and secondly, the impact of such an event on the individual. In respect of the first requirement a useful approach can be to say 'most clients experience', 'some have found that' and 'in a few cases' etc. Such a construction should be aimed at ensuring that the client can relate in a meaningful way to the likelihood of the accounts. While as a general rule patients should be told of likely outcomes if there is the possibility of a devastating impact that will need to be shared in appropriate terms linked to its likelihood, even though it may fall well below the balance of probabilities.

Working in partnership:

Fundamental to the concept of consent is that it should be freely and voluntarily given. Although the ethos is one of working in partnerships, the relationship between the parties is not that of equals. Patients are often anxious and apprehensive and see health professionals as authority figures. In the environment of intensive care there is often the added dimension of urgency. When patients subsequently claim that consent was not given, one of the issues the court will need to address is whether, in the specific circumstances, the agreement to proceed constituted consent or was no more than submission. In an emergency, where it is necessary to act immediately to preserve life or limb, no consent is required. Practitioners are protected in this situation by the common law defence of necessity. At the other extreme, for routine and planned procedures, sufficient time can be made available for the patient to reflect and reach a balanced view. The real difficulty for practitioners occurs in those situations where, while not an emergency, do have a pressing urgency. It is here that practitioners in intensive care may find themselves vulnerable. For those working to the standard of valid or effective consent, the risk should be manageable. However, for those purporting to obtain information consent, that task will be extremely difficult if not impossible.

Address for correspondence
Mr Peter Whyte
Bond Solon Training
13 Britton Street,
London, EC1M 5SX
Tel: 020 7553 3303
Fax: 020 7253 7051
Email: pwhyte@bondsolon.com

Manual Hyperinflation:

A survey investigating the use of current best evidence

Nicola Davies BSc (Hons). MCSP

Junior Physiotherapist
University Hospital of Wales
Heath Park
Cardiff
CF14 4XW

Simon Igo MSc, BSc (Hons), PGCert, MCSP.

Senior Lecturer Coventry University
School of Health and Social Sciences
Charles Ward Building
Coventry University
CVI 5FB
Tel: 02476 88196
Email: s.igo@coventry.ac.uk

Summary

Manual Hyperinflation (MH) is a common technique used by physiotherapists on intensive care units. This study used a non-experimental survey design to explore the use of evidence and guidelines to support the practice of MH and investigate MH technique. Despite the many sources of evidence used physiotherapists were in agreement as to what constitutes good MH practice.

Key Words
Manual Hyperinflation,
Evidence Based-Practice

INTRODUCTION AND LITERATURE REVIEW

Manual hyperinflation (MH) commonly known as "Bagging" is a technique that inflates a patient's lungs with a volume that is greater than their ventilated tidal volume using a manual resuscitator bag in an attempt to improve respiratory function (Rusterholz & Ellis, 1998). It has many applications, but is primarily used to assist the removal of secretions and re-expand areas of atelectasis (Denehy, 1999).

King and Morrell (1992) surveyed one hundred and seventy six hospitals in the United Kingdom and state that manual hyperinflation is an accepted and widely used form of intensive respiratory care treatment. However, they conclude that little objective data on the effects of this technique exists and there are no recognised or standardised guidelines for its application. There have been no further studies investigating the practice of MH since this study.

There have been many organisational changes within the health service driven by Government white papers such as, "A First Class Service" (DoH, 1998) and "The New NHS, Modern, Dependable" (DoH, 1997). Clinical Governance is a framework that is designed to safeguard high standards of care and enhances quality within the NHS (Roland & Baker, 1999). Integral components of Clinical Governance include evidence based practice and continuing professional development (DoH, 1998).

Robson (1998) states that MH, like all other patient treatments should be closely scrutinised to ascertain if it is evidence-based. That is, the conscientious, explicit and judicious use of current best evidence and clinical expertise in making decisions about the care of individual patients (adapted from Sackett et al 1996). No study to date has investigated what form of evidence physiotherapists use to inform the practice of MH.

Although research is limited in the area of MH, studies relating to technique, application and safe practice are available. For example, Gaskell and Webber (1973) and King and Morrell (1992) describe the technique of MH. In King and Morrell's (1992) study, their respondents agreed that the technique was characterised by three features:

1) A slow, deep inspiration.
2) An inspiratory hold to improve collateral ventilation.
3) Quick release of the MH bag to stimulate a cough.

Other authors describe techniques to reduce the dangers associated with MH such as barotrauma. Spears et al (1991) tested four different clinicians to determine whether the tension

and feel of the inflation bag was an effective form of feedback for MH. They concluded that the commonly held belief that the 'educated hand' permits clinicians to detect changes in pulmonary compliance is incorrect. Rusterholtz & Ellis (1998) corroborate Spears et al's (1991) work, focused their study on physiotherapists, and investigated factors affecting the safe and effective performance of MH. Experienced and student physiotherapists were requested to deliver MH with variations in lung compliance to an artificial lung system. They showed that the value of the feel of the bag does not appear to improve with experience.

The literature appears to agree that the 'feel of the bag' is not a sufficient indicator of the volumes being delivered to a patient's lung. A pressure manometer (P.M.) is a device that allows the deliverer to accurately monitor the airway pressure (Rusterholtz & Ellis, 1998). Clapham et al (1995) found that when a pressure manometer is used in the circuit there is a decrease in the mean positive airways pressure (PAP). They stated that the subjects (i.e. the staff on the ICU) were able to use the manometer as a visual feedback tool. Although authors disagree about the level of the safe upper limit, generally the higher the level of PAP the greater the probability that barotrauma will occur. Whilst the majority of physiotherapists claim that high levels of PAP are a contraindication for MH only 10% use a P.M. in the inflation circuit (King & Morrell, 1992).

As a student, the author was involved in departmental training on MH and observed many discrepancies relating to the application and understanding of MH. Thus, in light of the importance of working within a Clinical Governance framework and developing an EBP approach to patient care, this study aims to:

1) Partially repeat the work of King and Morrell (1992) to see if a standardised technique is now commonplace and to investigate if guidelines have been developed to inform practice.
2) Investigate what evidence clinicians are using to inform the practice of MH.

METHODS

A non-experimental survey approach was implemented using a postal questionnaire (Sim & Wright, 2000), to collect descriptive data from a widespread sample.

A list of 237 hospitals with an ICU was obtained from the Intensive Care Society (2000) using a systematic random sampling approach, every 4th hospital was selected and questionnaires were sent to each department (Bowling, 2000). Previous studies gained their information from senior physiotherapists (Hodgson et al, 1999; Jones et al, 1992; King & Morrell, 1992). However, in clinical practice a range of qualified staff and students use the technique. Irrespective of grade, physiotherapists working on an intensive care unit were invited to participate in the study.

Previous studies (Jones et al, 1992; King & Morrell, 1992) surveyed large geographical areas using postal questionnaires; thus, this study adopted the same approach and was deemed more appropriate than a telephone survey (Oppenheim, 1992). Pre-paid envelopes were included, all envelopes were hand written and black ink on yellow paper was used for each questionnaire to improve response rate (Chesson, 1993).

Each hospital was sent a questionnaire with a cover letter; a deadline of return was given. Those surveys not returned by this deadline were sent a repeat survey and cover letter; this method has been shown to increase the response rate (French et al, 2001).

Ethical Considerations

Ethical approval from 'Coventry University School of Health and Social Sciences Research Ethics Committee' was granted. The covering letter accompanying the questionnaire explained that the subject was under no obligation to complete the survey and should they return the blank survey, they would not receive further correspondence. Anonymity was assured throughout with the use of reference codes.

Questionnaire Design (Appendix I)

The first part of the questionnaire was designed to obtain demographic information from the elements in the sample. The second part of the questionnaire was designed to establish what equipment the respondents used for manual hyperinflation including the types of circuit and the use of pressure manometers. The third part of the questionnaire investigated MH technique and included a section on indications and contraindications. The fourth part explored the type of evidence and guidelines used and investigated the type of training received.

The questionnaire used a closed question format with open questions to allow respondents to elaborate on specific answers.

Pilot Study

A Pilot Study involving five members of staff at Coventry University was undertaken in order to improve the questionnaire and adjust any questions as necessary. All reviewers in the pilot study had a clinical background of

respiratory physiotherapy and experience in intensive care units. Content validity was assessed and adjustments were made to the final questionnaire.

Data Analysis

Descriptive statistics, using Microsoft Excel 2000, were used to summarise the raw data and help identify trends and relationships within the data.

RESULTS

70 questionnaires were distributed to respiratory physiotherapists working in intensive care units nation-wide. 61 were returned, giving a response rate of 87.1%. Nine of these hospitals had been sent a reminder letter after the deadline of the first questionnaire. Demographic data are summarised below:

A Summary of Demographic Data

TABLE 1.GRADE OF RESPONDENTS

GRADE	Freq	%
Junior	0	0
Senior II	9	14.8
Senior I	33	54.1
Superintendent	18	29.5
Other	1	1.6
Total	61	100.0

TABLE 2. Type of Intensive Care Unit Surveyed

TYPE OF ICU	Freq	%
General	54	88.5
Specialised	6	9.8
Both	1	1.6
Total	61	99.9

All of the 61 respondents (100%) stated that they used manual hyperinflation as part of their physiotherapy practice. 42 (68.9%) of respondents stated that they used a specific technique when delivering MH. Those 19 (31.1%) who did not use a specific technique, stated that their technique varied depending on "assessment of a patient's need", the "specific aims of hyperinflation", "lung compliance" and "experience, observation and feel". 23 (37.7%) of the respondents used the slow inspiration, inspiratory hold & quick release (stimulate cough) method.

The respondents were asked what they perceived as the indications and contraindications for MH, a summary of results is shown in table 3.

TABLE 3. Agreement amongst the respondents for:
i) Indications for MH ii) Dangers/contraindications for MH

Condition	Indications for MH (%)	Dangers/ contraindications for MH(%)
Assessment of lung compliance	32 (52.5%)	
Removal of excess bronchial secretions	57 (93.4%)	
Resolve atelectasis	47 (77.0%)	
Resolve consolidation	18 (29.5%)	
Improve ventilation	41 (67.2%)	
Improve lung compliance	14 (23.0%)	
Respiratory muscle re-education	10 (16.4%)	
Changing ventilator	33 (54.1%)	
Entonox treatment	1 (1.6%)	
Barotrauma		56 (91.8%)
Hypoxia		30 (49.2%)
Cardiovascular instability		60 (98.4%)
Depression of respiratory drive		36 (59.0%)
High peak airways pressure		50 (82.0%)
Bronchospasm		54 (88.5%)
High level of PEEP		51 (83.6%)
Undrained Pneumothorax		60 (98.4%)
Raised ICP		59(96.7%)
ARDS		33 (54.1%)

93.4 % of respondents reported that removal of excess bronchial secretions was the main indication for MH. There was strong agreement concerning dangers and contraindications; for example, un-drained pneumothorax (98.4%) and cardiovascular instability (98.4%) were viewed as the main contra indications.

Respondents were also asked which sources of evidence were used to help inform practice, results are summarised in Figure 1.

The literature review identified that monitoring airway pressure was important to prevent barotrauma. Respondents were asked if a pressure manometer (PM) or positive expiratory end pressure (PEEP) valve was used in the circuit. The results are shown in Figure 2.
15 (24.6%) respondents used a pressure manometer in the MH circuit to monitor pressures. 46 (76.4%) did not use a pressure manometer but 33 of these respondents identified other methods to assess patients prior to the application of MH. 22 (36.1%) of the respondents used PEEP valves in the MH circuit.

Respondents were also asked if guidelines or protocols were available to support the practice of MH, the results are shown in Figure 3.

FIGURE1: Evidence used by physiotherapists to support the practice of MH.
RCT = Randomised Control Trials, S.Reviews = Systematic Reviews

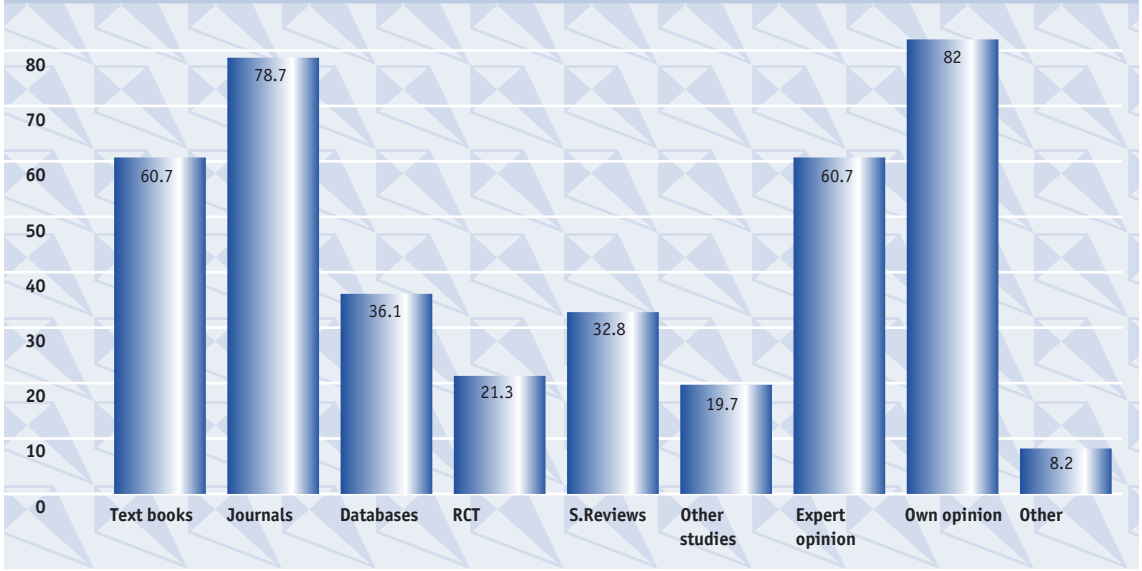
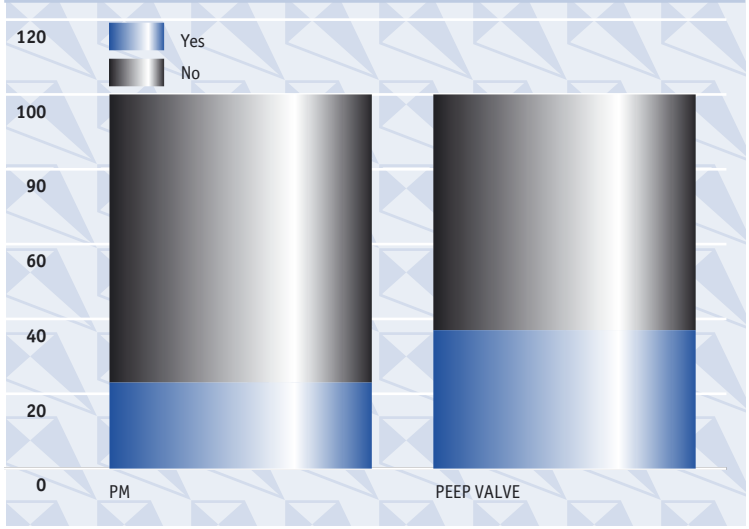


Figure 2: Physiotherapists use of a Pressure Manometer (P.M.) and PEEP Valve in bagging circuits

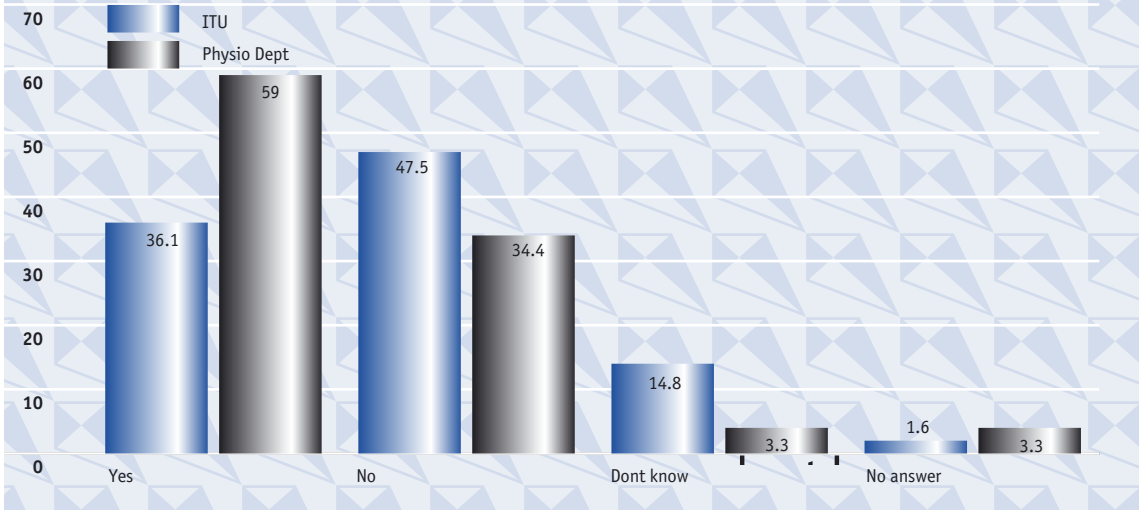


DISCUSSION

Best evidence is described as scientific evidence derived from research (Bury & Mead, 1998) and has a hierarchical structure. Moore et al (1995) states that strong evidence from at least one systematic review of multiple well-designed randomised controlled trials is the highest form of evidence and opinions of respected authorities, based on clinical evidence, descriptive studies or reports from expert committees are the lowest form.

The respondents used a wide variety of sources to

Figure3: Availability of guidelines for the practice of MH on the ICU and in the Physiotherapy Department



support the practice of manual hyperinflation. 13 (21.3%) of the sample used systematic reviews, the highest ranked form of evidence, whilst 50 (82%) used own opinion and 37 (60.7%) used expert opinion as their primary source. Use of Journals, 48 (78.7%) respondents, and textbooks, 37 (60.7%) respondents, were also rated highly. Despite the variety of sources of evidence used the respondents were in strong agreement as to what constitutes accepted and safe practice. For example, 42 (68.9%) used a specific technique akin to that described by King and Morrell (1992); also Table 3 shows that removal of excess bronchial secretions (93.4%), resolution of atelectasis (77.0%) and improvement of ventilation (67.2%) were the key indications for MH. Cardiovascular instability and barotrauma were key dangers and contraindications. This data supports King and Morrell (1992) and Jones et al's (1992) findings and supports the fact that physiotherapists are practicing MH in accordance with current literature and "best evidence".

Although there was strong agreement for the application of MH, these results show some interesting findings. Expert and own opinion rated highly on the type of evidence used to inform practice, only 13 (21.3%) used RCT's and 20 (32.8%) used systematic reviews, the highest form of evidence in Moore's (1995) hierarchy. This finding reflects the need for more clinically based studies to inform the process of MH although 48 (78.7%) of respondents state that journals were an important source of information. However, the author found few RCT's when conducting a literature search for this study and one systematic review.

Current evidence supports the use of a pressure manometer to contain MH pressures within a known range in an attempt to prevent barotrauma (Clapham et al, 1995; Rusterholz & Ellis, 1998). In this study, 15 (24.6%) of respondents incorporated one into the bagging circuit (double that of King and Morrels (1992) study) despite the fact that 56 (91.8%) of the respondents recognised that barotrauma was a danger to MH (Table 3). The limited use of pressure manometers may predispose patients to barotrauma; however, McCarren & Chow (1996) state that there is no documented evidence of barotrauma or volumtrauma occurring with MH in the clinical setting. This raises an interesting point, is barotrauma a real risk to patients receiving MH, if so is the use of a pressure manometer necessary? Despite evidence to the contrary (Clapham et al, 1995; Rusterholz & Ellis, 1998) physiotherapists may be able to detect lung changes and modify technique to reduce the danger of barotrauma. Interestingly 19, (31.1%) who did not use a specific MH technique, stated that their technique varied depending on "assessment of a patient's need", and "experience, observation and feel", this approach to the application of MH could be an important factor that prevents barotrauma. To support this point it is worthy to note that Rusterholz & Ellis's (1998) study used a small sample size, 8 subjects in each experimental condition. A small sample size reduces the external validity as larger subject numbers allows for higher statistical significance (Sim & Wright, 2000). Thus, further investigations are required to determine the exact nature of the risk of barotrauma.

A key step in the process of EBP is to develop guidelines that help to inform practice Sackett et al (1996) and forms an integral component within the clinical governance framework. This study shows evidence that progress has been made towards the development of guidelines. 22 (36.1 %) and 36 (59%) of the respondents, respectively, stated that MH guidelines have been developed or available on intensive care units or within physiotherapy departments. This is in contrast to King and Morrell's (1992) study in that there were few recognised or standardised guidelines for the application of MH. The process of clinical governance and the development towards and evidence-based culture may be a factor that has driven this development.

CONCLUSION

This study successfully collected data from a sample of physiotherapists working in intensive care, and established that a variety of sources of evidence are used to inform the practice and application of MH. Although the use of "own opinion" and journals are used widely to inform practice, RCT's and systematic reviews are being incorporated despite the lack of availability of such studies. This study shows that there has been progress towards the development of local guidelines compared with that of previous studies. The introduction of Clinical Governance and the necessity for an evidence based practice approach towards patient care may have influenced this development. This study also identifies that despite the many sources of evidence used there seems to be agreement as to what constitutes good MH practice.

Appendix 1

- Questionnaire Design – Final Questionnaire

Research Question: The Practice of Manual Hyperinflation (MH) by Respiratory Physiotherapists.

Please tick the response(s) that best describes you and your current practice.

Database: Please specify your grade *(Tick Box)*

Junior ☐
Senior II ☐
Senior I ☐
Superintendent ☐
Other ☐ Please state .....

Clinical Experience on the Intensive Care Unit *(Please specify to the nearest year)*

.....

1) What type of Intensive Care Unit do you work on? *(Please Tick)*

General ICU ☐
Specialised ICU ☐ Please specify.....

2) Is Manual Hyperinflation used as part of your Physiotherapy practice on the Intensive Care Unit? *(Please Tick)*

Yes ☐
No ☐

3) Who decides if a patient on the Intensive Care Unit requires Manual Hyperinflation as a treatment? *(Please Tick)*

Anaesthetist ☐
Nurse ☐
Physiotherapist ☐
Other ☐ Please state .....

4) What Bagging circuit is used on your unit? *(Please Tick)*

Water Circuits ☐
Mapleson C-circuit ☐
Macgill ☐
Laerdal self inflating resuscitator ☐
Hope ☐
Ambu ☐
Other ☐ Please state .....

Please state why this specific circuit is used.....

.....

5) Do you use Disposable or Reusable (sterilised) Bags?

Disposable ☐
Reusable ☐

If Reusable is the bag sterilised in-between patients?

Yes ☐
No ☐
Don't know ☐

6) Is a Pressure Manometer used in your circuit? (Please Tick)

Yes ☐
No ☐

If No, please state how you monitor your bagging technique.....

.....

.....

.....

7) Is a **PEEP** (Positive End Expiratory Pressure) valve used in the circuit? (Please Tick)

Yes ☐
No ☐

If Yes, please state which conditions you feel benefit from the PEEP valve

.....

.....

.....

8) Is there a specific Technique that you use when Manual Hyperinflating? (Please Tick)

Yes ☐

If Yes, Please give a brief description .....

.....

.....

No ☐

If No, Please state what determines your technique .....

.....

.....

9) What would you document following your treatment session when using Manual Hyperinflation? (Please tick as applicable)

SaO_2 levels ☐
Blood pressure ☐
Heart rate ☐
Sputum production ☐
Purpose of treatment ☐
Bagging technique ☐
Other ☐ Please describe anything else that you would document .....

.....

.....

10) What do you perceive as indications for MH? (Please tick as applicable)

Assessment of lung compliance ☐
Removal of excess secretions ☐
To resolve atelectasis ☐
Resolving consolidation ☐
To improve ventilation ☐
Improve lung compliance ☐
Respiratory muscle re-education ☐
Changing the ventilator ☐
Entonox treatment ☐

Please state any other indications that have not been listed above .....

.....

.....

.....

11) What do you perceive as dangers or contraindications to MH? (Please tick as applicable)

Barotrauma ☐
Hypoxia ☐
Cardiovascular instability ☐
Depression of respiratory drive ☐
High peak airways pressure ☐
Bronchospasm ☐
High level of PEEP ☐
Undrained pneumothorax ☐
Raised ICP ☐
Adult respiratory distress syndrome ☐

Do you see all of the above as strict contraindications? If **No** please state why

.....

.....

.....

.....

.....

12) Have you received any of the following formal training in Manual Hyperinflation? (Please tick as applicable)

Undergraduate Level: Theoretical ☐
Clinical Placement ☐
Post-Graduate Level: Course ☐ (Please specify).....

.....

Other ☐ (Please specify).....

.....

13) Have you received any informal training on Manual Hyperinflation? (Please tick as applicable)

In-service training ☐
Practice based learning ☐ Please describe .....

.....

14) Are you aware of any National guidelines for the practice of Manual Hyperinflation? (Please Tick)

Yes ☐
No ☐

If Yes, please state which guidelines you are aware of .....

.....

.....

.....

15) Are you aware of any Trust guidelines for the practice of Manual Hyperinflation? (Please Tick)

Yes ☐
No ☐

If Yes, please give brief details about these .....

.....

16) Is there a set Protocol or Guidelines available on the Intensive Care Unit for the practice of Manual Hyperinflation? (Please Tick)

Yes ☐
No ☐
Don't Know ☐

If Yes, please give brief details about these ……

……

……

17) Are they Guidelines available from your Physiotherapy Department about the practice of Manual Hyperinflation?

Yes ☐
No ☐
Don't Know ☐

If Yes, please give brief details about these ……

……

……

18) Which forms of evidence do you use to support your practice of Manual Hyperinflation? (Please tick any boxes that are applicable)

Text-books ☐
Journals ☐
Databases *(eg, Medline, Cinahl)* ☐
Randomised control trials ☐
Systematic reviews ☐
Other experimental studies ☐
Expert opinion ☐
Own opinion *(Personal Knowledge)* ☐
Other ☐ Please state……

Please make any additional comments that you have about the questionnaire

……

……

……

……

Thank you for taking the time to complete the questionnaire – the information that you provide will remain strictly confidential and anonymous.

REFERENCES

BOWLING A (2000)
Research Methods in Health: Investigating Health and Health Services. 1st Ed. Open University Press. Buckingham

BURY T & MEAD J (1998)
Evidence Based Healthcare – A Practical Guide for Therapists. Butterworth Heinemann, Oxford

CHESSON R (1993)
How to Design a questionnaire – a ten stage strategy. Physiotherapy, 79 (10) 711-713

CLAPHAM L, HARRISON J & RAYBOULD T (1995)
A Multidisciplinary audit of Manual Hyperinflation technique (sigh breath) in a neurosurgical Intensive Care Unit. Intensive and Critical Care Nursing, 11, 265-271

DENEHY L (1999)
The Use of Manual Hyperinflation in airways clearance. European Respiratory Journal, 14, 958-965

DEPARTMENT OF HEALTH (1997)
The New NHS: Modern. Dependable. HMSO, London

DEPARTMENT OF HEALTH (1998)
A First Class Service. HMSO London

FRENCH S, REYNOLDS F & SWAIN J (2001)
Practical Research: A Guide for Therapists (2nd Ed). Butterworth Heinemann, Oxford

GASKELL DV & WEBBER BA (1973)
The Brompton Hospital Guide to Chest Physiotherapy. Blackwell Scientific Publishers, Oxford

HODGSON C, CARROLL S & DENEHY L (1999)
A Survey of Manual Hyperinflation in Australian Hospitals. Australian Journal of Physiotherapy, 45, 185-193

INTENSIVE CARE SOCIETY (2000)
CMA Medical Data: NHS Hospitals and Units: Intensive Care Units

JONES AYM, HUTCHISON RC & OH TE (1992)
Chest Physiotherapy practice in Intensive Care Units in Australia, the United Kingdom and Hong Kong. Physiotherapy Theory and Practice, 8, 39-47

KING D & MORRELL A (1992)
A Survey on Manual Hyperinflation as a Physiotherapy technique in Intensive Care Units. Physiotherapy, 78 (10), 747-750

MCCARREN B & CHOW CM (1996)
Manual Hyperinflation: A description of the technique. Australian Journal of Physiotherapy, 42 (3), 203-208

MOORE A, MCQUAY H & GRAY JAM (EDS) (1995)
Evidence Based Everything. Bandolier 1 (12),1

OPPENHEIM AN (1992)
Questionnaire Design, Interviewing and Attitude measurements. Printer Publishers, London

ROBSON WP (1998)
To bag or not to bag? Manual hyperinflation in intensive care. Intensive and Critical Care Nursing,14, 239-243

ROLAND M & BAKER R (1999)
Clinical Governance – a Practical Guide for primary care teams. University of Manchester Publishers

RUSTERHOLTZ B & ELLIS E (1998)
The effect of lung compliance and experience on Manual Hyperinflation. Australian Journal of Physiotherapy, 44 (1), 23-28

SACKETT DL (1996)
Evidence Based Medicine: What it is and what it isn't. British Medical Journal, 312, 71-73

SIM J & WRIGHT C (2000)
Research in Health Care: concepts, design and methods. Stanley Thornes, Cheltenham

SPEARS RS, YEH A, FISHER DM & ZWASS MS (1991)
The "educated hand". Anesthiology, 75, 693-696

Address for correspondence
Simon Igo MSc, BSc (Hons), PGCert, MCSP.
Senior Lecturer Coventry University
School of Health and Social Sciences
Charles Ward Building
Coventry University
CVI 5FB
Tel: 02476 88196
Email: s.igo@coventry.ac.uk

The Use of Quality of Life Outcome Measures in Pulmonary Rehabilitation

Fiona Smith

Junior Physiotherapist,
Birmingham Heartlands Hospital
Bordesley Green
Birmingham
B9 5SS

ABSTRACT

Health-related quality of life (HRQOL) is an important concept in the treatment of any chronic pulmonary disease. Pulmonary rehabilitation (PR) aims to positively affect the HRQOL of these patients. However research suggests that measurement of HRQOL is not routinely undertaken in clinical practice. This study aimed to examine whether HRQOL outcome measures are regularly used in PR programmes, which measures were most commonly used and what factors influence their popularity.

75 members of the Association of Chartered Physiotherapists in Respiratory Care (ACPRC) with a stated interest in PR were sent a questionnaire about the use of HRQOL outcome measures on their PR programme. The response rate was 77%. The results showed a 100% use of HRQOL outcome measures on PR programmes with disease-specific measures being more popular than generic instruments. The reasons given for the selection of a measure were: that it was supported by literature (48%), that it was quick to use (46%), that it was easy to use for staff (44%) and patients (41%), and that it had a peer/colleague recommendation (34%).

The physiotherapists surveyed in this study are complying with guidelines regarding the use of HRQOL outcome measures in PR. However, there are an assortment of instruments used by different programmes, resulting in a lack of standardisation. Although disease-specific measures were the most popular, the wide variety of patients on the respondents' PR programmes suggests that these may not always be appropriate. It is questionable as to whether a single HRQOL outcome measure that fulfils the above reasons for selection by clinicians, whilst being valid, reliable and responsive to the array of patients on these programmes exists or can be developed. Thus, it may be more effective to use more than one type of measure. More research should also be carried out into the routine use of HRQOL measures in PR by physiotherapists who do not belong to a respiratory special interest group.

INTRODUCTION AND LITERATURE REVIEW

Why Measure Health Related Quality of Life?

Pulmonary rehabilitation (PR) is a multidisciplinary programme that aims to "reduce disability and handicap in people with lung disease, and to improve their quality of life" (BTS, 2001). Health-related quality of life (HRQOL) describes the "subjective experience of the impact of health on the ability to perform and enjoy acts of daily life" (Randall-Curtis et al, 1994). For patients with chronic pulmonary pathology, HRQOL is perceived as an important factor in the individual's psychological and physical well being, leading to the British Thoracic Society (2001) suggesting that HRQOL is an important outcome to be assessed during PR programmes. Outcome measures are important because they provide data regarding the value of physiotherapy for patients (Beattie, 2001) and they help to ensure that "treatment plans and evaluations focus on the patient rather than the disease" (Higginson and Carr, 2001). The Chartered Society of Physiotherapists (CSP, 2001) also suggests that the use of outcome measures complies with clinical governance guidelines, ensuring good quality care and enabling patients to make informed choices about different treatment options.

The use of outcome measures in the clinical setting

Much work has been undertaken regarding what forms the basis of a good outcome measure. Fitzpatrick et al (1998), suggest several criteria including its reliability, validity and its

responsiveness, or sensitivity to change. However, despite the development of a range of outcome measures that broadly encompass the characteristics outlined above, no research has examined whether these outcome measures are routinely used during PR in the clinical setting. According to Fitzpatrick et al (1992), "more attention has been given to the use of HRQOL instruments in clinical trials than to examining their value in routine clinical care". Kay et al (2001) suggest that a good research tool may not be practical for clinical uses, where the time, money and staff resources available are different to research trials.

A study of the use of outcome measures in rheumatology (Bellamy et al, 1999) suggests that the development of numerous instruments has resulted in a lack of standardisation of measures used, making it impossible to compare different interventions. This is also true of HRQOL outcome measures for patients with chronic pulmonary disease. These form a variety of measures, the most popular being self- or interviewer-administered questionnaires. These measures have been extensively used to assess HRQOL changes as a result of PR and can be broadly grouped into generic or disease-specific questionnaires.

Generic HRQOL Measures

Such a generic measure aims to "assess overall health status including social, emotional and physical health status, and are intended to be applicable across a broad spectrum of diseases, interventions and cultural subgroups" (Binkley et al, 1999). These standardised measures have an advantage in that they have been extensively validated as a means of assessing several domains of HRQOL (Hyland et al, 1994).

Garratt et al (2002) found, in a systematic review of the use of health outcome measures by patients with several illnesses, the MOS Short Form-36 (SF-36) (Ware and Sherbourne, 1992) to be the most widely evaluated generic HRQOL outcome measure. It is a self-completed instrument, designed for use in clinical practice and research, which has also been validated for use in patients with Chronic Obstructive Pulmonary Disease (COPD) making it appropriate for use in PR. However, generic instruments are often criticised for "not measuring crucial disease-specific aspects of HRQOL" (Guyatt et al, 1999) and hence being relatively insensitive in detecting small but clinically significant changes due to therapeutic interventions. This is important for patients with chronic pulmonary diseases for whom HRQOL changes after PR can be small but significant to them. In order for these generic HRQOL outcome measures to be more sensitive, larger groups of patients are required (Guyatt et al, 1993) which is not usually the case in PR programmes due to a limitation in resources such as staff, space and equipment.

Disease-Specific HRQOL Measures

Alternatively, disease-specific measures of HRQOL for patients with chronic pulmonary disease include only questions that are relevant to chronic pulmonary problems and so are more sensitive to change. This is an important feature of outcome measures that assess the usefulness of programmes such as PR as they are able to give more accurate conclusions regarding the effectiveness of such interventions on the HRQOL of patients (Guyatt et al, 1999). Disease-specific HRQOL outcome measures for patients with chronic pulmonary problems include the Chronic Respiratory Disease Questionnaire (Guyatt et al, 1987), the St George's Respiratory Questionnaire (Jones et al, 1991) and the Breathing Problems Questionnaire (Hyland et al, 1994) which will now be considered.

The Chronic Respiratory Disease Questionnaire (CRQ) takes the form of a structured interview. A self-reported version of the CRQ has also been designed to make it a less time consuming measure to administer, more cost-effective and more successful in enabling patients to reveal sensitive information about their condition and its effects on their HRQOL (Williams et al, 2001). Both versions have been reported to be valid, reliable and responsive measures of HRQOL for even small groups of patients with chronic pulmonary conditions (Guyatt et al, 1987; Williams et al, 2001) such as in PR.

The items in the CRQ are grouped into four subscales: dyspnoea, emotional function, fatigue and mastery (feeling of control over the disease) and some of the activities rated are selected by the patient. Patient selected activities make it difficult to standardise the questionnaire, which impacts upon the ability to compare patients or interventions in a PR programme (Jones, 1991). In addition, Chesson et al (1996) claim that usage of non-standardised outcome measures can damage the credibility of the physiotherapy profession as they give rise to unreliable assessments. However, Haywood et al (2003) claim that by enabling the patient to select items of importance and relevance to them, the content validity of an outcome measure is enhanced with the patients' perspectives taken into account. Therefore, such a measure is clinically useful in providing individualised data about the effects of PR on HRQOL

The St George's Respiratory Questionnaire (SGRQ) (Jones et al, 1991) is a self-administered

measure. This measure has three sections: respiratory symptoms, activities limited by breathlessness and impacts of breathlessness. It has been found to have good validity, responsiveness and repeatability, and it is a standardised outcome measure. However, standardised instruments may contain items that have been chosen by health professionals whose perspectives regarding the importance of such items upon HRQOL may differ to patients. This may lead to items being included that are actually of little relevance to some patients, or alternatively, these questionnaires may fail to include some areas of life that do impact upon the patients' HRQOL (Haywood et al, 2003). This then negatively affects the content validity of the measure and may actually be clinically less useful.

A comparison of the self-administered CRQ and SGRQ by Rutten-van Molken et al (1999) found that both questionnaires were valid, responsive, reliable and feasible for use for patients with moderate to severe COPD. They were unable to establish one measure as being better than the other and suggested that the choice of instrument should depend on factors such as sample size (CRQ for smaller samples).

Finally, the Breathing Problems Questionnaire (BPQ) (Hyland et al, 1994) was designed for patients with chronic lung disease with questions covering 13 domains. The questionnaire has been found to have content validity and reliability (Hyland, 1997) and it also allows for the idea that illness can have positive consequences, a concept not necessarily examined in "traditional content valid QOL questionnaires....which therefore do not present a complete picture of the domains of experience relevant to ill health" (Hyland et al, 1994).

According to a study by Yohannes et al (1998) the BPQ provided more valid assessments of HRQOL than the CRQ. However, the opposite was found by Hajiro et al (1998). Singh et al (1998) also suggest that the BPQ may not be as sensitive in detecting change after PR and is less responsive than the CRQ. As mentioned previously, HRQOL changes after PR may be small clinically but hugely significant to the patient.

Disease-Specific vs Generic HRQOL Outcome Measures

Mahler (2000) claims that both clinicians and patients find disease-specific questionnaires to be more relevant to the individual's problems but it could be argued that the restriction of such a questionnaire's content may not allow for the impact that other problems may have on the patient's HRQOL. For example, patients who have COPD commonly have co-pathologies such as arthritis, psychiatric or heart problems, which may also affect their HRQOL (ZuWallack, 1998). Whilst breathlessness has to be the limiting factor for PR, breathlessness does not necessarily have the only impact upon HRQOL.

Despite much research into the impact of PR programmes upon outcomes such as HRQOL (e.g. Persson et al, 2000), as well as investigation into the general use of HRQOL outcome measures in routine clinical practice (e.g. Higginson and Carr, 2001), there has been no research investigating whether HRQOL outcome measures are routinely used in PR programmes. Therefore, this study aims to examine whether HRQOL outcome measures are regularly used on PR programmes. It will seek to determine which measures are most commonly used and what factors influence their popularity. This will help to gain more insight into the use of quality of life outcome measures during PR and their subsequent use in future programmes.

METHODOLOGY

Research design

This study employed a survey method with the use of a postal questionnaire to answer the above research aims. This is relatively quick and cheap to administer to a large geographically spread population (Bowling, 2002). However, the response rate is traditionally low (Daykin and Stephenson, 2002). Targeting subjects with a specific interest in PR would enhance the response rates as the participants would have more interest in completing the questionnaire in order to further research in this area.

Participants

A purposive sample of 75 ACPRC members was used. This is a deliberately non-random sample (Bowling, 2002) meaning that ACPRC members with an interest in PR could be selected. However, this may lead to biased results as the respondents may have an increased awareness of HRQOL outcome measures for use in PR. In order to access the ACPRC database, contact was made with the secretary of the ACPRC who acts as a 'gatekeeper' to protect the members' interests and allow or deny access to information about members. In order to obtain an insight into current and recent practice only clinicians who had been involved in PR programmes within the last five years were included.

Procedure

Ethical approval was obtained from the Coventry University Ethical Approval Committee in July 2002. Consent to participate in the study was inferred by the return of a completed questionnaire. Subjects were

assured of the confidentiality of their responses by a covering letter.

A 10-item questionnaire (appendix 1) was developed by the researcher, as no existing questionnaire was available to answer the research question. The questions were designed after reviewing the literature, thereby enhancing the content validity of the questionnaire. The questions were predominantly closed questions however 'Other' categories were included to increase the depth of information and enable the respondent to give an answer if the appropriate response had not already been listed. In addition, the respondents were encouraged to detail any extra information that they felt was pertinent to the study alongside the appropriate question.

Two respiratory lecturers and one lecturer-practitioner piloted the questionnaire in order to enhance its validity and reliability (Daykin and Stephenson, 2002) that, due to the limited timescale of this study, has not been determined. The revised version was then sent to 75 subjects. Subjects who had not responded by the deadline given in the covering letter were contacted again by letter in an attempt to encourage them to either complete the questionnaire or return the uncompleted form.

Data Analysis

This study sought to obtain descriptive and nominal data from the questionnaire responses. This data was displayed in a descriptive format in tables and graphs for analysis (Walker, 1996).

RESULTS

Characteristics of the sample

Responses were obtained from 58 physiotherapists (response rate of 77%). However, 9 questionnaires were returned uncompleted, as the respondents had not been involved with a PR programme within the past five years. Respondents had been qualified for various lengths of time with a slim majority of respondents being qualified between six and ten years (29%). 74% of the respondents were senior one grade. Respondents had most commonly been involved with PR programmes for between one and five years (69%).

Findings

The results of the questionnaire showed that all of the respondents' PR programmes included the use of a HRQOL outcome measure in order to assess HRQOL changes as a result of PR. A range of outcome measures was used on respondents' PR programmes to assess HRQOL changes as a result of PR. Table 1 lists these measures and details the frequency with which they are used in order of popularity. Disease-specific measures were more popular than generic with the CRQ the most commonly used measure being used 'always' on 20 PR programmes (41%). The SGRQ was also well liked, being used 'always' by 14 programmes (29%). The HAD was the most popular generic measure, used 'always' on 10 programmes.

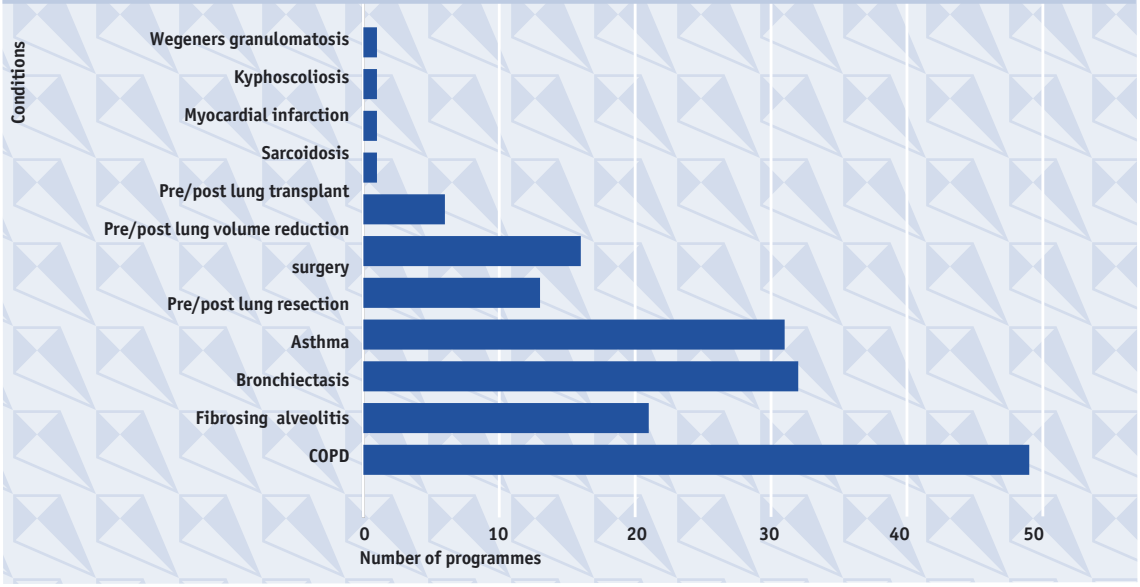
Figure 1 illustrates the variety of conditions that patients presented with on the PR programmes of the respondents. All of the 49 respondents' programmes involved some patients who presented with COPD. Patients with asthma (63% of programmes) and bronchiectasis (65%) also commonly attended.

Figure 2 shows the reasons for the choice of the selected outcome measure. The categories extremely/very influential and little/no influence are grouped together to aid interpretation. Extremely/very influential reasons for choosing a particular HRQOL

TABLE 1. Frequency of use of HRQOL outcome measurement tools by respondents on their PR programme

Outcome Measure	Number of programmes using the measure always
Chronic Respiratory Questionnaire	20
St Georges Respiratory Questionnaire	14
Breathing Problems Questionnaire	11
Hospital Anxiety and Depression Scale	10
Global Quality Of Life	5
Visual Analogue Scale	4
London Respiratory Questionnaire	3
Quality of life-Respiratory Illness Questionnaire	3
Borg Scale	2
Short form-36	1
Pulmonary Functional Status and Dyspnoea Questionnaire	1
Canadian Occupational Programme Measurement	1
Self-Efficacy	1
Medical Research Council Scale	1

FIGURE1: Conditions patients presented with on respondents' PR programmes



outcome measure were support for the measure in literature (48% of programmes), peer/ colleague recommendations (34%), and that it was quick to use (46%) as well as being easy to use and understand for staff (44%) and patients (41%).

DISCUSSION

This study shows that 100% of respondents surveyed do use HRQOL outcome measures as a part of the PR programmes that they are involved in. In fact, HRQOL and exercise tolerance were the only two outcomes that were assessed by every respondent's programme. These results disagree with the comments of Higginson and Carr (2001) who claim that HRQOL outcome measures are not routinely used in clinical practice.

Which HRQOL outcome measures are the most popular?

There are a large variety of HRQOL outcome measures used on respondents' PR programmes, with no key measure being used universally. This has implications for the ability to compare the effectiveness of one PR programme with another in terms of the benefits of these interventions for the patients, as well as other considerations such as their cost effectiveness.

Bellamy et al (1998) suggest some possible reasons for the lack of standardisation of the use of outcome measures with rheumatological patients, which may transfer to the setting of PR. These include time constraints, a lack of understanding of the different measures and how to administer and score them, a lack of research about outcome measures in clinical practice, and a lack of emphasis during training of professionals. This is being addressed by organisations such as the CSP who have produced a paper and a database on their website to help inform professionals about the use of appropriate outcome measures in clinical practice.

The most popular HRQOL measures used by respondents were the disease-specific measures including the CRQ (41%), the SGRQ (29%) and the BPQ (22%). However, there is a wide variety of conditions that patients present with on the respondents' PR programmes, including kyphoscoliosis (1 programme) and myocardial infarction patients who are not fit for cardiac rehabilitation (1 programme). This may mean that if a chronic pulmonary disease-specific HRQOL questionnaire was used for these patients it would not be a sensitive means of assessing change in their HRQOL as a result of PR. Also six programmes included pre/post lung transplant patients who may have exhibited changes in their HRQOL after transplantation as a result of improved function, not necessarily due to PR interventions. A lack of an appropriate outcome measure limits the ability to assess the effectiveness of PR for these types of patients (ZuWallack, 1998).

The most commonly used generic questionnaire (20%) was the Hospital Anxiety and Depression Scale (HAD; Zigmond and Snaith, 1983). This is used to assess mood state, producing separate scores for depression and anxiety. Although mood states affect HRQOL, especially for chronic chest patients (Hyland, 1997), this measure does not encompass all of the components of the multi dimensional HRQOL and therefore may not be a valid measure of changes in HRQOL for patients undertaking PR.

Reasons for the choice of the selected outcome measure

48% of respondents felt that "support by literature as a good indicator of HRQOL changes after PR" was influential in

the selection of their chosen measure. However, the CSP (2001) suggest "research papers can be of varying quality and information on the properties of the measure either non-existent or conflicting". Therefore, depending upon which papers were read, the respondents could have been influenced more favourably towards one type of measure than another.

Another factor influencing the selection of the HRQOL outcome measure was that the measure was quick to use (46% of respondents). This was supported by one respondent who commented, "The more sensitive measures are very time consuming and would be more applicable if we were undertaking research". In light of this, it is perhaps surprising that the CRQ is the most popular measure as it can be a time consuming tool to complete because of its interviewer-administered status (Williams et al, 2001). The questionnaire has been developed into a self-reported format, which detects the same components of HRQOL as the interviewer-administered version whilst being quicker to complete (Williams et al, 2001). However, in this study the format of the CRQ that was used was not established due to limitations with the questionnaire. Alternatively, respondents may have been prepared to sacrifice time for more individualised data, as a result of the patient selected activities within the CRQ. This was supported by one respondent who commented, "The CRQ gives greater insight into the individual patient".

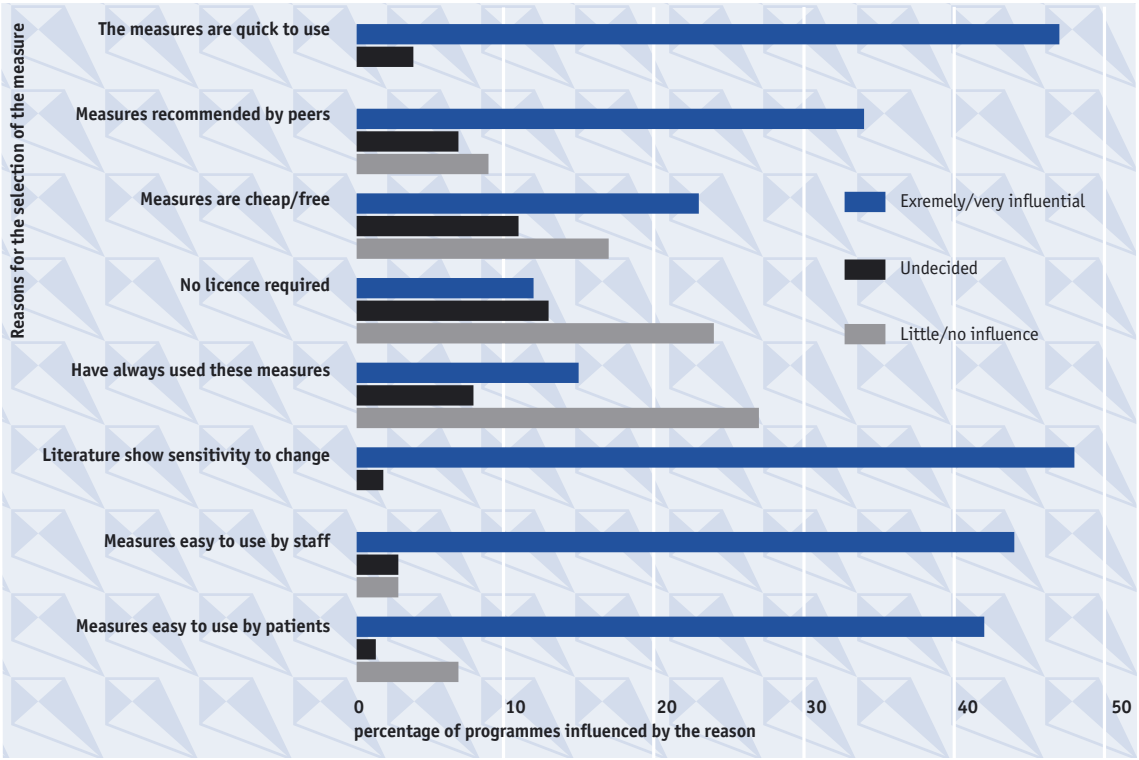
Another influential reason for the choice of a HRQOL outcome measure for use on the respondents PR programmes is the fact that the measure is easy to use and understand for staff (44%) and patients (41%). Higginson and Carr (2001) suggest training in the use of outcome measures is lacking in undergraduate education. Therefore, in clinical practice, measures that are easy to use and require little or no training prior to their use are likely to be more popular. This is supported by a respondent who says "we have tried other questionnaires but found them not to be as effective or user-friendly as the CRQ". This may also relate to the fact that 34% of respondents rated peer/colleague recommendation as a very/extremely influential reason for their choice of measure. Peers or colleagues are likely to recommend a measure that is easy to use and interpret.

Finally, only 15% of respondents rated the fact that they had "always used these measures" as a factor when choosing which outcome assessment to use on their PR programme. This may suggest that these physiotherapists are continually reviewing their practice and do not accept a measure solely on the basis of previous use. Again, the fact that the literature played such an important part in the choice of measures supports this.

Conclusion

This study has shown that the physiotherapists surveyed were complying with CSP and BTS guidelines as HRQOL outcome measures were used routinely on 100% of the respondents' PR programmes. Although the questionnaire used in this

FIGURE 2: Influences on the choice of a HR QOL outcome measure on the respondents' programmes



study achieved a relatively high response rate (77%) for a postal questionnaire, due to the purposive sample the external validity of these findings are decreased as the use of such a non-random sample limits the generalisability of results to the wider population of physiotherapists involved in PR (Bowling, 2002). The fact that the respondents were chosen from a special interest group, may mean that they are more aware of literature regarding outcome measurement in PR and subsequently use this knowledge to inform their practice. As such, future research should examine PR programmes where the physiotherapist was not a member of a respiratory specific interest group. A random sample of PR programmes would improve the external validity of the results.

With regards to the outcome measures used, although disease-specific measures such as the CRQ and SGRQ appeared to be the most popular, their use needs to be carefully considered when patients other than those with chronic pulmonary conditions are participating in the PR programme. The large variety of outcome measures used by respondents also highlights the lack of standardisation of outcome measurement use on PR programmes, making it difficult to compare the effectiveness of one programme with another.

This has implications for the quality of service provided to the patient whereby one is unable to assess which interventions produce the most positive change in the patient's individual HRQOL. Haywood et al (2003) suggest "the ultimate measure of HRQOL will capture a patient's individuality and uniqueness, while recognising and facilitating the dynamic nature of health and disease, both within and between patients". However, considering the large variety of patients attending the programmes examined in this study, it is questionable as to whether one such measure exists or can be developed for use in PR in its current format.

Unfortunately the format of the questionnaire made it impossible to determine whether any respondent's PR programmes combined the use of generic and disease-specific instruments to evaluate HRQOL, as recommended by Guyatt et al (1993) and Pashkow (1996). Combining their use allows a more content-specific and responsive measure to be used alongside a measure that enables the identification of the effects of co-pathologies upon HRQOL. However, this would be more time consuming to complete and many PR programmes are limited in their time and resources. If comparison of programmes becomes an overriding aim it may be necessary to limit the variety of conditions that patients present with, and the types of interventions used, in order to make the programmes more homogenous and therefore more available for comparison.

APPENDIX 1

Health-Related Quality of Life As An Outcome Measure In Pulmonary Rehabilitation

Thank you for answering the following questions which will be used to provide the data for my third year project about health-related quality of life outcome measures used in pulmonary rehabilitation programmes.

Should you wish to add any additional information at any point during the questionnaire please do so alongside the appropriate question.

Q1. How long have you been qualified? (Please tick the appropriate box)

Duration (years)	
1-5	
6-10	
11-15	
15-20	
20+	

Q2. What is your current professional grading? (Please tick appropriate box)

Grade	
Junior	
Senior 2	
Senior 1	
Superintendent 3	
Superintendent 2	
Superintendent 1	
Extended Scope Practitioner	
Physiotherapy manager	
Lecturer/Lecturer-Practitioner	
Researcher	
Other (please specify	

Q3a. Are you currently actively involved in a pulmonary rehabilitation programme? (Please tick appropriate box)

Yes ☐ **No** ☐

If "YES", please go to question 4

Q3b. If "**NO**", when were you last involved in a pulmonary rehabilitation programme? (Please detail the number of years and months since you were last involved in a pulmonary rehabilitation programme)

Years ..... **Months** .....

Q4. How long have you been involved in pulmonary rehabilitation programmes? (Please tick the appropriate box)

Duration (years)	
Less than 1 year	
1-5	
6-10	
11-15	
16+	

Q5a. Are you involved in research into any aspects of pulmonary rehabilitation? (please tick appropriate box)

Yes ☐ **No** ☐

If 'NO', please go to question 6

Q5b. If **'YES'**, please could you briefly describe below what your research is investigating?

.....

.....

.....

Q6. What type of pulmonary conditions do the patients on your pulmonary rehabilitation programme present with? (Please tick as many boxes as appropriate)

Condition	
COPD	
Fibrosing Alveolitis	
Bronchiectasis	
Asthma	
Pre/post lung resection	
Pre/post lung volume reduction surgery patients	
Other (please list)	

Q7. Do you use outcome measures to measure any of the following variables post pulmonary rehabilitation? (Please tick as many boxes as appropriate)

Variables	
Lung Function e.g. Spirometry	
Exercise Tolerance e.g. Shuttle Walk Test or Borg Perceived Breathlessness Scale	
Disease Education e.g. smoking cessation, nutritional advice etc	
Ability to carry out ADL	
Other (please specify)	

Q8a. Do you use outcome measures to assess changes in the patients' health-related quality of life after pulmonary rehabilitation? (Please tick the appropriate box)

Yes ☐ **No** ☐

If "**YES**", please go to question 9

Q8b. If "**NO**", why not? Please indicate your agreement with the following statements by circling the number which best corresponds with your opinion: 1 = strongly agree, 2 = agree, 3 = undecided, 4 = disagree, 5 = strongly disagree. **This question can be excluded if you do not wish to respond.**

There are no easy-to-use quality of life outcome measures	1	2	3	4	5
Quality of life is too time consuming to assess	1	2	3	4	5
Assessment of quality of life changes is not as important as assessing functional changes after pulmonary rehabilitation	1	2	3	4	5
Information about quality of life changes does not provide useful data regarding the cost-effectiveness of the pulmonary rehabilitation programme	1	2	3	4	5
The quality of life measures are not accessible due to cost or licensing	1	2	3	4	5
Other (please specify and circle appropriate number)	1	2	3	4	5

Q9. How often do you use the following measures of outcome to assess health-related quality of life changes after pulmonary rehabilitation? (Please tick appropriate boxes)

Measure	Never	Rarely	Often	Always
St Georges Respiratory Questionnaire (SGRQ) Jones et al, 1992				
Chronic Respiratory Questionnaire (CRQ) Guyatt et al, 1987				
Breathing Problems Questionnaire (BPQ) Hyland et al, 1994				
Quality of Life for Respiratory Illness Questionnaire (QOL-RIQ) Maille et al, 1997				
Short Form 36 (SF-36) Ware and Sherbourne, 1992				
Sickness Impact Profile (SIP) Bergner et al, 1981				
Nottingham Health Profile (NHP) Hunt et al, 1986				
Global Quality of Life Hyland et al, 1996				
VAS scale				
Other: (please specify below and tick appropriate box)				

Q10. How influential are the following reasons in your choice of the above outcome measure(s) for health-related quality of life? Please circle the number which best corresponds with how influential the reason is in making your choice: 1: extremely influential, 2: influential, 3: undecided/unsure, 4: little influence, 5: no influence.

The measures are easy to use and understand for staff	1	2	3	4	5
The measures are easy to use and understand for the patients	1	2	3	4	5
The measures are supported by the literature as a good indicator of quality of life changes after pulmonary rehabilitation programmes	1	2	3	4	5
Have always used these measures	1	2	3	4	5
The measures do not require licensing	1	2	3	4	5
The measures are cheap/free	1	2	3	4	5
Peers and/or colleagues recommend the use of these measures	1	2	3	4	5
Other (please specify and circle appropriate number)	1	2	3	4	5

REFERENCES

BEATTIE P (2001)
Measurement of Health Outcomes in the Clinical Setting: Applications to Physiotherapy. Physiotherapy Theory and Practice 17:173-185

BELLAMY N, MUIRDEN KD, BROOKS PM, BARRACLOUGH D, TELLUS MM & CAMPBELLL J (1999)
A Survey of Outcome Measurement Procedures in Routine Rheumatology Outpatient Practice in Australia. Journal of Rheumatology 26:1593-1599

BINKLEY JM, STRATFORD PW, LOTT SA, RIDDLE DL & THE NORTH AMERICAN ORTHOPAEDIC REHABILITATION RESEARCH NETWORK (1999)
The Lower Extremity Function Scale: Scale Development, Measurement Properties, and Clinical Application. Physical Therapy 79:371-383

BOWLING A (2002)
Research Methods in Health: Investigating Health and Health Services (2nd Edition) Open University Press. Buckingham

BRITISH THORACIC SOCIETY. STANDARDS OF CARE SUBCOMMITTEE ON PULMONARY REHABILITATION (2001)
Pulmonary Rehabilitation. Thorax 56:827-834

CAMP PG, APPLETON J & REID WD (2000)
Quality of Life After Pulmonary Rehabilitation: Assessing Change Using Quantitative and Qualitative Methods. Physical Therapy 80:986-995

CHARTERED SOCIETY OF PHYSIOTHERAPY (2001)
Outcome Measures Information Paper. Number PA49.

CHESSON M, MACLEOD M & MASSIE S (1996)
Outcome Measures Used in Therapy Departments in Scotland. Physiotherapy 82: 673-679

COLE T & FISHMAN AP (1994)
Workshop on Pulmonary Rehabilitation Research: A Commentary. American Journal of Physical Medicine Rehabilitation 73:132-3

DYKIN AR & STEPHENSON R (2002)
Questionnaire-Based Research Design. British Journal of Therapy and Rehabilitation 9:66-74

FERRER M, ALONSO J, PRIETO L, ANTO JM, HARPER R, BRAZIER J, WATERHOUSE J (1998)
Comparison of Outcome Measures in Patients With COPD. Thorax 53:813

FITZPATRICK R, DAVEY C, BUXTON MJ & JONES DR (1998)
Patient Assessed Outcome Measures. In Black N, Brazier J, Fitzpatrick R, Reeves B (eds) Health Sciences Research Methods. BMJ Books. London

FITZPATRICK R, FLETCHER A, GORE S, JONES D, SPIEGELHALTER D & COX D (1992)
Quality of Life Measures in Health Care. I: Applications and Issues in Assessment. British Medical Journal 305:1074-1077

GARRATT A, SCHMIDT L, MACKINTOSH A & FITZPATRICK R (2002)
Quality of Life Measurement: Bibliographic Study of Patient Assessed Health Outcome Measures. British Medical Journal 324:1417-1424

GUYATT GH, BERMAN LB, TOWNSEND M, PUGSLEY SO, CHAMBERS LW (1987)
A Measure of Quality of Life for Clinical Trials in Chronic Lung Disease. Thorax 42:773-778

GUYATT GH, FEENY DH & PATRICK DL (1993)

Measuring Health-related Quality of Life. Annals of International Medicine 118:622-629

GUYATT GH, KING DR, FEENY DH, STUBBING D, GOLSTEIN RS (1999)
Generic and Specific Measurement of Health-related Quality of Life in a Clinical Trial of Respiratory Rehabilitation. Journal of Clinical Epidemiology 52:187-192

HAJIRO T, NISHIMURA K & TSUKINO M (1998)
Comparison of Discriminative Properties Among Disease Specific Questionnaires for Measuring Health–Related Quality of Life in Patients With Chronic Obstructive Pulmonary Disease. American Journal of Respiratory Critical Care Medicine 157:785-790

HARPER R, BRAZIER JE, WATERHOUSE JC, WALTERS SJ, JONES NM & HOWARD P (1997)
Comparison of Outcome Measures for Patients With Chronic Obstructive Pulmonary Disease (COPD) in an Outpatient Setting. Thorax 52:879-887

HAYWOOD K, GARRATT AM, DZIEDZIC K & DAWES PT (2003)
Patient Centred Assessment of Ankylosing Spondylitis-Specific Health Related Quality of Life: Evaluation of the Patient Generated Index. Journal of Rheumatology 30:764-773

HYLAND ME (1997)
Assessment of Quality of Life in Chronic Lung Disease. In Morgan M, Singh S (eds) Practical Pulmonary Rehabilitation Chapman and Hall Medical. London

HYLAND ME, BOTT J, SINGH S & KENYON CAP (1994)
Domains, Constructs and the Development of the Breathing Problems Questionnaire. Quality of Life Research 3:245-256

HIGGINSON IJ & CARR AJ (2001)
Using Quality of Life Measures in the Clinical Setting. British Medical Journal 322:1297-1300

JONES PW, QUIRK FH & BAVEYSTOCK CM (1991)
The St George's Respiratory Questionnaire. Respiratory Medicine 85 (Supplement B) 25-31

JONES PW (1991)
Quality of Life Measurement for Patients With Diseases of the Airways. Thorax 46:676-682

KAY TM, MYERS AM & HUIJBREGTS MPJ (2001)
How Far Have We Come Since 1992? A Comparative Survey of Physiotherapists' Use of Outcome Measures. Physiotherapy Canada Fall: 268-275

MAHLER DA (2000)
How Should Health-Related Quality of Life Be Assessed in Patients in Patients With COPD. Chest 117:54S-57S

PASHKOW P (1996)
Outcomes in Cardiopulmonary Rehabilitation. Physical Therapy 76: 643-656

PERSSON I, OLSENI L & LAGERSTEDT M (2000)
Effects of an Outpatient Pulmonary Rehabilitaiton Program on Quality of Life and Physical Performance in Patients With Chronic Obstructive Pulmonary Disease (COPD). Physiotherapy Theory and Practice 16:195-201

RANDALL-CURTIS J, DEYO RA & HUDSON LD (1994)
Health-related Quality of Life Among Patients With Chronic Obstructive Pulmonary Disease. Thorax 49:162-170

RUTTEN-VAN MOLKEN M, ROOS B & VAN NOORD JA (1999)
An Empirical Comparison of the St George's Respiratory Questionnaire (SGRQ) and the Chronic Respiratory Disease Questionnaire (CRQ) in a Clinical Trial Setting. Thorax 54:995-1003

SINGH SJ, SMITH DL, HYLAND ME (1998)
A Short Outpatient Pulmonary Rehabilitation Programme: Immediate and Longer-Term Effects on Exercise Performance and Quality of Life. Respiratory Medicine 92:1146-1154

WALKER EM (1996)
Questionnaire Design in Practice. British Journal of Therapy and Rehabilitation 3:229-233

WARE JE, SHERBOURNE CD (1992)
The MOS 36-Item Short-Form Health Survey (SF-36). Conceptual Framework and Item Selection. Medical Care 30:473-483

WILLIAMS JEA, SINGH SJ, SEWELL L, GUYATT GH & MORGAN MDL (2001)
Development of a Self-reported Chronic Respiratory Questionnaire (CRQ-SR). Thorax 56:954-959

YOHANNES AM, ROOMI J, WATERS K (1998)
Quality of Life in Elderly Patients with COPD: Measurement and Predictive Factors. Respiratory Medicine 92:1231-1236

ZIGMOND AS & SNAITH RP (1983)
The Hospital Anxiety and Depression Scale. Acta Psychiatry Scandinavia 63:361-370

ZUWALLACK (1995)
Selection Criteria and Outcome Measurement in Pulmonary Rehabilitation. Monaldi Archives For Chest Disease 53:429-437

Correspondence to:
Fiona Smith
Junior Physiotherapist,
Birmingham Heartlands Hospital
Bordesley Green
Birmingham
B9 5SS

The Effect of Pursed Lip Breathing on Exercise Capacity and Breathlessness in Patients with Chronic Obstructive Pulmonary Disease.

R. Garrod, C. Daly, and C. Hoareau
School of Physiotherapy, St George's Hospital/Kingston University and Department of Physiotherapy St George's Hospital NHS Trust, London, United Kingdom

Key words:
Chronic Obstructive Pulmonary Disease, Pursed Lip Breathing, Exercise

ABSTRACT:

Background: Pursed lip breathing (PLB) may provide a potential mechanism for reducing dyspnoea during daily activities although it is unknown whether this enhances exercise tolerance. The purpose of this pilot study is to investigate the effect of PLB on exercise tolerance and breathlessness in naive COPD patients.

Methods: 22 patients performed a baseline practice walk using the Incremental Shuttle Walk Test (ISWT) they were excluded if they demonstrated PLB on this walk (2). Patients had a diagnosis of severe COPD, mean (SD) $FEV_1$1.41 (0.59)l, age 71 (55 -81) yrs. Patients then performed a further two walks: A = ISWT without PLB, B =ISWT using PLB. Respiratory rate (RR), arterial oxygen saturation SaO_2, heart rate (HR) and Borg breathlessness score were measured before and after each walk. Tests were double blinded. Data was analysed using the paired t test.

Results: There was a statistically significant difference in post exercise RR between the two walks, mean (SD) walk A: 28.1 (6.37) walk B: 25.1 (3.97), mean difference 95% CI; 3.05 (0.69 to 5.30), but no significant differences in any other outcomes: ISWT mean difference, 17 (58) metres p = 0.20; breathlessness; -0.3 (1.18) p = 0.20; SaO2, 1.05 (2.6) p = 0.9, HR, 0.8 (14) p = 0.8.

Conclusion: This pilot study suggests that PLB performed during exercise may lower post exercise RR in patients who do not normally adopt this technique. Although there appears to be little effect of PLB on exercise tolerance, larger studies are warranted to eliminate a type II error.

INTRODUCTION

There are approximately 600,000 people in the United Kingdom with Chronic Obstructive Pulmonary Disease (COPD). For these patients one of the most incapacitating symptoms reported concerns dyspnoea on exertion, often experienced during simple tasks of daily activities (Garrod et al, 2000). A variety of techniques have been used to address activity limitation and severe dyspnoea, one such technique is instruction in breathing patterns intended to reduce the work of breathing and minimise breathlessness. The use of relaxed breathing (abdominal breathing) is often advocated, usually in conjunction with positioning. However, evidence suggests that, for patients with more severe COPD, abdominal breathing may in fact be disadvantageous (Gosselink et al 1995). Pursed lip breathing (PLB), on the other hand, has been identified as a potential mechanism for reducing dyspnoea during daily activities (Barach, 1973), although it is unknown whether this enhances exercise tolerance, particularly in patients who do not adopt the technique naturally. PLB involves the subject performing expiration through pursed lips, this creates increased resistance to expiration, which in turn reduces the flow of air during expiration and initiates the physiological phenomenon known as positive end expiratory pressure (PEEP). PEEP reduces the work of breathing by holding alveoli open and enabling the subject to breathe at a higher point on the lung pressure-volume curve (Ingram & Schilder, 1967). Studies have shown that PLB is associated with increased arterial saturation, beneficial changes in chest wall muscle recruitment and enhanced diaphragmatic activity (Breslin, 1992, Ugalde et al, 2000). Alternatively, the creation of PEEP may make breathing harder

since the subject is required to produce greater inspiratory pressures to initiate breathing. Additionally abdominal muscle activity is increased during PLB, which may increase oxygen utilisation. A number of pulmonary rehabilitation programmes in the USA routinely advise patients to use PLB during functional activities although there is little data to support its use during exercise (Collins et al, 2001). Indeed, Mueller and colleagues showed no improvement in arterial blood gases when PLB was performed during exercise (Mueller et al, 1970). Furthermore, few trials have investigated the role of PLB in patients who do not naturally adopt the technique. The purpose of this pilot study is to evaluate the effect of PLB on walking distance in patients naive to this type of breathing and to determine appropriate sample size data.

METHODOLOGY:

This pilot study data was collected as a double blind trial. 24 patients with a diagnosis of Chronic Obstructive Pulmonary Disease (COPD) referred to out patient pulmonary rehabilitation were identified as potential subjects. Ethics permission was obtained from Wandsworth Local Research Ethics Committee and written consent was received from all patients prior to commencement.

Assessments:

Lung function:

Spirometry was performed using a rolling seal spirometer (P K Morgan Ltd. Rainham UK).

Exercise capacity:

Exercise capacity was assessed using the Incremental Shuttle Walk Test (ISWT), which is a maximal, standardised externally paced incremental exercise test (Singh et al, 1992). A baseline walk was performed whilst tidal breathing room air. Patients were excluded from the trial if they spontaneously demonstrated PLB during this walk (assessed by researcher 1). Results from this walk were not included in the analysis. A further two walking tests were performed with a rest of at least 20 minutes between each walk. For the first test walk patients were instructed to walk whilst using their normal breathing pattern. For the second test walk patients were taught to use PLB, researcher 2 assessed the technique and provided correction where necessary, patients were also provided with written information and diagrammatic instruction. Recent abstract data has reported the minimum clinically important difference for ISWT as a change of mean 48 (95% CI) (33.6 to 63.6) m, (Singh et al, 2002). SaO_2 was measured at the end of each walk using a pulse-oximeter (Minolta Pulsox 7, AVL Instruments, Schaffhausen, Switzerland).

Dyspnoea and perception of discomfort:

The patients were asked to indicate their level of breathlessness using the Borg Dyspnoea Score before and immediately after each walk (Burdon et al, 1982). Additionally patients were asked at the end of the walks, which test they perceived to be the most "comfortable".

Statistical analysis:

Differences in variables between PLB walk and tidal breathing walk were determined using the paired t test.

RESULTS

In two patients spirometric values were reflective of restrictive disease rather than obstructive, these patients were thus excluded from the trial. A further 2 patients were excluded from the trial after they demonstrated PLB on the initial practice test. Pilot data was therefore collected on 20 patients mean age (range) 71 (55 – 81) yrs with moderate to severe COPD, mean FEV_1 (SD) 1.41 (0.59) l.0.

Exercise tolerance and breathlessness:

Patients demonstrated a statistically significant difference in respiratory rate (RR) between walks, with a

TABLE 1. Difference between variables whilst performing PLB during walking test compared with non PLB walking.

	PLB (SD)	Non PLB (SD)	Mean difference (SD)	95% Confidence Interval
ISWT (m)	278 (105)	295 (128)	17 (58.0)	-10.2 to 44.2
Borg Breathlessness Score	3.9 (1.8)	4.3 (1.9)	-0.3 (1.2)	-0.9 to 0.2
Respiratory Rate	25.1 (3.9)	28.1 (6.4)	3.0 (4.9)	0.7 to 5.3
SaO_2 pre walk (%)	95.8 (2.0)	95.5 (2.8)	-0.3 (2.6)	-1.5 to 0.9
SaO_2 post walk (%)	92.8 (5.3)	93.8 (5.6)	1.1 (2.6)	-0.2 to 2.3
Heart rate post walk	95.5 (10.0)	96.4 (16.6)	0.8 (14.2)	-5.8 to 7.4

PLB = Pursed lip breathing ISWT = Incremental Shuttle Walk Test

slower RR after PLB compared with non PLB walking. There were no differences for the other variables investigated (Table 1).

Perception of comfort:

56% of the patients had no preference between walks, 22% felt PLB to be most comfortable whilst an equivalent number felt it was less comfortable.

Sample size calculation:

Based on a minimal difference in walking distance of 60 mts (Singh et al, 2002), at an alpha value of 0.05 and power of 80% it was estimated that 50 patients would be needed to detect a statistically significant difference between the walks. (nb: sample size data based on mean air walk of 278 (105)m and increase in walk of 60m at power 80% and p 0.05, 49 patients needed.)

DISCUSSION

This pilot study is the first trial to address the question of the role of PLB during exercise, in patients who do not normally adopt the technique. In accordance with other authors investigating PLB during rest we have shown a reduction in respiratory rate associated with PLB. It may be surmised that slower breathing rates will be responsible for a reduction in dyspnoea, however in our trial neither discomfort nor perception of dyspnoea were different between walks. Collins et al, (2001) suggest that PLB plays a fundamental role in the management of dyspnoea and recommend instruction to all patients. Although this work provides some support to this observation our pilot data indicates that much larger trials are needed in order to rule out a type II error.

One of the aims of management of patients with COPD is the relief of symptoms, PLB, whilst taught routinely in many countries is not advocated in the United Kingdom, except where patients assume the technique naturally. With the advance of pulmonary rehabilitation patients are learning to increase exercise tolerance, for many this will be in excess to previous activity levels. The role of PLB during maximal exercise requires clarification, particularly with respect to application in naive subjects and as part of formal exercise training. Indeed, this pilot data has shown that while smaller trials may be sufficient to detect a difference in respiratory rate due to PLB, trials of at least 50 patients are required to evaluate the technique during exercise. This data allows us to more accurately interpret future and past trials of PLB and demonstrates that further studies in this field are warranted.

REFERENCES

BARACH AL (1973)
Physiologic advantages of grunting, groaning, and pursed-lip breathing: adaptive symptoms related to the development of continuous positive pressure breathing. Bulletin of the New York Academy of Medicine; 49:666-73

BRESLIN EH (1992)
The pattern of respiratory muscle recruitment during pursed-lip breathing. Chest; 101:75-8

BURDON JG, JUNIPER EF, KILLIAN KJ, HARGREAVE FE & CAMPBELL EJ (1982)
The perception of breathlessness in asthma. Am Rev.Respir Dis.; 126:825-8

COLLINS EG, LENGBEIN WE, FEHR L & MALONEY C (2001)
Breathing pattern retraining and exercise in persons with chronic obstructive pulmonary disease. AACN.Clin.Issues; 12:202-9

GOSSELINK RA, WAGENAAR RC, RIJSWIJK H, SARGEANT AJ & DECRAMER. ML (1995)
Diaphragmatic breathing reduces efficiency of breathing in patients with chronic obstructive pulmonary disease. Am.J.Respir. Crit Care Med.; 151:1136-42

INGRAM RH, JR. & SSHILDER DP (1967)
Effect of pursed lips expiration on the pulmonary pressure-flow relationship in obstructive lung disease. Am.Rev.Respir.Dis.96: 381-8

MUELLER RE, PETTY TL & FILLEY GF (1970)
Ventilation and arterial blood gas changes induced by pursed lips breathing. J Appl.Physiol; 28:784-9

SINGH SJ, MORGAN MD, SCOTT S, WALTERS D & HARDMAN AE (1992)
Development of a shuttle walking test of disability in patients with chronic airways obstruction. Thorax; 47:1019-24

SINGH SJ, MORGAN MD, SEWELL L, & WILLIAMS JE (2002)
What is the minimum clinically important difference in the incremental shuttle walk test (ISWT) observed in pulmonary rehabilitation? European Respiratory Congress 2002

UGALDE V, BRESLIN EH, WALSH SA, BONEKAT HW, ABRESCH RT & CARTER GT (2000)
Pursed lips breathing improves ventilation in myotonic muscular dystrophy. Arch.Phys.Med. Rehabil.81: 472-8

Correspondence to:
Dr R Garrod
Senior lecturer
School of Physiotherapy
Faculty of Health and Social Care sciences
St George's Hospital Medical School
Cranmer Terrace, Tooting
SW17 ORE
020 8725 0377
rgarrod@hscs.sghms.ac.uk

Early Mobilisation of Post-Surgical Patients - A Review

Vivienne Durrant

3rd year Physiotherapy Student
Sheffield Hallam University
School of Health and Social Care
Collegiate Crescent campus
Sheffield
S10 2BP

Kath Moore

Senior Lecturer
Sheffield Hallam University
School of Health and Social Care
Collegiate Crescent campus
Sheffield
S10 2BP

Summary

Mobilisation is a common physiotherapy intervention in respiratory care for the post-surgical patient. The aim of this paper is to re-examine the theoretical arguments in favour of mobilisation and to assess how well the evidence base supports its clinical application. Twelve papers are critiqued for this review following a search of Cinahl, AMED and Medline databases. The findings and limitations of these studies are explored and the clinical implications highlighted. Finally recommendations for further research are made.

Early Mobilisation - The Rationale

The rationale for the early mobilisation of post-surgical patients is based upon the logical application of basic physiological principles. Elizabeth Dean outlines the importance of addressing the 'cardiopulmonary unit' rather than viewing the lungs and heart as separate anatomic entities (1994). Her integrated approach centres upon a physiological model called the oxygen transport pathway (figure 1), which incorporates four components:

1. Optimal distribution of ventilation to the alveoli
2. Diffusion of gases across the alveolar capillary membrane
3. Perfusion of the lungs
4. Gas transport to the tissues

This model encourages clinicians to consider the underlying pathophysiology behind their patient's condition and to evaluate the likely impact of their intervention in relation to it.

Figure 1: The Oxygen Transport Pathway (Dean, 1994)

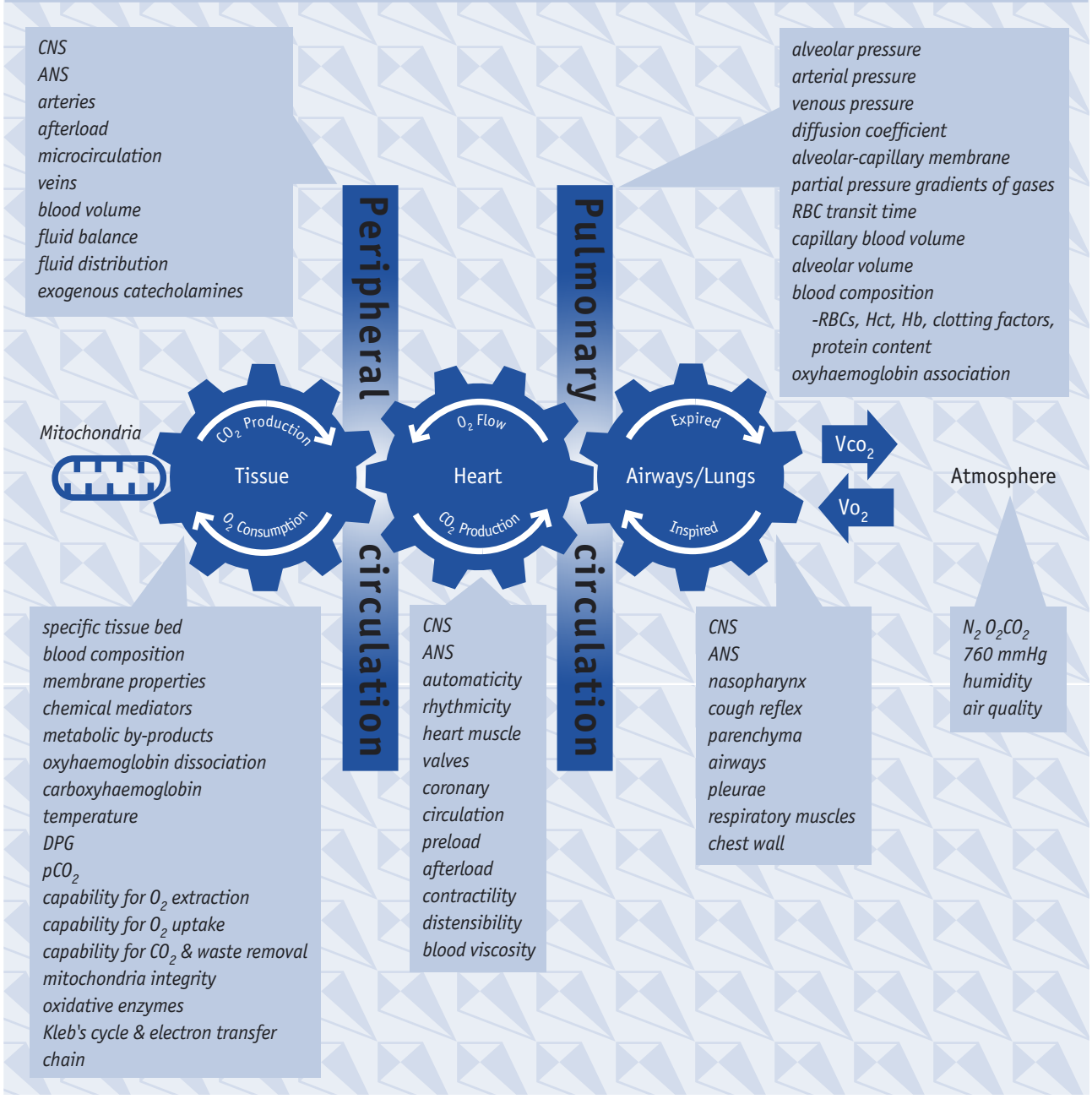
Along with respiratory problems that commonly affect post-surgical patients, such as atelectasis, pain, reduced diaphragmatic function, reduced functional residual capacity (FRC), hypoxaemia and chest infection (Hough, 2001), account needs to be taken of the specific complications associated with immobility and the supine position. These are summarised by Dean and Ross (1992), as follows:

- Increased resting and submaximal heart rate
- Decreased maximum oxygen uptake
- Reduced total blood volume, plasma volume and haematocrit
- Increased blood viscosity and decreasing venous blood flow (hence increased risk of thromboembolism)
- Reduced FRC, Residual Volumes (RV) and Forced Expiratory Volume (FEV), thus predisposing the patient to airway closure and ventilation: perfusion (V/Q) inequality.

In effect, every component of the oxygen transport pathway is potentially compromised in the post-surgical patient.

According to Dean (1994), the rationale for early mobilisation is to optimise oxygen transport and gas exchange at every step in the pathway. Avoidance of orthostatic intolerance and the benefits of increased cardiac output, increased lung volumes

FIGURE 1. The Oxygen Transport Pathway (Dean, 1994)



and increased respiratory rates will be the major benefits of mobilisation for the post-surgical patient.

Because mobilisation addresses multiple steps in the oxygen transport pathway, the need for expensive, invasive measures can often be minimised or avoided altogether. In addition, conventional techniques that may only address a single step in the oxygen transport pathway and are aimed at combating consequences rather than causes of cardiopulmonary dysfunction (such as postural drainage and manual chest therapy) should no longer be considered as first line interventions (Dean & Ross, 1992).

Evaluation of the Evidence Base for Mobilisation

Support for Dean's approach to body positioning and mobilisation is provided by Wong (2000), who implemented a successful rehabilitation programme for a patient in respiratory failure following a laparotomy. However, although the outcome was positive this is only a single case study and needs to be supported by further research.

Although over 20 years old, the study by Dull & Dull (1983) is still worthy of consideration due to the scarcity of relevant current research. They found that although early mobilisation was effective at restoring pre-operative lung volumes in most cardiopulmonary bypass patients (an efficacy that was not improved by the addition of incentive spirometry or breathing exercises) it was also associated with surprisingly high levels of post-operative

pulmonary complications (PPC's). This finding does suggest that caution needs to be applied when prescribing mobilisation as a "cure all" intervention, especially when surgery is combined with other risk factors, such as old age and co-morbidities. Clearly signs of deterioration need to be continually monitored and mobilisation may need to be supplemented by additional physiotherapy interventions.

Orfanos et al (1999), found that deep breathing exercises produced significant increases in tidal volumes (TV), whereas ambulation did not. They found that minute ventilation was increased during ambulation by a rise in respiratory rate rather than in TV. The clinical implications of this study appear clear - if the objective of physiotherapy is to improve lung volumes then ambulation may have to be augmented by breathing exercises. Furthermore, a patient's progression to ambulatory status does not necessarily mean that they should stop breathing exercises.

However, a key issue to note in the Orfanos et al study is that the intensity of the ambulation intervention is not objectively controlled. Patients were merely instructed to walk along a flat corridor "at a comfortable pace" for "approximately five or six minutes". With no reliable measure of how hard these patients worked the results become difficult to interpret. Further research is needed to help clarify the effect on lung volumes of different intensities of mobilisation.

Jenkins et al (1990) found no difference between the effects of breathing exercises (BE), incentive spirometry (IS) or mobilisation in restoring pre-operative lung volumes and arterial blood gases, or in preventing chest infection. Dean anticipated that addressing the cardiovascular system as well as the pulmonary system would result in improved clinical outcomes but Jenkins' study appears to refute this core idea. However, both the IS and BE groups were encouraged to complete their regimes whilst seated in a chair. Presumably this involved a bed-to-chair transfer and therefore included the direct application of both mobilisation (even if limited) and body positioning. Therefore it cannot be read as directly conflicting with Dean's work.

In support of Dean's ideas the major finding of clinical significance from the remainder of the literature reviewed for this paper is that postural changes from the supine, to the upright position sequentially improve lung volumes (Tucker & Jenkins, 1996; Meyers et al, 1975) and more importantly arterial oxygen saturations (Mynster et al, 1996). As with all of these reported findings, further supporting research is required.

Limitations of the Literature

The research on exercise therapy for the acute cardiopulmonary patient is sparse compared to that for the chronically dysfunctional patient. Furthermore, much of the available literature on acute patients pertains to cardiac surgery patients (Jenkins et al, 1990; Cockram et al, 1999; Dull & Dull, 1983) and as such is only directly relevant to a small subset of post-surgical patients.

Multi-modal Programmes

Three of the papers reviewed investigated the use of multi-modal accelerated recovery programmes (Basse et al, 2002; Kehlet, 1997; Kehlet & Mogensen, 1999). Although each of these studies had positive outcomes in favour of early mobilisation, the results were hard to dissociate from the contributory effects of the other constituents of the programme, such as early oral nutrition, continuous epidural analgesia and the use of cisapride and laxatives. Because of this, these studies were inconclusive and were only able to state that enforced early mobilisation "may" have been responsible for improving pulmonary function and oxygen saturation.

The speeding up of post-operative recovery times in these multi-modal programmes may suggest that early mobilisation actually relies upon other factors being in place in order for it to be effective. Early oral nutrition and good analgesia are obvious examples, but they all point the way to a more progressive approach to post-surgical care that places added emphasis on multi-disciplinary team working, goal setting and individualised care plans (Basse et al, 2002).

Patient Withdrawal Rates

An issue with some of the research was that significant numbers of the patients studied were withdrawn because their cardiopulmonary status worsened and they were unable to comply with their allocated treatment. In some studies the reasons for patient withdrawal were not clearly explained. Although PPC's tended to occur in both the exercise group and the control group the figures were rarely compared. Given that all post-surgical interventions are primarily aimed at avoiding the development of PPC's then the numbers of patients developing them should be viewed as highly relevant and included clearly in the results. The study by Dull & Dull that examined the effects of adding breathing exercises or incentive spirometry to mobilisation alone, was the only study to compare and draw conclusions about the number of patients who were withdrawn due to PPC's. Significantly, they

concluded that, "one mode of treatment is as ineffective as the others in preventing the occurrence of PPC."

Problems of Standardisation

Lack of standardisation was also apparent in many of the studies. Even if they were internally standardised with respect to factors such as patient position when lung volumes or blood gases were measured, comparisons between studies were difficult due to different measuring techniques or lack of information on how these measures were taken (bringing into question their reliability). Research in physiotherapy is significantly hampered due to the inherent problems of standardising variables and procedures. This difficulty is perpetuated in the clinical environment due to the flexibility of approach needed and the obvious ethical implications when using acutely ill patients as subjects for research.

Key Messages

- There is insufficient clinical evidence to support the wholesale use of mobilisation for the post-surgical patient.
- Multi-modal post-surgical regimes appear to reduce the rate of PPC's and length of hospital stay but the contribution of early mobilisation to these regimes is unclear.
- Most of the current literature is limited because it does not differentiate between different intensities of mobilisation. Results are therefore difficult to assess, implement or compare.
- Mobilisation may need to be supplemented with breathing exercises to restore lung volumes, especially with "high risk" patients.
- Future research needs to establish safe and effective parameters for the mobilisation of all post-surgical patients.

Lack of Differentiation in Mobilisation Interventions

Almost all the papers critiqued viewed mobilisation as a homogenous intervention. Only one piece of research attempted to differentiate and evaluate the efficacy of different forms of exercise on the cardiopulmonary system (Petta et al, 1998). This study compared the ventilatory and cardiovascular responses of normal subjects to three types of unsupported low-intensity upper limb exercises. There were no similar investigations comparing the cardiopulmonary effects of typical clinical interventions such as; position changing, transferring, marching on the spot, walking, different speeds of walking or stair climbing.

Because mobilisation has been viewed in this undifferentiated way, one of the biggest limitations of the papers reviewed is that the type and intensity of the mobilisation used is often not reported. Mobilisation, however, may consist of anything from passive bed exercises to ambulating independently around hospital corridors and stairways, or even hospital grounds. Not only does this limit the repeatability of these studies, it also makes their findings impossible to compare or implement clinically.

Recommendations for Further Research

- Cockram et al (1999), Orfanos et al (1999) and Dean (2002) all identify the need for future research to establish optimal levels for exercise intensity and progression in order to gain maximal cardiopulmonary benefits. Objective measuring techniques, such as heart rate monitors, pulse oximetry and respiratory rate measurements, are required to ensure that acute patients are exercised both safely and effectively.

- Because the patient population is becoming increasingly elderly, more "high risk" people are being operated on routinely. Despite improved surgical techniques, the elderly and those with pre-existing cardiopulmonary dysfunction warrant special attention. Future research should aim to establish safe inclusion criteria for post-operative mobilisation, with reference to oxygen saturations, blood pressure, resting heart rate, temperature etc.

- Most of the research reviewed in this paper looked at the immediate effect of mobilisation on cardiopulmonary functioning. Orfanos et al. (1999) was the only study that attempted to compare the carry-over effects of both ambulation and deep breathing after thirty minutes. Difficulties in getting patients to remain in the same position for thirty minutes meant that they were unable to measure the carry-over effect. Carry-over effect, or the length of time spent in hospital should be investigated by future research to avoid the danger of implementing a scheme of early mobilisation on the basis of improved oxygen transport that is only short-lived.

- Future research that breaks down and examines the different components of multimodal rehabilitation programmes is also required. Without this information it is unclear how multimodal programmes can be improved, or indeed why they seem to work in the first place.

- Further research into the wider benefits of mobilisation for

the postoperative patient, is also required. Psychological factors such as increased compliance, patient empowerment and reduction in postoperative anxiety are all clinically significant and need further investigation.

REFERENCES

BASSE L (2002)
Accelerated Postoperative Recovery Programme after Colonic Resection improves Physical Performance, Pulmonary function and body Composition. British journal of Surgery, 89: 446-453

COCKRAM J, JENKINS S & CLUGSTRON R (1999)
Cardiovascular and Respiratory Repsonses to Early Ambulation and Stair Climbing Following Coronary Artery Surgery. Physiotherapy Theory and Practice; vol 15: 13-15

DEAN E (2002)
Effects of Positioning and Mobilization, in J.A. Pryor & S.A. Prasad (ed) Physiotherapy for Respiratory and Cardiac problems. Churchill Livingstone

DEAN E (1994)
Oxygen Transport: a physiologically based conceptual framework for the practice of cardiopulmonary physiotherapy. Physiotherapy 80, 347-354.

DEAN E & ROSS J (1992)
Mobilising and Exercise Conditioning, in Zadai, C.C (ed) Pulmonary Management in Physical Therapy. Churchill Livingstone

DULL J L & DULL W L (1983)
Are Maximal Inspiratory Breathing Exercises or Incentive Spirometry Better then Early Mobilisation After Cardiopulmonary Bypass? Physical Therapy; Vol 63: 655-660

HOUGH A (2001)
Physiotherapy in Respiratory Care. (3rd edit) Nelson Thornes Ltd.

JENKINS S, SOUTAR S A, LOUKOTA J M, JOHNSON L C & MOXHAM J (1990)
A Comparison of Breathing Exercises, Incentive Spirometry and Mobilisation after Coronary Artery Surgery. Physiotherpay Theory and Practice; vol 6: 117-126

KEHLET H (1997)
Multimodal approach to Control Postoperative Pathophysiology and Rehabilitation. British Journal of Anaesthesia; Vol 78: 606-617

KEHLET H & MOGENSEN T (1999)
Hospital Stay of 2 Days after Open Sigmoidectomy with a multimodal Rehabilitation Programme. British journal of Surgery; Vol 86: 227-230

MEYERS J R, LEMBECK L, O'KANE H & BAUE A (1975)
Changes in Functional Residual Capacity of the Lung After Operation. Archives of Surgery; vol 110: 576-583

MYNSTER T, JENSEN L M, JENSEN F G, KEHLET H & ROSENBERG J (1996)
The Effect of Posture on Late Postoperative Oxygenation. Anaesthesia Vol 51: 225-227

ORFANSO P, ELLIS E & JOHNSTON C (1999)
Effects of Deep Breathing Exercises and Ambulation on Pattern of Ventilation in Post-operative Patients. Australian Journal of Physiotherapy; Vol 45: 173-182

PETTA A, JENKINS S & ALLISON G (1998)
Ventilatory and Cardiovascular Response to Unsupported Low-intensity Upper Limb Exercises in Normal Subjects. Australian Physiotherapy; Vol 44: No 2: 123-129

TUCKER B & JENKINS S (1996)
The Effect of Breathing Exercises with Body Positioning on Regional Lung Ventilation. Australian Journal of Physiotherapy. Vol 42, no 3, 219-227

WONG W.P (2000)
Physical Therapy for a Patient in Acute Respiratory Failure. Physical Therapy; Vol 7

Correspondence to:
Kath Moore
Senior Lecturer
Sheffield Hallam University
School of Health and Social Care
Collegiate Crescent campus
Sheffield
S10 2BP

The Role of Respiratory Clinical Specialist Physiotherapists in Two Spinal Cord Injury Units in the UK.

Kathryn Harris

Clinical Specialist Physiotherapist
The Department of Physiotherapy
Salisbury District Hospital
Odstock Road
Salisbury
SP2 8BJ

Jacqeline Bull

Clinical Specialist Physiotherapist
Ventilatory Support Unit
Princess Royal Spinal Injuries Unit
NorthenGeneral Hospital
Sheffield

Summary

The role of the respiratory clinical specialist is a varied one; parts of the role call for extended scope skills, such as in dealing with the technical side of the ventilators and the setting of weaning protocols. Along side this are a multitude of other skills, needed to secure a safe discharge of the ventilator dependent patient into the community. This leads to an interesting and highly satisfying role.

Introduction

The nature of spinal cord injury and its accompanying paralysis often leads patients to develop respiratory problems.

Any patient with paralysis of the diaphragm will have an ineffective cough and thus is in danger of sputum retention. The higher the lesion the greater the effect on the ventilatory mechanics, and even those who are young and previously fit and healthy can surprise the inexperienced clinician by developing acute respiratory failure necessitating mechanical ventilation. Although lung pathology usually does not persist, the impairment in the mechanics of breathing often leads to a prolonged weaning process. Spinal cord injured patients with respiratory complications can be divided into several descriptive groups:

Patients requiring long-term ventilation.

These individuals tend to have very high level cervical spine lesions above C4 and may have uni-lateral or bilateral hemi-diaphragm paralysis, or else they might have a lower injury but be either elderly or have pre-existing lung disease that prevents weaning. This is the smallest of the groups. These patients need rehabilitation to enable them to return to the community with verbal independence and skills in using assistive technology. Extensive care packages are arranged to support and care for them at home.

Patients who wean from ventilation.

These patients might have needed ventilation during the period of spinal shock when the level of paralysis rises, or if they had respiratory complications following their injury. Such patients will wean from ventilation, albeit over a prolonged period and following their rehabilitation will return home without the need for any ventilatory support.

Patients who need part time ventilatory support.

These patients might have been partially weaned (so that they can breathe independently for some period of time) or might never have been ventilated,

but have increasing respiratory problems as they age. A low vital capacity will mean that they are unable to provide adequate gas exchange without additional support for some part of the day or night. We are seeing an increasing number of these patients with the ageing population of patients with tetraplegia.

Roles of respiratory clinical specialists.

Our roles as respiratory clinical specialist physiotherapists in spinal cord injury have great similarities and in fact are based around the same job description. The Key aspects of which are:

- To lead, support and co-ordinate the ongoing development of respiratory skills and knowledge throughout all disciplines at the spinal unit.
- To contribute to the overall treatment of patients with spinal cord injury.
- To participate in the development of the spinal injury unit's respiratory service.

However, as the jobs have evolved, different needs have led us to emphasise different aspects of the role. To begin we will describe the commonality of the roles, and then move on to explain some of the variations, but first a little about the different units.

Salisbury

Salisbury has a fifty-two bedded spinal injuries' unit. The physiotherapists for the spinal unit are separate to those who cover the other parts of Salisbury District Hospital, which includes intensive care. Junior physiotherapists rotate to the spinal unit. Kathryn co-ordinates the six beds for patients needing ventilatory assistance.

Sheffield

Sheffield is also a separate unit to the main Northern General Hospital; again junior physiotherapists rotate from the main hospital to gain experience in the treatment of spinal cord injury. There are sixty-four beds in total and currently just two of these are staffed to care for patients in need of ventilation. The ventilator support unit has been running for just three years.

Common practices across within the roles.

Liaison

- Phone liaison with referring hospitals' nursing, physiotherapy and medical staff for general advice on care of a spinal cord injured patient.
- Most contact by telephone is for weaning advice as the patient stands a greater chance of being admitted if they not requiring ventilatory support or high levels of nursing.
- Internal hospital liaison with ITU (which is not part the spinal unit) – the role operates with a nurse and the two roles complement each other. The physiotherapist can advise regarding respiratory / ventilatory issues and more general physiotherapy issues and the nurse practitioner can advise on skin, bladder and bowel management and drugs.

Out-reach

- Visiting patients prior to admission to assess them, to answer their, (or their family's questions), and to offer support to the referring staff.
- Where the patient is not expected to wean from the ventilator in the current unit we establish the patient on our portable ventilator and keep close contact with the unit to monitor the patient's progress and to offer advice and support until the patient can be transferred to the spinal injury unit.
- At the other end of the rehabilitation process we often accompany the ventilator dependent patient home for the first days after discharge to support the team caring for the patient. This is not always necessary but is always considered to ensure smooth transition from hospital to home after a protracted inpatient stay.
- Patients with spinal cord injuries are followed up for life and to that end we visit ventilator dependent patients with their consultant at home routinely. This is not only because it is often easier for us to go to them, but it is also ensures more thorough follow up as many issues become apparent when seeing the patient at home rather than in the hospital clinic. For example, issues regarding care, accommodation and family relationships are all easier to discern in the home situation. The obvious downside of this follow up method is that it is extremely time consuming and because spinal units are supra regional, and hence have large catchment areas, we often need to travel more than 300 miles to see patients. Salisbury also has several patients in the Channel Islands.
- When ventilator dependent patients require new ventilatory equipment we need to evaluate which machine is the most suitable. This involves repeated visits with the consultant and representatives from various ventilator companies in order to trial all appropriate ventilators.

Ward based clinical work

- Treating ventilated patients
- Writing and ensuring that weaning protocols work.
- Trouble shooting with ward physiotherapists and treating patients with respiratory

problems.

Documentation / standards

- Responsible for setting standards regarding respiratory care and generating protocols to that end.

Education and training

- Training and maintaining respiratory skills of all spinal injury unit staff of all grades and disciplines.
- New system of respiratory competencies currently being implemented in Salisbury for all staff at all grades. This system covers respiratory skills that may be required for staff from ward clerks – (knowing when to summon assistance) to consultants (prescription of ventilation parameters). The largest group of staff being the nursing staff with many health care support workers undertaking NVQ qualifications.
- Tracheostomy care
- Arranging training programmes for care teams of ventilator dependent patients – fulfilling training, testing competencies.

Key worker role

- Informal key worker role for ventilator dependent patients. Thus ensuring that one person has an overview of situation. In Sheffield this involves case managing through the discharge process.
- Link between the spinal unit team and the community team or PCT representatives who will take on responsibility for care.

Equipment

- Evaluating new ventilators, monitors (oximeters, capnographs) tracheostomy tubes and dressings, humidifiers, batteries, suction units, nebuliser units for use with spinal patients both in the spinal unit and at home.
- Costing and providing equipment lists for all capital and consumable equipment for patients who are to be discharged home on ventilation. This is to enable the relevant PCT to cost the package and project ongoing costs.
- Responsible for ensuring that respiratory equipment is serviced and well maintained.

Waiting list

- In Salisbury there is a weekly meeting to discuss admissions, which Kathryn Harris attends. In Sheffield, Jacqui Bull manages the waiting list and keeps in regular contact with the referring units to check progress and provide support and advice. Due to the complex nature of the high spinal cord injury the patients often stay in hospital for a very long time. The average time from admission to discharge of a ventilator dependant individual in around 18 months, it is possible therefore that other patients will have a long wait on the intensive care unit, we try and support them during this wait by keeping regular contact and visiting if necessary.
- Responsible for ensuring adequate equipment available for proposed new patients, if for example there is not a suitable ventilator and humidifier available the patient cannot be admitted.

External education.

We are both involved in wider education. So far this has taking us in different directions. Kathryn has more experience and has presented at an international conference. A summary of her work to date includes:

- Presenting original research paper at the International Medical Society of Paraplegia (IMSOP) meeting in Sydney, Australia.
- Presenting at the ACPRC conference in 2000.
- Part of a team of three staff (in addition to a nurse lecturer practitioner and a consultant) teaching study days at referring hospitals on acute management of spinal cord injuries.
- Various opportunities for teaching to physiotherapy staff at referring hospitals.
- Teaching tracheostomy study day to rehabilitation unit staff.
- Updating education for care team of ventilator dependent patients.

Jacqui has so far kept this commitment nearer to home, lecturing on the undergraduate and postgraduate courses at Sheffield Hallam University, and setting up and running a study day following a request at Leicester Royal Infirmary.

We are both active members of the RISCI group (Respiratory Information in Spinal Cord Injury), which is a multi disciplinary group with representative from each of the spinal units in the UK. Jacqui started the group with an idea to gain exchange of ideas and peer support from fellow physiotherapists when she was first in post. The group has just had just had its 4th meeting which was attended by sixty delegates.

Where the roles differ.

Job share

The roles have taken on different emphasis in Salisbury with an interesting development as following maternity leave Kathryn has returned to work part time, for three days a week. The role is obviously a full time one and so there is now a job share partner – Wendy Hedley. She is employed as a G- grade nurse with a largely shared job description. She has experience in intensive care and ventilation of spinal cord injured patients and has undertaken clinical teaching on respiratory topics. Overall, she has the qualifications that were

needed to fulfil the role. The fact that Wendy is a nurse by profession, Kathryn sees this as an advantage as their skills and teaching methods are different and should complement each other. As a large part of the role is about teaching and ensuring that staff on the spinal unit, the bulk of whom are nurses, are clinically up to date with respiratory issues, Kathryn is glad that she now has Wendy to assist her with that large and often daunting task. Wendy's previous experience in intensive care will also be useful when liasing with both our own ITU in Salisbury and external units.

Taken as a whole, with Agenda For Change just around the corner, this job share represents a practical solution of the need to fulfil a role with skills that can be derived from more than one specific profession. Some may consider this an undermining of the physiotherapist's hard-earned position to the ever-dominant nurse within the health service, but Kathryn sees it as a very healthy interdisciplinary exercise. The more we all work in a truly interdisciplinary fashion the more we can utilise each others' skills for the benefit of the patient.

Pulmonary function testing.

One part of the role that has developed in Sheffield is that of pulmonary function testing, Jacqui is currently studying for the ARTP/BTS Spirometry Certificate, and undertakes the entire ward-based pulmonary function tests.

Medico-legal work.

In Sheffield Jacqui has been approached by a firm of solicitors to write a medico legal report on a patient with a high spinal cord injury. This has been an interesting experience which involved visiting the patient to assess their physiotherapy needs and potential to gain from further rehabilitation input and writing a report of these findings for the court.

PUBLICATIONS

Kathryn has been involved in one research paper and also co-written a chapter for a book the reference for both follow:

WARD,T.A. AND HARRIS, K.R (2002)
Spinal Cord Injury In: Pryor, J.A., and Prasad, S.A. (eds.) Physiotherapy for Respiratory and Cardiac Problems. (3rd edition) Churchill Livingstone. Edinburgh: 537-549

TAYLOR PN, TROMANS AM, HARRIS KR, SWAIN ID (2002)
Electrical stimulation of abdominal muscles for control of blood pressure and augmentation of cough in a C3 / C4 tetraplegic. Spinal Cord. 2002 (40) 34-36

Jacqui has to admit that although she has carried out a very interesting single case study on respiratory muscle training that this has yet to be published!

The Role of The Nurse Consultant (Respiratory Care)

Jane Scullion

Nurse Consultant
The Respiratory Unit
University Hospitals of Leicester
Glenfield Site
Groby Road
Leicester
LE3 9QP

Summary

The development of nurse consultant roles has created a well-defined career pathway for nurses and with its roots firmly in clinical practice enables the retention of experienced practitioners working with patients as their primary focus. Although the role is suited to many disease areas they are often developed where there are National Service Frameworks or areas of perceived need. As the burden of respiratory disease affects both acute care and chronic disease management and concern to primary and secondary care the role of nurse consultant appears to be a robust concept. The role has also paved the way for the development of consultant posts in the allied health professions. This article looks at the background to the role, the four areas of practice, its usefulness and its place in health care provision with particular reference to respiratory care

Background.

The nurse consultant role is the natural consequence of evolving nursing roles occurring as a natural reaction to the growth in specialisation originally amongst the medical profession. This rise in medical specialisation was based on the recognition that individual doctors could not acquire all the knowledge or skills required to manage all disease processes. As a response to the medical division of labour, developments in nursing roles followed with an increased focus on specialisation. Although some current nursing roles are a by-product of medical specialisation, others reflect the need to provide ongoing care for patients. More recently, nurse specialist roles and especially the nurse consultant role have developed in response to an expansion of knowledge and skills, a desire on the part of nurses for a more varied career structure, and an increase in the public demand for services provision (Scullion, 2003). In this way nursing has become a professional discipline that can be seen as complementary to other professions in health and social care. As society changes and healthcare provision accommodates these changes so nursing roles evolve and the development of the nurse consultant role reflects these changes.

The role of Nurse Consultant was proposed by Tony Blair at the 1998 Nurse Awards in response to a national consultation that was to inform a new strategy for nursing and in particular a broad consensus about the need to strengthen clinical leadership, and to improve career paths and opportunities. This was then formalised in the document 'Making a Difference' launched in 1999 with the NHS Plan in 2000 setting a target of 1000 nurse consultant posts by 2004 (DoH, 1999).

What's in a name?

Although an increasing number of nurses are referred to as 'nurse specialist' or 'nurse practitioner' these titles, unlike the term 'registered nurse', have no legal protection (Scullion, 2003). There is wide variation between individual nurse specialists and nurse practitioners in both roles and qualifications, and whilst some nurses using the 'specialist' and 'practitioner' titles have considerable knowledge and experience some have had little appropriate training or

education to support their role. This diversity reflects a poor conceptualisation over roles, and a lack of professional control over role development (Scullion, 2003). Nurse consultant posts were developed to keep experienced and expert practitioners in clinical practice whilst clearly defining the education and experience required for the post (DoH, 1999). It was envisaged this would help to provide better outcomes for patients by improving services and the quality of care, whilst strengthening nurse leadership (DoH, 1999). Unlike the development of many nursing posts the role of consultant was very clearly defined in four key areas encompassing expert/clinical practice, professional leadership and service development, training and education, research and evaluation.

Current role.

It is clear that the role of consultant nurse or midwife can be developed in any speciality where it can be shown that they will provide better outcomes for patients by improving services and quality. In respiratory disease both acute and chronic disease add to the burden of respiratory disease. Many respiratory diseases are chronic in nature although patients have acute episodes. Whilst early recognition and treatment of respiratory problems is fundamental to patient care it is perhaps the burden of chronic disease that is amenable to nursing intervention. Casteldine (1995) states that what nurses do well is to focus on situations and problems that arise from the disease processes, not merely on the medical treatments associated with the medical diagnosis. The post of respiratory nurse consultant in Leicestershire was created in the first tranche of consultant posts and was the first post created in respiratory care. Within Leicestershire there is a well-established respiratory unit with medical consultants, thoracic surgeons, specialist nursing posts and a pulmonary rehabilitation department. Whilst in some areas respiratory nurse consultant posts were established to provide services where none previously existed within Leicestershire the post developed to complement existing services and to work at the interface of primary and secondary care.

Expert/clinical practice.

Castledine contends that expert nursing practice should be rooted in nursing, and that nurses who become experts through experience and have a clear focus on nursing issues will be more reflective and analytical, whilst developing the body of nursing knowledge. It is clear that the expectation of workload for the consultant nurse is that 50% of time will be spent in expert/clinical practice. It is sometimes difficult to ascertain what is meant by expert practice but one interpretation is of keeping an expert working clinically. For many patients with respiratory disease once medical needs have been addressed, pulmonary rehabilitation is undertaken if appropriate residual handicap may persist. The clinical aspect of the Leicestershire post offers assessment, treatment and advice to patients with chronic disease and also those at the palliative stage of their disease process.

Professional leadership and service development.

Although around a third of acute admissions are for respiratory diseases which impacts upon acute care provision clearly the burden of respiratory disease falls on the community (Smith, 2002). The influence of politics on healthcare provision is reflected in the increasing number of government papers attempting to direct healthcare. 'The new NHS: modern, dependable' White Paper focuses on primary care, whilst 'Liberating the Talents' advocates a flexible and proactive approach to planning and delivering nursing services in primary care (DoH 1997, www.doh.gov.uk/cno/liberating talents.htm). The present focus is on new ways of working and on the interface between primary and secondary care. The role of consultant nurse allows the crossing of traditional barriers between primary and secondary care, working under the strictures of clinical governance by balancing patient need with service requirements (Scullion, 2003). A cross boundary role allows a focus both on prevention and chronic disease management and the role is supported by extensions in nurse prescribing and supplementary prescribing.

Training and education.

Education should be the foundation of advanced practice and developments in training are providing a higher degree of specialist knowledge among nurses (Dale, 2000). The consultant nurse role has a requirement for the practitioner to hold qualifications at masters' level and to work towards a doctorate thus increasing the body of nursing knowledge and improving individual skills and knowledge.

In addition to the individual's own education needs the consultant role incorporates the teaching of others and this can be either formally or informally and may involve affiliation to

the local university or to the specialist centres of respiratory education in Warwick and Liverpool.

Research and evaluation

Any new role clearly has to be both clinically and cost effective and therefore the role needs to be subject to both audit and evaluation. The evaluation of a role can be somewhat problematic if a service is a new development. When working with patients with chronic respiratory disease if no service has been provided before than provision of any service does have cost implications and although it may be beneficial in individual patient terms may be difficult to quantify. Clearly identifying and meeting unmet need can be important but it will come at a price.

Research also has a place within the nurse consultant role and it is likely that consultant nurses will develop a body of research pertinent to their own areas of expertise and is likely to be both pragmatic and patient focused.

The place of the consultant role in health care provision

Nursing is inextricably linked with societal change and health care politics. As in previous years in 2004 the UK health service faces a shortage of consultants and reductions in the hours worked by junior doctors, shortages in the nursing profession; unacceptable waiting times for patients, geographical inequalities and shortages in service provision. Those in consultant posts are expected to influence the health agenda at both local and national level, while improving patient outcomes.

The skills required of a nurse consultant are nursing skills, and post holders need the professional knowledge and skills commensurate with the post's responsibilities. Nurse consultants should not be a title change for a specialist nurse although many nurse specialists might claim that they fulfil the criteria. The creation of the nurse consultant role, for the first time clearly defines the criteria regarding role and function, together with a required educational level, have been laid down to define a new type of specialist nurse.

Conclusions

As new healthcare posts develop there is a blurring of traditional roles. Agenda for Change sets out new pay and career structures for nurses with equal pay for equal work aimed at breaking down the barriers to flexible working and creating patient-centred roles. All health professionals are responsible for the quality of their clinical practice however, supervision and regulation are important. It needs to be clear to patients and their carers what nurses do and what their skills are. Nurses need to be clinical leaders, not merely technical substitutes and any development of their roles should clearly be led by nurses. To meet patient needs the professions need to be open to change, working both flexibly and creatively for the benefit of patients. For nurses, role developments should be about nursing and not merely taking on tasks that others are unwilling or unable to do (Scullion 2003).

REFERENCES

CASTLEDINE G. (1995)
Will the Nurse Practitioner be a Mini Doctor or Maxi Nurse?
Br J Nurs, 4 (16): 938-9

DALE C. (2000)
The Emergence of the Nurse Specialist.
Nurse 2 Nurse, 1 (3): 14-16

DEPARTMENT OF HEALTH (1999)
Making a Difference – Strengthening the Nursing, Midwifery and Health Visiting Contribution to Health and Health Care. London: DOH

DEPARTMENT OF HEALTH (1997)
The New NHS -- Modern, Dependable. London: HMSO

SCULLION J E (2003)
The Developing Role of the Respiratory Nurse.
The Airways Journal, 1; 2:70-71

SMITH T (2002)
Breathing Space.
Nurs Stand, 17(8): 12

www.doh.gov.uk/cno/liberatingtalents.htm

Correspondence address:
Jane Scullion
Nurse Consultant
The Respiratory Unit
University Hospitals of Leicester
Glenfield Site
Groby Road
Leicester
LE3 9QP

Standards for Outpatient Pulmonary Rehabilitation

North-West Physiotherapy Audit and Clinical Effectiveness forum (P.A.C.E.F)
Sharon Baines

In collaboration with

Association of Chartered Physiotherapists in Respiratory Care
Rachel Garrod

& The British Thoracic Society
Mike Morgan

1. REFERRAL

STANDARD: There is a recognised referral pathway with a designated medical practitioner

Criteria:

1.1 The patient will be referred by a member of the multidisciplinary team involved with respiratory care from within acute and primary care settings (eg: practice nurse, respiratory therapist, respiratory specialist nurse, pulmonary physician, respiratory technician, general practitioner).

1.2 The patient will be given an appointment for an assessment within 12 weeks of receipt of the referral.

1.3 Referrals will be sent to an identified person in the pulmonary rehabilitation team.

1.4 Spirometry measurements of Forced Expiratory Volume in one second (FEV1) and Forced Vital Capacity (FVC) will be recorded prior to commencement of the programme, in accordance with BTS/ARTP guidelines.

1.5 The referral information will include:

Name
Date of birth
Address
Telephone number
Diagnosis
Height
Weight
Past Medical History
Drug History
Referral signature
Dated
Smoking status stated
Any special language requirements (e.g. translator)

2. INCLUSION CRITERIA

STANDARD: There is an identified minimum inclusion criteria [1]
Criteria:

2.1 Patients will be seen by a pulmonary physician in order to ensure optimisation and appropriate evaluation of medication prior to pulmonary rehabilitation.

2.2 Any known cardiac condition (e.g. angina) must be well controlled and stable.

2.3 Where possible the patients will provide their own transport, but local conditions may apply.

2.4 Patients will be informed that pulmonary rehabilitation requires their active participation.

2.5 Patients should have a diagnosed respiratory condition and consider themselves to be functionally limited either by breathlessness or by fatigue.

3. EXCLUSION CRITERIA

STANDARD: Patients with the co-morbidities listed below will be excluded from the programme

Criteria:

3.1 Unstable angina

3.2 Acute LVF

3.3 Uncontrolled hypertension

3.4 Any medical problems which severely restricts exercise or compliance with the programme (eg dementia, arthritis).

3.5 Uncontrolled cardiac arrhythmias [1]

3.6 Myocardial Infarction within 6 weeks of commencement of pulmonary rehabilitation.

4. EXERCISE TOLERANCE TESTING

STANDARD: A validated exercise performance measure will be recorded at baseline and at the end of the programme.

Criteria:

4.1 Physiological baseline measures should include; heart rate, respiratory rate, dyspnoea scale and pulse oximetry. These measures should be performed pre and post exercise test.

4.2 An appropriate, validated test will be used e.g. Shuttle Test [2], 6/ 12 minute walk [3] and administered according to standardised instructions [4;5]

4.3 Ambulatory oxygen will be available for use during exercise for patients on prescribed Long Term Oxygen Therapy (15 hours or more usage) or where a clear benefit (exercise tolerance, breathlessness) has been demonstrated.

5. OTHER OUTCOME MEASURES

STANDARD: Validated generic or disease specific measures of health status, Activity of Daily Living and psychological status will be recorded at baseline and at the end of the programme[6].

Criteria:

5.1 The questionnaires should be administered and scored as described by their authors.

6. STAFFING

STANDARD:
Staffing should be multidisciplinary in nature (local regulations may apply) [1, 7]. Recommend minimum of 1: 8 staff to patient ratio.

Criteria:

6.1 In venues where all patients cannot easily be observed staffing levels may need to increase.

7. DURATION OF PROGRAMME

STANDARD: The programme will be of a set duration for each participant.

7.1 Each patient will attend for 6 – 8 weeks [8].

7.2 At least 2 exercise sessions a week should be supervised by a professional trained in the provision of exercise therapy.

8. AN EXERCISE COMPONENT WILL BE INCLUDED

STANDARD: An individualised exercise plan is formulated in partnership with the patient.

Criteria:

8.1 The exercise modalities included should include aerobic training with a focus on functional activities and incorporate use of the upper and lower limbs [9] .

8.2 Patients should have an identified strategy for exercise prescription:
(i) Pre determined intensity of work rate
(ii) Programme of increasing work rate and/or duration.
(iii) Interval and / or endurance training [10]
(iv) A component of strength training where appropriate [11].

8.3 Patients should be provided with written instructions concerning an additional home exercise programme.

9. FREQUENCY OF EXERCISE

STANDARD: Exercise will be undertaken a minimum of 3 times a week, two sessions of which will be supervised [12].

Criteria:

1.1 Where patients are able, they should be able to exercise continuously for a minimum of 20 minutes by the time of discharge.

10. EDUCATION PROGRAMME

STANDARD: An education programme will run alongside the exercise programme and cover relevant topics associated with pulmonary rehabilitation [1].

Criteria:

10.1 The education package shall be delivered any health care professional or other person who has relevant information or expertise that may be useful to the group (e.g. Dietician, previous graduates, allied health professional, etc.)

10.2 The education programme may include the following topics:

a) Anatomy and physiology
b) Pathology of lung condition
c) Breathing control
d) Sputum clearance
e) Benefits of exercise
f) Relaxation, stress and anxiety management
g) Managing acute episodes
h) Smoking cessation
i) Social support
j) Nutrition
k) Medication
l) End of Life planning
m) Realistic goal setting
n) Adaptations to life style[13]

10.3 Patients will be given supporting written information at the education session. Supporting literature will be supplied in large print and other languages as required.

11. PROTOCOLS

STANDARD: There will be a local written instruction for all stages of rehabilitation.

(i) Referral
(ii) Assessment
(iii) Content, duration and frequency of programme
(iv) Reassessment
(v) Follow up / audit

11.1 The protocol will be reviewed annually.

12. AUDIT

STANDARD: There will be an annual audit [1]

Criteria:

12.1 There will be an audit of a representative sample of compliant patient's notes for standards 1-11.

12.2 There will be an audit of patients who:

a) Fail to attend the assessment appointment.
b) Fail to complete the programme (less than half supervised sessions).
c) Fail to attend the review dates.

12.3 Standard 11 will be audited at the annual review.

13. SAFETY

STANDARD: All staff will be aware of safety issues regarding patients and venues.

Criteria:

13.1 All staff will have evidence basic life support training.

13.2 There will be evidence of a risk assessment of the venue and equipment used.

REFERENCES

1. British Thoracic Society. Pulmonary rehabilitation. Thorax 2001;56:827-34

2. Singh SJ, Morgan MD, Scott S, Walters D, Hardman AE. Development of a shuttle walking test of disability in patients with chronic airways obstruction. Thorax 1992;47:1019-24

3. McGavin CR, Artvinli M, Naoe H, McHardy GJ. Dyspnoea, disability, and distance walked: comparison of estimates of exercise performance in respiratory disease. Br.Med J 1978;2:241-3

4. Steele B. Timed walking tests of exercise capacity in chronic cardiopulmonary illness. J Cardiopulmonary Rehabil 1996 16(1) 25-33

5. ATS statement: guidelines for the six-minute walk test. Am J Respir Crit Care Med 2002;166:111-7

6. Ambrosino N,.Clini E. Evaluation in pulmonary rehabilitation. Respir Med 1996;90:395-400

7. Hoberty PD, Chiu CY, Hoberty RJ. Staffing exercise sessions in pulmonary rehabilitation. Respir Care 2001;46:694-7

8. Green RH, Singh SJ, Williams J, Morgan MD. A randomised controlled trial of four weeks versus seven weeks of pulmonary rehabilitation in chronic obstructive pulmonary disease. Thorax 2001;56:143-5

9. Couser JI, Jr., Martinez FJ, Celli BR. Pulmonary rehabilitation that includes arm exercise reduces metabolic and ventilatory requirements for simple arm elevation. Chest 1993;103:37-41

10. Vogiatzis I, Nanas S, Roussos C. Interval training as an alternative modality to continuous exercise in patients with COPD. Eur.Respir J 2002;20:12-9

11.Gosselink R, Troosters T, Decramer M. Peripheral muscle weakness contributes to exercise limitation in COPD. Am J Respir Crit Care Med 1996;153:976-80

12. Puente-Maestu L, Sanz ML, Sanz P, Cubillo JM, Mayol J, Casaburi R. Comparison of effects of supervised versus self-monitored training programmes in patients with chronic obstructive pulmonary disease. Eur.Respir J 2000;15:517-25

13. Scherer YK, Janelli LM, Schmieder LE. A time-series perspective on effectiveness of a health teaching program on chronic obstructive pulmonary disease. J Healthc.Educ.Train. 1992;6:7-13

ACPRC AGM 2003

October 17th 2003, Birmingham International Convention Centre

1. Apologies:

2. Minutes of last AGM

2.1 unavailable for 2002 as no AGM took place
2.2 minutes for 2001 available in last year's Journal
2.3 no matters raised

3. Chair's report - Jane Cross (JC)

3.1 JC thanked all committee members for their work, especially those involved in Congress. A programme has also been accepted for next year's Congress
3.2 ACPRC journal now listed in AMED- JC noted this as a significant achievement
3.3 JC feels the committee have been representing ACPRC members very well in their current work

4. Treasurer's report – Lisa Plummer (LP)

4.1 Accounts for 2001/2002 available to all present, and will be available on website
4.2 Balance = £23871.78

5. Membership report - Hazel Horrobin (HH)

5.1 Membership 533 currently
5.2 Direct Debit system now running smoothly

6. PRO report - Beverley Harden (BH)

6.1 BH thanked all involved in the on-call project
6.2 BH also wished to thank Frontline for all their coverage
6.3 Regional Reps posts are now being re-developed, BH feels we should welcome this change and see it as a move forward

7. Research officers report - Rachel Garrod (RG)

7.1 RG gave a short description of her post/ duties
7.2 RG to run research workshops in November/ December- a 'how to' guide
7.3 Standards for pulmonary rehabilitation developed and endorsed by BTS
7.4 RG initiating national audit of pulmonary rehabilitation
7.5 RG represented physio at NICE

8. Publication chair's report - Nicky Garner (NG)

8.1 Respiratory Review popular, recently distributed, 6 new reviewers involved this year
8.2 Slide bank is being less used and does not warrant committee member post in the future- this will be explored later in section 9
8.3 Newsletter used for many adverts, but more articles need to be generated
8.4 Journal problems of the past are resolved (deadlines), and publications' committee feel that the recent journal is an excellent piece of work
8.5 Website:
8.51 problems with content being updated, rep from Medis present at AGM and will try to resolve these issues
8.52 rep also aware of problems with members accessing site- password may be the answer, she will follow up this issue

9. Presentation of proposed changes to committee

9.1 Kelly Redden-Rowley (KRR) presented a possible new structure for the main committee, and explained the reasoning behind this. All present were given a copy of this proposed structure
The Core committee and publications group remain relatively unchanged.
Three main areas are then identified, critical care, paeds, and chronic lung disease, which will each be led by one officer, or 'champion'. These posts will constitute the new committee
9.2 Discussion followed between committee members and the floor, exchanging ideas and confirming that similar structures were indeed working well
9.3 One concern was that the new structure may be off putting to junior

members of staff due to its more specialised nature. The committee did not feel that this was the intention, and will attempt to avoid an 'elitist' element to the organisation

9.4 There will not be a formal link to the Paediatric CIG

9.5 Clarification is needed as to where surgical members fit into the 3 groups – the committee recognised that a 4th group will be needed

9.6 There was a unanimous vote in favour of this change by those present

10. Changes to Constitution

10.1 A unanimous vote was received to make the changes necessary to implement the above plan (item 9)

11. Honorarium/ expenses

11.1 KRR proposed, following discussion at the main committee meeting of Sept 15th 2003, that the core committee member's honorarium is either increased to £100, or that free membership to the ACPRC be offered. These proposals were explained by JC

11.2 Mary-Ann Broad proposed that the committee members receive £100 and free membership. This was seconded by Jennifer Pryor and Alex Hough, and received a unanimous vote in favour from the floor

11.3 KRR also proposed following the main committee meeting that travelling expenses be increased in line with current NHS payments to 40p per mile. This was voted upon by all present, and was unanimous in favour of the motion

12. Membership fees

12.1 KRR also proposed following discussion at the main committee meeting that overseas and departmental membership fees be increased

12.2 This led to discussion and a vote followed- no one present wished to raise overseas membership fees.

12.3 No decision was reached regarding departmental membership, a unanimous vote was taken to continue this at the next committee meeting

13. Election of Officers

13.1 Wendy Browne was propsed for post of secretary by KRR, and seconded by Paula McNaughton (PM)

13.2 Sara Bolton was prosed for post of PRO by JC, and seconded by KRR

13.3 Both of the above were voted into post unanimously

13.4 KRR called for volunteers to the post of champions, Sheric Ellum and Paul Birch came forward for post of critical care champion, and Mandy Dryer for chronic lung disease. These members will be co-opted, and a formal vote will need to be taken at the next AGM. Any other volunteers for the remaining posts please contact the committee

14. AOB

14.1 Alison Aldridge formally resigned from post of CIGLO. This will become incorporated into the posts of chair and vice chair

14.2 Hazel Horrobin wishes to discuss at the next main committee meeting the issue of database access