Protocol Title: The effect of combining manual therapy with exercise for stable mild chronic obstructive pulmonary disease: a randomised controlled trial.

Version Number: 6

Date of Protocol: 24 March 2015

SYNOPSIS

Chronic obstructive pulmonary disease (COPD) is a major cause of disability, hospital admission and premature death. Current management strategies have not been successful in altering the loss of lung function typically seen as the disease progresses. Results from recent pilot trials suggest a combination of two interventions not traditionally used in the management of COPD have the potential to alter the pattern of decline in lung function typically seen in COPD. These interventions were manual therapy (MT) and exercise.

The aim of this study is to investigate whether the combination of MT and exercise produces sustainable changes in lung function in people with stable mild COPD. The primary outcome measure is lung function testing. The secondary outcome measures are exercise capacity, quality of life, anxiety and depression, chest wall expansion and blood biomarkers.

The study is designed as a randomised controlled trial.

Two hundred and two people with stable mild COPD will be divided in to two equal groups matched at baseline. The first group will receive a standardised exercise program (Ex). The second group will receive MT (massage and thoracic spinal manipulation) plus the same standardised exercise program (MT+Ex). Exercise will be administered a total of thirty-six (36) times over an eighteen (18) week period while MT will be administered in conjunction with exercise a total of fifteen (15) times over a six (6) week period. All MT will be delivered just prior to exercise.

The primary outcome measure is lung function (Forced expiratory volume in the 1st second: FEV_1 and forced vital capacity: FVC). The secondary outcome measures are six minute walking test (6MWT), quality of life questionnaire (St Georges Respiratory Questionnaire: SGRQ), anxiety and depression levels (Hospital Anxiety and Depression scale: HAD), frequency of exacerbations, non-invasive chest wall expansion measurements (tape measurements and a manual assessment of respiratory movement: MARM) and blood tests for systemic inflammatory biomarkers. All outcome measurements will be taken at 0, 4, 8, 16, 24, 32 and 48 weeks except for blood markers, which will be taken at 0, 4, 8, 12, 16 , 32 and 48 weeks.

Collecting outcome measurements after intervention has ceased will establish whether administering MT in conjunction with exercise delivers any additional benefits in COPD compared to exercise alone.

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Summary

Study title:	The effect of combining manual therapy with exercise for stable mild chronic obstructive pulmonary disease: a randomised controlled trial.
Protocol version:	6
Objectives	Primary objective To assess lung function following the administration of a combination of manual therapy and exercise to people with stable mild COPD Secondary objectives To assess exercise capacity, quality of life, anxiety, depression, frequency of exacerbations, chest wall expansion and blood biomarkers following the administration of manual therapy and exercise to people with stable mild COPD
Study design	Randomised controlled trial
Planned sample size	202
Selection criteria	(i) Mild COPD (COPDX classification: 60% ≤ FEV_1 < 80%) (ii) Stable COPD (no exacerbations for preceding 6 months) (iii) Currently non-smoking (for preceding 6 months)
Study procedure	The application of exercise with and without manual therapy to people with stable mild COPD
Statistical considerations	
Sample size calculation	202 (2 Groups of 101)
Analysis plan	Data will be reported as group means, standard deviations and confidence intervals. Analysis will be performed as an ANCOVA for difference between groups with baseline as a covariate. Statistical significance will be set at $p<0.05$. The Number Needed to Treat will be calculated. Missing data will be accounted for using the multiple imputation method. Two interim analyses will be conducted at 24 and 32 weeks.
Duration of the Study	2 years

TABLE OF CONTENTS

1. BACKGROUND

1.1. DISEASE BACKGROUND*

The primary source of exercise limitation in COPD is dyspnoea [1, 2]. The cause of this dyspnoea has been partly attributed to changes in chest wall mechanics [3-5] with an increase in chest wall rigidity being one of the major changes. This increase in rigidity disrupts the balance in chest wall recoil [6], leading to a fall in the efficiency of the ventilatory pumping mechanism. Falling efficiency causes an increase in the effort of breathing and a rise in dyspnoea levels [3, 7-9]. Reducing chest wall rigidity has therefore been suggested as a way of easing the level of dyspnoea [10].

The increase in chest wall rigidity typical of COPD is caused by expansionary forces exerted on the chest as a product of hyper-inflation of the lungs [6]. Some researchers however, have suggested that the rigidity may in part be due more to the history dependent mechanical properties of the chest wall rather than factors associated with the lungs [11]. These properties include a resistance to movement by the respiratory muscles that contribute to producing 'muscle stiffness', a phenomenon known as thixotropy [11, 12]. The thixotropic state of a muscle is determined by the position that a muscle is held in just prior to contraction. If the muscle is contracted while being held in a shortened state it remains shortened while if the muscle is contracted while being held in a lengthened state it remains lengthened. This occurs in the respiratory muscles when the lungs are hyper-inflated and the muscles are held in a shortened or lengthened position prior to contraction. Altering the length of these muscles could therefore decrease the level of chest wall rigidity and alleviate one of the factors responsible for producing dyspnoea.

This concept is supported by results from two recent pilot trials where manual therapy (MT) was administered to patients with COPD [13, 14]. The first trial, conducted on patients with moderate COPD, found a greater increase in forced vital capacity (FVC) and exercise performance over the short term for those receiving a combination of MT and exercise compared to those receiving exercise alone [13]. The second trial, conducted on patients with moderate to severe COPD undergoing pulmonary rehabilitation (PR), found clinically significant increases in FVC and exercise capacity in the group receiving MT and PR compared to PR only [14]. This finding had not previously been reported in the literature and is at odds with the prevailing view that PR programs are not capable of producing clinically significant increases in lung function [15, 16].

1.2. RATIONALE FOR PERFORMING THE STUDY*

Improving outcomes from pulmonary rehabilitation have the potential to help curb the rising burden of disease that is currently associated with COPD. This trial is designed to investigate an attempt to improve one of these outcomes *i.e.* lung function, by testing a novel combination of interventions on people with mild COPD. If successful it will provide evidence for including this approach in a full pulmonary rehabilitation program. We also hope to show if a sustained improvement in lung function has an effect on exercise capacity, quality of life, anxiety, depression and systemic inflammatory biomarkers.

2.STUDY OBJECTIVES*

2.1. PRIMARY OBJECTIVE*

To measure the long-term effect on lung function of administering manual therapy with and without exercise to people with mild COPD.

2.2. SECONDARY OBJECTIVES

To report on the effect of these interventions on the prognosis of COPD by measuring changes in exercise capacity, chest wall mechanics, quality of life, anxiety, depression, frequency of exacerbations and systemic inflammatory biomarkers.

3. STUDY DESIGN*

3.1. DESIGN*

Randomised controlled trial

3.2. STUDY GROUPS

Two groups

Group 1: Exercise (Ex)

Group 2: Manual therapy plus exercise (MT+Ex)

3.3. NUMBER OF PARTICIPANTS*

202 in total: 2 groups of 101

3.4. NUMBER OF CENTRES

One centre – all participants at a single centre

3.5. DURATION

Duration: 24 months

Start Date: 1 June 2014

End Date: 31 May 2016

4. PARTICIPANT SECTION

4.1. INCLUSION CRITERIA*

- Sex: Male and Female
- Age range: 50-65 years
- Disease status: Mild COPD (COPDX: 60% ≤ FEV_1 < 80% predicted)
- Concomitant disease status: Stable COPD (no exacerbations in preceding 6 months)
  Non-smoking (for preceding 6 months)
- Willingness to give written informed consent.
- Willingness to participate in and comply with the study requirements.

4.2. EXCLUSION CRITERIA*

- Inability to complete 6 minute walking test unassisted
- History of auto-immune disease such as rheumatoid arthritis (RA) or systemic lupus erythematosus (SLE) that may have permanent*ly* affect*ed* systemic inflammatory biomarkers
- Contra-indicated to thoracic spinal manipulation
    - Bone density (DEXA) scores below minimum levels (T score < -2.5 and/or Z score < -1)

    - Thoracic joint instability
    - Acute pain on thoracic joint range of motion testing
    - Below normal chest wall musculature for age and gender
    - High level of anxiety related to receiving thoracic spinal manipulation
- Inability to understand English
- People with a cognitive impairment, an intellectual disability or a mental illness
- Completed a pulmonary rehabilitation program in the previous 12 months

5. STUDY OUTLINE*

5.0 METHODS

The Study Flow Chart is outlined in 5.1 below.

Volunteers, who meet the inclusion criteria will be given an information sheet and asked to sign consent. They will then undergo a screening for contra-indications to thoracic spinal manipulation (see 5.4 below). After a volunteer has passed the screening test they will be enrolled in the trial and given a trial specific ID number. Baseline measurements for each participant will then be taken.
These include lung function, exercise capacity, chest wall expansion, quality of life, anxiety, depression and systemic inflammatory biomarkers.

All outcome measures will be taken by current members of Sutherland Hospital's pulmonary rehabilitation team familiar with administering these assessments. Lung function (Forced expiratory volume in the 1st second: FEV_1 and forced vital capacity: FVC) will be assessed using spirometry. Exercise capacity will be assessed using a six minute walking test (6MWT) where capacity is determined by the total distance walked in a period of six minutes. Quality of life (St Georges Respiratory Questionnaire: SGRQ) and anxiety and depression (Hospital Anxiety and Depression scale: HAD) scores will be calculated using questionnaires. Frequency of exacerbations will be gathered by direct questioning of the participants. Spirometry (FEV_1 and FVC) will be assessed with the participant in a sitting position. Exercise capacity will be measured using a hallway 6MWT with an assessor close by the participant at all times during the test to minimise any risk of fall during the test and to reassure the participant should they become anxious while undergoing the test. Non-invasive chest wall expansion measurements (tape measurements and manual assessment of respiratory movement: MARM) will be taken by a research assistant trained and experienced in the use of these measurements. Systemic inflammatory biomarkers will be collected via basic blood sampling (10mL) taken by a registered nurse.

All manual therapy (MT) will be administered by qualified chiropractors and/or osteopaths with experience in the manual therapy protocol (MTP) used in this trial. This is the same MTP that was used in two previous Australian trials on patients with COPD (13, 14). It consists of soft tissue therapy (ST) and thoracic spinal manipulation (SM).

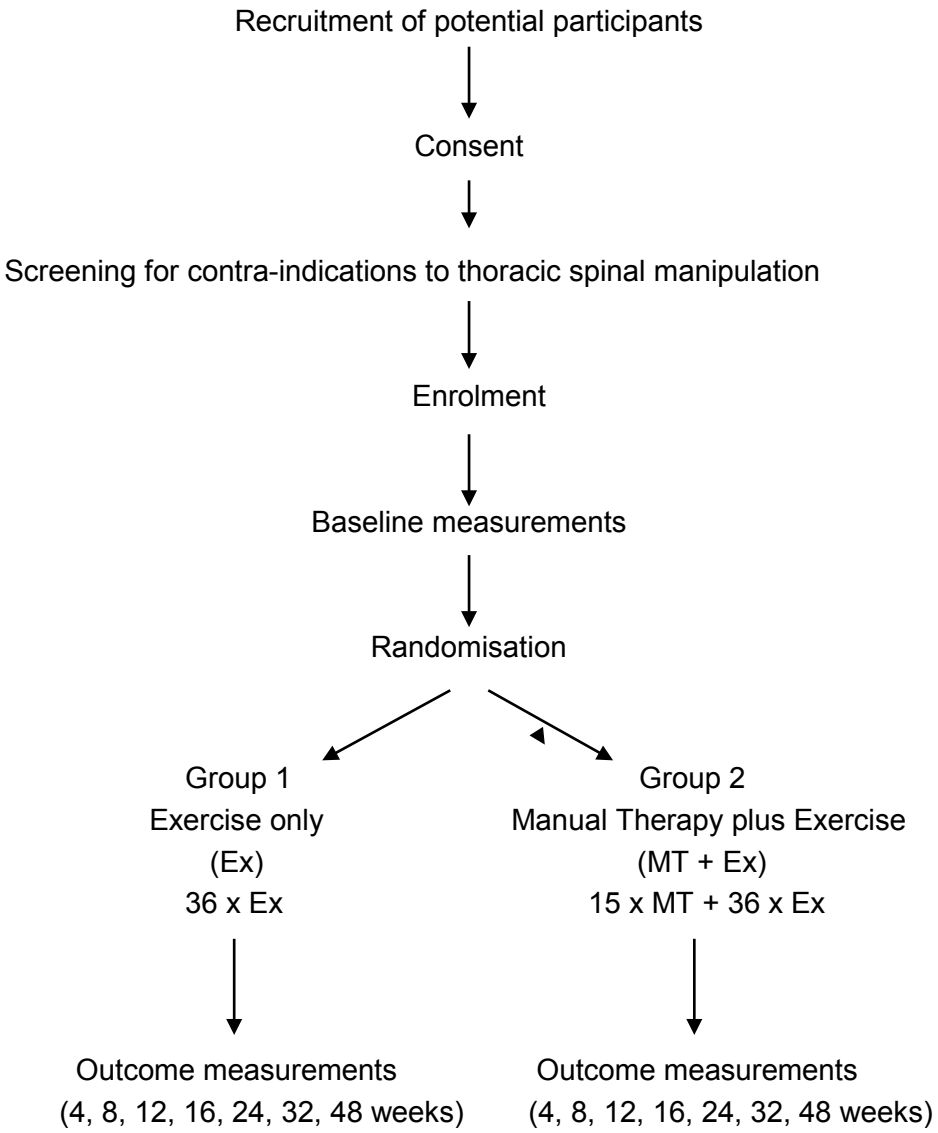
ST is made up of gentle Effleurage and cross-fibre friction massage applied to the muscles of the posterior chest wall including the intercostal, serratus posterior and anterior, rhomboid, trapezius, latissimus dorsi, erector spinae, quadratus lumborum and levator scapulae muscles. SM consists of two separate manipulations (Grade V mobilisation - Maitland [17]). Each manipulation involves the delivery of a high-velocity low amplitude (HVLA) posterior to anterior force directed at the inter-vertebral, costo-vertebral and costo-transverse joints. The first manipulation is

delivered at the level of the upper/middle thoracic spine while the second is at the level of the middle/lower thoracic spine. All SM is administered as non-specific, multi-joint (group) manipulations. Administering manipulation in this way reduces the total number required to manage an area as large as the chest within a single intervention session as each manipulation has the potential to affect several thoracic vertebrae and their associated ribs simultaneously.

MT sessions last approximately 20 minutes and will be administered just prior to the exercise component of the trial.

5.1. STUDY FLOW CHART

Diagram of the study design



5.2. INVESTIGATION PLAN*

Interventions	Visit 1 Baseline	Visit 2-8 weeks 1-4	Visit 9 week 4	Visit 10-19 weeks 5-8	Visit 20 week 8	Visit 21-32 weeks 9-16	Visit 28 week 12	Visit 33 week 16	Visit 34 week 24	Visit 35-38 weeks 25-26	Visit 39 week 32	Visit 40 week 48
Informed Consent	✓											
Medical history	✓											
Inclusion / Exclusion criteria	✓											
Screening for contraindications to spinal manipulation	✓											
Physical examination (height, weight, heart rate, blood pressure)	✓		✓		✓			✓	✓		✓	✓
Spirometry	✓		✓		✓			✓	✓		✓	✓
Chest wall movement measurements	✓		✓		✓			✓	✓		✓	✓
6 minute walking test	✓		✓		✓			✓	✓		✓	✓
Quality of Life questionnaires (SGRQ & HAD) Frequency of Exacerbations	✓		✓		✓			✓	✓		✓	✓
Blood test	✓		✓		✓				✓			✓
Exercise (Groups 1 & 2)		✓	✓	✓	✓	✓				✓		
Manual Therapy (Group 2 only)				✓	✓					✓		
Adverse Event & Serious Adverse Event Assessment		✓	✓	✓	✓	✓				✓		

Standard pulmonary rehabilitation includes exercise. The exercise intervention (Ex) used in this trial is the same as the exercise component of the pulmonary rehabilitation program currently being used at Sutherland Hospital.

Manual therapy intervention (MT) is not part of a standard pulmonary rehabilitation program.

Manual therapy will be administered according to a manual therapy protocol (MTP) previously tested on people with moderate to severe COPD (references 13 and 14).

5.3. STUDY PROCEDURE RISKS*

The risks of harm or discomfort to participants in this study primarily relate to the application of MT. Adverse events (AEs) associated with MT have been reported in the literature and can be classified in to three groups: mild, moderate and severe [18]. The majority of AEs associated with MT are mild and self-limiting. They include muscle soreness and local discomfort in and around the treated region. They do not require further medical attention

and resolve within 48 hours [18]. Moderate AEs have also been reported following certain types of MT such as joint manipulation. Moderate AEs have been estimated to occur at a rate of 1 in 40,000 manipulations [19]. Reports of major or catastrophic AEs resulting from spinal manipulation appear in the literature. The majority of these reports relate to neck (cervical) manipulation [18, 19]. As this trial only involves manipulation of the thoracic spine and ribs and does not include neck (cervical) manipulation any estimation of risk of a severe AE in this trial should not rely on the incidence or nature of AEs associated with neck (cervical) manipulation.

The manual therapy protocol (MTP) that will be used in this trial is the same MTP that was used in two previous trials on people with COPD [13, 14]. There were no severe or moderate AEs reported in either of those trials. Mild AEs resulting from MT were reported at a rate of 15% (18 out of 112) in the trial on moderate COPD (average age 56.1 years) [13] and at a rate of less than 1% (2 out of 403) in the trial on moderate to severe COPD (average age 65.5 years) [14]. Furthermore, in a case series of 6 elderly patients (average age 79.1 years) with moderate to severe COPD and low levels of daily activity, no major or moderate AEs were reported following 72 thoracic HVLA spinal manipulations while mild AEs were reported at a rate of 29% (21 out of 72) [20].

All three trials [13, 14, 20] included pre-trial screening for bone density with the two Australian trials [13, 14] including an additional exclusion criteria based on T and Z scores. As this trial will use the same pre-trial screening procedure, the same T and Z score exclusion criteria and the same MTP as the two previous Australian trials, it is reasonable to assume a similar level of risk of harm or discomfort to participants as in the previous trials. In addition to this, the participants in this trial will have a less-advanced stage of COPD compared to the other trials (mild versus moderate to severe) and could therefore be considered in a better position to tolerate a musculoskeletal intervention such as MT. With reports of only minor AEs following previous applications of this MTP we submit that the potential for benefit to lung function associated with this combination of interventions is adequately balanced against the level of risk of harm or discomfort to participants that may arise as a result of administering this form of MT.

5.4. RECRUITMENT AND SCREENING*

Recruitment will be by way of one or more of the following:

i) GPs from the Sutherland Medicare Local Network will be approached to refer existing patients with mild COPD to the trial.
ii) Respiratory specialists from the Sutherland region will be approached to refer existing patients with mild COPD to the trial.
iii) Lung Foundation Australia (LFA) will be approached to send out flyers by direct mail to members living in the region aged between 50 and 65 years with mild COPD.
iv) Advertisements seeking volunteers for the trial will be placed in the local print media.
v) Public information talks held at Sutherland Hospital and/or local Community Centres.

Potential participants referred to the trial by their GP and/or Respiratory Specialist will be directed in the first instance to contact Investigators 1 (RE) or 2 (PG) by email or telephone. RE or PG will perform an initial check for basic inclusion and exclusion criteria e.g. age, COPD category, etc. All discussions about participating in the trial will be the responsibility of these investigators. This will mitigate the possibility of any coercion by their treating clinician. Volunteers who respond to an LFA flyer, advertisement in the local media or public talk will follow the same process and be under no obligation to progress to full participation.

Once through the initial check a potential participant will then be screened for contraindications to thoracic spinal manipulation. This process, conducted by Principal Investigator 1 (RE), involves a physical assessment of the thoracic spine, rib cage and associated musculature, including a bone density scan (DEXA) where clinically warranted

and a discussion about the risks associated with receiving thoracic manipulation. The trial will use the same bone density exclusion criteria used in the two previous trials referred to in this application (T score < -2.5 and/or Z score < -1). Apart from low bone density, other reasons for exclusion include 'contra-indicated for thoracic spinal manipulation'. This includes one or more of the following: thoracic joint instability, acute pain on thoracic joint range of motion testing, below normal chest wall musculature for age and gender or a high level of anxiety related to receiving thoracic spinal manipulation.

5.5. Informed Consent Process*

Obtaining informed consent takes place before the pre-trial screening for spinal manipulation. No specific tools will be used to determine a participant's capacity to decide whether or not to participate in the project. All potential participants, including those who were referred to the trial by their GP or respiratory specialist and those who responded to an LFA flyer or public notice, will be supplied with a Patient Information Statement and Consent Form (PICF) explaining the trial's processes and procedures and what is expected from them during the trial. All potential participants will then be given the opportunity, either by telephone, email or in person, to ask questions about their participation in the trial. In the event there is any doubt on the part of the Investigators about a person's capacity to understand the information that has been supplied to them or to decide whether or not to participate in the trial, that person will be excluded from the trial.
Two copies of the consent form will be signed and dated by the participant and a representative from the trial. One copy will be given to the participant while the other will be retained as part of the trial's documents.

5.6. Enrolment Procedure*

After a participant has provided written informed consent and met all of the inclusion criteria (including screening for contra-indications to spinal manipulation) they will be enrolled in the trial. The participant will receive a trial-specific identification number which will be documented in their medical record and on all study documents.

5.7. Randomisation Procedure

Participants who have passed the screening test, provided written consent and completed baseline measurements will be divided according to gender. They will then be randomly allocated to study Groups (Ex or MT+Ex) using a random allocation sequence generated by an administrative officer in the Department of Chiropractic at Macquarie University. This person will have no other role in the trial.

6. SAFETY*

6.1. Adverse Event Reporting*

In this trial all adverse events will be recorded including mild, moderate and severe adverse events (see 5.3 for definition). An adverse event is any untoward medical occurrence in a participant which may or may not be related to the trial's treatment. It includes any unfavorable or unintended sign, symptom or condition that is directly or indirectly related to the application of manual therapy and/or exercise.

6.2. Serious Adverse Event Reporting

A serious adverse event is any untoward medical occurrence that results in the following: death, is life-threatening, requires inpatient hospitalisation, persistent or significant disability/incapacity or a condition that requires unnecessary medical or surgical intervention.

6.3. DATA SAFETY AND MONITORING BOARD

A Data Safety Monitoring Board (DSMB) has been appointed to oversee the study. It is made up of Dr Ben Kwan (Respiratory Physician), Ms Jackie Primmer (Southcare Nurse Manager), Ms Trish Wills (Sutherland Hospital - governance) and Ms Rosemary Giuriato (Macquarie University- Chiropractor). The initial meeting of the DSMB will be held 2 months after the trial commences and then every 4 months after that DSMB to review the study data.

6.4. EARLY TERMINATION

This research project may be stopped unexpectedly for a variety of reasons. These may include reasons such as unacceptable side effects or the treatment was shown not to be effective or the treatment was shown to work and not need further testing. In the event of the trial being terminated due to unacceptable side effects Investigator 1 (RE) will be responsible for managing all aspects of the early termination including informing participants, correspondence with the HREC and compiling a final study report.

7. BLINDING AND UNBLINDING

All assessors associated with collecting data from the outcome measurements will be blinded to a participant's Group. Staff providing Exercise intervention will also be blinded to a participant's Group. Staff providing MT intervention will obviously not be blinded to group allocation. All participants will be blinded to outcome measurements until the end of the trial.

8. STATISTICAL CONSIDERATIONS

Sample size calculation

Minimum clinically important difference in lung volume (FVC) = 200 ml

Standard deviation = 480ml (obtained from previous studies (references 13 & 14)

Power = 0.8 (80%)

Alpha = 0.05

Minimum sample size for two sample t-test = 92 per group

Minimum cohort size (i.e. 2 groups) is 2 x 92 = 184

Assuming a drop-out rate = 10%

Minimum cohort size = 202 (2 Groups @ 101)

Statistical analysis plan

Data will be reported as group means, standard deviations and confidence intervals (95%). Analysis will be performed as an analysis of co-variance (ANCOVA) for difference between groups with baseline as a covariate and standard errors calculated using a non-parametric bootstrap to allow for the different error variances for each group. A p value of < 0.05 will be set for statistical significance. For outcomes found to be statistically significant the proportion of participants with a change greater than the minimum clinically important difference (MCID) will be calculated for each outcome. The Number Needed to Treat (NNT) will be calculated using Bender's method for confidence intervals.

Missing data will be accounted for by using an intention-to-treat (ITT) analysis with data from subjects lost to follow-up imputed using the multiple imputation method.

Two interim analysis points are planned before the final analysis. They are:

(i) Mid-trial following the second blood test (week 24)
(ii) 6 weeks after completion of all intervention (week 32)

The conduct of the trial will not be affected by the results of these interim analyses. The purpose of the interim analyses is to facilitate timely publication of the relevant results once the trial has been completed.

9. STORAGE AND ARCHIVING OF STUDY DOCUMENTS*

Information will be stored in paper copy form and as encrypted computer files. All paper copy forms will be stored in a locked filing cabinet in the Southcare facility during the intervention phase of the trial. Once the intervention phase has been completed (post week 26), all data will be entered on to a Macquarie University laptop computer, stored as encrypted files and backed up on a second computer in the university office of Investigator 1 (RE). Once the trial has been completed, all paper copy forms will be stored in a locked filing cabinet in the university office of Investigator 1 (RE).

Information will be stored for a minimum of 5 years after the last publication that relies on the data from this trial.

Should Investigator 1 (RE) cease to be employed at Macquarie University, all information collected as part of this trial will be stored in a locked filing cabinet in the university office of Principal Investigator 3 (SV).

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11. APPENDICES

Appendix 1: Advertisement in local media and LFA flyer

Appendix 2: Hospital Anxiety and Depression scale

Appendix 3: St. George's Hospital Respiratory questionnaire

Appendix 1

COPD MANUAL THERAPY TRIAL

CALL FOR VOLUNTEERS

Project title: The effect of combining manual therapy with exercise for stable mild chronic obstructive pulmonary disease (COPD): a randomized controlled trial.

Musculoskeletal structures associated with breathing, such as the chest wall muscles and ribs, have been suspected as contributing to the decline in lung function typically seen in COPD.

While performing exercise has been shown to improve exercise capacity and quality of life in people with COPD, recent studies have reported additional improvements from combining exercise with manual therapy, an intervention that improves the flexibility of muscles and joints.

We are looking for volunteers to participate in a trial that will investigate the longer term effects of manual therapy and exercise on lung function, exercise performance and quality of life in people with mild COPD.

To participate in this trial, volunteers must:

- Have a current diagnosis of mild COPD
- Be between 50 – 65 years of age
- Be currently non-smoking (minimum 6 months)
- Be able to perform a 6 minute walking test unaided
- Not be contra-indicated for thoracic spinal manipulative therapy
- Not have taken part in a pulmonary rehabilitation program in the previous 12 months

If you are interested in participating in this trial or would like further information please contact:

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Appendix 2

HAD SCALE

MRN:
DOB:

Date: _____

Doctors are aware that emotions play an important part in most illnesses. If your doctor knows about these feelings he will be able to help you more.

This questionnaire is designed to help your doctor to know how you feel. Read each item and place a firm tick in the box opposite the reply, which comes closest to how you have been feeling in the **past week.**

Don't take too long over your replies: your immediate reaction to each item will probably be more accurate than a long thought-out response.

TICK ONLY ONE BOX IN EACH SECTION

I feel tense or "wound up"

- Most of the time
- A lot of the time
- Time to time, occasionally
- Not at all

I feel as if I am slowed down

- Nearly all the time
- Very often
- Sometimes
- Not at all

I still enjoy the things I used to enjoy

- Definitely as much
- Not quite so much
- Only a little
- Hardly at all

I get a sort of frightened feeling like "butterflies" in the stomach

- Not at all
- Occasionally
- Quite often
- Very often

I get a sort of frightened feeling as if something awful is about to happen

- Very definitely and quite badly
- Yes, but not too badly
- A little, but it doesn't worry me
- Not at all

I HAVE LOST INTEREST IN MY APPEARANCE

- Definitely
- I don't take as much care as I should
- I may not take quite as much care
- I take just as much care as ever

I can laugh and see the funny side of things

- As much as I always could
- Not quite so much now
- Definitely not so much now
- Not at all

I feel restless, as if I have to be on the move

- Very much indeed
- Quite a lot
- Not very much
- Not at all

Worrying thoughts go through my mind

- A great deal of the time
- A lot of the time
- From time to time but not too often
- Only occasionally

I look forward with enjoyment to things

- As much as I ever did
- Rather less than I used to
- Definitely less than I used to
- Hardly at all

I feel Cheerful

- Not at all
- Not often
- Sometimes
- Most of the time

I get sudden feelings of panic

- Very often indeed
- Quite often
- Not very often
- Not at all

I can sit at ease and feel relaxed

- Definitely
- Usually
- Not often
- Not at all

I can enjoy a good book or radio or TV programme

- Often
- Sometimes
- Not often
- Very seldom

Appendix 3

1. THE ST. GEORGE'S HOSPITAL RESPIRATORY QUESTIONNAIRE

This questionnaire is designed to help us learn much more about how your breathing is troubling you and how it affects your life. We are using it to find out which aspects of your illness cause you most problem, rather than what the doctors and nurses think you problems are.

Please read the instructions carefully and ask if you do not understand anything. Do not spend too long deciding about your answers.

Name: _____ **Date**: _____

I.D. Number: _____

Age: _____ **Sex**: Male / Female

PART 1

QUESTIONS ABOUT HOW MUCH CHEST TROUBLE YOU HAVE HAD OVER THE LAST YEAR. PLEASE TICK IN ONE BOX FOR EACH QUESTION.

		Most days a week	Several days a week	A few days a month	Only with chest infections	Not at all
1.	Over the last year, I have coughed:	☐	☐	☐	☐	☐
2.	Over the last year, I have brought up phlegm (sputum)	☐	☐	☐	☐	☐
3.	Over the last year, I have had shortness of breath	☐	☐	☐	☐	☐
4.	Over the last year, I have had attacks of wheezing	☐	☐	☐	☐	☐

5.	During the last year, how many severe or very unpleasant attacks of chest trouble have you had:	More than 3 attacks	☐
		3 attacks	☐
		2 attacks	☐
		1 attack	☐
		No attack	☐
6.	How long did the worst attack of chest trouble last: (go to Question 7 if you had no severe attacks)	A week or more	☐
		3 or more days	☐
		1 or 2 days	☐
		Less than a day	☐
7.	Over the last year, in an average week, how many good days (with little chest trouble) have you had:	No good days	☐
		1 or 2 good days	☐
		3 or 4 good days	☐
		Nearly every day is good	☐
		Every day is good	☐
8.	If you have a wheeze, is it worse in the morning	No ☐	
		Yes ☐	

PART 2

Section 1

HOW WOULD YOU DESCRIBE YOUR CHEST CONDITION? (PLEASE TICK IN ONE BOX ONLY)

The most important problem I have	☐
Causes me quite a lot of problems	☐
Causes me a few problems	☐
Causes no problems	☐

IF YOU HAVE EVER HAD PAID EMPLOYMENT, PLEASE TICK ONE OF THESE:

My chest trouble made me stop work	☐
My chest trouble interferes with my work or made me change my work	☐
My chest trouble does not affect my work	☐

Section 2

QUESTIONS ABOUT WHAT ACTIVITIES USUALLY MAKE YOU FEEL BREATHLESS THESE DAYS.
FOR EACH ITEM, PLEASE TICK EITHER TRUE OR FALSE AS IT APPLIES TO YOU.

	True	False
Sitting or lying still	☐	☐
Getting washed or dressed	☐	☐
Walking around the home	☐	☐
Walking outside on the level	☐	☐
Walking up a flight of stairs	☐	☐
Walking hills	☐	☐
Playing sports or games	☐	☐

Section 3

SOME MORE QUESTIONS ABOUT YOUR COUGH AND BREATHLESSNESS THESE DAYS.
FOR EACH ITEM, PLEASE TICK EITHER TRUE OR FALSE AS IT APPLIES TO YOU.

	True	False
My cough hurts	☐	☐
My cough makes me tired	☐	☐
I am breathless when I talk	☐	☐
I am breathless when I bend over	☐	☐
My cough or breathing disturbs my sleep	☐	☐
I get exhausted easily	☐	☐

Section 4

QUESTIONS ABOUT OTHER EFFECTS THAT YOUR CHEST TROUBLE MY HAVE ON THESE DAYS. FOR EACH ITEM. PLEASE TICK EITHER TRUE OR FALSE AS IT APPLIES TO YOU.

	True	False
My cough or breathing is embarrassing in public	☐	☐
My chest trouble is a nuisance to my family, friends or neighbours	☐	☐
I get afraid or panic when I cannot get my breath	☐	☐
I feel that I am not in control of my chest problem	☐	☐
I do not expect my chest to get any better	☐	☐
I have become frail or an invalid because of my chest	☐	☐
Exercise is not safe for me	☐	☐
Everything seems too much of an effort	☐	☐

Section 5

QUESTIONS ABOUT YOUR MEDICATION. IF YOU ARE RECEIVING NO MEDICATION GO STRAIGHT TO SECTION 6. TO COMPLETE THIS SECTION PLEASE TICK EITHER TRUE OR FALSE AS IT APPLIES TO YOU.

	True	False
My medication does not help me very much	☐	☐
I get embarrassed using my medication in public	☐	☐
I have unpleasant side effects from my medication	☐	☐
My medication interferes with my life a lot	☐	☐

Section 6

THESE ARE QUESTIONS ABOUT HOW YOUR ACTIVITIES MIGHT BE AFFECTED BY YOUR BREATHING. FOR EACH QUESTION, PLEASE TICK TRUE IF ONE OR MORE PARTS APPLIES TO YOU BECAUSE OF YOUR BREATHING, OTHERWISE TICK FALSE.

	True	False
I take a long time to get washed or dressed	☐	☐
I cannot take a bath or shower, or I take a long time	☐	☐
I walk slower than other people, or I stop for rests	☐	☐
Jobs such as housework take a long time, or I have to stop for rests	☐	☐
If I walk up one flight of stairs, I have to go slowly or stop	☐	☐
If I hurry or walk fast, I have to stop or slow down	☐	☐
My breathing makes it difficult to do things such as walk up hills, Carrying things up stairs, light gardening such as weeding, dance, play bowls or play golf	☐	☐
My breathing makes it difficult to do things such as carry heavy loads, dig the garden or shovel snow, jog or walk at 5 miles per hour, play tennis or swim	☐	☐
My breathing makes it difficult to do things such as very heavy manual work, run, cycle, swim fast or play competitive sports	☐	☐

Section 7

WE WOULD LIKE TO KNOW HOW YOUR CHEST TROUBLE USUALLY AFFECTS YOUR DAILY LIFE.

PLEASE TICK EITHER TRUE OR FALSE AS IT APPLIES TO YOU BECAUSE OF YOUR CHEST TROUBLE. (REMEMBER THAT TRUE ONLY APPLIES TO YU IF YOU CAN NOT DO SOMETHING BECAUSE OF YOUR BREATHING)

	True	False
I cannot play sports or games	☐	☐
I cannot go out for entertainment or recreation	☐	☐
I cannot go out of the house to do the shopping	☐	☐
I cannot do housework	☐	☐
I cannot move far from my bed or chair	☐	☐

HERE IS A LIST OF OTHER ACTIVITIES THAT YOUR CHEST TROUBLE MAY PREVENT YOU DOING. (YOU DO NOT HAVE TO TICK THESE, THEY ARE JUST TO REMIND YOU OF WAYS IN WHICH YOUR BREATHLESSNESS MAY AFFECT YOU).

Going for walks or walking the dog

Doing things at home or in the garden

Sexual intercourse

Going out to church, or place of entertainment

Going out in bad weather or into smoky rooms

Visiting family or friends or playing with children

PLEASE WRITE IN ANY OTHER IMPORTANT ACTIVITIES THAT YOUR CHEST TROUBLE MAY STOP YOU DOING.

.....

.....

NOW, WOULD YOU TICK IN THE BOX (ONE ONLY) WHICH YOU THINK BEST DESCRIBES HOW YOUR CHEST AFFECTS YOU.

It does not stop me doing anything I would like to do	☐
It stops me doing one or two things I would like to do	☐
It stops me doing most of the things I would like to do	☐
It stops me doing everything I would like to do	☐

THANK YOU FOR FILLING IN THIS QUESTIONNAIRE, BEFORE YOU FINISH WOULD YOU CHECK TO SEE THAT YOU HAVE ANSWERED ALL THE QUESTIONS.