Exercise rehabilitation for recovery from critical illness (Protocol)

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[Intervention Protocol]

Exercise rehabilitation for recovery from critical illness

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ABSTRACT

This is the protocol for a review and there is no abstract. The objectives are as follows:

The objective of this systematic review is to assess the effectiveness of exercise rehabilitation programmes, initiated after ICU discharge, on improving functional exercise capacity and quality of life in adult ICU survivors who have been mechanically ventilated for more than 24 hours.

We will compare an exercise intervention to any other intervention or a control or 'usual care' programme. Exercise includes any structured or taught programmes. Respiratory or inspiratory muscle training is excluded due to it being initiated within the ICU environment, for example with weaning from a ventilator, and not as post-discharge rehabilitation as required for this review.

BACKGROUND

Description of the condition

Critical Illness includes any condition that results in a stay in a critical care (CCU), intensive care (ICU), or high dependency unit (HDU) within a hospital, whether due to surgical complication, injury, trauma, exacerbated chronic illness, or acute onset of severe illness. It is often the case that critical care patients exhibit multiple pathologies and have a high risk of other comorbities, including increased risk of a cardiac episode, respiratory weakness, and development of diabetes. The episode of critical illness is not limited to the period in intensive care but can continue to influence the patients' and their families' lives for months and often years after hospital discharge (Angus 1997; Chaboyer 2003; Eddleston 2000; Elliott 2006; Fletcher 2003; Frank 2000).

The traditional goal of intensive and critical care medicine has been to decrease short-term mortality (Angus 2003). In recent years, both technological and medical advancements have resulted in more and more patients surviving intensive care (King 1998; Lewis 2003), leading to a need for greater patient turnover as ward beds need to be vacated for new admittances. Consequently, hospital discharge often occurs earlier, with a less prolonged implementation period to re-develop each patient's physical and psychological status.

Critical illness has a large weighting across the UK, and globally,

with a prolonged stay in ICU associated with high mortality, morbidity, and costs (Martin 2005).

The critical care population are a unique population in many ways, despite their heterogeneity (varied reasons for admission, large age range and background). As other ill populations look to maintain health or hinder the progression of the disease, many of those surviving intensive care have the opportunity to not simply maintain but improve and develop their strength, fitness, physical function, and quality of life.

Many factors can influence the individual experiences of ICU, irrespective of the admitting condition, but similar results are often observed by clinicians and researchers as survivors can suffer reduced physical function and independence, muscular atrophy and weakness, malnutrition and anaemia, and critical illness polyneuropathy and myopathy, all of which may negatively affect their quality of life. The majority of these contributing factors are associated with the admitting cause and the necessary treatment pathway prescribed by the medical staff, which cannot be greatly altered. It is, therefore, important to focus on prolonged and effective recovery and rehabilitation.

Description of the intervention

Regular exercise (physical activity) is known to improve the working function of many systems within the body, as well as to benefit muscular strength and size, improve balance and fitness, reduce the fear of falling in the elderly, and reduce the associated risk of hospital admission or re-admission. This has also been highlighted in other ill populations (reviewed by Kouidi 2002 for renal disease; Lavie 2009 for heart disease; and Puhan 2006 for pulmonary disease).

How the intervention might work

Older adults who regularly participate in physical training often gain significant improvements in both strength and aerobic power (Grimby 1986). Previously 'frail' older adults have greatly increased their functional ability (Gill 2002), helping to offset any decline and reducing the risk of illness. Older adults who regularly exercise are more resistant to chronic illness (Mazzeo 2001).

Clear evidence does exist linking muscle strength (assessed using hand grip strength) and muscle mass to mortality in the elderly (Miller 2002; Rantanen 2000). These measures can be used as factors in the prediction of long life in this population. There is a strong relationship between functional health status and mortality, as shown by Paffenbarger et al (Paffenbarger 1986) whose study into college alumni demonstrated a significantly lower result in all-cause mortality among those who regularly participated in physical activity. Investigations aimed at optimising and developing the strength and function of frail individuals have been successful when the individuals were trained over a prolonged period, over three months (Brown 1990; Fiatarone 1994; Smith 2006), indicating that frailty and weakness are reversible and are largely affected by muscle inactivity. This can be potentially overcome by exercise training.

Evidence from quality of life and anxiety scores suggest that regular exercise also benefits mental health in the chronically ill (Iversen 2003; Yoshida 1999). This is vital as this population experiences a greater frequency of negative emotions and depressive symptoms (either arising from the medical condition or as a possible cause in the emergence of the condition) than their healthy counterparts (Baumgartner 1999; Krishnan 2002; Yoshida 1999).

Why it is important to do this review

There are some published trials demonstrating the advantages of prolonged in-patient and out-patient rehabilitation programmes following ICU admission, including passive movement (Wiles 2009), mobilisation (Schweickert 2009), bedside cycling (Burtin 2009); alongside anecdotal evidence and individual case studies of rehabilitation in practice (Stiller 2000; Storch 2008). No systematic reviews are yet available on this topic, to quantify the response. With many survivors of critical illness living with reduced function, often beyond a year after their discharge from hospital, it is important to establish whether exercise rehabilitation following critical illness can benefit survivors by improving function and quality of life. This review could help guide rehabilitation practice in the future.

OBJECTIVES

The objective of this systematic review is to assess the effectiveness of exercise rehabilitation programmes, initiated after ICU discharge, on improving functional exercise capacity and quality of life in adult ICU survivors who have been mechanically ventilated for more than 24 hours.

We will compare an exercise intervention to any other intervention or a control or 'usual care' programme. Exercise includes any structured or taught programmes. Respiratory or inspiratory muscle training is excluded due to it being initiated within the ICU environment, for example with weaning from a ventilator, and not as post-discharge rehabilitation as required for this review.

METHODS

Criteria for considering studies for this review

Types of studies

We will include randomized controlled trials (RCTs), quasi-RCTs, and controlled clinical trials (CCTs).

Types of participants

We will include all adults (aged 18 years or over) who are mechanically ventilated for 24 hours or more and admitted to an ICU or critical care environment.
We will exclude patients that are terminally ill or in palliative care; patients with head injury or involved in trauma,as a large number of subgroups are already addressed in a number of reviews published by the Cochrane Bone, Joint and Muscle Trauma Review Group; and studies examining cardiac surgery patients, as a review has already been published on this patient group (Jolliffe 2001) and this group of patients already have a very specific rehabilitation programme they can access.

Types of interventions

Our experimental intervention will be exercise rehabilitation or training where exercise includes any structured or taught programmes, but not respiratory or inspiratory muscle training (chest physiotherapy).
Our comparative intervention will be usual care, a non-exercise intervention, or no intervention.

Types of outcome measures

Primary outcomes

1. Functional exercise capacity (with physical objective assessment and subjective assessment): an individual's maximal ability to perform functional exercise that is beneficial in day-to-day living, for example, walking, stair climbing, sit-to-stand exercises, and strength.
2. Quality of life, as measured by reliable assessment scales.

Secondary outcomes

1. Withdrawal rates (withdrawal from the intervention or exercise programme)
2. Adherence (ability to adhere to the prescribed protocol within a single exercise session)
3. Mortality
4. Other adverse events

Search methods for identification of studies

The subject search will use a combination of controlled vocabulary and free text terms based on the search strategy for MEDLINE (in Appendix 1).

Electronic searches

We will search Ovid SP MEDLINE (1966 to present) (Appendix 1); Ovid SP EMBASE (1988 to present) (Appendix 2); the current issue of the Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library*) (Appendix 3); CINAHL via EBSCOhost (Appendix 4).
A search strategy will be developed for use in MEDLINE and revised appropriately for other databases in conjunction with the Cochrane Anaesthesia Review Group.
We will not impose any language or publication restrictions.

Searching other resources

We will identify trials by manually searching abstracts of journals including Critical Care, Critical Care Clinics, Physiotherapy, Nursing in Critical Care, and European Society of Intensive Care Medicine.
We will check the reference list of included studies and articles. We will attempt to contact relevant trial authors to identify any additional studies.

Data collection and analysis

Selection of studies

Authors will scan the titles and abstracts of reports identified through electronic and manual searches. We will retrieve and evaluate potentially relevant studies, chosen by at least one author, in full-text versions of the reports. Authors will independently select trials that meet the inclusion criteria using a purpose-designed checklist (LG, LS). A third author will act as arbitrator (CT) if the two authors cannot reach a consensus on the studies to be included.

Data extraction and management

Two authors will independently extract data using a standardized checklist (LG, LS). Any disagreement will be resolved by the third author (CT). Data will be collected manually on paper extraction forms and put into intermediate software (Microsoft Excel for Windows), ensuring accurate transference by using double entry, before being entered in to RevMan 5.0. This will allow for any necessary statistical conversions. We will review the data from included studies qualitatively and then, where possible, combine it quantitatively by population, intervention, and outcomes.

Assessment of risk of bias in included studies

Risk of bias will be independently assessed by at least two authors (LG, LS). A third author will arbitrate and resolve any disagreements (CT or TM). As recommended by the Cochrane Handbook (Higgins 2008), the domains to be assessed are:
I - sequence generation;
II - allocation concealment;
III - blinding of participants, personnel, and outcome assessors (for assessment of each main outcome);
IV - incomplete outcome data (for assessment of each main outcome);
V - selective outcome reporting;
VI - other sources of bias.
Each will be explicitly judged using 'yes' = low risk of bias, 'no' = high risk of bias, 'unclear' = either lack of information or uncertainty over the potential for bias.
For each study, a risk of bias graph and risk of bias summary figure will be constructed from the risk of bias table.

Measures of treatment effect

Where possible, for continuous data the weighted mean difference (WMD), or standardized mean difference (SMD), and 95% confidence interval (CI) will be used for summary statistics (functional exercise capacity, quality of life). Any dichotomous data will be extracted, analysed and reported as relative risk (RR) with 95% CI.

Unit of analysis issues

When different measurement scales are used, attempts will be made to contact lead authors for raw data (for conversion to a standard unit).

Dealing with missing data

Where available, data regarding intention to treat (ITT) will be extracted. If researchers did not perform an ITT analysis but sufficient raw data is available, then an ITT analysis will be conducted prior to data entry to Review Manager.
Initially, all data from all studies will be included in the meta-analysis. Secondly, a sensitivity analysis of all studies by excluding those with more than 20% of data missing from the study will be performed.

Assessment of heterogeneity

Heterogeniety will initially be assessed by visual assessment of forest plots from a meta-analysis of studies thought appropriate for pooling. The degree of statistical heterogeneity will be based on the value of the I^2 statistic and, if present, it will be explored through subgroup analysis. We will also undertake quality control checks of data extraction and input, and review the clinical and methodological aspects of the study trials.

Assessment of reporting biases

To assess the level of publication bias, a funnel plot will be used (if we have greater than 10 studies) to make a visual assessment of whether small-study effects may be present in a meta-analysis.

Data synthesis

A fixed-effect Mantel-Haenszel model will be used for dichotomous and continuous data, with the assumption that between-trial variance is minimal. A random-effects model will be used if the I^2 statistic is greater than 50%. If the studies are sufficiently homogeneous, a meta-analysis will be performed and statistical heterogeneity will be assessed based on an intention-to-treat analysis, where possible.

Subgroup analysis and investigation of heterogeneity

Subgroup analysis is only to be conducted if there are considerable differences in effects, based on: exercise type, intervention duration and frequency, age-related variation, or duration of the critical condition. We do not expect large numbers of studies at this time, in which case subgroup analysis would not be appropriate.

Sensitivity analysis

Sensitivity analysis will be conducted using the Cochrane Handbook definitions (Table 8.7a) of low, high, or unclear risk of bias to see if the level of risk of bias affects the estimate of effect.

Summary of findings table

We will assess the quality of the total body of evidence associated with our listed outcomes (functional exercise capacity as objective and subjective assessments, quality of life, withdrawal rate, adherence, mortality, and other adverse events) using the principles of the GRADE system (Guyatt 2008). We will construct a 'Summary of findings' (SoF) table using the GRADE software.
The GRADE approach appraises the quality of a body of evidence based on the extent to which one can be confident that an estimate of effect or association reflects the object being assessed. The quality of the evidence assessment considers: within study risk of bias (methodologic quality), directness of the evidence, heterogeneity of data, precision of effect estimates, and risk of publication bias.

ACKNOWLEDGEMENTS

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* *Indicates the major publication for the study*

APPENDICES

Appendix 1. MEDLINE (Ovid SP) search strategy

1 exp Exercise-Therapy/
2 exp Exercise/
3 exp Physical-Fitness/
4 exp Weight-Lifting/
5 exp Physical-Medicine/
6 exp Physical-Therapy-Modalities/
7 (rehabilitation adj3 (Exercise or Physical)).mp.
8 (Exercise or Physiatrics or Physiatry or Physiotherapy or mobili?ation).ti,ab.
9 Activit*.ti.
10 (movement adj3 (Active or Whole body)).mp.
11 (Exercise adj3 (training* or Progressive or therapy or intervention)).mp.
12 (training adj3 (Aerobic or endurance or Strength or resistance or weight or Fitness or Interval or Circuit)).mp.
13 (Physical therapy).mp. or (Weight lifting).mp.
14 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
15 Critical-Care/ or exp Critical-Illness/
16 Intensive-Care/ or Intensive-Care-Units/
17 Atrophy/
18 Ventilator-Weaning/
19 Shock-Septic/
20 Sepsis/
21 (care adj3 (Critical or Intensive)).ti,ab.
22 (unit adj3 (Intensive care or High dependency or Intensive therapy or Intensive treatment)).mp.
23 (Critical adj3 (collapse or illness)).mp.
24 ((Critical illness) adj3 (neuropath* or myopath* or polyneuropath* or polyneuromyopathy)).mp.
25 (ICU or HDU or ITU or CIN or CIM or CIPN or CIPNM or ARDS).ti,ab.
26 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25
27 14 and 26
28 ((low back pain) or ((head or brain) adj3 injury) or pregnancy or stroke or (cardiac surg*)).mp.
29 27 not 28
30 CLINICAL-TRIAL.pt.
31 randomized.ab.
32 placebo.ab.
33 (clinical trials).sh.
34 randomly.ab.
35 trial.ti.
36 30 or 31 or 32 or 33 or 34 or 35
37 (animals not (humans and animals)).sh
38 36 not 37
39 29 and 38

Appendix 2. EMBASE (Ovid SP) search strategy

1 exercise therapy.mp.
2 exercise.mp.
3 physical fitness.mp.
4 Physical Medicine.mp.
5 Weight Lifting.mp.
6 physical therapy modalities.mp.
7 (exercise or physiatrics or physiatry or physiotherapy or mobili*ation).ti.
8 activit*.ti.
9 (physical therapy or weight lifting).mp.
10 (rehabilitation and (exercise or physical)).mp.
11 (movement and (active or whole body)).mp.
12 (exercise and (training* or progressive or therapy or intervention)).mp.
13 (training and (aerobic or endurance or strength or resistance or weight or fitness or interval or circuit)).mp.
14 (1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13).mp.
15 (critical care or critical illness).mp.
16 (intensive care or intensive care units).mp.
17 atrophy.mp.
18 Artificial Ventilation/
19 Septic Shock.mp.
20 sepsis.mp.
21 (care and (critical or intensive)).ti.
22 (unit and (intensive care or high dependency or intensive therapy or intensive treatment)).mp.
23 (critical and (collapse or illness)).mp.
24 (critical illness and (neuropath* or myopath* or polyneuropath* or polyneuromyopathy)).mp.
25 (ICU or HDU or ITU or CIN or CIM or CIPN or CIPNM or ARDS).mp.
26 (15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25).mp.
27 (14 and 26).mp.
28 (low back pain or ((head or brain) and injury) or pregnancy or stroke or cardiac surg*).mp.
29 (27 not 28).mp.
30 (crossover.mp. or multicenter.ab. or placebo.sh. or ((singl* or doubl* or tripl*) adj3 blind).mp. or controlled study.ab. or random*.ti,ab. or trial*.ti,ab.) not (animals not (humans and animals)).sh.
31 29 and 30

Appendix 3. CENTRAL search strategy

#1 MeSH descriptor Exercise Therapy explode all trees
#2 MeSH descriptor Exercise explode all trees
#3 MeSH descriptor Physical Fitness explode all trees
#4 MeSH descriptor Weight Lifting explode all trees
#5 MeSH descriptor Physical Medicine explode all trees
#6 MeSH descriptor Physical Therapy Modalities explode all trees
#7 (rehabilitation near (Exercise or Physical))
#8 (Exercise or Physiatrics or Physiatry or Physiotherapy or mobili?ation):ti,ab
#9 Activit*:ti
#10 (movement near (Active or Whole body))
#11 (Exercise near (training* or Progressive or therapy or intervention))
#12 (training near (Aerobic or endurance or Strength or resistance or weight or Fitness or Interval or Circuit))
#13 (Physical therapy) or (Weight lifting)
#14 (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13)
#15 MeSH descriptor Critical Care explode all trees
#16 MeSH descriptor Critical Illness explode all trees

#17 MeSH descriptor Intensive Care explode all trees
#18 MeSH descriptor Intensive Care Units explode all trees
#19 MeSH descriptor Atrophy explode all trees
#20 MeSH descriptor Ventilator Weaning explode all trees
#21 MeSH descriptor Shock, Septic explode all trees
#22 MeSH descriptor Sepsis explode all trees
#23 (care near (Critical or Intensive)):ti,ab
#24 (unit near (Intensive care or High dependency or Intensive therapy or Intensive treatment))
#25 (Critical near (collapse or illness))
#26 ((Critical illness) near (neuropath* or myopath* or polyneuropath* or polyneuromyopathy))
#27 (ICU or HDU or ITU or CIN or CIM or CIPN or CIPNM or ARDS):ti,ab
#28 (#15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27)
#29 (#14 AND #28)
#30 (low back pain) or ((head or brain) near injury) or pregnancy or stroke or (cardiac surg*)
#31 (#29 AND NOT #30)

Appendix 4. CINAHL (EBSCOhost) search strategy

S1 (MH "Therapeutic Exercise+")
S2 exercise AND therap*
S3 (MH "Exercise+")
S4 (MH "Physical Fitness+")
S5 (MH "Weight Lifting")
S6 (MH "Physical Medicine")
S7 (MH "Physical Therapy+")
S8 rehabilitation N5 (exercise OR physical)
S9 AB (exercise OR physiatrics OR physiatry OR physiotherapy OR mobili*ation)
S10 TI activit*
S11 movement N5 active
S12 movement N5 "whole body"
S13 training* OR progressive OR therapy OR intervention
S14 exercise N5 S14
S15 aerobic OR endurance OR strength OR resistance OR weight OR fitness OR interval OR circuit
S16 training N5 S16
S17 physical therapy OR weight lifting
S18 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S15 OR S17
S19 "critical care OR critical illness"
S20 (MM "Intensive Care Units")
S21 (MH "Atrophy+")
S22 (MH "Ventilator Weaning") OR (MH "Ventilators, Mechanical")
S23 (MH "Shock, Septic")
S24 (MH "Sepsis+")
S25 TI critical OR TI intensive
S26 care N3 S25
S27 intensive care OR high dependency OR intensive therapy OR intensive treatment
S28 unit N3 S27
S29 collapse OR illness
S30 critical N3 S29
S31 neuropath* OR myopath* OR polyneuropath* OR polyneuromyopath*
S32 "critical illness" N5 S31
S33 ICU OR HDU OR ITU OR CIN OR CIM OR CIPN OR CIPNM OR ARDS
S34 S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S27 OR S29 OR S31 OR S33

S35 S18 AND S34
S36 head OR brain
S37 injury N5 S36
S38 low* back pain OR pregnan* OR stroke OR cardiac surg*
S39 S37 OR S38
S40 S35 NOT S39
S41 PT clinical trial
S42 AB randomi?ed
S43 AB placebo*
S44 MW clinical trials
S45 AB random*
S46 TI trial*
S47 S41 OR S42 OR S43 OR S44 OR S45 OR S46
S48 animal*
S49 human*
S50 S48 AND S49
S52 S48 NOT S50
S53 S47 NOT S52
S54 S40 AND S53

Appendix 5. Study selection, quality assessment and data extraction

CARG 172 Exercise Rehabilitation for recovery from Critical Illness
Study Selection, Quality Assessment & Data Extraction Form

First author	Journal/Conference Proceedings etc	Year

Study eligibility

RCT/Quasi/CCT (delete as appropriate)	Relevant participants adults, >= 18years old ICU/critical care admission with mechanical ventilation	Relevant interventions Exercise taught/structured/ supervised	Relevant outcomes Functional exercise capacity Quality of Life Withdrawal rates Adherence Mortality Other adverse events
Yes / No / Unclear	Yes / No / Unclear	Yes / No / Unclear	Yes / No* / Unclear

* Issue relates to selective reporting when authors may have taken measurements for particular outcomes, but not reported these within the paper(s). Reviewers should contact trial lists for information on possible non-reported outcomes & reasons for exclusion from

publication. Study should be listed in 'Studies awaiting assessment' until clarified. If no clarification is received after three attempts, study should then be excluded.

Do not proceed if any of the above answers are 'No'. If study to be included in 'Excluded studies' section of the review, record below the information to be inserted into 'Table of excluded studies'

Freehand space for comments on study design and treatment:

References to trial

Check other references identified in searches. If there are further references to this trial link the papers now & list below. All references to a trial should be linked under one *Study ID* in RevMan.

Code each paper	Author(s)	Journal/Conference Proceedings etc	Year
A	*The paper listed above*		
B	*Further papers*		

Participants and trial characteristics

Participant characteristics	
	Further details
Age (mean, median, range, etc)	
Sex of participants (numbers / %, etc)	

(*Continued)*

Disease status / type, etc (if applicable)	
Time on Mechanical Ventilation (mean, median, range, etc)	
Other	

Trial characteristics	
	Further details
Single centre / multicentre	
Country / Countries	
How was participant eligibility defined?	
How many people were randomized?	
Number of participants in each intervention group	
Number of participants who received intended treatment	
Number of participants who were analysed	
Treatment(s) used	
Dose / frequency of administration	
Duration of treatment (State weeks / months, etc, if cross-over trial give length of time in each arm)	
Median (range) length of follow-up reported in this paper (state weeks, months or years or if not stated)	
Time-points when measurements were taken during the study	
Time-points reported in the study	
Time-points you are using in RevMan	
Trial design (e.g. parallel / cross-over*)	
Other	

* If cross-over design, please refer to the Cochrane Editorial Office for further advice on how to analyse these data

Methodological quality

Allocation of intervention	
State here method used to generate allocation and reasons for grading	Grade (circle)
Note reason for allocation:	Adequate (Random)
	Inadequate (e.g. alternate)
	Unclear

Concealment of allocation **Process used to prevent foreknowledge of group assignment in a RCT, which should be seen as distinct from blinding**	
State here method used to conceal allocation and reasons for grading	Grade (circle)
Note reason for allocation:	Adequate
	Inadequate
	Unclear

Blinding	
Person responsible for participants care	Yes / No
Participant	Yes / No
Outcome assessor	Yes / No
Other (please specify)	Yes / No

Intention-to-treat
An intention-to-treat analysis is one in which all the participants in a trial are analysed according to the intervention to which they were allocated, whether they received it or not

(*Continued*)

All participants entering trial	
20% or fewer excluded	
More than 20% excluded	
Not analysed as 'intention-to-treat'	
Unclear	

Were withdrawals described? Yes ? No ? not clear ?

Discuss if appropriate

Data extraction

Outcomes relevant to your review	
	Reported in paper (circle)
Outcome 1 Functional capacity (subjective/objective) Including one or more of - Vo_2max and/or VO_2peak Muscle mass and/or morphology Body composition Strength and/or endurance tests Resting HR and/or BP	Yes / No Specify:
Outcome 2 Quality of Life	Yes / No
Outcome 3 Withdrawal rates	Yes / No
Outcome 4 Adherence	Yes / No
Outcome 5 Mortality	Yes / No
Outcome 6 Other adverse events	Yes / No

For Continuous data

Code of paper	Outcomes	Unit of measurement	Intervention group		Control group		Details if outcome only described in text
			n	Mean (SD)	N	Mean (SD)	
A etc	Functional capacity subjective						
	Functional capacity objective						
	Quality of Life						
	Vo_2max and/or VO_2peak						
	Muscle mass or morphology						
	Body composition						
	Strength test						
	Endurance test						
	Resting HR	Beats/min					
	Resting BP	mmHg systole/diastole					

For Dichotomous data

Code of paper	Outcomes	Intervention group (n) n = number of participants, not number of events	Control group (n) n = number of participants, not number of events
	Withdrawal		
	Adherence		

(*Continued*)

	Mortality (i.e. deaths)		
	Adverse events (not death)		

Other information which you feel is relevant to the results
Indicate if: any data were obtained from the primary author; if results were estimated from graphs etc; or calculated by you using a formula (this should be stated and the formula given). In general if results not reported in paper(s) are obtained this should be made clear here to be cited in review

Freehand space for writing actions such as contact with study authors and changes

References to other trials

Did this report include any references to published reports of potentially eligible trials not already identified for this review?		
First author	Journal / Conference	Year of publication

Did this report include any references to unpublished data from potentially eligible trials not already identified for this review? If yes, give list contact name and details

WHAT'S NEW

Date	Event	Description
9 August 2010	Amended	Typo in acknowledgement section corrected

HISTORY

Protocol first published: Issue 8, 2010

CONTRIBUTIONS OF AUTHORS

Conceiving the review: Louise Geneen (LG), Tom Mercer (TM)

Co-ordinating the review: LG

Undertaking manual searches: LG

Screening search results: LG, Lisa Salisbury (LS), Colin Thomson (CT)

Organizing retrieval of papers: LG, LS, CT, TM

Screening retrieved papers against inclusion criteria: LG, LS, CT

Appraising quality of papers: LG, LS, CT, TM

Abstracting data from papers: LG, LS, CT, TM

Writing to authors of papers for additional information: LG

Providing additional data about papers: LG

Obtaining and screening data on unpublished studies: LG, LS, TM, CT

Data management for the review: LG

Entering data into Review Manager (RevMan 5.0): LG, LS, CT

RevMan statistical data: LG, CT

Other statistical analysis not using RevMan: CT, LG

Double entry of data: (data entered by person one: LG; data entered by person two: CT/LS)

Interpretation of data: LG, CT, TM, LS, Tim Walsh (TW)

Statistical inferences: LG, CT

Writing the review: LG

Securing funding for the review: n/a

Performing previous work that was the foundation of the present study: TM, LS, TW

Guarantor for the review (one author): LG

Person responsible for reading and checking review before submission: LG, CT, TM, LS, TW

DECLARATIONS OF INTEREST

Prof Walsh is currently involved in clinical studies that are investigating potential strategies to improve recovery rates after critical illness and to evaluate patient outcomes.

Lisa Salisbury has been involved in the design and completion of a small pilot study to evaluate enhanced physical and nutritional rehabilitation after a prolonged intensive care stay. This may be eligible for inclusion in this Cochrane review. Ongoing work involves the design of a larger study evaluating enhanced physical and nutritional rehabilitation.

All other authors: none known.

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- Queen Margaret University, Edinburgh, UK.

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External sources

- No sources of support supplied