

Physical rehabilitation in critically ill children

## **Online Supplement**

**Title:** Measurement and Reporting of Physical Rehabilitation Interventions in Pediatric Critical Care: A Scoping Review

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**Supplemental Table S1.** Electronic search strategy

**a. OVID Medline**

	<b>Subject Headings (MeSH)</b>	<b>Key Words</b>
1. ICU subject headings and keywords	Critical care Critical illness Intensive care units Respiration, artificial Respiratory care units	Acute care Critical care Critical care unit* Critical* ill* ICU ICU patient* Intensive care Intensive care unit* Intubated Mechanical ventilation Respiratory care unit* Ventilated patient*
2. Physical activity subject headings and keywords	Activities of daily living Exercise Exercise therapy Mobility limitation Muscle strength Physical and rehabilitation medicine Physical therapy modalities Range of motion, articular Recovery of function Rehabilitation Rehabilitation, vocational	Activit* Activit* of daily living ADL Early ambulation Early mobili* Exercis* Exercise therap* Functional mobili* Mobili* Muscle strength Physical activit* Physical and rehab* medicine Physical function* Physical mobili* Physical therap* Physiotherap* Range of motion Recovery of function Rehab* Rehab* intervention* ROM

1. We combined all ICU subject headings and keywords with the OR operator

2. We combined all physical rehabilitations subject headings and keywords with the OR operator

3. We combined these 2 groups with the AND operator

**b. CINAHL**

	<b>Subject Headings</b>	<b>Keywords</b>
1. ICU subject headings and key words	Critical care Critical illness Critically ill patients Intensive Care Units Respiration, artificial Respiratory care Units	Acute care Critical care Critical care unit* Critical* ill* ICU ICU patient* Intensive care Intensive care unit* Intubated Mechanical ventilation Respiratory care unit* Ventilated patient*
2. Physical rehabilitation subject headings and keywords	Activities of daily living Early intervention Exercise Muscle strength Physical activity Physical therapy Rehabilitation Therapeutic exercise	Activit* Activit* of daily living ADL Early ambulation Early mobili* Exercis* Exercise therap* Functional mobili* Mobili* Muscle strength Physical activit* Physical and rehab* medicine Physical function* Physical mobili* Physical therap* Physiotherap* Range of motion Recovery of function Rehab* Rehab* intervention* ROM

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**c. AMED**

	<b>Subject Headings</b>	<b>Keywords</b>
1. ICU subject headings and keywords	Critical care Critical illness Intensive care Respiration artificial Ventilators, mechanical	Acute care Critical care Critical care unit* Critical* ill* ICU ICU patient* Intensive care Intensive care unit* Intubated Mechanical ventilation Respiratory care unit* Ventilated patient*
2. Physical rehabilitation subject headings and keywords	Activities of daily living Early ambulation Exercise Exercise therapy Mobility limitation Muscle strength Physical therapy modalities Physiotherapists Range of motion Rehabilitation	Activit* Activit* of daily living ADL Early ambulation Early mobili* Exercis* Exercise therap* Functional mobili* Mobili* Muscle strength Physical activit* Physical and rehab* medicine Physical function* Physical mobili* Physical therap* Physiotherap* Range of motion Recovery of function Rehab* Rehab* intervention* ROM

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3. We combined these 2 groups with the AND operator

**d. EMBASE**

	<b>Subject Headings</b>	<b>Keywords</b>
1. ICU subject headings and keywords	Artificial ventilation Critical illness Intensive care Intensive care unit	Acute care Critical care Critical care unit* Critical* ill* ICU ICU patient* Intensive care Intensive care unit* Intubated Mechanical ventilation Respiratory care unit* Ventilated patient*
2. Physical rehabilitation subject headings and keywords	Daily life activity Exercise Kinesiotherapy Mobilization Muscle strength Physical activity Physiotherapy Rehabilitation Vocational rehabilitation	Activit* of daily living ADL Early ambulation Early mobili* Exercis* Exercise therap* Functional mobili* Mobili* Muscle strength Physical activit* Physical and rehab* medicine Physical function* Physical mobili* Physical therap* Physiotherap* Range of motion Recovery of function Rehab* Rehab* intervention* ROM

1. We combined all ICU subject headings and keywords with the OR operator
2. We combined all physical rehabilitations subject headings and keywords with the OR operator
3. We combined these 2 groups with the AND operator

**e. PEDro**

<b>Keyword</b>
1. (intensive care unit OR critical care OR critical illness)
2. (intensive care unit* AND “electrotherapies” [Therapy field])
3. (critical ill* AND “stretching, mobilisation, etc.” [Therapy field])
4. (intensive care unit* AND “stretching, mobilisation, etc.” [Therapy field])

**Supplemental Table S2a.** Intervention category definitions for physical activity interventions

<b>Intervention Category</b>	<b>Definition/Criteria</b>
Active interventions	Includes activities such as active range of motion, active positioning, interactive video gaming, etc. that involve full participation from the patient (i.e. no passive components) but are not part of a progressive mobility regimen
Cycling	Includes upper or lower extremity cycle ergometry, either passively completed by the equipment, components of active participation from the patient, or full participation from the patient
Passive interventions	Includes activities such as passive range of motion, positioning in bed, massage, etc. that are completely passive (i.e. no active components) but are not part of a progressive mobility regimen
Progressive mobility	Mobility activities progressing from less difficult (e.g. activity in bed) to more difficult (e.g., out of bed activities such as up to chair or ambulation). May include range of motion or strengthening activities, but only as part of a mobility activity and not as a separate therapeutic program.
Multicomponent	Includes at least 2 or more interventions which could include any combination of single component interventions above

**Supplemental Table S2b.** Intervention category definitions for chest physiotherapy interventions

<b>Intervention Category</b>	<b>Definition/Criteria</b>
Lung inflations	Includes manual or ventilator lung inflations
Manual techniques	Includes cupping, clapping, vibration, suctioning and saline instillation
Positioning	Includes passive interventions like positioning that are not part of a progressive regimen
Multi-component	Includes at least 2 or more interventions which could include any combination of single component interventions above

**Supplemental Table S3:** Decision rules for applying “not applicable” when evaluating reporting items\*

Item Number	Item Description	Not Applicable
<b>CONSORT</b>		
3b	Changes to methods or trial design after trial commenced	Studies that did not make changes to methods
6b	Any changes to trial outcomes after the trial commenced, with reasons	Studies that evaluated the planned outcomes as outlined in the methods
7b	Interim analyses	Studies that did not conduct interim analyses
8-10	Randomization	Non-randomized trials
12b	Additional analyses	Studies that did not plan to perform subgroup or adjusted analyses
14b	Trial ended or stopped early	Studies that did not end or were not stopped early
17b	Outcomes and estimation – presentation of absolute and relative risk size for binary outcomes	Studies that did not evaluate binary outcomes
18	Ancillary analyses	Studies that did not perform subgroup or adjusted analyses
<b>STROBE</b>		
6b	Matching criteria	Studies that did not match
12b	Describe statistical methods used to examine subgroups	Studies that did not plan to evaluate/analyze subgroups
12c, 14b	Missing data	Studies that did not have missing data
12d	Describe how loss to follow up was addressed	Studies that did not report any loss to follow up
14c	Summarize follow-up time	Studies that did not plan to have a follow-up period
16b	Category boundaries	Studies that did not plan to categorize continuous variables
16c	Translating estimates of relative risk to absolute risk	Studies that did not plan to evaluate relative or absolute risk
17	Other analyses	Studies that did not plan to perform additional analyses

<b>SQUIRE</b>		
	13f Missing data	Studies that did not have missing data
<b>CERT</b>		
	3 Describe whether exercises performed individually or in a group	We assumed that all interventions in the ICU were performed individually
	4 Describe whether exercises supervised or unsupervised	We assumed that all interventions in the ICU were supervised
	5 Describe how adherence to exercise is measured and reported	Studies evaluating an intervention consisting of a single session
	6 Describe motivation strategies	Studies evaluating passive interventions (e.g., CPT)
	7a Describe decision rules for determining exercise progression	Studies evaluating passive interventions (e.g., CPT)
	7b Describe how the exercise program was progressed	Studies evaluating passive interventions (e.g., CPT)
	9 Describe any home program content	Studies that did not implement a home program
	10 Describe whether there are any non-exercise components	Studies that did not implement a non-exercise component
	13 Describe exercise intensity	Studies that only evaluated positioning
	14b Describe how exercises are tailored to the individual	Studies that did not individually tailor interventions

Legend: CERT, Consensus on Exercise Reporting Template; CONSORT, Consolidated Standards of Reporting Trials; CPT, chest physiotherapy; ICU, intensive care unit; SQUIRE, Standards for Quality Improvement Reporting Excellence; STROBE, Strengthening the Reporting of Observational Studies in Epidemiology. \* Denominators for reporting calculations were determined by subtracting the total number of “not applicable” items from the total number of reporting tool items.



**Supplemental Table S4.** Stated functional outcomes

<b>Stated Outcome</b>	<b>ICF-CY Domain</b>	<b>ICF-CY Code</b>	<b>Value*</b>
<b>Body Structure and Function</b>			
Vital sign changes	<i>Functions of the respiratory system</i>	<b>B440-B449</b>	14 (58.3)
Blood gas changes			
Respiratory compliance/ spirometry			
Severity of illness score			
Duration of intubation	<i>Consciousness functions</i>	<b>B110</b>	2 (8.3)
Delirium prevalence			
Sedation use	<i>Functions of the cardiovascular, haematological, immunological and respiratory systems, other specified</i>	<b>B498</b>	2 (8.3)
Oxidative stress markers			
Neuropsychological measures			
Chest x-ray changes			
	<i>Intellectual functions</i>	<b>B117</b>	1 (4.2)
	<i>Structure of the respiratory system</i>	<b>S430</b>	1 (4.2)
<b>Environmental Factors</b>			
Number of PT/OT consultations	<i>Health services, systems and policies</i>	<b>E5800</b>	3 (12.5)
<b>Personal Factors</b>			
Quality of life	<i>Personal factors</i>	<b>No code</b>	1 (4.2)

Legend: ICF-CY, World Health Organization International Classification of Functioning, Disability, and Health (Child and Youth version); OT, occupational therapy; PT, physiotherapy.

\* Data presented as n (%), unless otherwise specified.