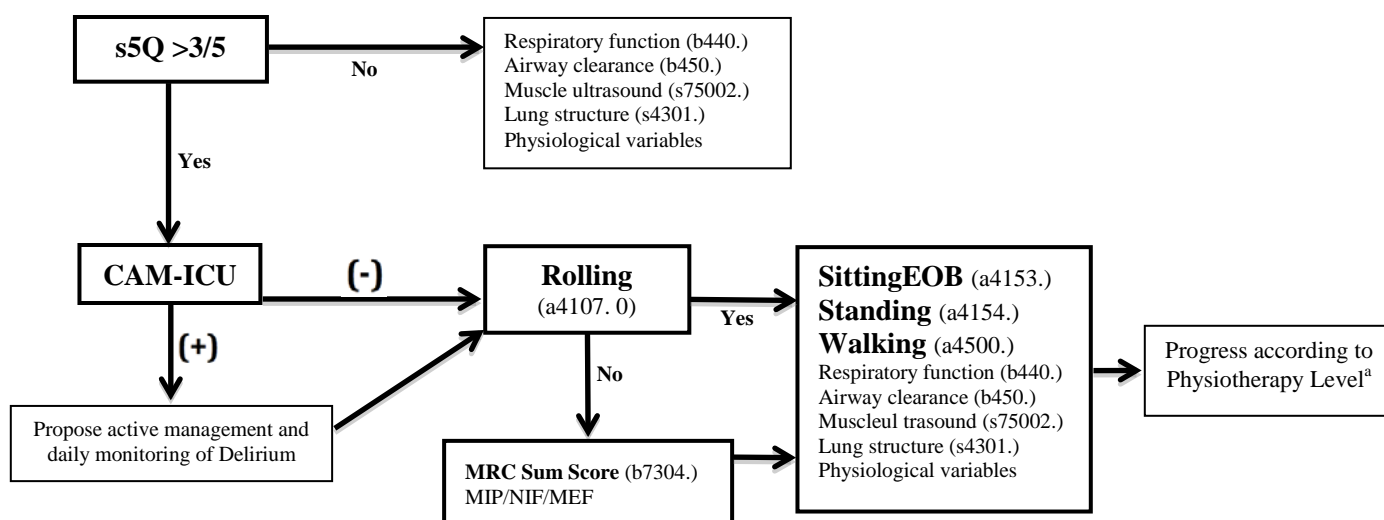


Supplementary material of: González Seguel FA, Lee Goic JE, Cárcamo Ibaceta ME, Blaitt Convalia AA, Castillo Merino FA, et al. (2017) Functional Mobility in Mechanically Ventilated Critically ill Patients: An Observational Study. *JSM Physical Med Rehabil* 1(2): 1007.

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1. PHYSIOTHERAPY DAILY ASSESSMENT



Abbreviations: s5Q: Standardized 5 Questions; CAM-ICU: Confusion Assessment Method for the ICU; MRC SS: Medical Research Council Sum Score; MIP: Maximum Inspiratory Pressure; NIF: Negative Inspiratory Force; MEF: Maximum Expiratory Flow; EOB: Edge of the Bed

The codes of the International Classification of Functioning, Disability and Health (ICF) are used to qualify the difficulty in mobility, where 0 = no difficulty and 4 = complete difficulty.

^aPhysiotherapy Level sare specified in Supplementary material 2.

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2. ICU Physiotherapy Levels(1)

	Without Mobility LEVEL 0	Bed Mobility LEVEL 1	Out of bed Mobility		
			LEVEL 2	LEVEL 3	LEVEL 4
			Sitting	Stand	Walking
s5Q	≤3/5	>3/5	>3/5 and Clinical Stability		
Level Goal	Functions and Structures Protection	a4107.1 (Minimal Assistance to perform Rolling)	a4153.1 (Minimal Assistance to Sitting on the Edge of the Bed)	a4154.1 (Minimal Assistance to Standing Position)	a4500.1 (Minimal Assistance to perform Walking)
Assessment options	Physiological variables ¹ Respiration Function/structure ² Muscle Ultrasound	MRC SS/MIP CAM-ICU Muscle Ultrasound	FSS-ICU MRC SS/ MIP CAM-ICU Muscle Ultrasound	FSS-ICU MRC SS/ MIP CAM-ICU Muscle Ultrasound	FSS-ICU/Walking speed MRC SS/ CAM-ICU Muscle Ultrasound
Interventions options	Passive mobilization Chest physiotherapy NMES Stretching/strengthening exercise Family/patient educations	Passive/Active mobilization Chest physiotherapy Respiratory muscle training NMES Stretching/strengthening exercise Family/patient educations	Functional mobility training Static/dynamic balance Trunk control exercises Exercise tolerance Chest physiotherapy Respiratory muscle training Stretching/strengthening exercise Family/patient educations	Functional mobility training Pre-walking exercises Static/dynamic balance Trunk control exercises Exercise tolerance Chest physiotherapy Stretching/strengthening Family/patient educations	Functional mobility training Walking training Static/dynamic balance Trunk control exercises Exercise tolerance Stretching/strengthening Family/patient educations
Positioning options	Every 2hr turning Suggest Splinting	Cardiac Chair Suggest Splinting Tilt-table	Cardiac Chair Passive transfer to chair Tilt-table	Chair position	Chair position

This table shows the physiotherapy levels based on goals of functional mobility in ICU. When the patient achieves each level's goal, they can advance to the next level. At level 0 the patient is not cooperative to perform active mobilization, but from the moment he has s5Q> 3/5, level 1 will begin. If the patient does not achieve the goal of each level, or requires more than minimal assistance, they would continue at the same level.

Clinical stability is determined by the *clinical stability flow diagram* (supplementary material 3).

Different assessment, intervention and positioning options are shown in the table, but do not mean that all must be done every day. The *daily assessment* by physiotherapist and team is important to the decision making process.

¹Physiological variables: hemoglobin, plasma electrolytes, blood pressure, heart rate, respiratory rate, oxygen saturation, platelets, blood lactate, etc.

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²Respiration function/structure (b440/s4301): PaO₂/FiO₂ Ratio, oxygenation index, pulmonary compliance, driving pressure, transpulmonary pressure, ventilator-patient synchrony, amount of days in mechanical ventilation, arterial gases, venous gases, Chest x-ray, Computed axial tomography scan, respiratory ultrasound, etc.

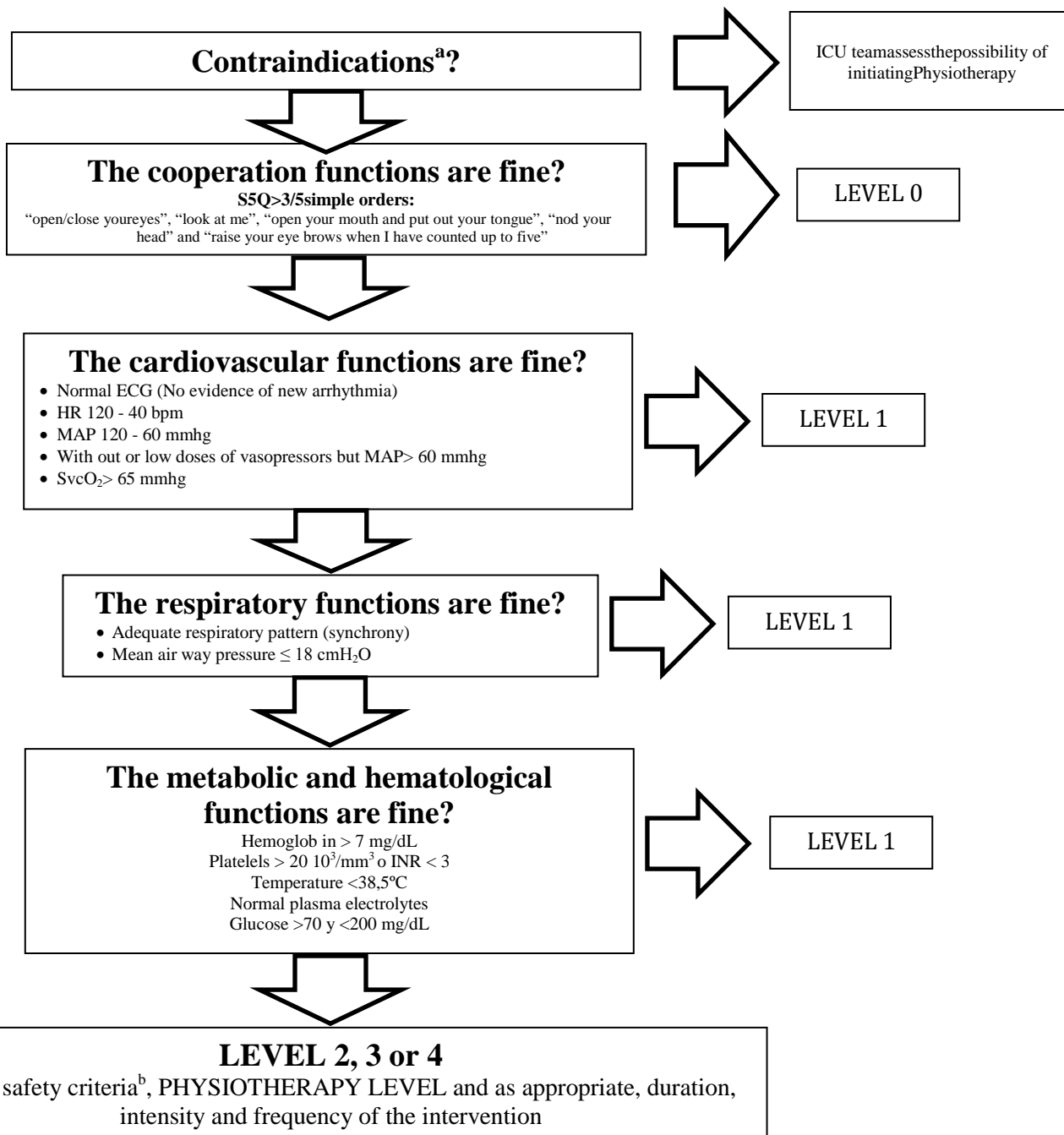
The codes of the International Classification of Functioning, Disability and Health (ICF) are used to qualify the difficulty in mobility, where .0 = no difficulty and .4 = complete difficulty. Progress from level 1 to 2, 3 or 4, will be determined by the clinical stability and by the achievement of the respective level goal with minimal assistance (.1) or without assistance (.0). If the activity is not performed, or is achieved with moderate (.2), maximal (.3) or complete assistance (.4), the goal of this level should be maintained.

ICF category: a4107 (Bed Rolling); a4153 (Sitting on the Edge of the Bed); a4154 (Standing); a4500 (Walking).

Abbreviations: s5q: Standardized 5 questions scale; CAM-ICU: Confusion Assessment Method for the ICU; MRC SS: Medical Research Council Sum Score; FSS-ICU: Functional Status Score for the Intensive Care Unit; MIP: maximum inspiratory pressure/force; NMES: neuromuscular electrical stimulation.

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3. Clinical Stability Flow Diagram



^a CONTRAINDICATIONS:

- Uncontrolled acute myocardial infarction
- Known or suspected acute DVT/PE
- Known uncontrolled active bleeding
- Unstable fractures
- ICP not in desired range
- Risk of vasospasm
- Ischemic stroke (caution in the first 4 days)
- Recent skin graft (wait day 7 or 10 post graft)
- PICCO catheter withdrawal (first 4 hours)
- Removal of pericardial needles (first 2 hrs)
- Open abdomen with risk of dehiscence
- Two or more vasopressors

^b SAFETY CRITERIA:

- Define roles
- Select appropriate equipment and disconnect non-essential lines prior to mobility.
- Safe and permeable airway.
- Ensure invasive and non-invasive devices.
- Safe and comfortable footwear.
- ≥ 3 devices: at least 2 assistants for walking
- In patients with mechanical ventilation:
 - Sitting EOB and standing: at least 2 assistants
 - Walking: at least 3 assistants
 - CAM-ICU (-) for walking

STOPPING PHYSICAL THERAPY CRITERIA:

- Pulse oximetry < 90%; RR > 40 bpm
- MAP > 130 mmHg y < 60 mmHg
- HR > 130, < 40 bpm or increases 20 bpm from baseline in cardiac surgery or 30 bpm in acute myocardial infarction.
- Dyspnoea that limits activity
- Ventilator-patient asynchrony
- Pain that limits activity
- Diaphoresis
- Severe agitation
- Accidental removal of tubes/lines

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Abbreviations: ICU: Intensive Care Unit; s5Q: Standardized 5 Questions; ECG: Electrocardiogram; HR: Heart Rate; BPM: Breath Per Minute; MAP: Mean Arterial Pressure; SvcO₂: Central Venous Saturation; cmH₂O: Centimeters of Water; INR: International Normalized Ratio; DVT/PE: Deep Vein Thrombosis/Pulmonary Embolism; ICP: Intracranial Pressure; EOB: Edge of the Bed; CAM-ICU: Confusion Assessment Method for the ICU; RR: Respiratory Rate

Supplementary material of: *González Seguel FA, Lee Goic JE, Cárcamo Ibaceta ME, Blaitt Convalia AA, Castillo Merino FA, et al. (2017) Functional Mobility in Mechanically Ventilated Critically ill Patients: An Observational Study. JSM Physical Med Rehabil 1(2): 1007.*

4. Scale for Scoring the FSS-ICU

Score	Definition ^a
0	Unable to attempt or complete task due to weakness
1	Complete dependence
2	Maximal assistance (patient performing $\leq 25\%$ of work)
3	Moderate assistance (patient performing 26% - 74% of work)
4	Minimal assistance (patient performing $\geq 75\%$ of work)
5	Supervision only
6	Modified independence
7	Complete independence

Abbreviation: FSS-ICU: Functional Status Score for the Intensive Care Unit.

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^aFull details of FSS-ICU, including description of the scoring scales are available at www.ImproveLTO.com

5. References

1. Morris PE, Goad A, Thompson C, Taylor K, Harry B, Passmore L, et al. Early intensive care unit mobility therapy in the treatment of acute respiratory failure. *Crit Care Med.* 2008;36:2238-2243.
2. Huang M, Chan KS, Zanni JM, Parry SM, Neto S-CGB, Neto JAA, et al. Functional Status Score for the ICU. *Crit Care Med.* 2016; 44:1155-1164.