**Rating scale used**

| RATING | WORD | DESCRIPTION |
|---|---|---|
| 1 | Essential | without this element the effective functioning of the protocol would be severely impaired |
| 2 | Very important | without this element the protocol would be less effective, but not severely impaired |
| 3 | Important | this element desirable, but its absence would not make the protocol noticeably less effective for most |
| 4 | Unimportant | absence of this element would have little impact on effectiveness |
| 5 | Undesirable | presence of this element would have a detrimental effect on effectiveness |

# CLINICAL ALGORITHM FOR THE POSITIONING AND MOBILZATION OF PATIENTS THAT HAVE NOT REACHED PHYSIOLOGICAL STABILITY TO INITIATE EARLY ACTIVITY

Steps rated as **ESSENTIAL** reaching CONSENSUS SIQR < 0.5

| CLINICAL ALGORITHM STEP | SUBJECT AREA | SIQR | RANGE | AGREEMENT | ALTERNATIVE RATING BY PANELLISTS | MEDIAN RATING |
|---|---|---|---|---|---|---|
| Assure that<br>• there are no new cardiac arrhythmias visible on ECG;<br>• HR < 75% age predicted maximum rate at rest<br>• patient is on low dose inotrope support: Dopamine <10mcg/kg/min; Nor/adrenaline<01mcg/kg/min<br>• there is less than 20% variability in BP<br>• sufficient oxygenation (SpO2>90) can be maintained<br>**POSTED COMMENT**:<br>I remain with my rating or perhaps I am even more tentative. The same concerns regarding arbitrary values compared with looking at the individual as whole. For example, the HR criterion in relation to APM which I take to mean age-predicted maximum is not very meaningful. | CRITERIA TO DETERMINE CARDIOVASCULAR RESERVE | 0.00 | 1-2 | 6/7 | 2 | **ESSENTIAL (1)** |

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| Semi-recumbent positioning of at least 30 degrees head up with the goal of reaching a 45 degree head up position<br>**POSTED COMMENT**:<br>• Based on the physiologic literature and consideration of the 'physiologic' body position is being upright and moving, we need to approximate upright and moving progressively within the patient's physiologic tolerance and safety (based on objective measures), of course. This goal even in the medically unstable patient remains the same. Of course, it will take longer and being positioned upright may not be indicated some days, and on some other days, the time even in increasing higher recumbent positions may be short. But, the goal is to assess and decide at each visit so that a small window of opportunity can be exploited when it appears. | CORE ELEMENTS OF A MOBILITY PLAN | 0.25 | 1-4 | 5/7 | 2;4 | **ESSENTIAL (1)** |
| Regular change of position: with the aim of two hourly changes in position.<br>**POSTED COMMENT**S:<br>• Regular change of position is in accordance with what can be safely tolerated by the patient in the interest of achieving therapeutic goals, in particular, optimal oxyen delivery (not meaning supplemental oxygen). | CORE ELEMENTS OF A MOBILITY PLAN | 0.00 | 1-4 | 6/7 | 4 | **ESSENTIAL (1)** |

Steps rated as **VERY IMPORTANT** reaching CONSENSUS SIQR < 0.5

| CLINICAL ALGORITHM STEP | SUBJECT AREA | SIQR | RANGE | AGREEMENT | ALTERNATIVE RATING BY PANELLISTS | MEDIAN RATING |
|---|---|---|---|---|---|---|
| Initiate discussions with interdisciplinary team members with regards to medication affecting patient consciousness (including sedation) with the goal of ensuring patient is alert and awake as soon as possible | CRITERIA TO DETERMINE CARDIOVASCULAR RESERVE | 0.00 | 1-2 | 6/7 | 1 | **VERY IMPORTANT (2)** |
| Discuss the potential benefits of implementing the core elements (positioning; regular position change and passive movements) compared to the possible compromise of the cardiovascular; renal; neurological and pulmonary systems with the interdisciplinary team and document patient specific parameters. | CRITERIA TO DETERMINE CARDIOVASCULAR RESERVE | 0.00 | 1-2 | 6/7 | 1 | **VERY IMPORTANT (2)** |
| Passive movements of the upper and lower extremity joints. Five repetitions of all | CORE ELEMENTS | 0.00 | 1-4 | 5/7 | 1;4 | **VERY IMPORTANT (2)** |

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| physiological movements completed once daily<br>**POSTED COMMENT**S:<br>• Little or no evidence to support this frequency and duration of passive movts.<br>• Passive movements in many parts of the world are executed without thought and not infrequently in patients who are perfectly capable of some active movement. One has to always think of the goal? Why? Patients without neuromuscular deficits (particularly spasm) would achieve better benefit with active mobility with and without a full range of movement). | OF A MOBILITY PLAN | | | | | |

Steps rated as **DESIRABLE** reaching CONSENSUS SIQR < 0.5

| CLINICAL ALGORITHM STEP | SUBJECT AREA | SIQR | RANGE | AGREEMENT | ALTERNATIVE RATING BY PANELLISTS | MEDIAN RATING |
|---|---|---|---|---|---|---|
| If the equipment is available include neuromuscular electrical stimulation (NEMS) to target the muscles:<br>**POSTED COMMENT:**<br>• First, our interventions should theoretically have noting to do with 'availability'. If we need it, then we agitate for it.NEMS may be done for two distinct reasons. First, if the patient is in an induced coma, then NEMS usually of the ulnar nerve needs to be done on a regular basis (when the sedation is lighted) to detect the potential for critical care neuropathy. This is usually done in consultation with the anesthetist (some places it is done by this individual alone). PTs can certainly support the team in ensuring this is done. Second, I am not confident that we know enough about NEMS as an intervention for maintaining or restoring muscle function. There are a couple of problems with it. First, its prescriptive parameters are not well documented. Second, it would need to be done judiciously meaning that it would not be done to replace more active mobility (even if very minimal – self initiated movement is always preferable to induced). And third, and perhaps most important, is that electrotherapy type interventions in the ICU can interfere with the monitoring equipment in the ICU so often are not considered options (including other interventions such as TENS for pain control). | Core elements of a mobility plan | 0.25 | 3-4 | 5/7 | 4;4 | DESIRABLE (3) |

# CLINICAL ALGORITHM FOR THE REHABILITATION OF ACUTELY ILL PATIENTS

Steps rated as **ESSENTIAL** reaching CONSENSUS SIQR < 0.5

| CLINICAL ALGORITHM STEP | SUBJECT AREA | SIQR | RANGE | AGREEMENT | ALTERNATIVE RATING BY PANELLISTS | MEDIAN RATING |
|---|---|---|---|---|---|---|
| Before evaluating a patient's respiratory; hemodynamic or cardiovascular reserve to initiate early activity consider the presence of any surgical intervention (e.g. recent SSG); neurological or orthopedic condition that could restrict activity | CRITERIA USED FOR THE PRELIMINARY SCREENING OF PATIENTS CONSIDERED FOR ACTIVE MOBILIZATION | 0.00 | 1 | 7/7 | - | **ESSENTIAL (1)** |
| Before evaluating a patient's respiratory; hemodynamic or cardiovascular reserve to initiate early activity consider and address the following environmental factors (Patient size and help available; length and placement of lines / attachments and patient consent) | CRITERIA USED FOR THE PRELIMINARY SCREENING OF PATIENTS CONSIDERED FOR ACTIVE MOBILIZATION | 0.00 | 1 | 7/7 | - | **ESSENTIAL (1)** |
| Include into the algorithm that even though the initiation of early activity is guided by specific criteria the decision is based on the clinical judgment of the therapist. This decision should be sufficiently documented. | CRITERIA USED TO DETERMINE THE PHYSIOLOGICAL STABILITY FOR THE INITIATION OF EARLY ACTIVITY | 0.00 | 1 | 7/7 | - | **ESSENTIAL (1)** |
| Discuss the potential benefits of early activity compared to the potential risks of any of the criteria with members of the interdisciplinary team | CRITERIA USED TO DETERMINE THE PHYSIOLOGICAL STABILITY FOR THE INITIATION OF EARLY ACTIVITY | 0.00 | 1 | 7/7 | - | **ESSENTIAL (1)** |
| Determine pulmonary reserve:<br>• PaO2:FiO2>300<br>• SpO2>90 variations less than 4%<br>• Satisfactory respiratory pattern<br>• Able to maintain adequate respiratory support<br>• FiO2 <.6<br>• PEEP<10<br>Posted Comment:<br>• Okay to mobilise some patients with FIO2> 0.6<br>• It is unclear with this PO/FiO ratio how to start early rehab.<br>• The SpO2 is troublesome. With SpO2 vs SaO2 we need to be extra cautious because of the measurement error. The variability given 4% coupled with measurement error, makes this value dangerously low. | CRITERIA USED TO DETERMINE THE PHYSIOLOGICAL STABILITY FOR THE INITIATION OF EARLY ACTIVITY | 0.25 | 1-4 | 5/7 | 2;4 | **ESSENTIAL (1)** |

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| Document specific functional goals with regards to mobility in consultation with each patient | SPECIFIC ACTIVITIES INCLUDED DURING EARLY ACTIVITY | 0.00 | 1 | 7/7 | - | **ESSENTIAL (1)** |
| Mobilization activities include progressing from:<br>• lying to sitting on the edge of the bed;<br>• sitting to standing;<br>• a standing transfer from the edge of the bed to a chair;<br>• walking with assistance;<br>• walking independently;<br>• climbing stairs | SPECIFIC ACTIVITIES INCLUDED DURING EARLY ACTIVITY | 0.00 | 1 | 7/7 | - | **ESSENTIAL (1)** |
| Determine medical stability<br>• Sepsis controlled<br>• No uncontrolled hemorrhage<br>• No uncontrolled arrhythmias, heart failure, or unstable angina<br>• Secure parenteral line<br>**POSTED COMMENT**:<br>Yes…but this is a limited number of conditions that establish medical stability. | CRITERIA USED TO DETERMINE THE STABILITY OF DECONDITIONED PATIENTS BEFORE INITIATING AN EXERCISE PLAN | 0.00 | 1 | 7/7 | - | **ESSENTIAL (1)** |
| In patients deconditioned due to a prolonged period of immobility caused by physiological instability, initiate a targeted exercise program in addition to ambulation<br>**POSTED COMMENT**S:<br>Yes and no. Being upright and moving for optimal oxygen transport and reduced risk of complications is the primary goal. | INTENSITY AND FREQUENCY OF A DIRECTED EXERCISE PLAN INCLUDED FOR DECONDITIONED PATIENTS. | 0.00 | 1 | 7/7 | - | **ESSENTIAL (1)** |
| Target the muscles of the trunk, upper and lower limb for strengthening and endurance training | INTENSITY AND FREQUENCY OF A DIRECTED EXERCISE PLAN INCLUDED FOR DECONDITIONED PATIENTS. | 0.00 | 1 | 7/7 | - | **ESSENTIAL (1)** |
| Maintain sufficient oxygenation (SaO2>90) during all activity (can increase FiO2)<br>**POSTED COMMENT**:<br>However, an SaO2 of exactly 90% is accepted given the oxyhemoglobin dissociation curve, but an SpO2 is not. This needs to be distinguished. Oximeters have a +/-2% measurement error. Some practitioners without thinking whether the saturation is from an arterial line or pulse sensor may not distinguish this and need to be reminded. | CRITERIA USED TO MONITOR A PATIENT DURING EARLY ACTIVITY | 0.00 | 1 | 7/7 | - | **ESSENTIAL (1)** |
| Monitor that blood pressure remains stable | CRITERIA USED TO MONITOR A PATIENT DURING EARLY ACTIVITY | 0.00 | 1 | 7/7 | - | **ESSENTIAL (1)** |

Steps rated as **VERY IMPORTANT** reaching CONSENSUS SIQR < 0.5

| CLINICAL ALGORITHM STEP | SUBJECT AREA | SIQR | RANGE | AGREEMENT | ALTERNATIVE RATING BY PANELLISTS | MEDIAN RATING |
|---|---|---|---|---|---|---|
| Determine cardiovascular reserve:<br>• Resting heart rate < 50% age predicted maximum<br>• BP less than 20%variability<br>• ECG normal (arrhythmias)<br>• Major cardiac pathologies excluded<br>• Absence of orthostatic hypotension and catecholamine drips<br>**POSTED COMMENT**:<br>• I don't think you need an ABSENCE of catecholamine drips - low dose okay.<br>• Clinically, I have considerable trouble with types of parameters. Physiologically, cardiovascular reserve needs to reflect SaO2 and PaO2 as well as heart rate (determinants of oxygen delivery). The use of APM (if this means age-predicted maximum) is not a defensible parameter. The BP criterion seems arbitrary and needs to be based on the patient as a whole. The ECG criterion of (ECG normal (arrhythmia) is also difficult to defend. In the ICUs, I have linked with, most patients have dodgy and changeable ECGs. Also, what does ECG normal (arrhythmias) mean exactly? | CRITERIA USED TO DETERMINE THE PHYSIOLOGICAL STABILITY FOR THE INITIATION OF EARLY ACTIVITY | 0.00 | 1-4 | 5/7 | 1;4 | **VERY IMPORTANT (2)** |
| Other factors favorable<br>• HB >7gm/dl<br>• Platelet >30,000 cells/m3<br>• White cell 4300 – 10800 cells/m3<br>• Body temp <38.5 >36<br>• Blood glucose level 3.5-20mmol/L<br>**POSTED COMMENT**:<br>• there is little evidence to support these are helpful<br>• HB> 8.5 | CRITERIA USED TO DETERMINE THE PHYSIOLOGICAL STABILITY FOR THE INITIATION OF EARLY ACTIVITY | 0.00 | 1-3 | 5/7 | 1;3 | **VERY IMPORTANT (2)** |
| Include lower limb exercises in addition to ambulation<br>**POSTED COMMENT**:<br>Yes, but not to the exclusion of other things including short ambulation time | SPECIFIC ACTIVITIES INCLUDED DURING EARLY ACTIVITY | 0.00 | 2 | 7/7 | - | **VERY IMPORTANT (2)** |
| If patient is unable to mobilize out of bed include lower limb strengthening exercises<br>**POSTED COMMENT**:<br>I agree but not to the exclusion I trust to trunk mobility and upper extremity exercises, and being progressively positioned upright to optimize circulating blood volume. | SPECIFIC ACTIVITIES INCLUDED DURING EARLY ACTIVITY | 0.00 | 1-2 | 5/7 | 1;1 | **VERY IMPORTANT (2)** |

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|---|---|---|---|---|---|---|
| Determine pulmonary stability<br>• Stable and secure airway:<br>• Minimal aspiration<br>• Secretions: manageable with infrequent suctioning<br>• Oxygen: adequate oxygenation with FIO2 <50%,<br>• PEEP =/<5 cm H2O, SpO2 >92%<br>• Ventilator settings: stable, no sophisticated modes<br>• Patient assessment: comfortable, no increased WOB or dyspnea<br>**POSTED COMMENT**S:<br>• This is different from other criteria. In the other one (which I disagreed with), it said you need a FIO2 < 0.6 (by the way, it should be expressed as a fraction, not a %). Similarly I think SpO2 was > 90% not the 92% here. Needs to be consistent.<br>• I can understand why the airway needs to be secure. I do not see the justification for the aspiration criterion; or secretions (this would be an indication for mobilizing the patient not a contraindication); in fact, I can see exceptions to the remainder of the items Clearly, caution needs to be observed with many of these items, but that is why we are qualified to reason what is appropriate for the patient based on a comprehensive assessment (should we intervene at this time and why, should we not and why not); and then to monitor appropriately to see if we made the best judgment and how the patient is responding | CRITERIA USED TO DETERMINE THE STABILITY OF DECONDITIONED PATIENTS BEFORE INITIATING AN EXERCISE PLAN | 0.25 | 2-4 | 5/7 | 3;4 | **VERY IMPORTANT (2)** |
| Exercise frequency should be at least daily; progressing to two sessions per day<br>**POSTED COMMENT**S:<br>Prescription is patient dependent, and response dependent. | INTENSITY AND FREQUENCY OF A DIRECTED EXERCISE PLAN INCLUDED FOR DECONDITIONED PATIENTS. | 0.00 | 1-4 | 5/7 | 1;4 | **VERY IMPORTANT (2)** |
| Appropriate incremental increase in heart rate<br>**POSTED COMMENT**:<br>• I won't change my rating, but actually what I would prefer this to read is 'appropriate changes in heart rate'; to account for lower intensities as well as higher ones. | CRITERIA USED TO MONITOR A PATIENT DURING EARLY ACTIVITY | 0.00 | 1-2 | 5/7 | 1;1 | **VERY IMPORTANT (2)** |

Steps rated as **IMPORTANT (DESIRABLE)** reaching CONSENSUS SIQR < 0.5

| CLINICAL ALGORITHM STEP | SUBJECT AREA | SIQR | RANGE | AGREEMENT | ALTERNATIVE RATING BY PANELLISTS | MEDIAN RATING |
|---|---|---|---|---|---|---|
| Progression of early activity should be guided by patient's tolerance, but with the goal of walking at least 100m on discharge from the unit<br>**POSTED COMMENT:**<br>• Unrealistic to set a minimum distance<br>• Not exclusively, objective measures as well. The patient may feel the exercise is tolerated well but if they are throwing PVCs or other dysrhythmias, or I detect other hemodynamic signs that the mobilization stimulus is not being tolerated well, then the activity would desist or cut back (depending on the seriousness of the untoward sign). Mmmmm…100 m. Good goal, I suppose. Generally, the farther they can go the better either below or above this value | SPECIFIC ACTIVITIES INCLUDED DURING EARLY ACTIVITY | 0.00 | 2-5 | 5/7 | 2;5 | **DESIRABLE (3)** |
| If patient is unable to mobilize out of bed include arm exercises (both strengthening and endurance) into early activity<br>**POSTED COMMENT:**<br>I agree provided it is not contraindicated, is prescribed based on the patient's status, and the prescription is tolerated well. | SPECIFIC ACTIVITIES INCLUDED DURING EARLY ACTIVITY | 0.00 | 3 | 7/7 | - | **DESIRABLE (3)** |
| Muscle training should include low resistance multiple repetitions (3 sets of 8-10 repetitions at 50%-70% of 1 repetition maximum)<br>**POSTED COMMENT:**<br>This seems more for people not in the ICU. Patient response should drive the prescription. Muscle training has a role at this stage, mostly as it supports being upright and moving.<br>Muscle training has cardiovascular effects. I would train more for aerobic effect (lower intensity and higher repetitions) rather than strength per se (higher intensity and lower repetitions). The patient is in the ICU because of threats to or deficits in oxygen transport, thus, support oxygen transport (specifically oxygen delivery, in my view, is our priority). More vigorous training can follow. | INTENSITY AND FREQUENCY OF A DIRECTED EXERCISE PLAN INCLUDED FOR DECONDITIONED PATIENTS | 0.00 | 3 | 7/7 | - | **DESIRABLE (3)** |
| Exercise intensity should be at a level between 11 and 13 on the Borg Rating of Perceived Exertion Scales (RPE)<br>**POSTED COMMENT:**<br>All parameters of the mobilization prescription should be tolerated well. Absolute RPE values sounds nice and even scientific, but not reflective of holistic practice in my view. | INTENSITY AND FREQUENCY OF A DIRECTED EXERCISE PLAN INCLUDED FOR DECONDITIONED PATIENTS | 0.00 | 3-4 | 6/7 | 4 | **DESIRABLE (3)** |

## Steps that did not reach consensus

| CLINICAL ALGORITHM STEP | SUBJECT AREA | SIQR | RANGE | AGREEMENT | ALTERNATIVE RATING BY PANELLISTS | MEDIAN RATING |
|---|---|---|---|---|---|---|
| Patient physical appearance: conscious state, respiratory pattern, pallor, flushing, sweating, clamminess, cyanosis, visible or patient reported signs of pain, discomfort or fatigue | CRITERIA USED TO MONITOR A PATIENT DURING EARLY ACTIVITY | 0.5 | 1-3 | 5/7 | 1;1;3;3;3;3;3 | **DESIRABLE (3)** |
| Presence of increasing ectopic beats; arrhythmias | CRITERIA USED TO MONITOR A PATIENT DURING EARLY ACTIVITY | 1 | 1-3 | 4/7 | 1;1;1;3;3;3;3 | **DESIRABLE (3)** |