**ICU Pediatric Early Mobilization**

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**Contraindications**
- Increased intracranial pressure (ICP) greater than or equal to 15
- Acute or uncontrolled intracranial event
- Positive end expiratory pressure (PEEP) greater than or equal to 10 on invasive mechanical ventilation
- Volumetric diffusive respiration (VDR) or high frequency oscillatory ventilation (HFOV)
- Difficult airway
- Hemodynamic instability

**Precautions**
- Venous thromboembolism
- External ventricular drain
- RASS score of +1 (Appendix C)
- Mechanical ventilation
- Hemoglobin 8-10 grams/dL
- Continuous dialysis
- Lumbar drain
- Any major surgery
- Vasopressor medication
- Uncontrolled pain
- Unstable fracture
- Uncontrolled seizures
- Acute abdomen
- RASS score of -3 and lower, or +2 and higher (Appendix C)
- Fraction of inspired oxygen (FiO₂) greater than or equal to 0.60
- Hemoglobin less than 8 grams/dL or Platelets less than 20 K/microliter
- Active bleeding
- Active bleeding
- Continuous dialysis
- Lumbar drain
- Any major surgery
- Vasopressor medication

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Order received to implement ICU Early Mobilization

- Contraindication present?
  - Yes
    - Establish PROM exercises with caregiver to reduce the likelihood of contractures
    - Educate donning and doffing of PRAFO to prevent tightness on Achilles tendon and reduce the likelihood of footdrop
    - Re-evaluate in 24 hours for early mobilization
  - No

- Evaluate for precautions

- Precautions present?
  - Yes
    - Discuss with team (including RT for mechanically ventilated patients) prior to initiating mobilization activity
  - No

- Patient on invasive mechanical ventilation?
  - Yes
    - RT to be present during the entire session for artificial airway
    - RT to be present at beginning and end of session for established tracheostomy
    - Ensure endotracheal tube or tracheostomy is secure before moving patient
    - Proceed with mobilization interventions (See Appendix A)
  - No

- Signs of intolerance which do not resolve within 10 minutes? (See Appendix B)
  - Yes
    - Suspend activity and re-evaluate within 6 hours
  - No

- Re-assess mobility level every 12 hours

- Continue with mobilization interventions as indicated by appropriate level

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APPENDIX A: Mobility Levels

<table>
<thead>
<tr>
<th>Mobility Level</th>
<th>Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td></td>
</tr>
<tr>
<td>RASS -5 to +2</td>
<td>PROM BID x 10 repetitions with family/nursing staff/nursing assistant staff</td>
</tr>
<tr>
<td>Functional Level: Total Assist</td>
<td>Splinting and repositioning every 2 hours by nursing staff/nursing assistant staff</td>
</tr>
<tr>
<td></td>
<td>Bed in chair position BID by nursing staff/nursing assistant staff for 20 minutes to 2 hours</td>
</tr>
<tr>
<td></td>
<td>Skilled therapeutic interventions by PT/OT as indicated</td>
</tr>
<tr>
<td>Level 2</td>
<td>ROM exercises BID x 10 repetitions with family/nursing staff/nursing assistant staff</td>
</tr>
<tr>
<td>RASS -2 to +2</td>
<td>Splinting and repositioning every 2 hours by nursing staff/nursing assistant staff</td>
</tr>
<tr>
<td>Functional Level: Maximum to Moderate Assist</td>
<td>Bed in chair position BID by nursing staff/nursing assistant staff for 20 minutes to 2 hours</td>
</tr>
<tr>
<td></td>
<td>OOB to neuro chair with family/nursing staff/nursing assistant staff for 30 minutes to 2 hours</td>
</tr>
<tr>
<td></td>
<td>Skilled therapeutic interventions by PT/OT as indicated</td>
</tr>
<tr>
<td></td>
<td>Participate in ADL</td>
</tr>
<tr>
<td>Level 3</td>
<td>Home exercise program BID</td>
</tr>
<tr>
<td>RASS -1 to +2</td>
<td>Reposition every 2 hours while in bed</td>
</tr>
<tr>
<td>Functional Level: Moderate Assist to Supervision</td>
<td>OOB to bedside chair for 30 minutes to 2 hours</td>
</tr>
<tr>
<td></td>
<td>Ambulate as directed by PT/OT</td>
</tr>
<tr>
<td></td>
<td>Skilled therapeutic interventions by PT/OT as indicated</td>
</tr>
<tr>
<td></td>
<td>Participate in ADL</td>
</tr>
</tbody>
</table>

PROM: Passive range of motion
ROM: Range of motion
OOB: Out of bed
ADL: Activities of daily living
BID: Twice daily

APPENDIX B: Signs of Intolerance

- Oxygen saturation less than 88%
- Increased work of breathing
- Use of accessory muscles
- Perioral cyanosis
- Breath holding
- Nasal flaring
- Subcostal retractions
- Change in character of cry
- Development of any contraindications
- Vital signs outside of pediatric normative values (See Appendix C)
- Irritability

APPENDIX C: Pediatric Normative Values

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Respiratory Rate per minute</th>
<th>Heart Rate per minute</th>
<th>Systolic Blood Pressure (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn (less than 1 month)</td>
<td>30-50</td>
<td>120-160</td>
<td>50-70</td>
</tr>
<tr>
<td>Infant (1-12 months)</td>
<td>20-30</td>
<td>80-140</td>
<td>70-100</td>
</tr>
<tr>
<td>Toddler (1-3 years)</td>
<td>20-30</td>
<td>80-130</td>
<td>80-110</td>
</tr>
<tr>
<td>Preschooler (4-5 years)</td>
<td>20-30</td>
<td>80-120</td>
<td>80-110</td>
</tr>
<tr>
<td>School Age (6-12 years)</td>
<td>20-30</td>
<td>70-110</td>
<td>80-120</td>
</tr>
<tr>
<td>Adolescent (greater than 12 years)</td>
<td>12-20</td>
<td>55-105</td>
<td>110-120</td>
</tr>
</tbody>
</table>

APPENDIX D: Richmond Agitation Sedation Scale (RASS)

<table>
<thead>
<tr>
<th>RASS</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+4</td>
<td>Combative</td>
</tr>
<tr>
<td>+3</td>
<td>Very agitated</td>
</tr>
<tr>
<td>+2</td>
<td>Agitated</td>
</tr>
<tr>
<td>+1</td>
<td>Restless</td>
</tr>
<tr>
<td>0</td>
<td>Alert and calm</td>
</tr>
<tr>
<td>-1</td>
<td>Drowsy</td>
</tr>
<tr>
<td>-2</td>
<td>Light sedation</td>
</tr>
<tr>
<td>-3</td>
<td>Moderate sedation</td>
</tr>
<tr>
<td>-4</td>
<td>Deep sedation</td>
</tr>
<tr>
<td>-5</td>
<td>Unarousable</td>
</tr>
</tbody>
</table>

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SUGGESTED READINGS


Brower, R. G. (2009). Consequences of bed rest. *Critical Care Medicine, 35*(1), 139 - 145. doi: 10.1097/CCM.0b013e3181b6e30a


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ICU Pediatric Early Mobilization

This practice consensus algorithm is based on majority expert opinion of the ICU Pediatric Mobilization work group at the University of Texas MD Anderson Cancer Center. It was developed using a multidisciplinary approach that included input from the following:

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DEVELOPMENT CREDITS

This practice consensus algorithm has been specifically developed for MD Anderson using a multidisciplinary approach and taking into consideration circumstances particular to MD Anderson, including the following: MD Anderson’s specific patient population; MD Anderson’s services and structure; and MD Anderson’s clinical information. Moreover, this algorithm is not intended to replace the independent medical or professional judgment of physicians or other health care providers.

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