

Techniques to Improve Respiratory Function in Patients with Neuromotor Delay^{1,2}

Accessory Muscle Activation: Upper Chest¹

- **Patient position:** Supine
- **Therapist position:** Kneeling next to patient
- **Therapist hand placement:** Both hands placed on patient's upper chest, below the clavicles
- **Patient instructions:** "Take one normal breath and let it go, then take a full breath in as you breathe into my hands"
- **Therapist motion:** Provide quick stretches caudally through hands as patient inhales

1)



2)



Cough Assist¹:

- **Patient position:** Side-lying
- **Therapist position:** Kneeling next to patient
- **Therapist hand placement:** One hand on upper abdominal area below the xiphoid process, the other hand on the lateral border of the ribs
- **Patient instructions:** "Take one normal breath and let it go, then take a deep breath in, hold it, cough"
- **Therapist motion:** Fast and deep pressure with both hands during cough



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Soft Tissue Release²:

- **Patient position:** Side-lying, towel roll under lower ribs, top arm in complete abduction, bottom knee flexed
- **Therapist position:** Standing behind patient's shoulder blade
- **Therapist hand placement:** Non-dominant hand stabilizes patient under axilla, dominant hand uses thumb between ribs to access intercostal muscles
- **Patient instructions:** "Take a breath in and hold it"
- **Therapist motion:** Apply pressure starting in the posterior intercostal muscle and continue through to the anterior side of that intercostal muscle segment



Ribcage Mobilizations²:

- **Patient position:** Side-lying, towel roll under lower ribs, top arm in complete abduction, bottom knee flexed
- **Therapist position:** Standing behind the patient's sacrum
- **Therapist hand placement:** The flat surfaces of six fingers (3 from each hand) on superior portion of rib
- **Patient instructions:** "Relax, let me move you. Take a deep breath in, hold it, let it out"
- **Therapist motion:** Mobilize each rib individually; start from inferior, posterior portion of rib 10 and move superiorly and anteriorly on subsequent ribs. Perform a quick stretch to rib, push patient anteriorly during inhale, perform mobilizations while patient holds breath



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Spinal Mobilization²:

- **Patient position:** Sitting
- **Therapist position:** Sitting next to patient with leg extended behind patient
- **Therapist hand placement:** One forearm stabilizes anterior shoulder, the other hand uses thumb to apply pressure between the spinous process and the contralateral transverse process of the thoracic spine
- **Patient instructions:** “Relax, let me move you”
- **Therapist motion:** Pull patient into side-bend with forearm on shoulder, apply lateral pressure towards the contralateral side to increase side-bend. Move up as many levels as necessary



*The images from the first page come from the first reference and the images from pages 2 and 3 come from the second reference.

References:

1. Massery M. Respiratory management of the patient with quadriplegia. [DVD]. Glenview, IL. Rehabilitation Institute of Chicago.
2. Massery M. Screening and treating musculoskeletal restrictions related to breathing and/or postural impairments. [DVD]. Glenview, IL. Rehabilitation Institute of Chicago.