

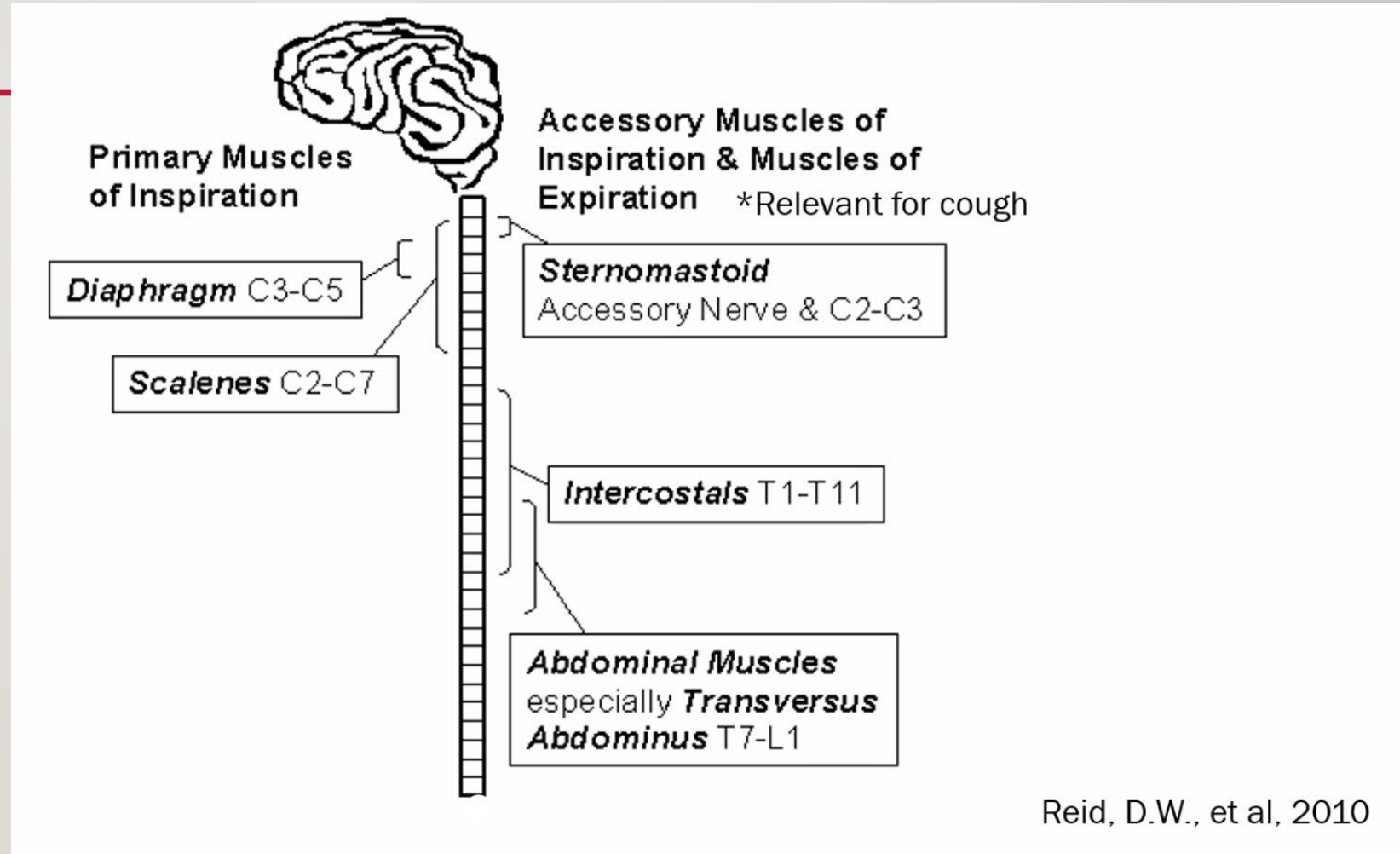
RESPIRATORY MANAGEMENT IN SCI - POST ACUTE CARE

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IMPACT ON BREATHING DEPENDS ON:

- SCI level
- Prior Respiratory Status
- Events at the time of injury and initial management



RESPIRATORY IMPAIRMENT BY SCI LEVEL

- C1-C2: permanent invasive ventilation. ?diaphragm pacing
- C3-C4: possible independent breathing; nocturnal NIV
- C5: +/- independent breathing. Long term support for coughing
- C6-C8: independent breathing likely. Help with coughing.
- [T6 and below: reduced risk of autonomic dysfunction]
- T12 and L: nor respiratory compromise; effective cough.

RESPIRATORY PROBLEMS AFTER SCI

- Difficulty coughing/clearing mucus
- Difficulty taking a deep breath
- Choking spells if swallow impaired
- Respiratory failure
- Sleep disordered breathing
- Pneumonia
- Chronic respiratory failure
- Bronchiectasis ← recurrent pneumonia
- Frozen chest
- Post-operative respiratory failure

NEUROPULMONARY ASSESSMENT

- Talk
- Eat/swallow
- Cough
- Breathe
- Breathe during sleep
- Smoker
- Prior respiratory disease; inhaler use
- Other injuries to the chest
- Other disease/injuries
- Vaccine status
- - - - Nasal symptoms; hand/arm function

NEUROPULMONARY INVESTIGATIONS

- VENTILATION: ETCO₂; ABG
- OXYGENATION: SpO₂, ABG
- RESPIRATORY MUSCLE POWER: MIP/MEP; NIF
- COUGH STRENGTH: peak cough flow (PCF)
- SPIROMETRY: upright and supine
- SLEEP: overnight oximetry; L3 sleep study
- +/- Assessment of swallow

NEUROPULMONARY MANAGEMENT STRATEGIES

- For chest wall restriction and ineffective airway clearance:
 - Lung volume recruitment
 - Mechanical in-/ex-sufflation
 - Chest percussion therapies
 - Medications to thin airway secretions



NEUROPULMONARY MANAGEMENT STRATEGIES

- For reduced respiratory muscle power
 - Respiratory muscle strength training
 - Diaphragm pacing – for SCI >C2 (>C3)
 - ? FES to eg abdominal muscles?
 - ? Implanted spine stimulators



NEUROPULMONARY MANAGEMENT STRATEGIES

- For sleep disordered breathing:
 - CPAP for OSA
 - BiPAP for nocturnal hypoventilation
- For chronic respiratory failure
 - Noninvasive ventilation with BiPAP and mouthpiece ventilation
 - [Invasive ventilation]



OTHER MANAGEMENT STRATEGIES:

- Smoking cessation
- Prevention: Vaccination; environmental controls
- Education:
 - Symptom management
 - Infection control and action plan for chest infections
 - Choking action plan
 - Symptoms of sleep disordered breathing and respiratory failure
- Support/Contact: Home Care RRT, PCP, SCI RN Coordinator

ANTICIPATORY MANAGEMENT - IF GOING TO ER/HOSPITAL

- Take respiratory equipment
 - LVR apparatus; MI-E machine
 - CPAP or BiPAP (empty humidity chamber)
- Notify Home Care RRT: resource for hospital RRT
- Notify SCI Team/Clinic Nurse Coordinator

ANTICIPATORY MANAGEMENT - IF GOING FOR SURGERY

- Notify the Neuropulmonary Specialist
 - May need pre-op assessment by this specialist
 - May need pre-op assessment by ICU with bed on hold
- Bring respiratory equipment to OR for use in Recovery Room or ICU

GOAL OF NEUROPULMONARY REHABILITATION:

- To maximize quality of life
- To be pro-active and pre-emptive in managing respiratory symptoms
- To prevent or at least minimize respiratory complications
- → <https://www.canventottawa.ca>

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