### Electrode Placement Guide

<table>
<thead>
<tr>
<th>Functional muscle actions</th>
<th>Possible signs &amp; symptoms</th>
<th>Possible VitalStim electrode placements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oropharyngeal “sling”</strong></td>
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<tr>
<td>- Orbicularis oris</td>
<td>- anterior spillage/leakage</td>
<td>4a ▶ maximum facilitation of synergists when electrodes applied bilaterally</td>
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<tr>
<td>- Buccinator</td>
<td>- premature spillage, residuals</td>
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<tr>
<td>- Superior pharyngeal</td>
<td>- pocketing, holding, stasis</td>
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<td></td>
<td>- nasal regurgitation</td>
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<tr>
<td><strong>Tongue: bolus manipulation and tongue base retraction</strong></td>
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<tr>
<td>- Intrinsics tongue</td>
<td>- ↓ AP transit</td>
<td>2a/b ▶ horizontal channel facilitates recruitment of muscles innervated by CN XII</td>
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<tr>
<td>- Extrinsic tongue</td>
<td>- premature spillage</td>
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<tr>
<td>- Superior pharyngeal constrictor</td>
<td>- coating tongue base/post. pharynx</td>
<td>4a ▶ increases sensory input - CN V and VII</td>
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<tr>
<td></td>
<td>- delayed swallow trigger</td>
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<td></td>
<td>- vallecular pooling</td>
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<tr>
<td><strong>Velopharyngeal seal</strong></td>
<td>- nasal regurgitation</td>
<td>4a ▶ maximum facilitation of synergists when electrodes applied bilaterally</td>
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<tr>
<td>- Levator veli palatini</td>
<td>- residuals</td>
<td></td>
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<tr>
<td>- Superior pharyngeal constrictor</td>
<td>- delayed pharyngeal transit</td>
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<tr>
<td><strong>Hyolaryngeal Excursion</strong></td>
<td>- decreased hyolaryngeal excursion</td>
<td>2b ▶ good facilitation of geniohyoid, mylohyoid and thyrohyoid muscles</td>
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<tr>
<td>- Laryngeal extrinsics</td>
<td>- penetration, aspiration</td>
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<tr>
<td>- Suprahyoid muscles</td>
<td>- voice abnormalities</td>
<td>1 ▶ facilitation supra- and infrahyoid muscles</td>
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<tr>
<td></td>
<td>- decreased UES opening</td>
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<td></td>
<td>- pooling residuals</td>
<td>3a ▶ good facilitation of digastric and thyrohyoid muscles</td>
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<tr>
<td><strong>Pharyngeal concretion</strong></td>
<td>- penetration, aspiration</td>
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<tr>
<td>- Superior, middle and inferior pharyngeal constrictors</td>
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<tr>
<td>- Pharyngeal shortening mm</td>
<td>- piecemeal deglutition</td>
<td>3b ▶ electrode placements on attachments of middle (hyoid) and lower (thyroid) pharyngeal constrictors</td>
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<tr>
<td></td>
<td>- residuals</td>
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<td></td>
<td>- decreased pharyngeal transit time</td>
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<tr>
<td><strong>UES seal opens and closes</strong></td>
<td>- delayed opening UES</td>
<td>2b ▶ focus on hyolaryngeal excursion</td>
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<tr>
<td>- Cricopharyngeus</td>
<td>- decreased opening UES, CP bar</td>
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<tr>
<td>- Supra and infrahyoid mm</td>
<td>- premature closure UES</td>
<td>1 ▶ focus on maximal sensory input</td>
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<td>- Pharyngeal constrictors</td>
<td>- penetration, aspiration</td>
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<tr>
<td>- Pharyngeal shortening muscles</td>
<td>- pyriform pooling, residuals</td>
<td>3a ▶ focus on hyolaryngeal excursion (TH)</td>
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<td></td>
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<td>3b ▶ focus on pharyngeal constriction</td>
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</tbody>
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