Electrode Placements

Placement 1

- All electrodes aligned vertically along midline
- First electrode is placed well above hyoid bone
- Second electrode is placed just below first one, above the thyroid notch
- 3rd and 4th electrode placed at equal distances below first two electrodes
- Bottom electrode should not end up below cricoid cartilage

Muscles reached

**Superficial**: mylohyoid, possibly sternohyoid

**Deeper**: geniohyoid, cricothyroid
Placement 2a

- Channel 1: electrodes aligned horizontally at or above hyoid bone
- Channel 2: electrodes aligned vertically along midline, top electrode at level of thyroid notch, bottom electrode below it

Muscles reached

**Superficial:** mylohyoid, anterior belly digastric

**Deeper:** geniohyoid, thyrohyoid, cricothyroid, possibly sternohyoid, possibly hypoglossal nerve
Placement 2b

- Channel 1: electrodes aligned along midline, over geniohyoid belly
- Channel 2: electrodes placed at either side of thyroid notch, over thyrohyoid muscle belly

Muscles reached

**Superficial:** mylohyoid, possibly sterno- and omohyoid

**Deeper:** geniohyoid, thyrohyoid, possibly superior laryngeal nerve (CN X)
Placement 3a

- Channels aligned vertically on either side of midline
- Top electrodes are placed just above hyoid bone
- Bottom electrodes are over the thyrohyoid muscle – at the level of the thyroid notch
- Note: DO NOT place electrodes too far laterally so as not to send current through carotid sinus

Muscles reached

**Superficial**: anterior belly digastric, possibly sterno- and omohyoid

**Deeper**: thyrohyoid, possibly geniohyoid, possibly hypoglossal nerve, possibly superior laryngeal nerve (CN X)
Placement 3b

- Electrodes channel 1 aligned horizontally at or above hyoid bone
- Top electrodes are placed just above hyoid bone
- Bottom electrodes are over the thyrohyoid muscle – at the level of the thyroid notch
- Note: DO NOT place electrodes too far laterally so as not to send current through carotid sinus

Muscles reached

**Superficial:** mylohyoid, anterior belly digastric, possibly sterno- and omohyoid

**Deeper:** geniohyoid, thyrohyoid; middle pharyngeal constrictors (not depicted) may be stimulated as well with sufficient intensity; if top electrodes are placed far enough apart the hypoglossal nerve may be reached as well

**Note:** with any of the placements with a paramedian electrode placement, the platysma may be recruited. If this presents too much of a nuisance factor or interferes with treatment, try adjusting the position of the electrodes.
Placement 4a

- Electrodes are placed over buccal branch of facial nerve
- Channel may be placed bilaterally
- Second channel may be placed superior to hyoid (as in top channel of placement 3b) to facilitate recruitment of CN XII
- Alternatively, 2nd channel may be placed on opposite side to increase facilitation of oropharyngeal sling

Placement 4b

- Electrodes are placed over main trunk of facial nerve
- Second channel may be placed superior to hyoid (as in top channel of placement 3b) to facilitate recruitment of CN XII
- Alternatively, 2nd channel may be placed on opposite side to increase facilitation of oropharyngeal sling
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<td>- Intrinsics tongue&lt;br&gt;- Extrinsic tongue&lt;br&gt;- Superior pharyngeal constrictor</td>
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<td>2b good facilitation of geniohyoid, mylohyoid and thyrohyoid muscles 1 facilitation supra- and infrahyoid muscles 3a good facilitation of digastric and thyrohyoid muscles</td>
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<td><strong>UES seal opens and closes</strong></td>
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<td>2b focus on hyolaryngeal excursion 1 focus on maximal sensory input 3a focus on hyolaryngeal excursion (TH) 3b focus on pharyngeal constriction</td>
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<tr>
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Electrode placement is influenced by multiple factors:

- A very small neck may not offer sufficient room for 4 electrodes, except maybe for placement 2.
- Do not place an electrode directly on a fresh surgical incision.
- Do not allow current to flow through indwelling foreign material (tracheotomy, staples, sutures, etc.)

Procedure for electrode placement:

- Ensure skin is clean, dry and well shaven.
- Clean skin with included cleaning swab or alcohol swab; the included swab improves adhesion and conductivity.
- Maintain head position as neutral as possible.
- Attach electrodes per placements diagrams on previous page.
- Improve contact with bandage or tape if skin sags too much or as required.

**Coaching Swallow Attempts during Treatment**

- **Swallow hard**
  When recovering from dysphagia individual needs to concentrate on a strong swallow.

- **Swallow fast**
  Timing is as important as strength. Any delay in swallowing can result in aspiration.

- **Swallow in single contractions**
  It is important to clear the pharynx as much as possible to prevent passive aspiration.

- **Swallow; clear throat and swallow again**
  An individual who experiences pyriform sinus pooling with residual can help to clear the pharynx by clearing the throat and swallowing. Clearing the throat helps to clear the pyriform sinuses.

Carnaby, 2006: Study compared standard low-intensity and high-intensity behavioural interventions with usual care for dysphagia. 306 patients with clinical dysphagia admitted to hospital with acute stroke were randomly assigned to receive usual care (n=102), prescribed by the attending physician; standard low-intensity intervention (n=102), comprising swallowing compensation strategies and diet prescription three times weekly for up to a month; or standard high-intensity intervention and dietary prescription (n=102), at least daily for up to a month. Data show a consistent trend towards more favourable outcomes in dysphagic stroke patients who are assigned a standard programme of early behavioural swallowing intervention, including active therapeutic approaches and dietary modification.