

# Training Protocol

## Ultrasound-guided Localisation of the Cricothyroid Membrane Study

### Prior certification/qualification.

Study operators will be consultant emergency physicians or advanced trainees in emergency medicine, who have completed basic credentialing in emergency ultrasound, with at least eFAST and AAA competency (minimum of 25 satisfactory scans and a supervised 'exit examination' in both modalities).

### Training.

Study operators will undergo didactic training using a video and a one-hour practical training session involving the accurate identification of the cricothyroid membrane in at least 5 healthy volunteers. Study operators will receive a reference card for revision of practice. Accurate localisation of the cricothyroid membrane during training will be determined by consensus between the two supervisors of training (CP & IF).

**Prior eLearning:** [Localising the Cricothyroid Membrane \(CM\) with Ultrasound](#)  
via [AirwayManagement.dk](http://AirwayManagement.dk)

## Technique for Ultrasound-guided Localisation of Cricothyroid Membrane (CTM).

### Patient:

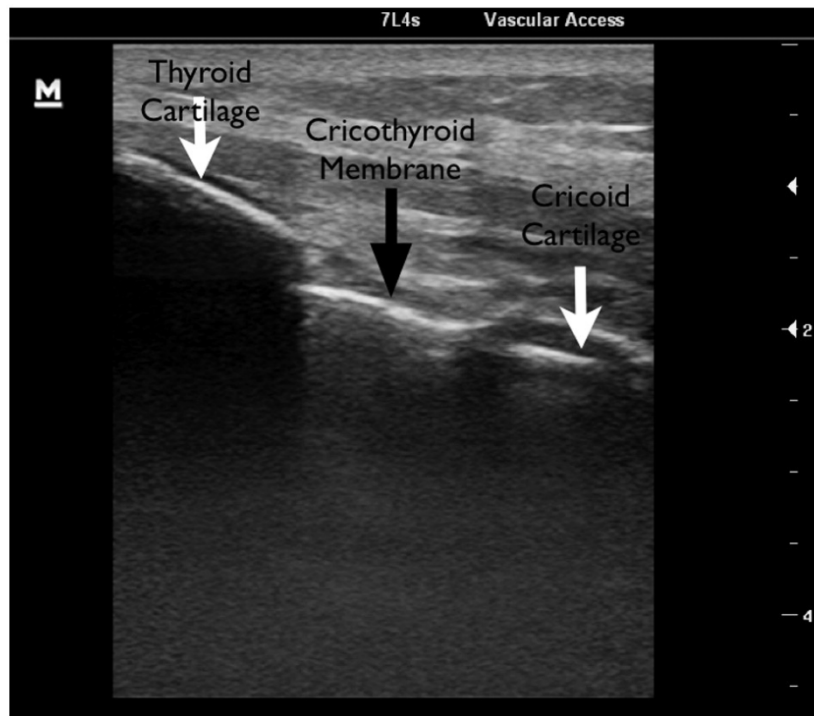
- Positioned to maintain spinal precautions.
- Cervical collar removed by nursing assistant during localisation of CTM.
- Collar replaced once CTM marked.

### Probe:

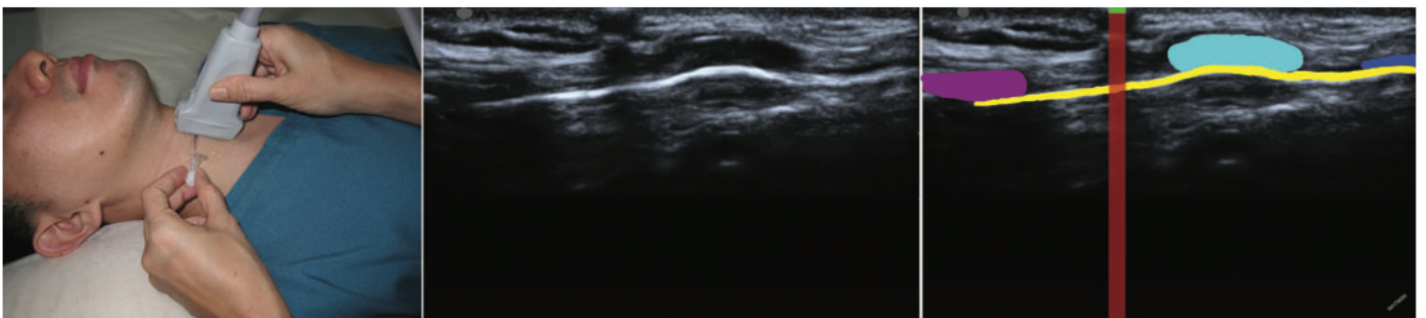
- High-frequency linear transducer.

### Procedure:

- The linear transducer is held in the non-dominant hand of the clinician in the longitudinal orientation with the probe marker toward the patient's head just lateral to the midline of the trachea to identify the cricothyroid membrane.
- The cricothyroid membrane is centred on the screen of the US machine (see Fig 1).
- CTM centring is confirmed by sliding a blunt, 19G drawing up needle underneath the US probe until it casts a shadow in the centre of the CTM (see Fig 2).
- The US probe is then rotated 90° so that the probe marker is pointed to the patients' right.
- The CTM is again identified and the peak of the membrane placed in the centre of the US screen.
- An invisible line is drawn in the centre of the probe, this time in the sagittal plane, indicating the midline of the patient's neck and the CTM.
- The study marker is then placed at the intersecting points of these lines, indicating the geographical centre of the CTM.



**Fig. 1.** Ultrasound image of the CTM in the sagittal plane.



**Fig 2** Yellow shows the tissue-air border, the mucosal lining in the trachea. The distal part of the thyroid cartilage (purple) is seen. The cricothyroid membrane can be identified by sliding a needle (used only as a marker) underneath the ultrasonography transducer from the cranial end until it casts a shadow (red line) immediately cranial to the cricoid cartilage (turquoise). The green spot represents the reflection from the needle. Care is taken not to touch the patient with the sharp tip of the needle.

**Additional material:** [Episode 19 – Full Cric](#)  
via [UltrasoundPodcast.com](http://UltrasoundPodcast.com)

## References.

1. Mallin, M., Curtis, K., Dawson, M., Ockerse, P., & Ahern, M. (2014). Accuracy of ultrasound-guided marking of the cricothyroid membrane before simulated failed intubation. *The American Journal of Emergency Medicine*, 32(1), 61–63. <http://doi.org/10.1016/j.ajem.2013.07.004>
2. <http://www.airwaylearning.com/awel/articles/articles-1.aspx?Action=1&NewsId=2128&M=NewsV2&PID=71655>
3. [www.ultrasoundpodcast.com/2012/01/episode-19-full-cric/](http://www.ultrasoundpodcast.com/2012/01/episode-19-full-cric/)