

# Ultrasound of the Head and Neck

- welcome into the world of shadows!



-a hands-on workshop

XXXIII Congress of the Nordic Association of Otorhinolaryngology

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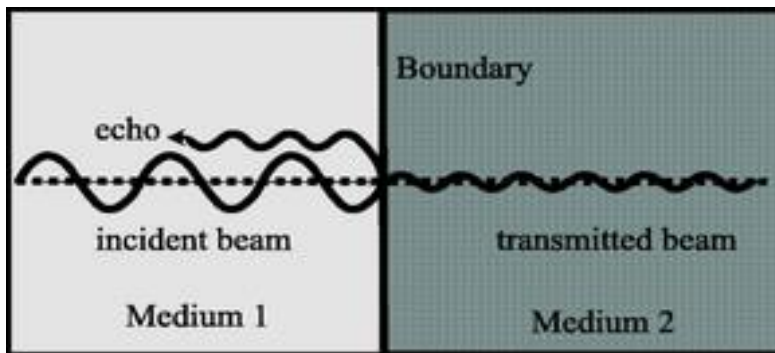
# Schedule:

- Ultrasound basics (very short)
- Fields of application
- Demonstration
- Hands on! Anatomy, puncture, cytology

# Ultrasound physics



- Ultrasound is produced and detected by a transducer
- Speed of sound is dependent on the density of the tissue
- Differences in density produces echo
- Ultrasound "beam" is very thin, approx 1 mm



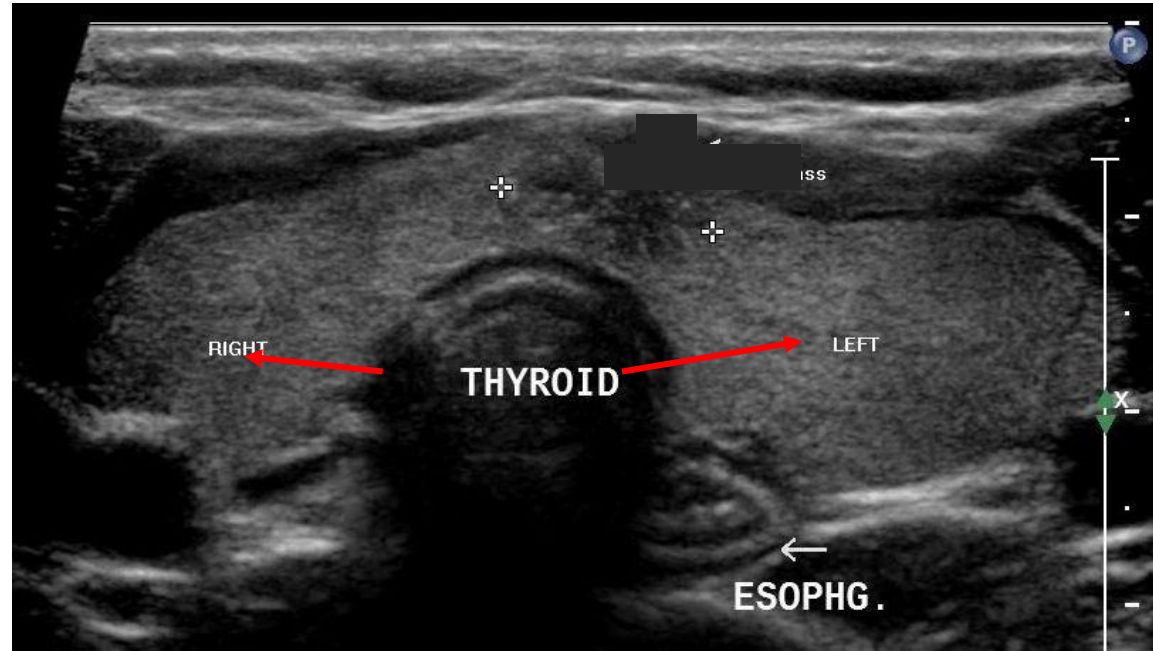
# Ultrasound physics

**Sound = waves.**

**1 Hz = 1 cycle/sec**

- Audible range 20 Hz – 20 000 Hz
- Freq  $\geq$  20 K Hz = ultrasonic
- Head and neck ultrasound 7,5-15mHz

**High frequency = high resolution but lower depth**



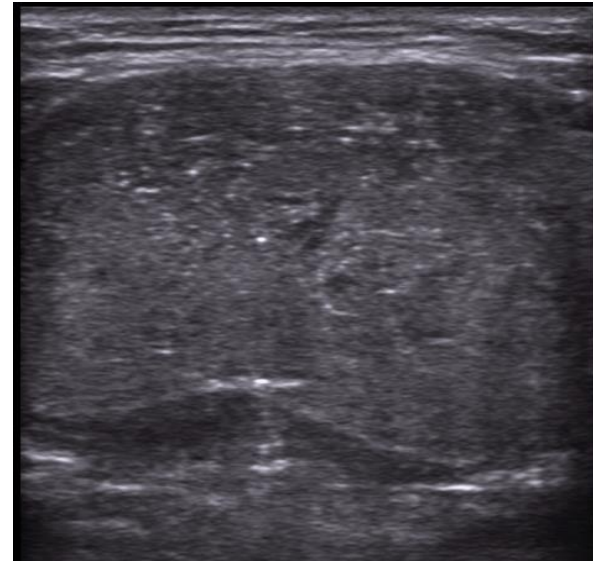
# Ultrasound physics

- Many different ways of optimizing image.....
- Important to know your anatomy+ common artefacts

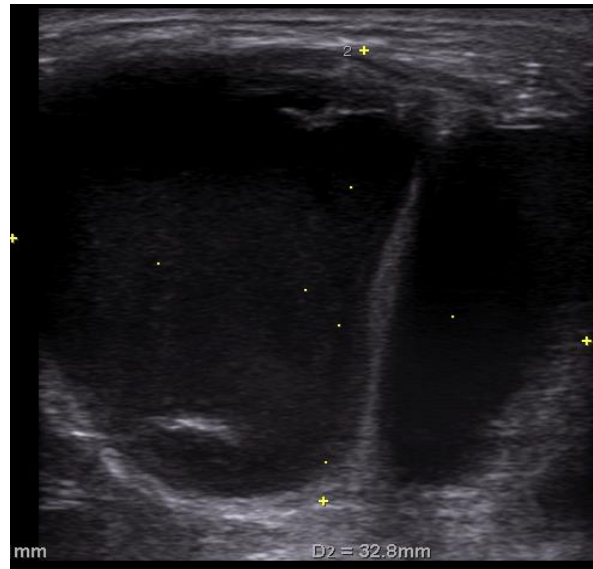
# Fields of application

## Diagnostics:

- Lymph node mapping + FNAC
- Benign cysts in the head and neck area
- Abscesses, post-operative seromas
- Calculi in salivary glands

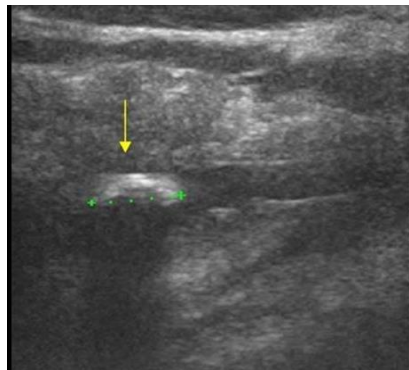


Dermoid cyst



Lymphatic malformation

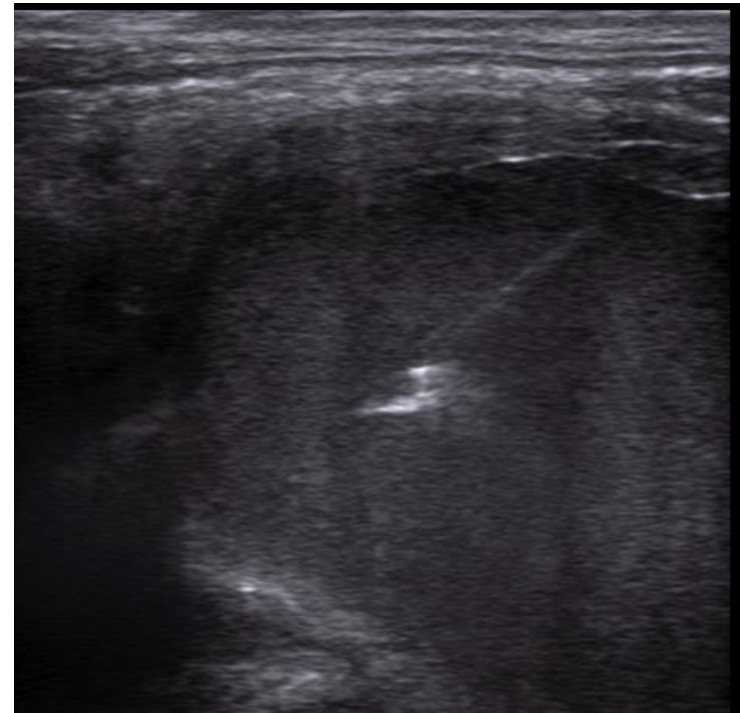
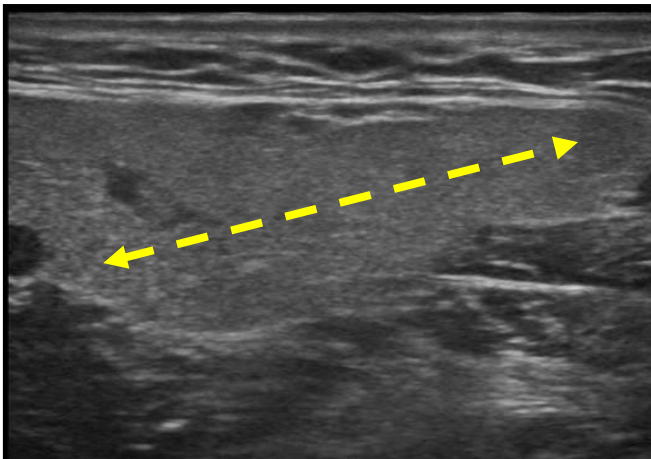
Calculi of the submandibular gland



# Fields of application

## Treatment:

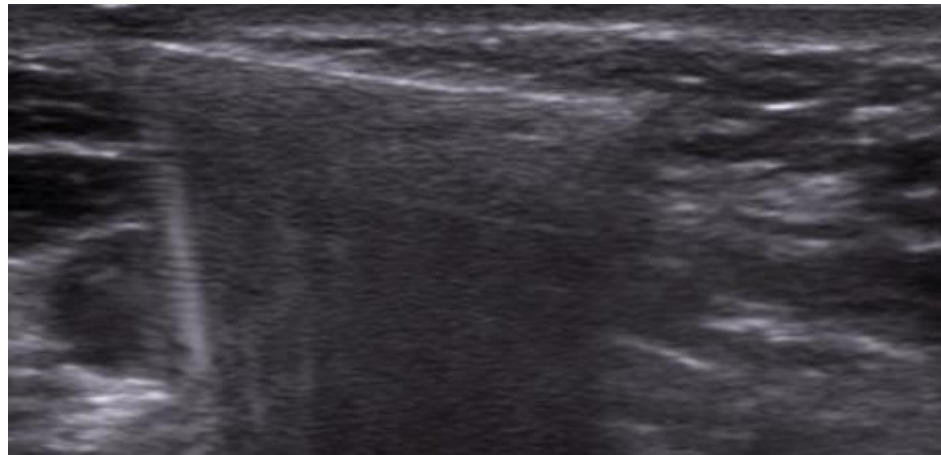
- Sclerosing therapy (lymfatic malformations, benign cysts)
- Botox injection of salivary glands (hypersalivation)



# Fields of application

## Peroperative:

- Lymph node extirpation (supraclavicular fossa, deep nodes)
- Foreign body (glass etc.)



Piece of glass in the lower part of the neck

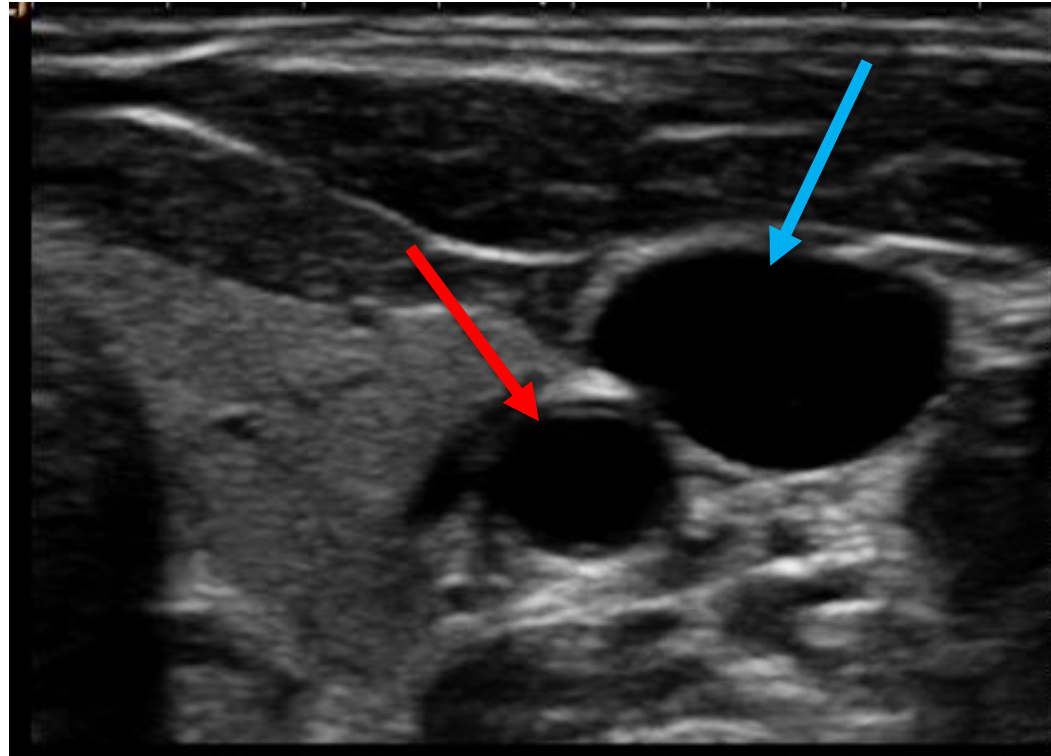


# Hands on - anatomy

Try to identify the following structures:

- Internal jugular vein
- Carotid artery incl. bifurcation
- Submandibular and parotid gland
- Some lymph nodes
- Thyroid gland
- Vocal cords

# Internal jugular vein and carotid artery

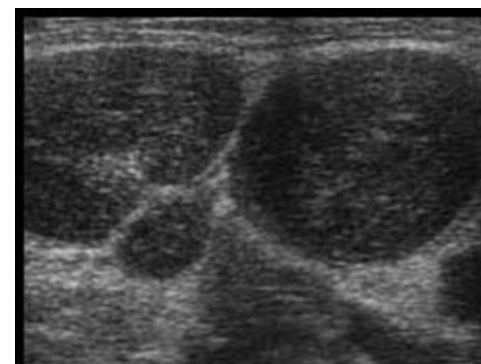
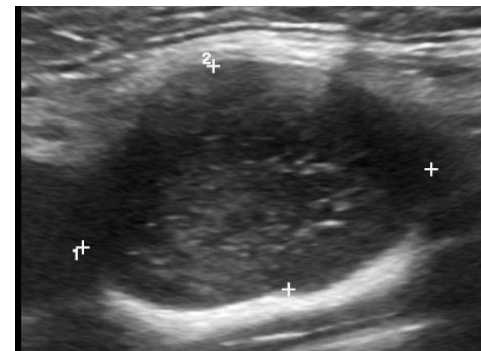


# Lymph nodes

**Benign:** Preserved hilus with blood-flow. Oval shape

**Malignant:** Rounded. No hilus. Heterogenous echogenicity. Vessels only in perifer parts.

**Lymfomas:** Low, homogenous echogenicity. Scattered vessels.



# Hand on – puncture technique

- Remember: it's a VERY thin "beam"!
- Place the ultra sound screen in front of you
- Straight line between transducer/needle
- If free-hand puncture plan your angle
- Don't look at the screen too fast
- Avoid puncturing the muscles if possible – it hurts!
- If the angle is not right – back out and start over again
- If you are out of field try to change angle of the transducer

# Hands on - puncture

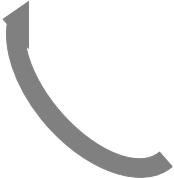
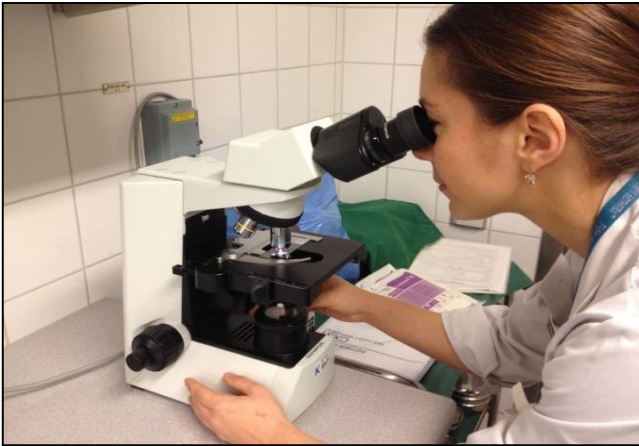
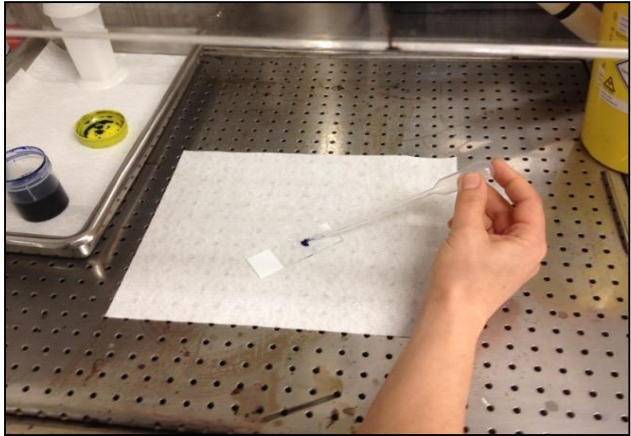
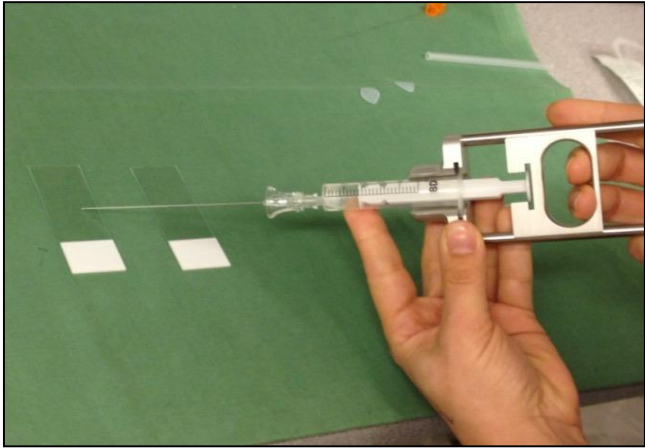
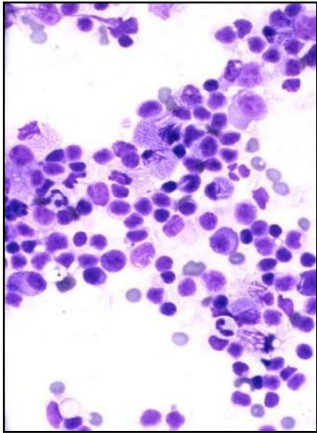
- Needle guide



- Free-hand technique



# Cytology



# Now, let's practice!

