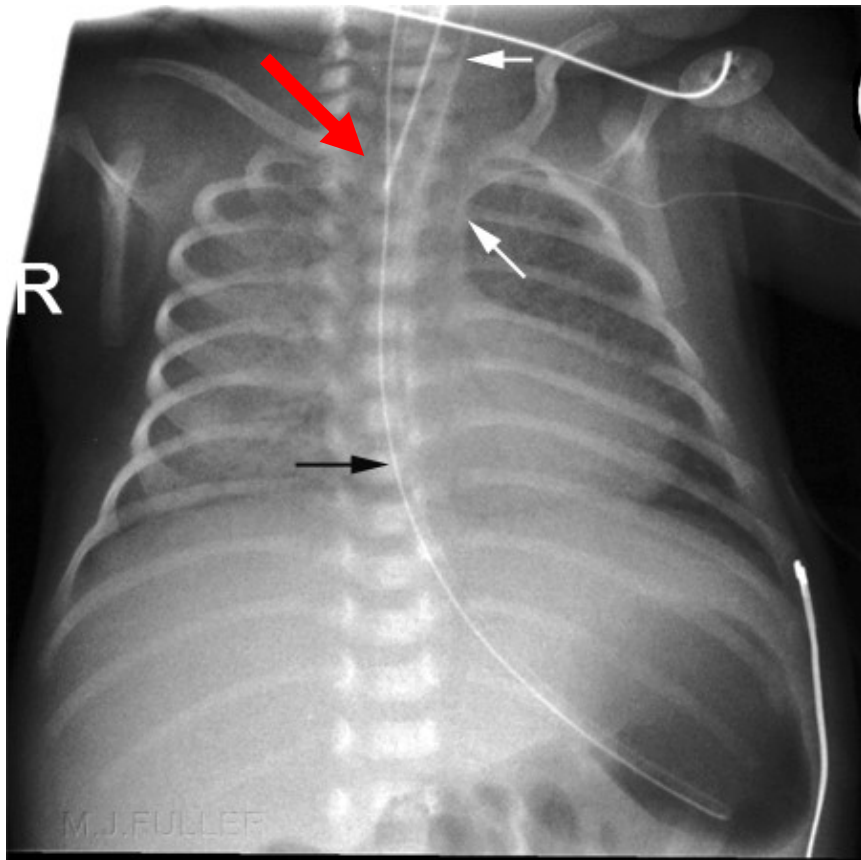


Ultrasound evaluation of endotracheal tube position in neonatal practice – not yet standard of care

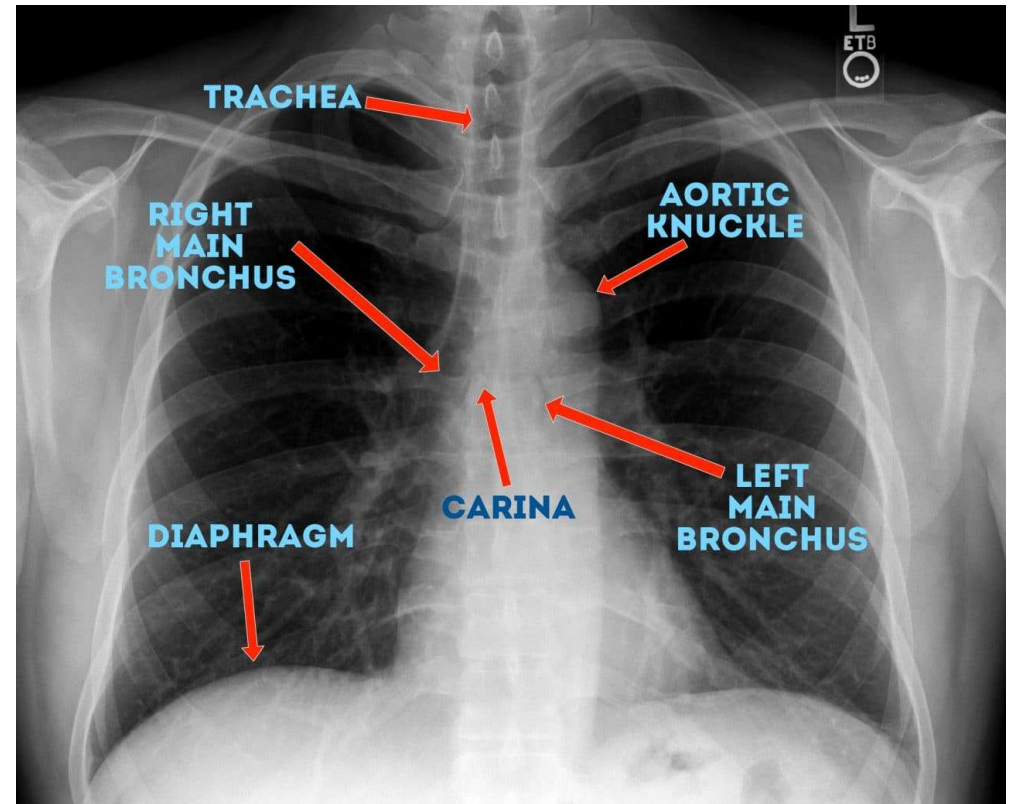
Agata Więckowska (Pająk), Jan Mazela

**Department of Neonatology and Infectious Diseases,
Poznan University of Medical Sciences, Poznań, Poland**

CXR – gold standard



<http://www.wikiradiography.net/page/neonatal+lines,+tubes+and+catheters>



<https://geekymedics.com/assessing-nasogastric-ng-tube-placement/>

Author	Year	Title	Number of patients
Dennington et al.	2012	Ultrasound confirmation of endotracheal tube position in neonates.	30
Najib et al.	2015	Ultrasonographic Confirmation of Endotracheal Tube Position in Neonates	40
DeKock et al.	2015	The feasibility of determining the position of an endotracheal tube in neonates by using bedside ultrasonography compared with chest radiographs	53
Zaytseva et al.	2018	Determination of optimal endotracheal tube tip depth from the gum in neonates by X-ray and ultrasound	30

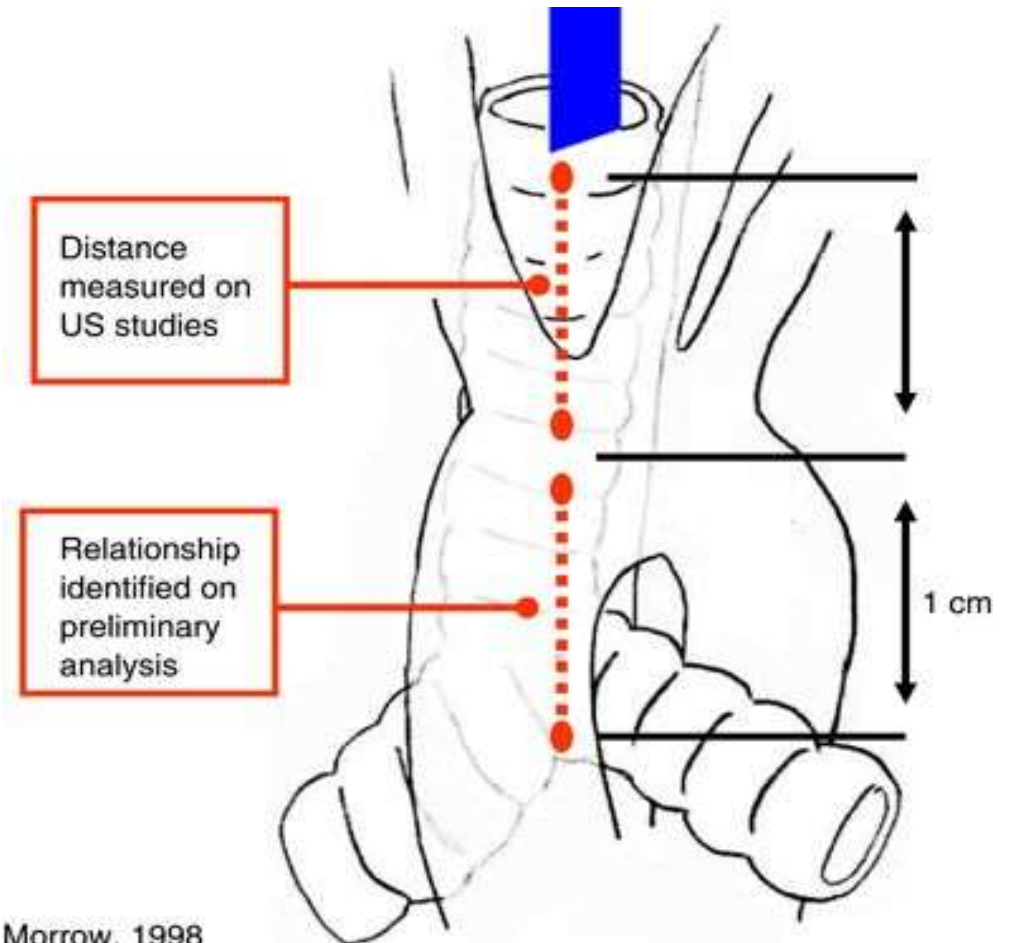
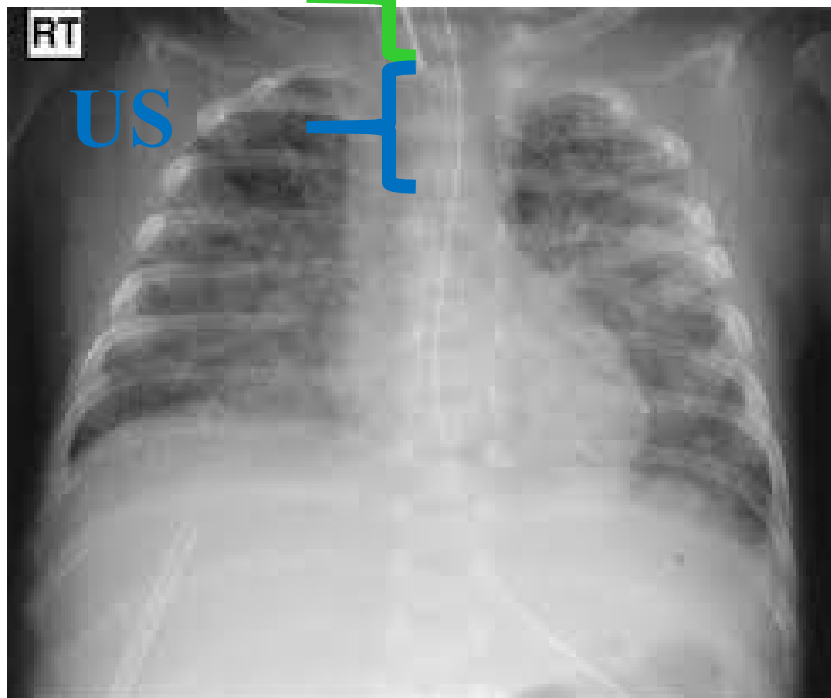
Linear transducer position



Department of Neonatology and Infectious Diseases, Poznan
University of Medical Sciences, Poznań, Poland

Measurement of ETT

CXR



Morrow, 1998

The concordance of ultrasound technique versus X-ray to confirm endotracheal tube position in neonates, R Chowdhry, B Dangman, J M Pinheiro, *Journal of Perinatology* volume 35, pages481–484 (2015)

ETT localization



Current Neonatal Applications of Point-of-Care Ultrasound, B H. Kim, N Shalygin, A Safarulla June 11th 2018Published: November 5th 2018 doi: 10.5772/intechopen.79441



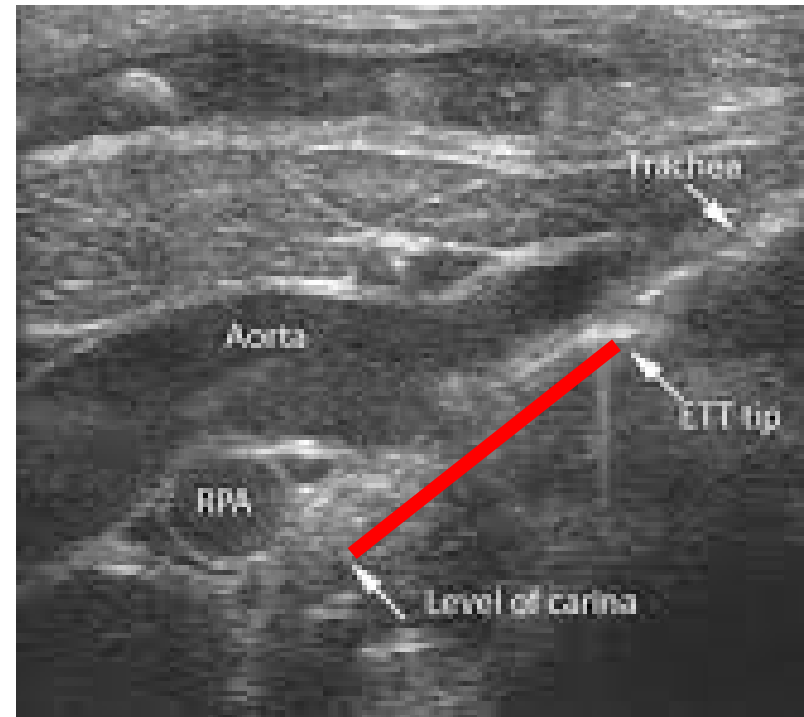
Image of endotracheal tube in trachea

- 1 - cricoid
- 2 - tracheal rings
- 3 - lines of tracheal tube

Ultrasound guided airway access, N Lages a, D Vieiraa, Joana Dias, Rev Bras Anesthesiol. 2018;68(6):624-632

ETT localization

- the distance between the tip of the ET and the carina of the trachea (tip-to-carina) (Dennington 2012)
- the level of the superior aspect of the RPA (Najib 2015)
- or an aortic arch (DeKock 2015)



Dennington D, Vali P, Finer NN, Kim JH, Ultrasound confirmation of endotracheal tube position in neonates, Neonatology. 2012;102(3):185-9. Epub 2012 Jul 6

ETT normal position

tip-to-carina distance	1,5cm
the superior aspect of the RPA	1,5cm
upper border of aortic arch	0,5 – 1,0cm

Results

	EET correction	optimal position	All patients
USG	7	146	153
CXR	15	138	153

USG detection	EET correction	optimal position	
yes	7	0	7
no	8	138	146
	15	138	

Sensitivity=0.47

Specificity=1.0

PPV= 1.0

NPV=0.95

Conclusions

US method for evaluation of ETT in NICU is:

- faster
- safer
- potentially more available than CXR

BUT:

- sensitivity is not meeting clinical expectations.

US method for evaluation of ETT in NICU should not be used as standard of practice for ETT placement determination yet.