

# Appropriateness Criteria of Point-of-Care Ultrasound for Nasogastric Tube Placement Confirmation

## BACKGROUND

- Nasogastric tubes are necessary for nutrition in critically ill patients and confirmation is essential to prevent complications.
- Currently, nasogastric tube placement is confirmed with chest x-ray as the gold standard.
- Complications of improper placement can be fatal, such as aspiration pneumonia.
- Effective NGT placement confirmation should be accurate, timely and non-invasive.
- According to ACR Appropriateness Criteria in ICU patients with nasogastric tube placement, Portable Chest Radiograph is “usually appropriate” as initial imaging and Chest Ultrasound “may be appropriate”.
- We completed a literature review to initiate implementation of Point-of-Care Ultrasound (POCUS) as “usually appropriate” initial imaging modality for nasogastric tube (NGT) placement for intensive care unit (ICU) patients according to American College of Radiology (ACR) Appropriateness Criteria.
- We investigated POCUS for NGT placement confirmation given ultrasound is less commonly used for this indication at our institution.

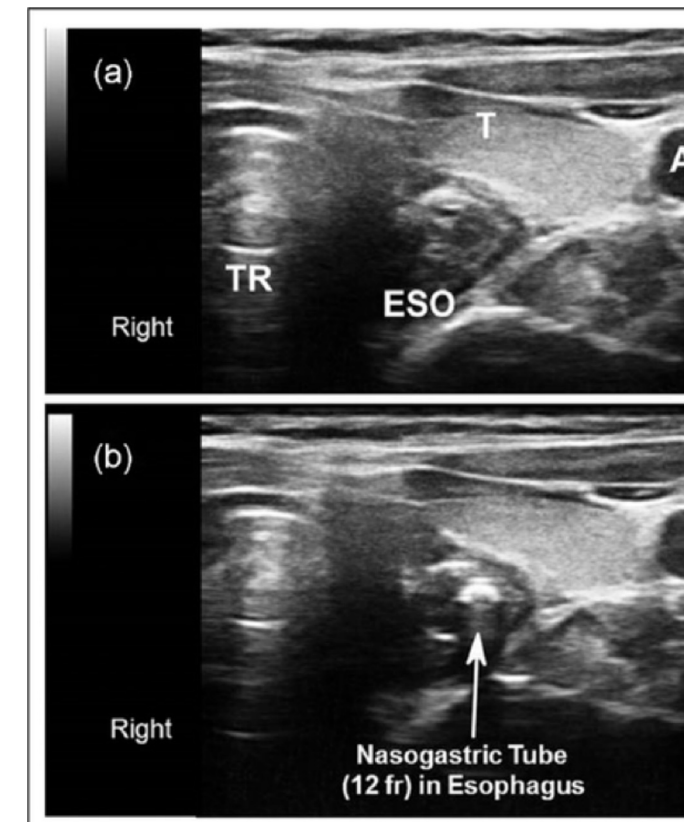


Figure 1- Nasogastric tube placement in esophagus on ultrasonography (Kim HM, *Scandinavian Journal of Trauma, Resuscitation, and Emergency Medicine*. 2012.)

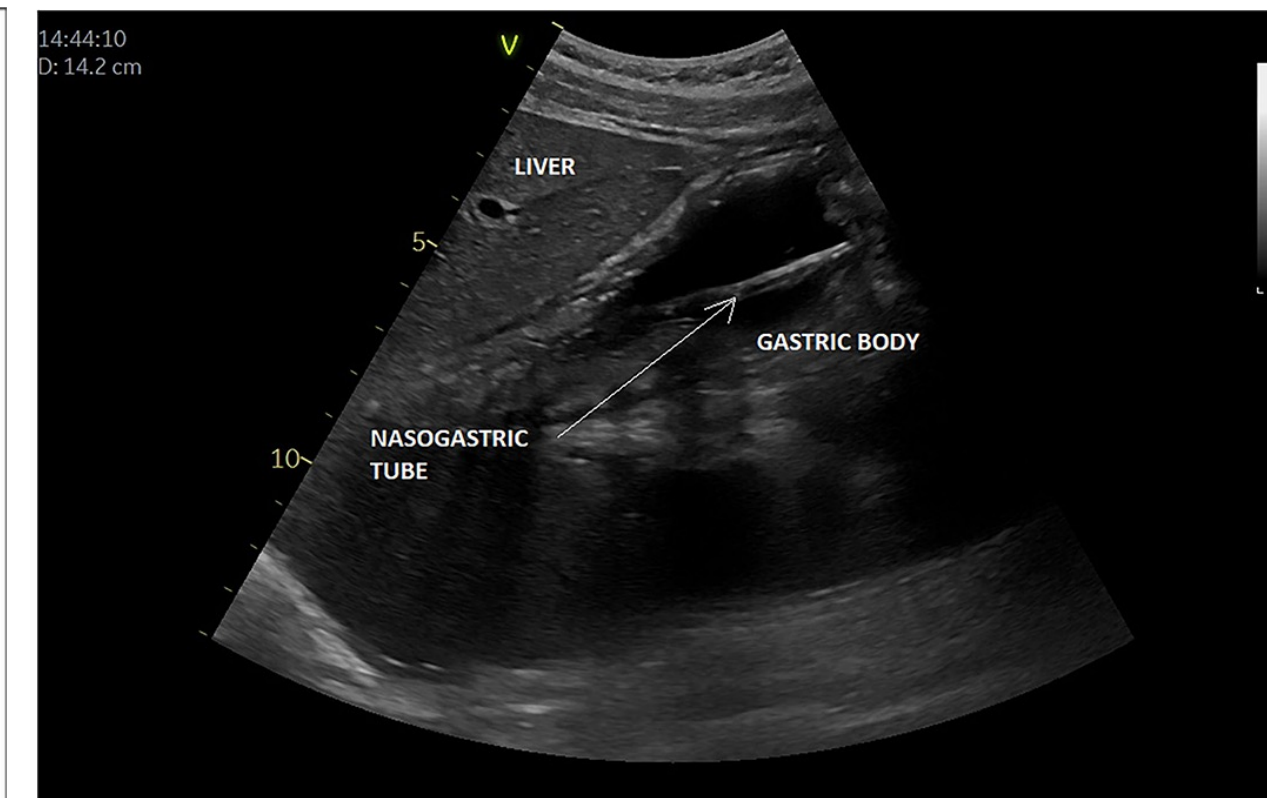


Figure 2- Nasogastric tube placement in gastric body on ultrasonography (Valla FV, *Frontiers in Pediatrics*. 2022.)

## METHODS

- Literature review was performed of 21 studies utilizing PubMed, which included randomized controlled trials, meta-analyses and literature reviews.
- Inclusion criteria were terms “bedside ultrasound, “point-of-care ultrasound” and “nasogastric tube placement”.
- Exclusion criteria were literature published greater than 10 years ago.

## RESULTS

- Through the literature review, several studies in critical care literature have shown high sensitivities (97-100%) and specificity of 100% with POCUS for NGT confirmation.
- Several studies in critical care have shown POCUS-confirmed NGT placement performed and interpreted in less than 10 minutes with an average of 5 minutes.

## CONCLUSIONS

- POCUS is equally non-invasive, facilitates dynamic evaluation, reduces patient radiation exposure and provides confirmation faster than portable x-ray.
- POCUS can be used rapidly at bedside, provides better access and interpretive ability in clinical real time (Figure 1) compared with portable x-ray.
- As point-of-care ultrasound has shown similar capability as chest x-ray, implementation of POCUS as “usually appropriate” initial imaging for ICU patients with nasogastric tube placement confirmation should be considered. POCUS can improve patient safety and optimize patient care.

## REFERENCES

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