



Gastric Residual Volumes in ICU: How do we measure up?

Clíona Mc Hugh, Senior Dietitian, Regional Hospital Mullingar (RHM), Co. Westmeath



Background

- Enteral nutrition (EN) is the preferred route of nutritional support in critically ill patients requiring mechanical ventilation¹.
- Gastrointestinal dysfunction, affects up to 60% of critically ill patients² and can increase the risk of aspiration and ventilator-associated pneumonia.
- Gastric residual volume (GRV) refers to the quantity of gastric contents (including feed, fluids, and secretions) aspirated via an nasogastric (NG) tube at specific intervals and elevated GRV's have historically been considered a measure of gastrointestinal dysfunction and enteral feeding intolerance.
- This practice continues in the majority of ICUs, across the UK and Ireland³, despite a number of International guidelines⁴ recommending against routine GRV checks, especially once tolerance to EN is established. Furthermore, a recent Systematic Review⁵, found that the impact of GRV's on clinical outcomes such as mortality, pneumonia, vomiting, and length of hospital stay remains uncertain.
- This prompted many hospitals to review current practice and ensure existing protocols are in line with evidence based guidelines.

Aims

This audit aimed to:

1. Evaluate adherence to the current RHM GRV protocol, specifically relating to; the frequency of GRV checks on day 1-3 day of EN and day 7 of EN (as applicable), documentation of GRV checks and documentation relating to any deviations from GRV policy recommendations.
2. Evaluate compliance with RHM 'out-of-hours' EN protocol and EN regimens prescribed by the Dietitian.
3. Assess compliance with the RHM prokinetic policy used in the management of raised GRVs (>200mls).
4. Determine the size of the NG feeding tubes inserted in these patients.

Methodology

- The audit was prospective and patients were eligible for inclusion in the audit if they were mechanically ventilated and received EN for a duration exceeding 72 hours.
- Specific audit questions were formulated and an audit tool was developed using Microsoft Excel.
- ICU monitoring sheets and nursing notes served as the primary sources for data collection.
- Between September 2024 and January 2025, data was collected to achieve a predefined sample size target of 10 patients.

Results

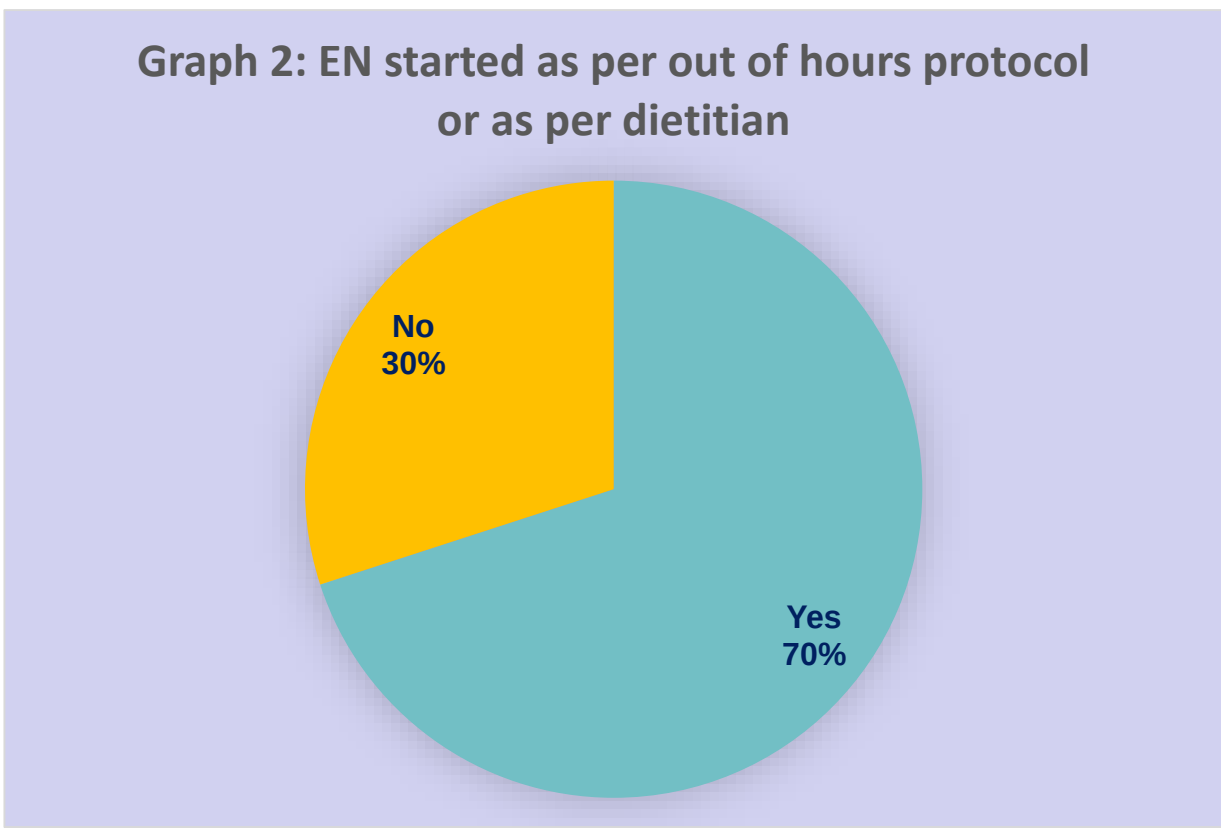
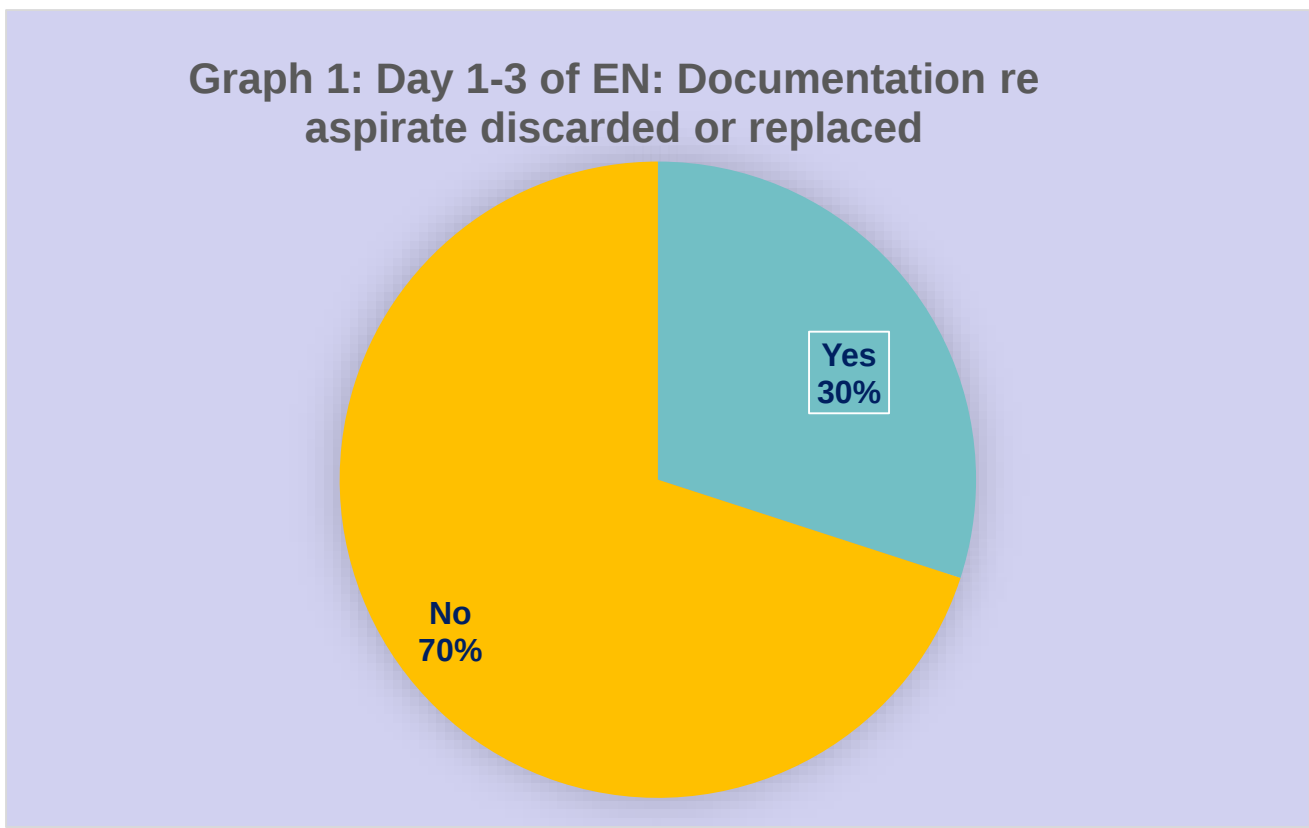
The sample (n=10) consisted of 80% males and 20% females, with an average age of 63 years (range 37–83 years).

Frequency of GRV checks:

- **Day 1-3 of EN:** 0% of the patients had GRVs assessed at the recommended frequency of 8 checks/day. The mean frequency was 4.3 GRV checks per patient/day. The existing protocol, however, recommends less frequent checks once EN is 'established', which lacks definition and may account for the reduced frequency of GRV checks.
- **Day 7 of EN:** At day 7 of EN, 50% of patients remained on MV and EN. The mean frequency of GRV checks at day 7 of EN was 4 checks per patient/day.

Documentation of GRV checks: 30% of patients had all GRV checks recorded as to whether they were returned or discarded (Graph 1). Inconsistent terminology, however, was used to denote if aspirates were returned or discarded.

Prokinetics: 40% of patients had raised GRVs (>200ml) and were commenced on Prokinetics as per policy recommendations but yet only half of these patients received the recommended first-line agents.



Enteral feeding practices:

EN Initiation: 70% of patients commenced EN at the rate recommended by the dietitian or that of the 'Out-of-hours' EN protocol (Graph 2). Deviations included inappropriate high-rate initiation (n=1), appropriate trophic feeding with PN due to colitis (n=1), and incorrect low-electrolyte feed initiation (n=1).

EN Rate Deviations post initial commencement: EN rates deviated from dietitian recommendations in 30% of patients. Two patients (20%) had feeds reduced due to GRVs of 200–500 mL without other intolerance signs and one patient (10%) required feed cessation due to vomiting.

NGT size: A wide variation in NGT size was observed (12-18French)

Conclusion

- This audit revealed deviations in practice versus local EN, GRV, and prokinetic protocols in critical care patients on MV in RHM.
- Although GRV checks were performed at only half the frequency recommended by the current protocol, this reduction aligns with emerging evidence and evolving clinical practice supporting less frequent GRV monitoring^{1,3} and this will be reflected in the updated GRV protocol.
- The future GRV protocol should also define terminology clearly and emphasise the importance of assessing signs of feeding intolerance beyond GRV alone to prevent unnecessary EN interruptions and underfeeding.
- Documentation relating to GRV aspirates and returns requires improvement, alongside clearer recording of any protocol deviations and their justifications.
- Only half (50%) of the patients received recommended first-line prokinetics, suggesting variability in guideline adherence or local policy awareness; further evaluation with a larger sample is warranted.
- Additionally, standardising NGT sizes inserted in this ICU patients requires further review.
- Multidisciplinary collaboration, revised nursing tools, and targeted education will support these improvements.

Acknowledgements: Rosanne Smith, Audit nurse MRHM. Aoife Flynn, Senior Dietitian in RHM, Grainne Flanagan, Dietitian Manager in RHM

References:

1. Singer P, Blaser AR, Berger MM, et al. ESPEN practical and partially revised guideline: clinical nutrition in the intensive care unit. Clin Nutr 2023; 42(9): 1671–168

2. Patrick Eaton, Matthew Faulds, Gastrointestinal dysfunction in the intensive care unit, Surgery (Oxford), Volume 39, Issue 10, 2021, Pages 684-689

3. Jenkins B, Calder PC, Marino LV. Gastric residual volume monitoring practices in UK intensive care units: A web-based survey. Journal of the Intensive Care Society. 2023;25(2):156-163. doi:10.1177/17511437231210483

4. McClave, Stephen A., et al. "Guidelines for the provision and assessment of nutrition support therapy in the adult critically ill patient: Society of Critical Care Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (ASPEN)." JPEN. Journal of parenteral and enteral nutrition 40.2 (2016): 159-211.

5. Yasuda H, Kondo N, Yamamoto R, Asami S, Abe T, Tsujimoto H, Tsujimoto Y, Kataoka Y. Monitoring of gastric residual volume during enteral nutrition. Cochrane Database of Systematic Reviews 2021, Issue 9. Art. No.: CD013335. DOI: 10.1002/14651858.CD013335.pub2. Accessed 29 August 2025.