Reference ***(include title, author, journal title, year of publication, volume and issue, pages)***	**Evidence level (I-VII)**	**Key findings, outcomes or recommendations**

ASPEN Safe Practices for Enteral Nutrition Therapy. Boullata, J., et al. Journal of Parenteral and Enteral Nutrition, 2017, 41(1), pg. 15–103		- A source of sterile water for flushing is considered best practice for the immunocompromised patient. - Use accurate measurement of enteral tube insertion length, gastric pH testing, and visual observation of gastric aspirate as acceptable nonradiologic methods for assessing tube placement. Obtain an abdominal radiograph when other nonradiographic methods for validation of tube location are not confirmatory. - Avoid using auscultation as verification for enteral feeding tube placement. - Maintain elevation of the HOB to at least 30° or upright in a chair when administering enteral feeds/medications. - Flush feeding tubes immediately before and after intermittent feeding and medication administration. With continuous feedings, flush at standardized intervals. - In neonatal and pediatric patients, flush feeding tubes with the lowest volume necessary to clear the tube. - To unblock naso/orogastric tubes instill warm water into the EAD and apply a gentle back-and-forth motion with the plunger of the syringe. - If resistance is met, the plunger of the syringe may be moved using a gentle back-and-forth motion to help loosen the clog, then clamp the tube and soak for up to 20 minutes to allow the warm water to penetrate the clog. - Confirm the drug dosage form is appropriate for enteral feeding tube administration (ie, immediate release). i. Avoid any solid dosage form medications that would result in a significant change in the absorption of the active ingredient(s) if opened (capsule) or crushed (tablet). ii. Evaluate each medication for its inherent solubility and release characteristics. If crushing the medication alters its - Medications should not be directly added to an enteral feeding formula. - Administer each medication separately through an appropriate access and avoid mixing together different medications intended for administration. - Avoid high-osmolality or highly viscous preparations. c. Any medication order that will require a preparation step (eg, crushing, diluting, mixing) prior to administration is identified. i. Establish and follow organizational policies and procedures to prepare medications for enteral administration

		- Use available liquid dosage forms only if they are appropriate for enteral administration. If liquid dosage forms are inappropriate or unavailable, substitute only immediate-release solid dosage forms. - Prepare approved immediate-release solid dosage forms of medication for enteral administration according to pharmacist instructions. Techniques may include: a. Crush simple compressed tablets to a fine powder and mix with purified water. b. Open hard gelatin capsules and mix powder containing the immediate-release medication with purified water.
Effectiveness of the auscultatory and pH methods in predicting feeding tube placement, Turgay, A S., & Khorshid, L. Journal of Clinical Nursing, 2010, 19, pg 1553-1559.	IV	- **Study compared the effectiveness of auscultation and pH readings relating to NG tube position, tube position was then confirmed via Xray.** - **There was no statistical agreement between auscultation and Xray methods to confirm tube placement.** - **The ausculatatory method should not be used independently to identify correct tube placement as it may increase the risk of not identifying incorrectly placed tubes.** - **pH readings are an effective tool to confirm tube placement and can be attempted even when H2 receptors antagonists are in use.** - **Xray is the gold standard however disadvantages include increased radiation and delays in feeding, therefore it is recommended when pH reading is not able to be established.**

Confirming nasogastric feeding tube position versus the need to feed, Taylor, S., Intensive and Critical Care Nursing, 2013, 29, pg 59-69.	VI	- **Review of current methods utilized to confirm Nasogastric tube placement; conducted via reviewing current guidelines and practice in the UK.** - **Findings include that staff underestimate the consequences of tube misplacement due to failure to confirm position, lack of knowledge to accurately assess tube position and inaccuracies within confirmation methods.** - **Difficulties with confirmation of tube placement cause ongoing delays to patient treatment.** - **Xray is the gold standard for confirmation of tube placement, however can cause further delays in treatment and exposure to radiation. Therefore this is a second line option.** - **PH assessment is the most timely and practical option, with less than 5 indicating gastric placement.** - **Further research required to investigate avoiding misplacement and improving accuracy.**
Determination of a practical pH cutoff level for reliable confirmation of nasogastric tube placement, Gilbertson, H., Rogers, E., & Ukoumunne, O., 2011, 35(4), pg 540-544.	III	- **The study was conducted in a paediatric setting (older than 4 weeks), pH testing was conducted via nasogastric aspirates, if pH was greater than 4 a chest x-ray was conducted, 65 endotracheal samples were also collected.** - **This study identified the lowest pH of a misplaced tube and the lowest endotracheal sample as 5.5 and 6 respectively, therefore the conclusion was in paediatric patients it would be acceptable to accept pH less than 5 to confirm correct placement of nasogastric tubes.** - **pH readings greater than 5 should be confirmed via radiographic examination.**
Gastric residual volumes in critically ill paediatric patients: A comparison of feeding regimens, Horn, D., Chaboyer W., & Schluter, P., Australian Critical Care, 2004, 17(3),pg 98-103.	II	- **This study compared enteral feeding regimes – continuous verus intermittent with 4th hourly GRV in critically ill patient in a PICU. T** - **This study provides some support that the definition of delayed gastric emptying being described as greater than 5ml/kg 4/24, but further research is still required to support this finding on a larger scale and determine the relevance when providing enteral feeding.**

Should gastric aspirate be discarded or retained when gastric residual volume is removed from gastric tubes? Williams, T., & Leslie, G., Australian College of Critical Care Nurses, 2010, 23, pg 215-217.	IV	- **Critique of a prospective randomized clinical trial compared two methods of managing gastric residual volume in an adult intensive care setting.** - **The following measures were outlined – blocked tube, pulmonary aspiration, intolerance (nausea, vomiting), enteral feeding delays, discomfort and hyperkalemic or hyperglycemic episodes.** - **The study found that the intervention group had lower incidence of delayed gastric emptying and that returning GRV improved patient outcomes without increasing complications.** - **However the critique highlighted the need for more detailed research as outcomes regarding electrolyte and fluid balance management were not adequately outlined in this study. Limited evidence to guide/change practice.**
To return or to discard? Randomised trial on gastric residual volume management. Juve-Udina, M/. Valls-Miro, C., Carreno-Granero, A., Martinez-Estralella, G., Monterde-Prat, D., Domingo-Felici, C., & Llusa-Finestres, G., Intensive and Critical Care Nursing, 2009, 25, pg 258-267.	II	- **This randomized prospective clinical study aimed to determine the effect of returning or discarding gastric residual volume (GRV) in critically ill adults (ICU, 18+ years old)** - **Key indicators included gastric emptying delays, feeding issues, electrolyte balance and patient comfort.** - **The findings support the return of GRV in critically unwell adults without increasing complications and providing increases glycemic control.**
Medication administration via enteral tubes: a survey of nurses' practices, Phillips, N M., & Endacott, R., Journal of Advanced Nursing, 2011,67(12), 2586-2592.	VI	- **Australian Nurses surveyed regarding practices of verifying enteral tube position pre-medications, flushing of tubes, types of medications administered via tubes.** - **Best practice includes pH or Xray to confirm position, flushing tubes pre, during and post medication administration and ensuring that slow release or enteral coated medications administered for tubes are appropriate for that route.**
Pediatric enteric feeding techniques: insertion, maintenance, and management of problems, Nijs, E., & Cahill, A., Cardiovascular Intervention Radiology, 2010, 33, pg 1101-1110.	VIII	- **Short term nutritional deficit consider NGT or NJT; when longer deficits are predicted a Gastrostomy tube should be considered.** - **Complications discussed included tube clogging, dislodgement, leakage, infection and granulation tissue. Discussion and recommendation regarding these issues provided based on experience, guidelines and a range of studies.**