The Hierarchy of Evidence

The Hierarchy of evidence is based on summaries from the National Health and Medical Research Council (2009), the Oxford Centre for Evidence-based Medicine Levels of Evidence (2011) and Melynyk and Fineout-Overholt (2011).

I Evidence obtained from a systematic review of all relevant randomised control trials.

II Evidence obtained from at least one well designed randomised control trial.

III Evidence obtained from well-designed controlled trials without randomisation.

IV Evidence obtained from well designed cohort studies, case control studies, interrupted time series with a control group, historically controlled studies, interrupted time series without a control group or with case-series

V Evidence obtained from systematic reviews of descriptive and qualitative studies

VI Evidence obtained from single descriptive and qualitative studies

VII Expert opinion from clinicians, authorities and/or reports of expert committees or based on physiology


<table>
<thead>
<tr>
<th>Reference (include title, author, journal title, year of publication, volume and issue, pages)</th>
<th>Evidence level (I-VII)</th>
<th>Key findings, outcomes or recommendations</th>
</tr>
</thead>
</table>
| 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. |
| A retrospective survey of tube-related complications in patients receiving long-term home enteral nutrition, Crosby, J., & Duerksen, D., Digestive Diseases and Sciences, 2005, 50(9), pg 1712-1717. | IV | - Questionnaire utilized to investigate long-term complications of enteral feeding tubes. Included both adult and paediatric participants.  
- Common complications included formation of granulation tissue, leaking tube, leaking at the site and infection.  
- While tube complications are common, they are not life threatening but do require increased access to health services.  
- Further research into preventative methods would be beneficial.|
### 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. |

| 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. |


| II | - This study compared enteral feeding regimes – continuous versus intermittent with 4th hourly GRV in critically ill patient in a PICU. 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. |
- 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. |
- 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. |