Background

Enteral nutrition is favored over parenteral nutrition whenever possible. Often times small bowel feeding is the preferred route. Many clinicians experience difficulties in blindly placing tubes at the bedside. The procedure is often lengthy, causes discomfort, jeopardizes patient safety and utilizes multiple hospital resources including multiple x-rays and the use of pharmacological agents. Frequently successful placement may require up to several days, thus delaying initiation of nutritional therapy.

An Electromagnetic Tube Placement System (ETPS) was FDA approved in 2005. The device was designed to assist in bedside placement of nasoenteric feeding tubes. The ETPS allows an in vivo real time tracking of tubes through the GI tract, and should provide a safer more efficient means of enteric feeding tube placement.

Methodology

Upon consultation, indications and contraindications for insertion were reviewed and when appropriate the tubes were placed utilizing the ETPS. After placement, the tip location was documented and a post procedure abdominal X-ray was obtained. The abdominal X-rays were reviewed and correlated to the ETPS for all patients. The time to place tubes was recorded in minutes.

Results

- 683 tubes placed from January 1, 2006 to November 26, 2006
- No inadvertent pulmonary placements noted on x-ray
- 4 asymptomatic bronchial placements were aborted without complication
- 97% correlation of ETPS reading to abdominal x-rays
- 66% reduction in overall time to place tubes
- ETPS procedure cost savings totaled $137,655

Discussion

We did not report our first two months insertions (Nov/Dec, 2005), as there was a learning curve. Visual confidence in the correlation of the ETPS to anatomy was our primary obstacle. Successful small bowel placement at our institution is defined as the tip is beyond the first portion of the duodenum. The 3% of tubes that did not correlate to X-ray perplexed us. The radiology reports usually indicated the tube was “coiled” within the stomach. Generally these placements were “more difficult” and the tubes did not follow the usual anatomical path. We obtained repeat x-rays with contrast in these situations and found nearly all tubes to be within the small bowel. One might surmise that the tubes had spontaneously advanced into the bowel, but we found that tip locations on both readings to be the same or very similar. Most likely the pyloric and duodenum lay more posterior and tortuous than the usual path encountered and thus appear “coiled”.

Since the correlation of the ETPS to x-ray is excellent and we aborted all pulmonary placements without complication, our institution has adopted a policy of allowing “expert” users of the ETPS to order a post procedure x-ray at their discretion.

Conclusions

The ETPS provided an efficient method of placing bedside enteric feeding tubes while improving patient comfort and safety in addition to reducing hospital costs.

Future Directions

- More efficient and cost-effective means of providing enteral nutrition
- Potential reductions in parenteral nutrition
- Small “skilled” Tube Teams to ensure efficiency and cost reductions
- Multi center trials to further investigate the effects and outcomes associated with early enteral feeding

Study Purpose

- To prospectively evaluate all enteric feeding tube placements using the ETPS at William Beaumont Hospital in Royal Oak.
- To monitor for markers that could improve tube placements such as, the percentage of small bowel placements on first attempt, correlation of ETPS to abdominal x-ray reports, inadvertent pulmonary placements and economic impact.

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97.4% Correlation of System Reading to Abdominal X-Ray

Cost Savings for Bedside Nasoenteric Feeding Tube Placement Utilizing Device

- $137,655 in savings

97.4% Correlation of System Reading to Abdominal X-Ray