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Homerun! Improved patient safety and outcomes while reducing costs; changing practice around feeding tube placement with electromagnetic technology.


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Conflicts of Interest

- No conflict of interest
- No commercial support or sponsorship has been received for this activity.

1

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Abbott Northwestern Hospital

- Located in Minneapolis, Minnesota, Abbott Northwestern is a nonprofit, tertiary care, Magnet-recognized hospital; the largest of 13 hospitals within the Allina Health system.
- Licensed for 952 beds and staffed for 630 beds, with 62 ICU beds.
 - 30-bed medical/surgical/neuro ICU
 - 32-bed cardiovascular ICU
- Abbott Northwestern campus

2

Prior State

- All feeding tubes, in ICU placed blindly at the bedside by RNs
- Abdominal x-ray done post placement and if any question of tube tip placement to re-verify tip location
- If post pyloric placement required, patients transported to radiology department for procedure

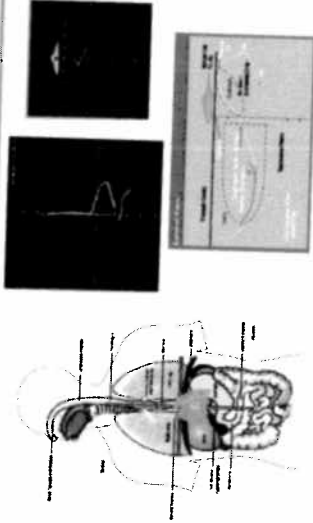
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How Electromagnetic Technology Works

- The tip of the feeding tube stylet contains an electromagnetic transmitter that generates a location signal. A receiver unit, placed at the patient's xiphoid process, acquires the signal from the stylet and tracks in vivo movement during tube insertion
- The location and path of the tube is shown on a bedside monitor with multiple views
 - Anterior, lateral, and a depth cross-section view

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Views



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Electromagnetic Placement Device

- Allows for real-time computer navigation of feeding tube tip to guide and verify accurate bedside placement of small bore feeding tubes
 - Allows for immediate recognition of lung placement
 - Improves ability to place tube post pyloric at bedside
 - Device FDA approved for tube tip confirmation and guidewire re-insertion

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Literature

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Background

- Piloted in ICUs early 2014
 - 32 bed cardiovascular ICU
 - patient populations including general surgery, respiratory failure, renal failure, multiple organ failure, obstetrical, and neurocritical care
 - 30 bed med/surg/neuro ICU
 - patient populations include cardiac surgery, advanced heart failure, targeted temperature management, ECMO, VADs, and heart transplants

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Background

- Implemented device use in ICUs Feb. 2015
 - Core team trained- ~20 nurses/3 dietitians
 - Policy language change to support use of electromagnetic device in ICUs
 - "All feeding tubes in the Intensive Care Units will be placed using the electromagnetic device, unless a trained user is not available by the time the tube is necessary."
 - "Feeding tubes are placed at gastric level unless ordered to be post pyloric by physician or unless placed in the ICU via electromagnetic device. Post pyloric placement is done under fluoroscopy by Interventional Radiology or in the ICU with the use of electromagnetic device."

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Core Team Certified/Training

- ICU CNSs became certified then led training/certification initiative
- Competency/Certification:
 - Classroom didactic with simulation of placement and tip location interpretation on manikin
 - Three bedside placements with another certified user

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Data Analysis

- 667 total feeding tube placements with electromagnetic device (Feb. 2015- Feb. 2016)
- 599 placements analyzed (complete data abstracted)
- 20 different nurses and 3 dietitians placed tubes

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| Data Analysis |
|--|
| <ul style="list-style-type: none">• 597/599 (99.7%) final tube placement in stomach or small bowel, confirmed by x-ray |

12

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| Data Analysis |
|--|
| <ul style="list-style-type: none">• 128/599 certified user interpretation does not match x-ray read but tube in Gastric system |

13

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| X-ray Read Recommends Advancement or Reposition |
|--|
| |

14

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Post pyloric Interpretation/X-ray

- Flat abdominal x-ray may be read as looped in the stomach as depth is not always verified
- Use of contrast allows for better determination if tube tip is indeed post-pyloric

15

Safety

- 7.5% (n=41) entered trachea/bronchus during insertion with electromagnetic device
- Use of electromagnetic device allowed this to be immediately identified, tube pulled back and no lung placement or adverse patient harm occurred

16

Benefit

- Triple aim "Improving the patient experience of care (including quality and satisfaction)"
 - Safety - done under direct visualization
 - Reduced time to feeding/med administration
- Triple aim "Reducing the cost of per capita health care"
 - Reduce x-rays
 - Reduce fluoro (transport to radiology department)
- X-ray exposure - patient/staff
- Reduced physician time to read x-rays

17

Policy Language

Policy language:

- Electromagnetic device will be utilized to verify tip confirmation before anything is administered via the tube; however radiologic confirmation/verification of tube placement by abdominal x-ray or other appropriate radiographic tests such as abdominal CT scans is required for feeding tubes placed with electromagnetic device when:
 - patient has a history of gastric bypass surgery, hiatal hernia and/or pneumonectomy
 - it is determined medically necessary that the tip of the feeding tube be in the small bowel (i.e. demonstrated gastric intolerance, pancreatitis, ECMO, demonstrated reflux with aspiration),
 - the tube crosses before the 4th vertical marking on the central axis device
 - Certified user cannot confirm tip location or there is an unusual tracing or abnormal tube advancement that may cause concern of an anatomical variance

14

Approval Process

- Critical Care Committee
- Patient Safety and Quality Committee
- Medical Executive Committee

19

X-ray Free

- Cortrak users will move x-ray free after 10 tube placements via Cortrak with accurate interpretation
 - 3 mentored placements (certification)
 - 7 placements with x-ray verification (CNS review of interpretation compared to x-ray)

20

Cost Savings

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21

Thank You!

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