METALS MATTER: An Endoscopy Movement Toward MRI Safety

A Quality Improvement Initiative Focused On Patient Safety During MRI Studies Post Endoscopic Metal Clip, Coil, and Stent Placement

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INTRODUCTION

In Endoscopy, placement of metal devices such as clips, coils, and stents are not uncommon. In our fiscal year, between July 1, 2023 through July 1, 2024, a total of **3,715 metal devices** were purchased by Baylor St. Luke's Medical Centers' (BSLMC) Endoscopy department at O'quinn Medical Towers. With a volume of 9,197 cases during that time, it is safe to assume that many patients left with metal implants. Although most metal implants placed were intended to fall out naturally, there is typically no definitive way to ensure the metal had exited the body versus being retained. The aim of our initiative was to enlighten staff on the uses of a medical device ID card to properly identify metal in the body, with a goal to implement distribution of cards to every patient that receives a metal device.

DEFINE

Historically, clips have been used to treat bleeding, stents used to treat strictures, and coils to treat gastric varices. In more recent years, the growth of third-space endoscopy procedures and advanced technology has required an increased need for hemostatic closure devices. For many patients, co-morbidities and disease processes necessitate patients undergo additional diagnostic testing such as Magnetic Resonance Imaging (MRI) post-endoscopy. The American College of Radiology expert panel recommends that positive identification of metal implants are made prior to MRI for best safety practices (Accorsi et al, 2017). In the past, stents (as well as clips and coils) were generally considered safe for MRI because they are made from non-ferromagnetic materials (Shellock, 1999). However, this assumption has been challenged due to the unexpected behavior of clips under magnetic fields and notable retention times that were longer than expected (Accorsi et al, 2017). In Endoscopy, no medical device ID cards were being utilized to document the metal type and anatomical placement as a record for patients. Without proper education paired with a physical record, it is likely patients will not know or remember specific details regarding their implanted metal device.

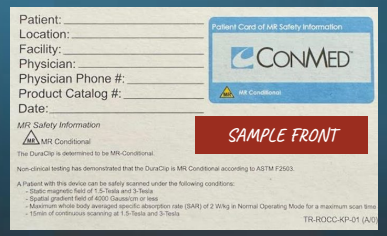
MEASURE

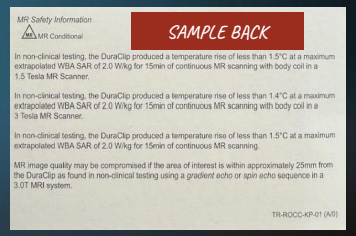
Our baseline data began at **ZERO patients for the year**, as no medical device IDs were being used or distributed. A total of **78 different implantable devices** were identified as **metal**, including clips, stents, and coils. The United States Food and Drug administration requires a labeling standard to classify MRI safety of all implanted medical devices (Accorsi et al, 2017). Classifications are: safe, unsafe, and conditional.

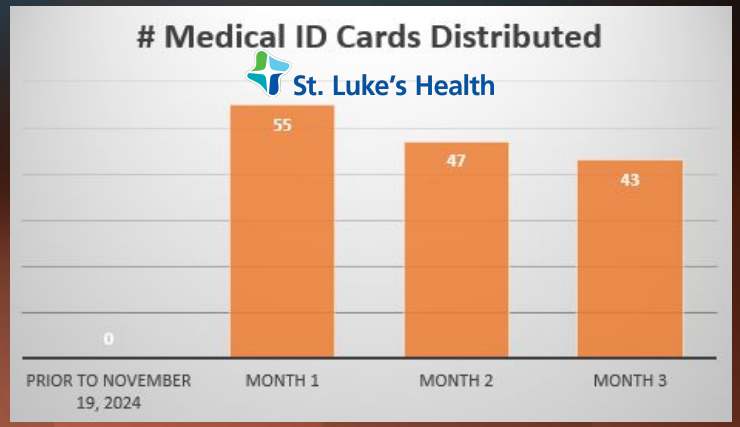
ANALYZE

As we did not have the technology to produce an accurate electronic detail of how many patients received implanted metal devices, or what count of clips, stents or coils were placed, limitations existed on analyzing the percentage of those who actually received a card in relation to those who were intended to. Despite our limitation, we were content comparing the number of cards given out to the the number of devices purchased during the previous year. In addition, we acknowledged that patients often receive multiple implants, such as clips, and some products remain wasted and unused. Therefore, we did not set our goal to equal the total number of devices purchased.

St. Luke's Health VENDOR	DEVICE USED/ # TYPES AVAILABLE	MRI CLASSIFICATION SAFE/UNSAFE/ CONDITIONAL
Boston Scientific	Clips (4) ; Stents (56)	Conditional; Conditional
Conmed	Clips (2)	Conditional
Cook	Clips (1) ; Coils (5)	Conditional; Conditional
Gore	Stents (6)	Conditional
Micro-Tech	Clips (3)	Conditional
Ovesco	Clips (1)	Conditional







IMPROVE

Endoscopy and Post Anesthesia Care Unit (PACU) nurses were unfamiliar with the cards and classification of the devices, so we began by educating the clinical nurses on the information required to be written on the medical ID card, which devices were metal, and their safety classification for MRI. Subsequently, we began keeping a log to track which patients received a card, and what procedure they had completed to maintain an accurate count of how many cards were being disseminated post-procedure. Initial education to implement this new process took place on November 19, 2024. Thereafter, the newly established Medical ID Distribution process began the same day. In 90 days, **145 cards were distributed**.

CONTROL

To maintain compliance on documentation and address any knowledge deficits, re-education for clinical nurses took place on January 13, 2025 and March 5, 2025. Data collection of how many patients receive a card is scheduled to be completed every three months indefinitely, or until evidence can be obtained that indicate 100% of patients who receive a metal implanted device have also received a medical ID card.

CONCLUSION

To our knowledge, no adverse event related to MRI has occurred involving the use of any of the endoscopically placed metal implanted devices mentioned based on our literature search. However, it is widely accepted as best practice prior to MRI studies to identify all metal in the body when determining magnetic field strengths, what anatomical location to image or avoid, limitations on specific absorption rates, the sequences performed, and when to consult a radiologist on whether or not to proceed. Risks remain undetermined and evidence lacks in the field of MRI-induced complications involving endoscopically placed clips, coils, and stents. We hope that our efforts will further protect endoscopy patients who undergo MRI from any possibility of a negative outcome. It is our mission to stay vigilant in properly identifying metals implanted during endoscopy, while maintaining our process to educate patients on MRI safety, and ensure every patient who leaves with a metal implanted device receives a medical device ID card.

RESOURCES

1. Accorsi, F., Coutu, G., Simms, E., Lalonde, A., Leswick, D. (2017). *Endoscopic Clip MRI Screening: A Canada-Wide Policy Survey.* Health Care Policy and Quality. American Journal of Roentgenology. pp. 130-135.

2. Shellock, F., Shellock, V. (1999). *Metallic Stents: Evaluation of MR Imaging Safety.* American Journal of Roentgenology. pp. 543-547.