A Streamlined Method for Perioperative Identification and Management of Implantable Cardiac Devices

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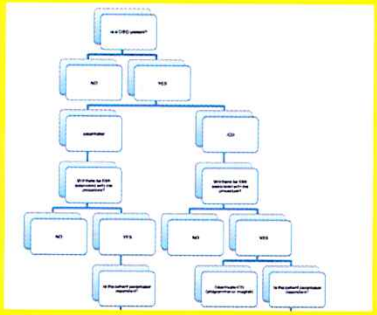
Background: As the population as a whole continues to get older, anesthesiologists are more frequently providing care for patients with a wide range of comorbidities, including complicated cardiac histories. In addition to the physiologic management of these patients, anesthesiologists must also be familiar with the technological management of a number of implantable cardiac devices. During the perioperative course, electromagnetic interference (EMI) with pacemakers and automated implantable cardioverter-defibrillators (AICD) presents a real concern to physicians, as interference could potentially inhibit pacing or lead to inappropriate shocks. While precautionary steps can be taken to limit EMI, it is sometimes necessary to have the device reprogrammed or temporarily placed in special modes through the use of a magnet. Therefore, in order to safely and properly manage the patient, it is imperative that the anesthesiologist knows the type of device and indication for placement. Unfortunately, however, properly identifying these implantable devices is often easier said than done.

Aim: Since the advent of the implantable pacemaker in the 1960s, there have been a number of manufacturers of devices each with their own specific features, modes, and functions varying from model to model. This lack of uniformity creates a difficult challenge for anesthesiologists as differing models have differing responses to both EMI and the placement of a magnet. Additionally, patients are sometimes unaware of the type or brand of device, making the process of identifying and managing the devices time consuming and inefficient.

Aim cont.: In order to streamline this process and decrease the risk of potentially fatal complications, we are advocating for the development and utilization of a standardized reference manual for anesthesia providers in order to more efficiently identify and manage implantable devices.

Methods: The nature of this study makes it difficult to accurately quantify objective improvements. Each case is variable; as such, quantifying time saved on properly identifying the make, model, and proper managements is not feasible. Our goal, however, is to provide a concise and organized reference for anesthesiologists in the perioperative setting. To test the efficacy of this packet, we will provide before and after surveys assessing physician confidence regarding differentiation of pacemakers vs AICD, management differences between the two, and ease of identification of device.



Change Recommendations: First and foremost, the reference manual will provide basic background information on pacemakers and AICDs, as well as their common indications. Since many times patients will present without their device identification card, the manual will also provide a number of x-ray images specific to certain companies, as well a list of contact information for each manufacturer to facilitate quicker identification. Additionally, it will include a concise algorithm (shown here) covering the indications for magnet requirements vs interrogation and reprogramming. A reference table for the most commonly used devices will highlight typical management for intraoperative reference. The manual will be placed in each OR to provide quick access in case of emergency.

Conclusion: The identification and management of implantable cardiac devices can often be confusing and unclear, particularly with physicians in training. Poor documentation, as well as inadequate patient education, often lead to barriers in identification of the devices, which leads to decreased productivity, while also leading to potential safety issues intraoperatively. By providing a concise and unified guide for the quick identification and management of these devices, it is our hope that we will provide a useful educational resource to anesthesia care providers, while also contributing to continued improved patient outcomes.

Sources: Miller, Basics of Anesthesia; Morgan and Mikhail's Clinical Anesthesiology; Open Anesthesia