Automatic Internal Cardioverter-Defibrillator *Prodigy Anesthesia*

The automatic implantable cardioverter defibrillator or AICD is a device that is implanted in patients who are at risk for sudden death from cardiac arrhythmias. The AICD has decreased deaths from lethal arrhythmias significantly. The older AICDs were large, heavy devices and were commonly implanted in the abdomen. Modern AICDs have integrated pacing functionality, are much smaller, and are lighter than their predecessors. The improved AICD can be placed in the pectoral region either under or on top of the muscle. Three companies manufacture AICDs in the US, Medtronic, St. Jude Medical, and Boston Scientific.

If a patient does not know if they have an AICD or a pacemaker, is unconscious, or a poor historian, there are a number of ways to clarify the situation. First, ask the family if they have a device card. The manufacturer, model, and serial number should be listed on it, along with a technical support number. If there is no card, look at the size. Generally speaking, an AICD is larger than a standalone pace maker. You could also call their cardiologist if her office is open or one could call all three companies that make the devices and have them do a name search their databases.

The situation may be so grave that there is not time for the collection of the aforementioned information. In this situation, place a magnet over the device and assess the rate. The AICD may deactivate when a magnet is placed over it (magnet deactivation can be *deactivated* if the patient works in an area of magnetic exposure, e.g. MRI tech). However, a standalone pacemaker will enter an asynchronous mode when a doughnut magnet is placed over it. Each of the three AICD manufactures have a different default rate (see the table below). This may help you decide which company to call first.

	Standalone Pacer + magnet	**AICD + magnet**
Boston Scientific	*100 asynchronous*	*tone*
Medtronic	*85 asynchronous*	*tone*
St. Jude Medical	*98 asynchronous*	*vibration (new models)/no tone*

(Tone may be very difficult to hear, use a stethoscope.)

An arterial line may be warranted in these patients, especially if the case is complicated or the patient's ventricular function is severely compromised. There should also be a defibrillator in the operating room during these procedures. One may even apply the hands free pads to the patient's chest if it does not interfere with the surgical field. Bipolar cautery should be utilized whenever possible. However, if monopolar cautery must be used, short bursts at the lowest possible energy should be used and the cautery tip should be kept at least six inches from the device. The ground pad should also be placed so that energy *does not* flow over or through the AICD.

An AICD should always be deactivated before surgery. This is accomplished by a representative of the company that manufactures the device or a doughnut magnet. A wand is placed over the chest and the defibrillator sensing and therapy function is turned off. If the device is not properly deactivated, it may sense the electrocautery as an arrhythmia and fire. That would be bad. If this should occur, immediately tape a doughnut magnet over the device for the remainder of the case and closely monitor the rhythm. If the patient should require therapy during the case one can simply remove the magnet (at

least two feet) and the AICD will reactivate and institute appropriate therapy, i.e. cardioversion or defibrillation.

It is important to note that the application of a magnet to the AICD will inhibit the cardioversion/defibrillator function, but not the bradycardia pacing feature. Once the surgical procedure is complete, the device should be interrogated by a technician to ensure proper settings and functionality.

Electrocautery. (2002). St. Jude Medical Technical Services. St. Jude Medical Cardiac Rhythm Management Services.

General surgery. (2002). St. Jude Medical Technical Services. St. Jude Medical Cardiac Rhythm Management Services.

Magnet Use for SJM Implanted Cardioverter-Defibrillators. St. Jude Medical Technical Services. St. Jude Medical Cardiac Rhythm Management Services.

Magnet use for suspending medtronic ICD detection Rev B, 18-DEC-2007. (2007). CDRM Technical Services.

Electrocautery and implantable device systems. (2007). Boston Scientific Corporation.