KAPC Practice Guideline

Title: Perioperative Management of Patients with ICDs

Date Approved: 6/6/2016

Definitions:

ICD – internal cardiac defibrillator (excludes pacemakers which are not defibrillators)
EMI – electromechanical interference
EMI Sources – electrocautery (including bipolar), radio frequency (RF) ablation, magnetic resonance imaging (MRI), radiation therapy (XRT), ECT, TURP, GI endoscopy using electrosurgery, TENS units, lithotripsy

Policy Overview: The general approach to perioperative management of patient's with ICDs is to avoid use of EMI sources where practical, and to suspend the device's defibrillating function during surgery when use of an EMI source is unavoidable. If defibrillation is suspended, it must be reestablished as soon as possible postoperatively, and the device must be interrogated to confirm appropriate device settings prior to discontinuation of ECG monitoring. As always, clinical circumstances may require variation from this policy. Also, with appropriate information and support from a physician familiar with and responsible for a patient's device, it may be reasonable to forgo or modify specific portions of this policy. Finally, special consideration may be required for patients with an ICD who are also pacemaker-dependent, as magnet placement over these devices will generally suspend tachyarrhythmia detection, but will not provide for asynchronous pacing.

An expert consensus statement recently published by the Heart Rhythm Society in conjunction with the ASA, and a separate practice advisory published by the ASA, have clarified some previously confusing issues. These clarifications are incorporated into this policy update.

Policy Steps

Preoperative

Elective Procedure: the following information should be obtained:

1. Brand and model of ICD
2. Date of last device and battery check (should be within 6 months of procedure for ICDs, and 12 months for pacemakers)
3. Original indication for ICD placement
4. Patient's underlying rhythm
5. ICD magnet response, including whether or not tachyarrhythmia detection will automatically resume upon magnet removal

KAPC makes available on its website a tool which allows efficient communication of this information, as well as an opportunity for the responsible electrophysiologist to provide additional input and decision making if he / she so desires. Optimally, this information will have been obtained and made available to the anesthesiologist prior to the preanesthetic evaluation.

Nonelective procedure, or preop evaluation unavailable: assume arrhythmia detection will resume upon magnet removal, as this is by far the most common device setting.

Intraoperative:

1. A magnet and external defibrillation capability should be readily available if an EMI source will be used during a procedure.
2. Disabling Arrhythmia Detection is Generally Unnecessary If:
    1. EMI source is below the umbilicus, and ICD location and patient position would allow magnet placement during procedure if necessary, or
    2. Only bipolar electrocautery is planned, as in ophthalmologic procedures, or
    3. No EMI source will be used during the procedure
3. Consider Disabling Arrhythmia Detection and Placing External Defibrillation Pads Preoperatively If:
    1. EMI source is below the umbilicus, and
    2. ICD location and patient position would preclude magnet placement during procedure, i.e., lateral or prone procedure
4. Disable Arrhythmia Detection and Place External Defibrillation Pads Preoperatively If:
    1. Monopolar EMI source is above the umbilicus

Postoperative:
The purpose of a post-procedure device interrogation is, generally, to rule out "reset." This may be done at the bedside or remotely. Some situations will require interrogation prior to discharge from PACU or other monitored location, while other situations may only require interrogation within 1 month or even no extra interrogation.

1. Interrogate device prior to PACU or monitored site discharge if:
    1. ICD arrhythmia detection was electively disabled prior to or during surgery, using either reprogramming or magnet placement, or
    2. Monopolar electrocautery was used above the umbilicus, regardless of whether device was reprogrammed, or
    3. "Hemodynamically challenging surgery" was performed, identified as major vascular procedures including abdominal aortic surgery
    4. Significant intraoperative events occurred, such as cardiac arrest, defibrillation, or cardiopulmonary resuscitation
    5. Patient is deemed unlikely to follow up with ICD clinic within one month (see #2)
2. Interrogate device within 1 month of procedure if:
    1. Device was not reprogrammed, and magnet was not placed, prior to or during surgery, and
    2. Monopolar EMI source was limited to below the umbilicus
3. No specific device interrogation is indicated if:
    1. Device was not reprogrammed, and magnet was not placed, prior to or during surgery, and
    2. Only bipolar electrocautery was used, or
    3. No EMI source was used, or
    4. Hysteroscopic endometrial ablation was performed without monopolar electrocautery, or
    5. Upper or lower endoscopy was performed without monopolar electrocautery

Specific situations:

Common Surgical Procedures

1. Ophthalmologic surgery using only bipolar electrocautery: no need to disable sensing preop or to interrogate device postop
2. Upper GI endoscopy:
    1. Monopolar electrocautery planned: disable sensing preop; interrogate device prior to discontinuing EKG monitoring postop
    2. Monopolar electrocautery not planned and not used: have magnet available; do not disable sensing preop; no need for device interrogation postop
3. Laparoscopic cholecystectomy: disable sensing (magnet or reprogram); interrogate device prior to discontinuing EKG monitoring postop
4. Hip surgery, lateral position: reprogram to disable sensing if possible; acceptable to not reprogram and to have magnet available intraoperatively; interrogate device prior to discontinuing EKG monitoring postop

Magnet vs. Reprogramming

Advantages and disadvantages exist for both methods of altering an ICD's function. The main advantage of magnet placement is that it is readily reversible. The disadvantages of magnet placement include the following:

1. difficulty in verifying correct magnet placement, particularly in obese patients,
2. difficulty in assuring that the magnet stays in place once it is properly positioned,
3. the unlikely possibility that the magnet response of a particular ICD has been programmed to something other than "suspend tachyarrhythmia detection,"
4. the unlikely possibility that the device does not resume tachyarrythmia detection upon magnet removal; this concern is addressed by the policy of interrogating any device which has been reset by magnet placement prior to PACU discharge

The main disadvantages of reprogramming an ICD include the need for the presence of specialized equipment and personnel, both preoperatively and, more importantly, postoperatively.