**Guidelines for Perioperative Management of Pacemakers and Defibrillators**

**Developed By:**
Deborah Wolbrette, MD, Medical Director, Electrophysiology Lab, Dept of Cardiology
Kane High, MD, Department of Anesthesiology
Donald Martin, MD, Department of Anesthesiology
Diane Kupstas, BS, CCT, Clinical Program Manager, Cardiology

**PURPOSE**
The purpose of this policy is to clarify the process required for magnet use and/or reprogramming required for patients with cardiac rhythm control devices undergoing a surgical procedure. All personnel caring for the patient are responsible to know how the type of device, how device is programmed and the type of therapy it should provide. Personnel in all areas (Pre-admissions, Same Day Unit, Pre-operative holding, Operating Room, Post Anesthesia Recovery Unit and all in-patient clinical areas) should be thoroughly familiar with this policy.

**GENERAL GUIDELINES FOR PACEMAKERS AND DEFIBRILLATORS**

**A. Pre-Admissions and Healthy Track Process**

1. At patient entry into system, the patient is asked for his/her wallet device identification card. The two critical pieces of information needed are:
   a. **TYPE of device (pacemaker or ICD) and the**
   b. **MANUFACTURER.**
   c. **Document** in the Ad hoc pacemaker/ICD form in Powerchart.
   **NOTE:** For patients entering the system through pre-admissions

2. If the patient does not know this information and/or is unable to produce the card, call the device clinic to see if the patient is followed at HMC. If not, question where the device was implanted and what device clinic is following the patient.

3. **Call** the physician or followup clinic to obtain device type and manufacturer. A chest X-ray may also help to identify the device. **NOTE:** many patients scheduled for procedures at HMC are **NOT** followed in the HMC device clinic so this information is **NOT** available in the HMC PACEART database. Information about the device **MUST** be available prior to scheduling a patient for a procedure where use of electrocautery is being considered. Please **notify the pacemaker clinic as early as possible if assistance is needed to identify the device.**

4. Patients who are not followed in the device clinic or those who have not been seen within the past three months will be sent to the pacer clinic during the pre-admission testing visit to have a complete device check completed. The Device Clinic staff will provide anesthesia with recommended programming changes for the day of surgery. The Device Clinic Staff will print a copy of the device programming recommendations (see sample Appendix A) for the pre-admissions team for the day of surgery.

5. For patients who are not seen by anesthesiologists before the day of surgery, please call the Device Clinic Staff when the patient arrives on day of surgery and staff will come to the unit to evaluate the device. An order will need to be placed for a pre-op and post op device check.

6. No pacemaker has an ICD but all ICDs have a pacemaker. When the order is entered in Connected specify as **EITHER** a pacemaker OR and ICD but **NOT** both (unless the patient actually does have two separate devices), to insure appropriate device evaluation.

7. If the surgery is below the waistline or is eye surgery, no reprogramming of the device is needed. (Exception: If the device is implanted in the patient’s abdomen, call the pacemaker
8. For procedures utilizing electrocautery, enter an order for both the pre and post-procedure check. A follow-up call must be placed to notify the pacemaker clinic staff of the patient’s location and time device check is required.

B. CT surgical patients:

1. The PA from CT surgery is responsible to place the order for pre and post op device check, the day prior to surgery. The pacemaker clinic has access to the OR schedule in order to prioritize 7 am device checks.
2. Pacer clinic personnel will don scrubs, mask, shoe and hair covers, and enter the OR to reprogram both pacemakers and ICDS as needed.
3. When the patient arrives in the OR, the CT charge nurse will call the device clinic to request staff to turn off ICD or to program pacemaker to asynchronous mode.
4. When the patient returns to the SICU or any other unit, the receiving RN will implement the order for the postoperative device check by notifying the pacemaker clinic of the patient’s location.

C. Operating Room Procedure for Pacemakers

1. Connect patient to cardiac rhythm monitor and observe rhythm.
2. If no pacing is observed, no reprogramming is required.
3. If pacing is present, use a magnet to force the pacemaker to pace the patient asynchronously at the programmed magnet rate.
4. The magnet rate varies by manufacturer. (See below).
   NOTE: If the patient’s heart rate drops with administration of anesthesia, the patient may become pacer dependent. If this happens, place a magnet over the device to maintain asynchronous pacing at the programmed magnet rate.

<table>
<thead>
<tr>
<th>MANUFACTURER</th>
<th>MAGNET RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medtronic</td>
<td>85 bpm</td>
</tr>
<tr>
<td>Boston Scientific</td>
<td>100 bpm</td>
</tr>
<tr>
<td>St. Jude</td>
<td>98 bpm or programmed rate</td>
</tr>
<tr>
<td>Biotronic/ELA</td>
<td>Device must be reprogrammed. Call x3736</td>
</tr>
</tbody>
</table>

5. If patient positioning challenges the ability to maintain the position of the magnet or if a lengthy case is anticipated, it is optional to have the device reprogrammed by pacemaker clinic staff.
6. At the completion of the case, remove the magnet and observe the patient’s heart rate. The patient’s rhythm should resume pre-magnet behavior. If the heart rate remains at the magnet rate or higher, enter an order and call the pacemaker clinic to have a post-operative/procedural device check completed with a device programmer.

D. Operating Room Procedure for ICDs

1. The pacemaker in an ICD is NOT inhibited by placement of a magnet. It is not necessary to reprogram the pacemaker portion of an ICD. The device will automatically revert to asynchronous backup pacing in response to detection of electrical noise.
2. If the patient has an ICD, shock therapy must be turned off prior to the case and turned back on after the case is completed. This is done by a technician from the pacemaker clinic.
3. Any time that the device is off, the patient requires continuous cardiac monitoring.
4. When the patient is ready for post-operative device reprogramming, call a pacemaker
technician. If no one answers, please leave a message. It will immediately roll to the paging system and contact a technician.

E. Post-operative Device Patient Management

1. For a patient with an ICD that was turned off preoperatively, call the pacemaker clinic to notify the CV technician of patient’s location and request post-operative device check.
2. If a call is not received to turn the device on by 4:30 pm, a pacemaker technician will verify the patient’s location and either
   a. Turn the device back on or
   b. Determine that the patient is still in the OR and contact the Cardiology fellow on call by telephone to inform of the need to turn device on after five o’clock. The technician will document the time and name of the fellow receiving report.
   c. It is still necessary to call the fellow on call to inform of patient location and request the device check once the case is completed.
3. All patient device checks begin with printing the presenting rhythm and programmed parameters, and end with printing the final parameters, which documents the changes that were made. Regardless of the patient’s location, a printout of the device setting and parameters will be available to all staff, in the progress notes section of the patient’s chart.

Cardiac Rhythm Management
Device
Perioperative Algorithm
Step 1

Identify:
1. Device Type (Pacemaker/ICD)
2. Manufacturer/Model #
3. Serial #

- Pacemaker
- ICD or Unknown
  - Cautery
    - Planned
      - Go to Step 2
      - Yes
      - No
Cardiac Rhythm
Management Device
Perioperative Algorithm
Step 2 – Reprogramming

Page Pacemaker Technician (in advance if possible):

Time of Surgery

0700-1700
Page Pacemaker Technician to:
Pre- and Post-op reprogram device

1700-0700
Page Cardiology Fellow on call to:
Pre- and Post-op reprogram device
Pacer / AICD Form
04/01/09 11:01 am Performed by Loser, Matthew W
Entered on 04/01/09 11:01 am

**Medical Device**
- **Medical Device Nursing Question:** Yes
- **Procedure Type:** Pacemaker
- **Electrocardiography Planned:** Yes
- **Device Manufacturer:** Electronic
- **Medical Device Type:** Pacemaker
- **Medical Device Insertion Date:** 04/01/09
- **Medical Device Serial Number:** 123
- **Medical Device Model:** 123
- **Pacemaker Rate Setting:** 741
- **Medical Device Check Date:** 04/01/09
- **Pacemaker Mode:** Atrial fixed (AOA)
- **Pacemaker Rate Setting:** 741
- **Medical Device Max Tracking Rate:** 1232123
- **Medical Device Chambers:** Single chamber
- **Pacer Dependent:** Yes
- **Medical Device Rate Response On:** Yes
- **Medical Device On Time Options:** No programming changes needed before or after