5I - IMPLANTABLE PACEMAKER MANAGEMENT ADULT & PEDIATRIC

PARAMEDIC

Clinical Pearls:

1. Correlate electrical pacing activity with mechanical heart activity (eg. pulses).

2. If electrical pacer spikes seen on the ECG monitor are not consistently and immediately followed by electrical activity of atrial, ventricular, or both atrial and ventricular depolarization, then the pacemaker may be intermittently functioning. This may be normal if the patient's heart rate is above 60 beats per minute, since most pacemakers will be set to a demand mode (pacing only when needed). Alternately, if the patient is bradycardic, the pacemaker may be non-functional (eg. battery failure).

3. The "sensor function" of a pacemaker attempts to anticipate increased metabolic needs and raises heart rate. The most commonly used sensor is an accelerometer which raises pacing rate when motion is detected. Thus, physical motion of the patient (including motion created by riding on the ambulance stretcher enroute to the hospital) can stimulate increasing rates of pacing. If the paced rate is noticeably higher than usual set rates of 60-80 beats per minute, attempt to minimize the patient's physical motion and observe if pacing rates decline.

4. Due to the variety of pacemaker types and settings, pacemaker manufacturers supply patients with a card to be carried (usually in wallet or purse) that identifies the pacemaker by manufacturer, type, and date of implantation.

5. Specific types of pacemaker malfunction include the following:
   a. Failure to pace/output – no pacing spikes seen in a bradycardic patient. (example, oversensing of myopotentials, dead battery)
   b. Failure to sense – pacing becomes asynchronous. (example, patient's heart voltage too low for pacer to sense)
   c. Failure to capture – pacing spikes seen without capture. (examples, lead becomes dislodged from myocardium or breaks)
   d. Overpacing or "runaway pacing" – pacemaker pacing at fast rates without clear reason. (examples, sensor-driven pacing from motion, pacemaker-mediated tachycardia)

6. In the setting of sustained, symptomatic rapid pacing suspected to be related to overpacing (see Item 4 above) tachycardia may be able to be controlled by placing a doughnut-shaped medical magnet over the generator.
7. In the setting of cardiac arrest, treat per usual resuscitation, but avoid placing defibrillation pads over the pacemaker generator.

8. **Consult on-line medical control early in the course of suspected pacemaker management issues for further guidance.**