Fast Fact and Concept #111 Cardiac Pacemakers at End of Life

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Worldwide, there are about 3 million people with pacemakers, and each year 600,000 new pacemakers are implanted with the majority of these devices in patients over the age of 60. The primary function of pacemakers is to treat bradyarrhythmias (e.g. heart block). More recently, patients with heart failure, subvalvular stenosis and treatment resistant atrial fibrillation patients may qualify for pacemakers. Additionally, patients with congestive heart failure may receive biventricular pacemakers to improve symptoms.

Pacemaker Function at Time of Death
Patients and their families often make assumptions that pacemakers prolong the dying process and thus prolong suffering. However, a pacemaker is not a resuscitative device. In general, pacemakers do not keep palliative care patients alive, as terminal events are often due to sepsis, hemorrhage, pulmonary emboli, or arrhythmias from metabolic abnormalities associated with end-stage cancer, liver or renal failure. At the time of death, the myocardium is usually too sick to respond to the pacemaker generated signals.

When is Pacemaker Deactivation indicated?
In patients with irreversible cognitive failure, where continued pacemaker activity is not meeting the goals of care, it may be appropriate to discuss the option of deactivation. In most other situations, deactivation is not indicated since the result is likely to be a symptomatic bradycardia, producing signs and symptoms of worsening heart failure (fatigue, dizzy, dyspnea). In contrast to popular belief, it is rare that disabling the pacemaker will result in a swift and painless death as few patients are 100% pacemaker dependant--especially during the Syndrome of Imminent Death (Fast Fact # 3), where tachycardia is the most common rhythm. Note: When questions arise concerning dependency on the pacemaker, consult the cardiology/pacemaker service.

Ethical/Legal issues
A patient's/surrogate's right to request withdrawal of life sustaining medical interventions, including pacemakers, is both legal and ethical. Withdrawal of a life sustaining medical intervention with the informed consent of a patient or legal surrogate is not physician-assisted suicide or euthanasia.

Summary
Initiate a discussion about pacemaker deactivation only if there is potential for patient benefit; consider the potential negative effects of deactivation before disabling the pacemaker.
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Purpose: Instructional Aid, Self-Study Guide, Teaching

Audience(s)

Training: Fellows, 3rd/4th Year Medical Students, PGY1 (Interns), PGY2-6,
Physicians in Practice

Specialty: Anesthesiology, Emergency Medicine, Family Medicine, General Internal
Medicine, Geriatrics, Hematology/Oncology, Neurology, OB/GYN, Ophthalmology,
Pulmonary/Critical Care, Pediatrics, Psychiatry, Surgery

Non-Physician: Nurses

ACGME Competencies: Medical Knowledge, Patient Care

Keyword(s): Antibiotics, Blood products, Clinical interventions, Hydration, Interventional procedures,
Non-oral feeding, Radiation or chemotherapy, Rehabilitation, Surgery, Treatment withdrawal/withholding