



[Print](#) :: [Close](#)

FAST FACTS AND CONCEPTS #111

Author(s): Harrington MD, Luebke DL, Lewis WR, Aulisio MP, Johnson NJ

Introduction

This *Fast Fact* discusses management of cardiac pacemakers at life's end. *Fast Fact* #112 discusses implantable cardioverter-defibrillators.

Background

Worldwide there are about 3 million people with pacemakers. 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 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 dying 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, dizziness, 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, particularly during the period of imminent death (*Fast Fact* # 3), where tachycardia is the most common rhythm. 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.

References

1. Braun TC, Hagen NA, Hatfield RE, Wyse DG. Cardiac pacemakers and implantable defibrillators in terminal care. *J Pain Symptom Manage.* 1999; 18:126-131.
2. Kolarik RC, Arnold RM, Fischer GS, Tulsy, JA. Objectives for advance care planning. *J Palliative Med.* 2002; 5(5):697-704.
3. Mueller PS, Hook CC, Hayes, DL. Ethical analysis of withdrawal of pacemaker or implantable cardioverter-defibrillator support at the end of life. *Mayo Clin Proc.* 2003; 78:959-963.

4. Wood MA, Ellenbogen KA. Cardiac pacemakers from the patient's perspective. *Circulation*. 2002; 105:1022-1024.

Fast Facts and Concepts are edited by Drew A Rosielle MD, Palliative Care Center, Medical College of Wisconsin. For more information write to: drosiell@mcw.edu. More information, as well as the complete set of Fast Facts, are available at EPERC: www.eperc.mcw.edu.

Version History: This Fast Fact was originally edited by David E Weissman MD and published in April 2004. Re-copy-edited in April 2009.

Copyright/Referencing Information: Users are free to download and distribute Fast Facts for educational purposes only. Harrington MD, Luebke DL, Lewis WR, Aulisio MP, Johnson NJ. Cardiac Pacemakers at End-of-Life. Fast Facts and Concepts. April 2004; 111. Available at: http://www.eperc.mcw.edu/fastfact/ff_111.htm.

Disclaimer: Fast Facts and Concepts provide educational information. This information is not medical advice. Health care providers should exercise their own independent clinical judgment. Some Fast Facts cite the use of a product in a dosage, for an indication, or in a manner other than that recommended in the product labeling. Accordingly, the official prescribing information should be consulted before any such product is used.

ACGME Competencies: Medical Knowledge, Patient Care

Keyword(s): Ethics, Law, Policy Health Systems

© 2008 Medical College of Wisconsin

Medical College of Wisconsin

8701 Watertown Plank Road, Milwaukee, WI 53226

www.mcw.edu | 414.456.8296

[Print](#) :: [Close](#)