

Pacemaker Reuse in a 65-Year-Old Woman in the Philippines with Severe Medical Need

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As disparities in healthcare between the industrialized world and low- and middle-income countries (LMIC) continue to widen, novel methods of delivering cardiovascular therapies—specifically electrophysiological devices—must be explored. Post-mortem pacemaker donation is a safe and effective method of decreasing the morbidity associated with cardiovascular disease in LMIC. (PACE 2010; 33:e8–e9)

pacemaker reuse, healthcare disparity, low- and middle-income countries

Due to improved technology and widespread access to healthcare, many industrialized nations have seen a decrease in the morbidity and mortality related to cardiovascular disease (CVD) in recent decades.¹ However, those in low- and middle-income countries (LMIC) continue to witness an epidemic of CVD that has now become the leading cause of death globally.² Moreover, this widening disparity has become no more evident than in the field of cardiac electrophysiology—specifically device implantation. We present the case of a patient in an LMIC undergoing successful implantation of a pacemaker-extracted post-mortem from the United States.

Case Report

A 65-year-old woman, with no significant past medical history, presented to the University of Philippines-Philippine General Hospital (UP-PGH) in Manila, Philippines. She experienced a syncopal episode and was subsequently diagnosed with third-degree heart block. A temporary pacemaker was recommended but the patient refused, citing financial concerns, and requested discharge. One week later she experienced another syncopal episode and underwent hospitalization and temporary transvenous pacing.

The woman is a widow with two grown children who are her sole support after the bankruptcy of her corner store. Her daughter is a housewife, and her son is a window installer. The patient and her family were advised that she needed a permanent pacemaker, but they did not have the necessary means to pay for the device. As a result, the patient remained hospitalized in the UP-PGH

Coronary Care Unit with transvenous pacing until further arrangements could be determined.

After 15 days of temporary pacing, cardiologists at UP-PGH received a donation of sterilized pacemakers extracted post-mortem with battery life >70% from World Medical Relief (WMR) in Detroit, Michigan. WMR is a nonprofit international charitable organization whose mission is to collect and distribute medical commodities to those in LMIC. Pacemakers explanted, after consent, were donated from funeral directors residing in southeastern Michigan. Devices from patients with evidence of communicable infectious disease or previously recalled were not accepted. Trained physicians at WMR interrogated the devices to assess battery life, eliminated all patient identifier data, and cleaned the donated pacemakers with pipe cleaners and other instruments in order to remove all debris, specifically at the lead insertion site. Devices were then soaked overnight in an enzymatic cleanser and sterilized via an eight-hour ethylene oxide gas sterilization protocol.^{3,4}

A sterilized pacemaker extracted post-mortem with an 85% battery life was implanted in our patient without a complication. The patient has not shown any evidence of infection, and her device is functioning properly at 6-month follow-up.

Discussion

CVD has become the primary cause of international mortality, accounting for 30% of all deaths worldwide.² The World Health Organization estimates that nearly 20 million people will die from CVD, the great majority of which will occur in LMIC.^{5,6} Few LMIC have national healthcare systems or widespread health insurance, meaning all costs must be borne by patients and their families. Primarily due to cost issues, the field of cardiac electrophysiology is either nonexistent or severely underdeveloped in many LMIC. The average pacemaker can cost thousands of dollars, which is far more than the annual per capita income of patients living in many underdeveloped nations.

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This patient exemplifies the great disparity in access to healthcare technology between those in LMIC and the industrialized world. It also serves to highlight an effective way to deliver cardiovascular healthcare to those in need. The idea of re-implanting used pacemakers has been examined for greater than two decades and repeatedly has been found safe as long as proper protocols such as sterilization with ethylene oxide are utilized. Mugica et al.⁷ investigated 151 patients with implanted devices and found no significant difference in survival between those with new versus used pacemakers. In addition, Panja et al.⁸ followed 642 patients implanted with used pacemakers for a mean of 7.5 years and found that the mortality and infection rate was comparable to those who had new pacemakers. Finally, Linde et al. found no statistical difference in infection rate or other complications between those with new or used pacemakers in a case-control study involving 200 patients.⁹

These previous studies have established that pacemaker reuse is a safe and effective method

to deliver cardiovascular healthcare to those who otherwise would not be able to obtain such medical therapies. Moreover, 91% of individuals with pacemakers in the United States are in favor of donation to underserved nations if given the opportunity via advanced directives.¹⁰ Given that safety of pacemaker reuse has been established and that the great majority of patients with these devices are in favor of reuse, it is time to evaluate the feasibility of regional if not nationwide pacemaker donation programs, in order to alleviate the burden of symptomatic bradyarrhythmia seen in underprivileged nations.

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