

Recycling Used Pacemakers: A Small Implant Can Make a Huge Difference

Section I—Description of the idea

Essence of the Idea

Each year more than a million individuals worldwide die due to lack of access to pacemakers; yet, most individuals with pacemakers would donate their device to others in need, recycle used pacemakers, if given the chance. Many of the folks who die simply did not have access to pacemakers; they are among the poorest in the world. Meanwhile, in developed nations, used pacemakers (many still functional) sit unused in desk drawers in funeral homes. This project proposes to join the excess supply in the developed world with the unmet need in the developing world. To do so, however, the world needs to know about the project—contemporary governmental programs, coupled with current social media offer global channels for communication.

Creative Approach

A strong cardiovascular system, with controlled heart rhythm problems, is critical to combat a number of diseases. Thus, this project targets a need common to a variety of diseases, in support of UN Millennium Development Goal 6. It “Explore[s] New Solutions in Global Health Priority Areas” as it applies existing pacemaker technology from the developed world to previously uncharted territory in the developing world. Pacemakers expand the perimeter of life.

Why don't people in the developed world donate used pacemakers? For those electing pre-planned final arrangements involving cremation, pacemakers MUST be removed from the cadaver lest the crematorium explode. Yet, most of these necessarily-removed pacemakers are at best stored in some desk drawer, or at worst, discarded in the trash. Clearly people do not know about the possibility of such donation.

Most states in the U.S.A. offer a program through the Secretary of State office to place a mark on a driver's license (or similar identification card) to indicate that the bearer of the card is a donor of natural organs. No such mark exists for artificial organ donations (such as pacemakers). We propose to implement such a program as part of building a pacemaker census or registry that goes beyond the hidden numbering and protected medical records showing that numbering—to do so, we would employ existing social networks that reach hundreds of millions of individuals around the world. Everyone has a heart; not everyone has a pacemaker—knowing who does, in a clear and straightforward manner, is critical to effective recycling.

We have communicated, on our own, about this program among one set of living potential donors from a target group of over 165,000 duplicate bridge players (average age of 69) in which the density of pacemakers must be greater than in a corresponding random group. Now, we propose extending the idea, via contemporary communication networks, to the world's population.

Scientific Basis

Recycling has a sound environmental basis. Pacemakers have a sound medical basis. Integrating these concepts for the benefit of a large segment of the world's population without access to pacemaker therapy makes sense. Doing so represents a cross-disciplinary approach that engages technical disciplines which are less represented in the global health arena.

Hypothesis. If an educated population is aware of pacemaker recycling, then there will be an increase in pacemaker registration of a desire to eventually donate a pacemaker.

Pacemaker recycling works: there are scientifically-grounded pacemaker recycling programs in place at major universities in the US. To date, at least one of them has collected over 4000 devices; roughly one in five has the needed 70% (or more) of the original battery life left. A protocol for sterilization, for legal matters, and similar matters at US hospital facilities is in place. Further, there is at least one outreach program already in place, for training in-country personnel in pacemaker installation and maintenance in the Philippines and in Kenya.

What is missing is some form of pacemaker registration that would, by its mere nature, enhance widespread communication of the project. Each year over 100,000 pacemakers are implanted in the US (<http://www.surgeryencyclopedia.com/La-Pa/Pacemakers.html>). Worldwide, there are over 3 million existing pacemaker implants with about 600,000 new implants annually (<http://circ.ahajournals.org/content/105/18/2136.full>).

The deliverable is a system for the registration of pacemakers on driver's licenses in all 50 states of the United States. System implementation within the pacemaker community is to parallel the corresponding system for donation within the natural organ community.

Section II. Testing of the Idea

Testing and implementation of the hypothesis would be aided by the fact that individuals receiving pacemakers already receive an identification card from the manufacturer that includes information about the specific model of pacemaker and its serial number. We anticipate success will be based on effective communications with Offices of Secretaries of State in all 50 US states and in conjunction with existing organizations that have worked to create a natural organ registration system in various states.

First 12 months.

- Establishment, in conjunction with existing organ donation programs, of a state-by-state registration system through driver's license programs to offer an optional mark on licenses for pacemaker donation.
- Participation of pacemaker recycling program on social media networks
- Success will be tested by
 - increases in participation in a registration marks on driver's licenses program.
 - Counts of number of pacemaker recycling links accessed on existing social media
 - In the long run, increases in actual pacemaker donation should follow suit, but perhaps not within a 12 month time frame—there may be a lag in response time (but there may not be)
 - publications about the project
- Reporting of results at the end of the first year will draw from the above-stated measures for testing for success.

Months 12 to 18—Ramping It Up

- Work with Secretaries of State to see what might be involved in going beyond pacemaker marks to possibly include a broader artificial organ donation mark.
- Work with other North American or European groups to expand donor pool.
- Perform ground work for extending bases of operation to other developed nations.
- Measures for testing success and reporting of results will parallel those in Phase I.