Implementation of bystander-CPR as an effective tool in universal health care: A novel approach

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Abstract

Cardiac arrests can occur at any time, but generally transpire outside of the hospital. (1) The biggest determining factor in ensuring the survival of a patient from cardiac arrest is response time. (2) For every minute of delay in providing medical assistance, a patient’s likelihood of survival decreases by 7-10% post ventricular fibrillation onset. (3) In developing countries, there are several obstacles that impede the provision of medical assistance for out-of-hospital cardiac arrests. They include:

- Scarcity of resources;
- Lack of readily available emergency medical services (EMS);
- A shortage of trained medical service providers;
- Our goal: to promote cardiopulmonary resuscitation (CPR) use as a primary tool for improving outcomes in patients suffering from a cardiac arrest.
- We want to mobilize and use an online scalable system that provides low-cost training, certification and skill evaluation to train the general public on CPR practices in developing countries.

This will help dismiss common myths surrounding bystander CPR

Cross-Cutting Themes

- Gender Equality

  Concern: Females may be uncomfortable with a male resuscitator due to various cultural or personal reasons
  Intention: To empower females, along with males, to pursue a leadership role in performing CPR until further medical aid is available to support the individual suffering from a cardiac arrest

- Resource Management

  Concern: Need for the creation of new resources that might impact the economy or environment of the country
**Intention:** Using and allocating pre-existing local resources, including but not limited to: the internet, computers, local manpower

- **Good Governance**

  **Concern:** Lack of sensitivity towards local cultural values and beliefs; empowerment of community members to be self-sufficient

  **Intention:** To establish an open, inclusive and long-lasting project that involves people from different backgrounds and strata to increase the efficiency and effectiveness of the delivery of local EMS

**Implementation**

- **Conceptual Understanding**

  Website with introductory information on CPR, FAQs, and hands-on training centres
  Web-based training modules for CPR knowledge certification with embedded feedback
  Quality of CPR performance increased using simulation-based training, automated feedback and training refreshers (3)
  Pre- and post-training questionnaires assessing performance and learning

- **Hands-on Training**

  Workshops held in various locations within target countries (initial focus: urban centres and youth)

  Hands-on training will be promoted at large congregations (e.g. sports tournaments) and celebration events

  Local residents to be trained in conducting workshops
**Figure 1: CPR Initiative Website** | Screenshot displaying the home page of the website

**Boldness and Creativity**
The website and modules that we will create will impact both the McMaster and international communities in terms of raising awareness on health and related issues.

Training module videos created for the website will be available in multiple languages, allowing us to tailor them to the needs of different geographical and cultural groups.

The videos will also contain graphics on proper CPR procedures as well as different modes of providing constructive feedback to learners.

Through the website and a smart-phone application we hope to maximize impact by reaching educational institutions in developing countries such as India, (South Asia), Uganda, Nigeria, Botswana.

**Impact**

![Venn Diagram](image)

**Figure 2: Program Impact Foci |** An Integrated approach towards the implementation of this initiative.

**Social Entrepreneurship:**
With the help of federal, state and local governments, NGOs, universities and community partners, we hope to build an educational and certification system, which can provide not only theoretical training, but also practical experience on how to perform CPR. Partnership with local organizations will help with the recruitment of local trainees who may become trainers in the future.

Scaling:
In developing countries, resources are scarce, emergency medical services are not readily available and there is often a lack of trained providers of medical services. In these countries, a simple, effective and inexpensive tool can be used to increase survival rates from a cardiac arrest is bystander hands-only CPR, because its practise does not require any specific medical tools or expensive supplies.

Sustainability:
The implementation of this project will become sustainable through online education, jurisdiction-based certification and the integration of hands-only CPR training in the school curriculum. This will create jobs for trainers, generate the need for advanced resuscitation teams, and expand the market of mannequin production, automatic external defibrillators (AEDs) and other medical kits.

Figure 3: Map of Targeted Countries | Map highlighting the countries proposed for implementation of this initiative.
References

1 CPR & Sudden Cardiac Arrest Fact Sheet. 2011; Available at: http://www.heart.org/HEARTORG/CPRAndECC/WhatisCPR/CPRFactsandStats/CPR-Statistics_UCM_307542_Article.jsp. Accessed February, 2014.


Dr. Tapas Mondal Bio
Dr. Mondal is primarily a clinician educator devoting the majority of his time to patient care and teaching, working in a very busy tertiary care center. Dr. Mondal has been recognized for his outstanding patient care by patients and colleagues. He was awarded the “Best Teacher Award” in 2006 and 2009 by the McMaster Residents. He enjoys teaching students from all learning levels, mentoring students from Health Science students to Fellows.

Dr. Mondal also has a keen interest in research, publishing several journal articles. For the last 2 years he is actively collaborating with others on a wearable wireless ECG monitoring system. He is also acting as a reviewer on a number of journals. Currently Dr. Mondal is working on the concept of easy access training and teaching CPR to lay people in developing countries. Dr. Mondal is working on transportation for patients on remote islands in India, the boat ambulance is the first of its kind in the area. Another project that Dr. Mondal is currently working on is improving drinking water supply in rural communities with special attention to desalination at a domestic level.