Introduction

- Biomedical Engineering (BME) - A discipline that advances knowledge in engineering, biology, and medicine to improve human health.
- It is interdisciplinary with the ultimate goal to further clinical practice.
- It relies on the acquisition of innovative knowledge through experimental and analytical techniques from various engineering sciences.
- Its benefits include improved medical delivery mechanisms, processes and systems.
- The primary goal of this study was to contribute to the awareness of the medical and public health communities issues associated with the procurement and optimization of medical devices.

Innovations and Associated Challenges

- Postpartum Hemorrhage (PPH) is the leading cause of maternal mortality in low-income countries.
- Defined as a blood loss of 500 ml or more within 24 hours.
- The use of intrauterine balloon tamponade is recommended for refractory bleeding or if uterotonics are unavailable.
- If no resources are available, uterine artery embolization should be considered.
- Field solutions (A) cannot be the standard of care (B) in a world full of options.
- Field solutions do not take into account all technologies that can provide better and oftentimes cheaper options.
- The standard device of a fully equipped obstetrical suite can be harder to procure at $400 USD/kit

Opportunities for Improvement

- Medical devices that are compatible with our environment.
- Medical devices with considerations of material porosity to lessen microbial adhesion and proliferation of nosocomial diseases.
- Organic contamination is of importance but lessening inorganic contaminants could also decrease pyrogenic impurity on medical devices.

Sustainable Efforts for Interventions

- Prototyping, testing and/or manufacture can be accomplished on the continent or specific countries.
- This would minimize warehousing thereby decreasing the chances of using expired devices or worse yet, not having the necessary tools to address the needs of the population
- Real-time manufacture and delivery of devices would optimize public health capacity and associated response to population needs.

Field Solution

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Standard of Care

- At first glance, Biomedical Engineering and Public Health may seem to be different, but the goal is the same (i.e., betterment of our society)
- Biomedical Engineering is considered an expensive solution of health issues
- Public Health is mostly seen as resourceful by necessity, utilitarian, and focused primarily on access to healthcare and preventive medicine
- Reality is that a potential exists for collaborative innovation

Perceived Polarization of Two Disciplines

- Multiple opportunities exist in the developing world (and specifically West Africa) to improve the field of Public Health and clinical medicine. Biomedical Engineering is a field that can contribute to the said improvement.

Summary

References


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