

## Chapter 25

# Clinical Engineering in India: A Case Study

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### ABSTRACT

*Clinical Engineering (CE), an interdisciplinary field derived from classical engineering emphasize on the importance of two important domains, medical and engineering. The field comprises of major themes that include medical terminology, clinical measurement and instruments, human factor engineering, medical ethics. As a clinical engineer, he/she makes sure on safety aspects in the hospital, ensures regular preventive maintenance procedures, evaluates new technologies, and develops a close relationship with clinicians. All this process ensures effective patient care and successful outcome of treatment. If clinical engineering procedures are incorporated in a larger scale in greater number of hospital and healthcare centers, a better patient-care outcome can be expected. The proposed work reports on the case study on need for clinical engineering and clinical engineers in India to bridge the crucial gap between engineering and medical domains. A survey was conducted to know from the public on initiating a new post graduate program on clinical electronics engineering. The outcome of the survey clearly shows an indication on the need for initiating the course in the post graduate level engineering program.*

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## **INTRODUCTION**

India is a country with an estimated population of 1.27 billion as per 2013. With a growing population like ours, there comes a tremendous need for an increase in the healthcare facilities to cater to the masses. More importantly, there needs to be a safe and efficient delivery of healthcare and thus the interdependency of healthcare and technology cannot be ignored. For any country, development of a strong Clinical Engineering Profession becomes a top priority which intends to provide high quality and safe healthcare to its citizens. According to American College of Clinical Engineering (ACCE), clinical engineer is considered as a professional person who provides technical as well as clinical support with reliable patient care by making use of domain knowledge from engineering and medicine. For better understanding, one can refer the white papers and other information from ACCE webpage (<http://www.accenet.org>). Various attempts have been taken in the past to introduce a specialized course in the university level to cater the need of the clinical community (Frize(1990); Frize et al., (2005); Baker & Timothy,(2002); David & Rohe (1986);. Albert L-N(1999)) made a brief note on the preparation of clinical engineers for the millennium. The article emphasized on the need for the course and its potential impact on the global market. Mullaly & Frize (2008) made a survey of clinical engineering effectiveness in developing world hospitals in the context of equipment resources, procurement and donations. Saide et al., (2007) made an attempt to identify the clinical engineer, the clinical engineering activities and the kind of employer worldwide. In this work, authors have made a survey on the need for clinical electronics engineering course for post graduate engineering level and have evaluated the outcome based on the inputs received from public in India.

## **CLINICAL ENGINEERING IN INDIA**

Being a densely populated country, there is a strong need to develop clinical engineers in India so that healthcare delivery and improvising the quality of day today routine gains much attention. The application of latest technology with modernized clinical practice forms the integral part of clinical engineering. Clinical Engineering is a fairly new course of study in India. It wasn't until 2008 that the first ever course in Clinical Engineering was introduced in India jointly by three institutes' namely Sree Chitra Tirunal Institute for Medical Sciences & Technology (SCTIMST), IIT-Madras and Christian Medical College (CMC), Vellore. It is the first course of its kind in the country and the minimum essential qualification for joining this course is bachelor's degree in any discipline of engineering except civil engineering and a valid GATE score. This course aims at training graduate engineers to effectively manage technology in hospitals by closely involving themselves into equipment procurement, routine maintenance and safety testing activities. Furthermore, an important aspect of this training is simultaneous, long term and detailed exposure to clinical environment as well as to medical device development activity. This is aimed at making students understand the process of identifying 'unmet clinical need' and thus, contributing to the development of new medical devices in the country.

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