

# Provincial Structure of Clinical Engineering in Canada and its Management

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## I. INTRODUCTION

*"Hospitals should have sufficient access to clinical engineering expertise."* [1] Clinical Engineering (CE) departments are a fundamental aspect of the smooth running of healthcare organizations since CE's origin in the late 1960s [2]. From then, CE departments were tasked with various responsibilities, namely managing medical device technologies. While the role of a Clinical Engineer is similar across the world, each country differs in their funding structure, patient needs, and healthcare capabilities. Indeed, even the operation of healthcare within a country can change altogether between regions, affecting CE services which are directly influenced and controlled by administrative and corporate decisions [3]. In Canada, the standard for healthcare is set by the federal government but funding and management are set by the provincial government [4]. Therefore, CE structural changes happen often, depending on funding and public requirements. This paper will investigate how the structure, management, and development of CE conforms and differs across the provinces and territories of Canada to elucidate common challenges and successes in CE.

## II. METHODOLOGY

Data was collected through a variety of methods. General information was gathered through research into textbooks, journal articles, conference proceedings, and webinars. Site-specific information about CE management was obtained via interviews with CE staff to learn more about their healthcare organization and provincial configuration. The collected information was referenced against provincial population density, the number of beds staffed and in operation in 2020-2021, and the location of the seven Biomedical Engineering Technologist (BMET) diploma-based colleges in Canada.

## III. DISCUSSION

A few key elements of each region were collected. The reporting structure of CE was noted as either centralized across the province or decentralized within each healthcare organization or region. The means of data recording at these

CE sites was documented, such as whether centralized or individual Computer Maintenance Management Systems (CMMS) were used. Additionally, we noted the use of any standardized information lists at the provincial level, such as procurement catalogues or Preventative Maintenance (PM) processes. Research for this article also focused on certain milestones that reflect the size and growth of CE departments, including the presence of a provincial CE society and specialized medical device programs.

Showcasing Canadian CE departments shows that there are many similarities and differences in the way CE is structured and managed. Some provinces featured large organizational CE structures with multiple directors and specialized CE programs, whereas others modelled a small organizational CE structure with few Clinical Engineers. The trend was observed to be towards centralized CE management, with a couple of provinces currently changing their healthcare structure to consolidate services. Analyzing each province/territory's CE department elucidated some challenges that CE departments across Canada are facing.

Overall, our research shows that each province and territory brought a unique twist with the general aim to grow the CE profession.

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