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Preface to the 1st Edition

Benchmarking has been around nearly as long as the clinical engineering profession itself. From the beginning, we have tried to measure our current performance against standards of practice, against our own past performance, and against other healthcare technology management (HTM) programs. It has not been easy.

One of the fundamental problems has been that we have measured our performance in ways that differ from those of our colleagues. We also have long recognized that we are dealing with “apples and oranges” when trying to compare our HTM programs, which we typically regard as unique and special, with other programs. If our numbers look bad, we can say we are different and they do not measure things the way we do.

But those days are gone. As HTM professionals, we need to measure our performance and be able to demonstrate that it is competitive with performance in other healthcare facilities. This HTM Benchmarking Guide, published by AAMI, is an effort to take a step in the right direction. We look at the history and current need for benchmarking. We summarize the literature and identify available tools. We provide examples from AAMI’s web-based Benchmarking Solutions platform as food for thought and a starting point for discussion. Time to get moving!

—Ted Cohen, Frank Painter, and Matt Baretich
Subject Matter Experts for AAMI’s Benchmarking Solution

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Preface to the 2nd Edition

It has been only three years since the 1st edition of the HTM Benchmarking Guide was published in 2015, but a lot has happened:

» AAMI's Benchmarking Solution (ABS), an online subscription service that was in operation from 2009 to 2016, was decommissioned. The reasons are outlined in this new edition.

» The HTM Benchmarking Task Force was established to apply lessons learned from our ABS experience. The Task Force has completed its work, which is included in this edition.

» One lesson was the importance of appropriately allocating corporate-level HTM expenses to individual facilities within a multiple-facility system. Systems are the new norm.

» Another lesson was the need to distinguish (a) equipment maintenance expenses from (b) engineering and project-related expenses. The latter category is where HTM is growing.

» And, to supplement the long list of ABS metrics that were included in the 1st edition, we have proposed refinements in the definitions of a short list of key performance benchmarks.

» Additionally, the 2nd edition of the HTM Benchmarking Guide has benefited from the addition of David Braeutigam to the team.

—Ted Cohen, Frank Painter, Matt Baretich, and David Braeutigam
Subject Matter Experts for the AAMI HTM Benchmarking Task Force

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HTM Benchmarking
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Introduction

The U.S. healthcare system, and the healthcare technology on which it depends, is going through complex and fundamental changes. The Affordable Care Act, a major change highlighted in the 1st edition of the HTM Benchmarking Guide, is now the focus of major political activity. The HITECH (Health Information Technology for Economic and Clinical Health) Act and the ARRA (American Recovery and Reinvestment Act) have created many regulations that include financial incentives to computerize healthcare data and to expand the use of electronic medical records (EMR)/electronic health records (EHRs).

These and other pressures are driving further consolidation of hospitals and medical providers into larger multi-hospital systems with large associated group practices. Meanwhile the widespread use of technology continues to increase in healthcare and in all aspects of our lives, including wireless communication technologies, wearable activity monitoring devices, video streaming, and new automobile technologies.

How do these changes affect HTM? The consolidation of healthcare organizations has allowed many organizations to create and grow their in-house technical abilities. Most healthcare organizations are now large enough to have a well-trained and active HTM or Clinical Engineering department, either “in-house” or available from the corporate or system level. The HTM program may not directly service every technology (it’s rare that they can), but most can support many of the more common technologies and many are capable of managing the service and supporting all of the medical technologies (albeit with some help from the manufacturer and other service providers).

One important result, as projected by the U.S. Bureau of Labor Statistics, is that the Biomedical Equipment Technician occupational category (which the BLS refers to as Medical Equipment Repairers) is projected to grow by 30% per year for the next 10 years and is listed as one of the 10 fastest-growing professions in the United States (www.bls.gov/ooh/installation-maintenance-and-repair/medical-equipment-repairers.htm). Another impact on HTM is that computerization in the healthcare delivery system has resulted in a tremendous growth in the number of medical devices connected to the information technology (IT) network. Not long ago, the majority of connected devices were a few large, expensive medical imaging systems connected to an image repository system or PACS (picture archiving and communication system). Now the average hospital has hundreds or thousands of other devices—including continuous patient monitoring devices, “smart” infusion pumps, glucometers, and other products—that send and receive data over the IT network.

Another impact, and contrast, is in clinical alarm management. The Joint Commission has issued a ongoing National Patient Safety Goal that calls on healthcare facilities to better manage clinical alarms. With the increase in continuous monitoring in acute care areas and further requirements for continuously monitoring patients on opioid medications likely forthcoming, alarms are going to become increasingly prevalent. At the same time, there is pressure to decrease the number of “nuisance” alarms in order to avoid “alarm fatigue,” which is the desensitization to non-actionable or low-priority alarms. All of these changes drive a need for more engineers, technicians, and IT professionals to work in healthcare to make these new complex “systems of systems” work effectively.
How do all these changes affect HTM *benchmarking* as a management tool? HTM programs are growing and need to do so efficiently. Benchmarking allows some guidelines and relevant comparisons to similar organizations (peers) to be made regarding staffing and other factors in growing HTM or Clinical Engineering programs. Multiple metrics are needed to accurately measure how well an HTM program operates. Financial performance, customer service, equipment uptime, and other indicators all are needed. For example, the cost-of-service ratio (COSR)—the ratio of the total of all internal and external service costs and repair parts costs divided by the total of all medical device acquisition costs—continues to be the most well-established financial performance metric. Device count has been shown to be a poor workload indicator unless the equipment in the workload is of similar cost and complexity.

Other contrasts on the HTM front include inefficiencies caused by the various, sometimes contradictory, regulations from federal, state, local, and other regulators—AEM (Alternative Equipment Maintenance) programs, requirements for 100% on-schedule completion of scheduled maintenance, exaggerated attention for RPTs (Relocatable Power Taps), continued mandates for periodic electrical safety leakage current inspections by many jurisdictions despite recognition since the 2012 edition of NFPA 99 Health Care Facilities Code that such testing is unnecessary—and so on.