

## Accounting for Readiness—Integrating Time-Driven Activity-Based Costing (TDABC) into the Military Health System

*Junaid Nabi, MD, MPH\*†; LCDR Austin J. Haag, PhD, MHA, MEcon, MEd, MSC, USN‡; Quoc-Dien Trinh, MD\*†*

In the last two decades, the U.S. Military Health System (MHS) has achieved unprecedented success in overseas missions—especially toward improving the delivery of critical care and accomplishing the highest survival rates in combat.<sup>1,2</sup> These achievements have been lauded as a framework that can improve the practice of medicine in the U.S.<sup>2</sup> At the same time, the U.S. MHS has come under intense scrutiny over the costs and quality of their services within the country.<sup>3,4</sup> This dichotomy is a consequence of the dual role that the MHS plays: while one of them is delivery of medical care in combat situations, the other is caring for members of the military service and their families at home. Although the achievements for overseas missions are recognizable, the health system at home has been deemed inefficient and expensive.<sup>3,5</sup> Currently, members of the military services, retirees, and their dependents receive medical care in a variety of clinical settings. On one side is “direct care” where clinical services are provided directly at military treatment facilities (MTFs) by salaried military providers and contractors, whereas on the other side is “purchased care” where clinical services

are provided at civilian medical facilities. These services are reimbursed through the military health insurance (TRICARE), as well as supplemental care paid for—and provided via—an interlocking group of private and governmental organizations.

Currently, the MHS is grappling with a unique challenge: TRICARE beneficiaries are increasingly seeking medical care at local civilian hospitals under the purchased care system as opposed to being treated at MTFs.<sup>5</sup> This is despite limited evidence around differences that may exist in cost or quality of care delivered within these distinct care settings. This presents a variety of additional problems for the MHS—affecting military readiness, escalating costs within the MHS, and threatening its long-term financial sustainability. This shift has resulted in a reduction in case volumes at MTFs and could have a deleterious effect on military training programs.<sup>6</sup> Given that physician expertise is crucial for the effective management of emergent conditions, this shift in care setting should be viewed as a threat to combat readiness.<sup>7</sup> For instance, giving military surgeons opportunities to perform high-acuity scenarios can ensure that military health care teams retain combat readiness. Furthermore, between 2006 and 2015, the military health spending has continuously increased, growing by 13.9%.<sup>5</sup> Although part of this escalation in costs has been attributed to expanding TRICARE benefits, such as “TRICARE for Life” that limits out-of-pocket costs for military members eligible for Medicare by the Congressional Budget Office, the exact mechanism remains largely unknown.<sup>5</sup> Clearly, these cost trends are on an unsustainable track. These trends are undeterred by evidence across several disease conditions that the direct care system (ie, receiving care by salaried military physicians) can in some cases provide more consistent high-quality care.<sup>8</sup>

To address these challenges, the Defense Health Agency has invested in research projects that attempt to elucidate mechanisms that have led to the current quality and cost differences between direct and purchased care settings. These gaps in literature continue to engender several research collaborations, and supplemental studies have already revealed some of the benefits for patients within the direct care system:

\*Department of Surgery, Brigham and Women’s Hospital, Harvard Medical School, 45 Francis St., ASB II-3, Boston, MA 02115

†Center for Surgery and Public Health, Brigham and Women’s Hospital, 1620 Tremont St., Suite 2-016, Boston, MA 02120

‡Department of Preventive Medicine & Biostatistics, F. Edward Hébert School of Medicine, Uniformed Services University of the Health Sciences, 4301 Jones Bridge Road, Bethesda, MD 20814

JN and AJH have nothing to disclose. QDT is supported by a Health Services Research pilot test grant from the Defense Health Agency, and an unrestricted educational grant from the Vattikuti Urology Institute. QDT reports personal fees from Astellas, Bayer, Janssen, Insightec, and Intuitive Surgical.

The contents of this publication are the sole responsibility of the authors and do not necessarily reflect the views, assertions, opinions, or policies of the Uniformed Services University of the Health Sciences (USUHS), the Departments of the Army, Navy, or Air Force, or the Henry M. Jackson Foundation for the Advancement of Military Medicine. Mention of trade names, commercial products, or organizations does not imply endorsement by the U.S. Government.

doi:10.1093/milmed/usaa051

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racial disparities in surgical care—which are profound within the civilian health systems—are alleviated among TRICARE patients within the MHS.<sup>9</sup> Currently, there is no clear consensus on why costs between direct and purchased care vary so drastically.<sup>10,11</sup> The results so far have been mixed and inconclusive.<sup>10</sup> Eaglehouse et al were among the first investigators to conduct economic evaluations of direct versus purchased care settings, and to examine the cost efficiency of cancer care within the MHS, and their analysis reported that overall costs associated with breast cancer were lower in a direct care setting. However, in the same article, they also conceded that breast cancer care costs varied significantly across care settings—with per-capita costs for inpatient surgery in direct care being significantly higher than purchased care.<sup>11</sup>

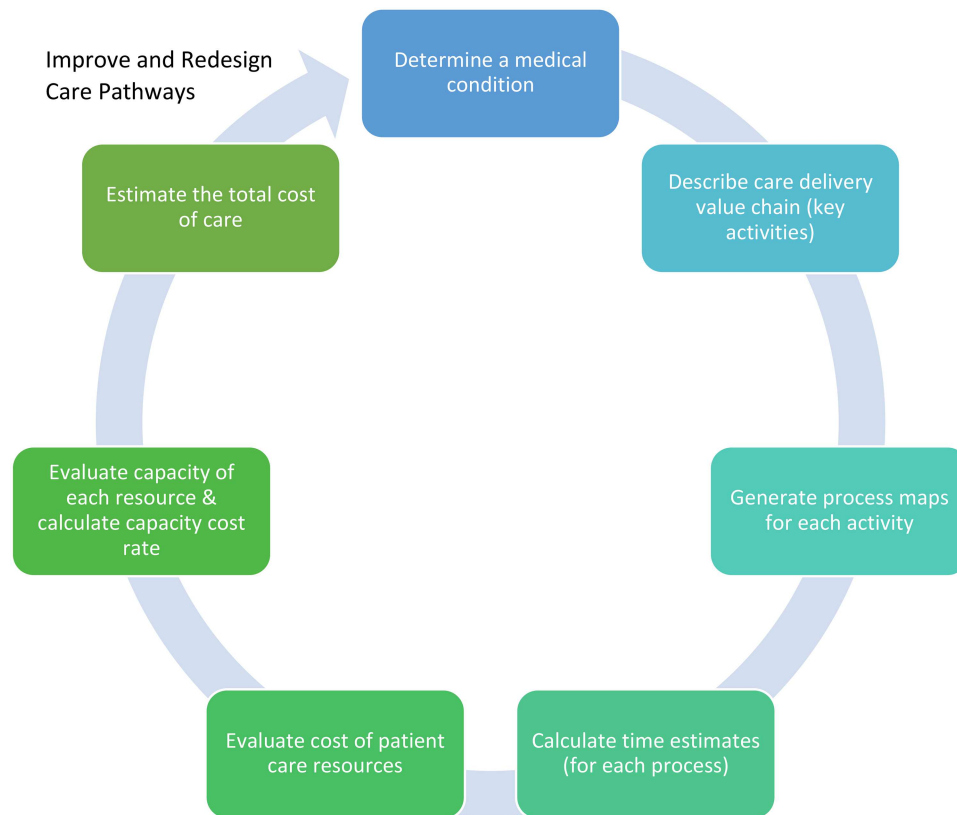
The significance of these findings is numerous. For one, they suggest that surgery within direct care is either inefficient, generating more costs for the same services provided, or unsafe, as the additional costs incurred may be related to the management of complications and lengthier hospitalizations. Moreover, they suggest that moving a larger proportion of purchased care to MTFs would lead to higher costs for the already scrutinized MHS. But we propose two alternative explanations for these observations: (1) inaccurate cost accounting at MTFs and (2) inefficient care resulting from fragmentation of complex surgical care with the direct care system. Although investigating the impact of inefficiencies resulting from decreasing MTF patient volumes is an ongoing effort, understanding the cost-accounting mechanisms within the MHS should be an immediate undertaking, as this will also provide additional insights into the “value” of health care services delivered.

Exposing the “true” cost patterns within the MHS will allow for a better understanding of the differences in costs within direct care setting versus the purchased care setting. Currently, the MHS utilizes traditional cost-accounting systems of ratio of costs to charges or relative value units—and there is a growing body of evidence that these cost-accounting systems are not precise and are unable to offer an assessment of “true” resource utilization.<sup>12</sup> Indeed, “true costs” have been shown to differ significantly from costs recorded in traditional hospital cost-accounting systems.<sup>13</sup> In order to quantify the elusive “value” of health care services (within the MHS), strategy experts have devised a novel framework of value-based health care (VBHC).<sup>14</sup> According to this model, the value equation is derived by calculating health outcomes realized per unit cost disbursed over a complete care delivery value chain.

This model promotes care pathways designed around a patient’s condition, facilitating comparability on health outcomes achieved per cost, allowing for competition on delivering the best value for a health care service, while preserving costs. Another advantage of the VBHC is that it does not assume that all surgeons are the same—and that they vary in terms of skills, speed, complications, and outcomes. VBHC is precisely more relevant because these methodologies do not

group surgeons as a homogenous economic bundle. For example, using the VBHC framework (value = outcomes/cost), those surgeons with higher complications or worse outcomes are delivering low-value care, and vice versa. Indeed, employing a VBHC model will enable health care organizations to identify and measure low-value care, which is the first step toward minimizing waste of health care resources.

For the MHS, this presents a unique opportunity to understand the underlying mechanisms of higher costs within the direct care setting. The VBHC framework recommends that using time-driven activity-based costing (TDABC) could address this cost-crisis.<sup>12</sup> We believe employing a TDABC approach could be a potential tool, which is commonly used in other industries and within health care,<sup>15</sup> to understand these discrepancies and investigate the costing inefficiencies resulting from fragmentation of complex surgical care within the MHS and lead to development of policy solutions. The MHS has already initiated programs that incorporate VBHC in health care delivery models. In 2016, the MHS launched the Value-Based Reimbursement Demonstration Project, with the dual aim to improve quality of care and reduce health care spending. Employing TDABC will augment the aims of the program by enabling precise cost calculation and identification of inefficient clinical practices that lead to excess spending. TDABC is an extension of activity-based costing models. According to this model, developed by Kaplan, each patient has a unique pathway between their diagnosis with a surgical condition and their arrival at a surgical outcome. TDABC relies on defining all phases of care for any patient who presents for complex surgery. In TDABC, this pathway is outlined through the use of “process mapping”—a delineation of patient’s interaction with all members of the health system through a precise, step-by-step, time-dependent method that encompasses the entire cycle of surgical procedure. This process mapping determines the effort of professional staff and utilization of equipment for each episode of care and calculates the minutes spent. These estimates will enable the calculation of capacity cost rate (CCR) for each type of personnel and resource. CCR is calculated dividing resource cost by resource capacity (CCR [\$ /min] = Resource Cost/Resource Capacity). In this equation, “resource costs” encompass all related costs (such as: salary, fringe benefits, occupancy, support resources, etc.) associated with having that person (or piece of equipment) available to treat patients. Additionally, “resource capacity” is related to the capacity (time) that each resource (personnel or equipment) has available for treating and caring for patients—including number of days the personnel is available for clinical work multiplied by number of minutes available per day for patient-related activity (net of breaks, meetings, training, education, etc.) As an example, a surgeon’s cost-per-minute (or personnel CCR) is determined by dividing total annual compensation by the number of minutes the surgeon provides health care services. Similarly, the equipment’s cost-per-minute (or equipment CCR) is determined by dividing



**FIGURE 1.** Stages and processes of TDABC for health care delivery systems, as described by Kaplan and Porter.

operating costs by the number of minutes that it was used for clinical care. The process required for calculation is outlined in Figure 1.<sup>12</sup> For each clinical pathway of interest, the cost-per-minute of all resources will be multiplied by associated time and then added together with consumable costs (these costs will be obtained through discussion with consumable product vendors or publicly available catalog listings) in order to determine overall costs across the patient’s entire cycle of care, given by the equation:

$$\text{Overall Cost} = \text{Cost-per-Minute} \times \text{Associated Time} + \text{Consumable Costs}$$

Because TDABC approach has been shown to be less resource intensive and precise for complex health care services such as surgery,<sup>15</sup> these qualities also make this analysis particularly useful for implementation in the MHS. Numerous health care systems have already reported how TDABC has allowed them to improve patient outcomes, while containing cost.<sup>15</sup> These systems include cancer centers that have seen observed increases in their institutional bandwidth to care for patients, while reducing burden on their human and infrastructural resources. Given these considerations, the MHS can benefit immensely from using TDABC in understanding

professional workflows and resource utilization to improve efficiency and quality.

In conclusion, development of relevant costing models that are more transparent and accurate will enable MHS to address the intense scrutiny over their costs and quality of services—and guide future policy decisions. With the Department of Defense’s recent initiative to restructure the delivery of health care within the MHS—with nonuniformed beneficiaries to gradually transition toward civilian providers—the importance of assessing the true resource utilization cannot be understated.<sup>4</sup> Policy decisions made on archaic cost calculations should not be made in the absence of better data. This undertaking would necessitate funding research programs that attempt to investigate more accurate means of calculating costs. Although addressing the challenges faced by the broader U.S. health care system may take time, addressing cost challenges in the MHS is within reach.

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### Commentary

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