

VIEWPOINT

Improving Value in Health Care Through Comprehensive Supply Optimization

Cassandra Thiel, PhD
Division of Healthcare Delivery Science, Department of Population Health, NYU School of Medicine, New York, New York; and NYU Robert F. Wagner Graduate School of Public Service, New York, New York.

Leora I. Horwitz, MD, MHS
Division of Healthcare Delivery Science, Department of Population Health, NYU School of Medicine, New York, New York; and Center for Healthcare Innovation and Delivery Science, NYU Langone Health, New York, New York.



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Corresponding Author: Cassandra Thiel, PhD, Department of Population Health, NYU School of Medicine, 550 First Ave, TRB, Room 636, New York, NY 10016 (cassandra.thiel@nyulangone.org).

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The United States spends nearly twice as much on health care as other high-income countries, yet it achieves some important outcomes that are worse. Historically, high health care spending in the United States was considered to be attributable to disproportionately high utilization. Recent cross-national comparisons, however, show that health care utilization per capita is not appreciably higher than in other high-income countries. Rather, a disproportionately high price per service accounts for the majority of cost differences. Recent efforts to reduce health care costs have focused on avoiding unnecessary or excess care; however, overtreatment accounts for only about 6% of health care costs. Instead, a potentially more effective means of cost reduction may be to focus on reducing the cost of providing all care—making appropriate, necessary care more efficient through supply optimization.

Spending on Medical Supplies

Although price per service includes labor costs, recent studies report that some of the increases in national health expenditures appear to arise from increased spending on purchased goods and services. Hospital care

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is the single largest component of health care spending, accounting for 32% of all expenditures.¹ Nationally, it is estimated that hospitals spent approximately \$161 billion on medical supplies in 2015. The medical supply chain represents 15% to 40% of a hospital's expenses. When accounting for cost of procurement, storage, and labor, activities in the supply chain can account for 50% of an organization's budget.² Moreover, these estimates do not include the cost to dispose of used supplies. By conservative estimates, US hospitals generate more than 4.7 million tons of waste annually, which translates to 12 kg (27 lb) per staffed hospital bed per day.³ In 2014, the US health care sector spent approximately \$5.9 billion on medical waste management,⁴ and global expenditures on medical waste are projected to reach US \$33.4 billion by 2025.⁵ As new medical technologies emerge into the market, supply and disposal expenses are expected to increase.

There is limited research on the factors that influence health care supply utilization and costs, but re-

cently, a variety of case studies have demonstrated marked inefficiencies in supply utilization in a variety of areas.

Inefficient Resource Use

Unused, wasted items are of particular concern in surgical units because they represent unnecessary materials which, although unused, must be discarded. These items still incur a cost to the hospital and often a charge to the patient. Although few studies have analyzed this particular type of cost, it appears to be significant. A survey of waste from 58 neurosurgical procedures found that on average, 13% of surgical supplies went unused, totaling \$653 per case or \$2.9 million annually for the neurosurgical department that was studied.⁶ Other studies of birth procedures, hysterectomy, and inpatient stays have found that disposable supply custom packs and the set-up of inpatient rooms often led to unused items being regularly discarded, although these studies did not quantify what percentage of the discarded, wasted items comprised unused supplies.

Partially used supplies, a result of inappropriate sizing and restrictive multiuse policies, may also represent a significant cost. A study of pharmaceutical waste in cataract surgeries found that across 4 facilities and 40 cases studied, an average of 45% of drugs (by volume) were unused and discarded after every case. Two of the 4 facilities each discarded more than \$190 000 worth of drugs every year.⁷ That amount would cover the costs of 50 additional cataract surgeries at each facility, based on current market rates. This study also noted many reasons for wasteful disposal of drugs, including packaging size, policies prohibiting the operating room from dispensing drugs home to the patients on discharge, and policies prohibiting multidose drug administration, even if the bottle is labeled as multidose.

Expiration dates of supplies and pharmaceuticals, often a result of arbitrary labeling by manufacturers, is yet another area increasing the costs of health care. Emerging research on the strength of pharmaceuticals' active ingredients beyond the labeled lifespan suggested that substantial savings on drug reacquisition costs for health care facilities and also for patients could be achieved if expiration dates were extended.

Variation in care delivery among physicians could result in increased surgical supply costs and wasted unused materials. Addressing this variation with its 12 surgeons, one facility reduced the average cost of surgical supplies in laparoscopic appendectomies by 17% per case, not including cost savings from disposing of fewer wasted materials.⁸ These studies suggest that inefficient utilization of supplies, leading to unnecessary and

excessive supply costs, is present across many specialties. Yet, health services research has not yet comprehensively identified the larger organizational and contextual issues that lead to excessive or unnecessary costs. This limits the ability to create broad strategies for reducing unnecessary supply waste and spending at a national level.

A Comprehensive Approach Is Needed

Surveys of physicians and other health care professionals indicate that change is needed. Studies of surgeons (n = 236) and anesthesiologists (n = 780) have shown that clinicians perceive that much of the surgical waste they generate (and therefore the resources they use) is unnecessary and has been increasing throughout their years of practice.^{9,10} When individual-level interventions have been tested (eg, switching to reusable supplies or standardizing instrument trays and preference cards), they have been found to generate savings without adverse clinical outcomes.

Resource use in health care delivery needs to be addressed comprehensively to contain and reduce costs. Just as some other industries have realized major savings through supply chain optimization and waste reduction, there may be similar potential for cost reduction in health care. Furthermore, such reductions could be achieved while maintaining current profit margins for hospitals and insurers, which could increase the likelihood of adoption. By contrast, efforts to encourage health care systems to reduce the volume of services delivered have been challenging to achieve at scale. Explicit attention to the social factors, financing systems, organizational structures and processes, health technologies, and personal behaviors that influence the cost of the resources used to provide health care services is a major untapped potential source for cost reduction and should be a priority area of focus for physicians and other clinicians, health care center administrators, payers, funders, and policy makers.

ARTICLE INFORMATION

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