

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.JournalofSurgicalResearch.com

Association for Academic Surgery

The impact of breast lumpectomy tray utilization on cost savings



Emily Malone, MPH,^a Jason Baldwin, RN,^b Joshua Richman, MD, PhD,^a
 Rachael Lancaster, MD,^a Helen Krontiras, MD,^a
 and Catherine Parker, MD^{a,*}

^a Department of Surgery, University of Alabama at Birmingham, Birmingham, Alabama

^b Perioperative Services, University of Alabama at Birmingham, Birmingham, Alabama

ARTICLE INFO

Article history:

Received 12 March 2018

Received in revised form

24 May 2018

Accepted 19 June 2018

Available online xxx

Keywords:

Breast surgery

Lumpectomy

Surgical tray optimization

Cost savings

Efficiency

Operating room

ABSTRACT

Background: Right-sizing instrument trays reduce processing and replacement costs, physical strain, and turnover times. Historically, a 98-instrument head and neck tray has been used for breast lumpectomy cases at our institution. Observations revealed that many instruments on the tray were not used during the breast cases. With the significant number of surgical breast lumpectomies performed annually, tray downsizing could significantly reduce costs and physical strain.

Methods: Surgical technicians identified instruments needed for a standard breast lumpectomy. Breast surgeons reviewed the list and made final recommendations. Three of 13 existing head and neck trays were converted to breast lumpectomy trays. The number of breast lumpectomies in 2017 was pulled from the institution's health information system. Instrument quantities were verified using instrument management software. Weights were taken on a digital scale, and processing cost was estimated by a consultant.

Results: The new breast trays included 51 instruments rather than the standard 98-instrument trays. Reprocessing cost decreased from \$49.98 to \$26.01. With 449 breast lumpectomies performed at the institution in 2017, the annual reprocessing savings totaled \$10,763. The tray weight was reduced from 27 to 16 pounds. Setup time decreased from 7 to 4 min per use (22.5 h saved annually).

Conclusions: Downsizing from a head and neck tray to a specific breast lumpectomy tray demonstrated a reduction in reprocessing cost, tray weight, and setup time. Lighter trays allow for safer handling and transport by surgical personnel. In the current health-care environment, it is important to maximize operating room efficiency and minimize cost.

© 2018 Elsevier Inc. All rights reserved.

* Corresponding author. UAB Division of Surgical Oncology, Faculty Office Tower 1153, 1720 2nd Avenue South, Birmingham, AL 35294-0016. Tel.: +(205) 975 5972; fax: (205) 975 5971.

E-mail address: ccparker@uabmc.edu (C. Parker).
 0022-4804/\$ – see front matter © 2018 Elsevier Inc. All rights reserved.
<https://doi.org/10.1016/j.jss.2018.06.063>

Introduction

The health-care system is continuously working to reduce waste of time and resources. In 1988, Taiichi Ohno, of Toyota, developed the lean production methodology and categorized different areas of “waste” to guide the Toyota Production System and improve efficiency.¹ Methodologies used in the manufacturing industry, such as Ohno’s, have been adapted to the health-care environment to address extraneous spending in the hospital setting.²⁻⁶ Roger Bush’s commentary in the *Journal of the American Medical Association (JAMA)* highlights the application of one of Ohno’s 7 areas of waste, “waste of stock on hand,” to the health-care system via instrument tray utilization projects.^{1,4} Opportunities to initiate operating room (OR) efficiency initiatives persist in today’s health-care environment.

Right-sizing surgical instrument trays have been shown to reduce the processing costs and operating room staff burden at multiple institutions.^{3,5-8} The work of Lunardini et al. showed that removing unnecessary instruments from spinal surgery trays led to a significantly decreased tray weight, which was seen by hospital administrators, operating room staff, and the processing department to be very important.⁵ Fewer instruments also correlate to shorter setup time.^{6,8}

As personnel change, surgical techniques evolve, and newer technology and instruments are introduced to the OR; hospitals may fail to remove older, redundant instruments from their trays.⁹ Prior studies have shown that, on average, around 20-50% of instruments on a tray are used during a given operation.^{5,10,11} Removing unneeded instruments results in better efficiency. Stockert and Langerman examined instrument trays in 4 specialties (otolaryngology, plastic surgery, bariatric surgery, and neurosurgery) and found that trays with fewer instruments had higher percentages of instrument utilization and reduce turnover time.¹¹

Change can be received with skepticism, especially when the change may be viewed as adversely affecting patient care and process performance. However, altering instrument trays for better utilization has not been shown to affect short-term patient outcomes and safety in previous studies.^{12,13} A systematic review by the University of Chicago confirmed these findings among various operating room efficiency improvement studies.¹⁴ In addition, Farrokhi et al. at Virginia Mason Medical Center concluded that reducing the instruments included in spinal surgery trays did not adversely affect surgery time.⁶

Instrument tray utilization methods have been examined in a variety of surgery specialties, including but not limited to thyroidectomy, gynecology, pediatrics, and colon.^{2,7,10,12,13} Historically, our institution utilized a 98-instrument head and neck biopsy tray for all breast lumpectomy surgical cases. The same 98-instrument tray was used for thyroidectomies, parathyroidectomies, adrenalectomies, and other procedures. Observations revealed that many of the instruments included in the head and neck tray were not utilized during our lumpectomy cases.

Given the significant number of breast lumpectomy procedures performed at our institution annually, we sought to initiate a cost saving initiative, similar to previous studies, to develop a breast surgery procedure tray for improved efficiency.

Methods

This project was initiated by our Division of Surgical Oncology and perioperative nursing in late 2016. As part of a separate project related to needle localization efficiency, our perioperative quality improvement coordinator observed several breast lumpectomy procedures and noted that many instruments on the existing tray were not used. The surgical team (surgeons, perioperative nursing staff, and surgical technicians) then collaborated on this performance improvement initiative.

Experienced surgical technicians identified instruments needed for a standard breast lumpectomy procedure. A sentinel lymph node biopsy is commonly performed during the lumpectomy procedure; therefore, instruments used for the sentinel lymph node biopsy are also included on this tray. Three breast surgeons reviewed the list of instruments and made final recommendations. The new trays were created by the Central Sterile department by removing unneeded instruments from existing head and neck trays. Instrument quantities were verified using the institution’s instrument management software (SPM).

The number of breast lumpectomies documented in 2017 was pulled from our institution’s health information system (Cerner). Tray weights were taken on a digital scale, and tray setup times were recorded by our perioperative quality improvement coordinator. The instrument processing cost was estimated by a Navigant health-care consultant at \$0.51 per instrument, aligning with conservative cost estimates used in prior studies.^{6,7,11,15} This estimate represents a widely variable time and processing investment dependent on the type and condition of the instrument (e.g., clean scalpel or soiled retractor).

This project was approved by the University of Alabama at Birmingham (UAB) Institutional Review Board (nonhuman subjects determination).

Results

Based on case volumes, three of 13 existing head and neck trays were downsized for use in breast lumpectomy cases, at no cost for new trays or instruments. The new breast lumpectomy trays included 51 of the 98 instruments on the head and neck surgical instrument tray (Figs. 1 and 2). Therefore, 48% of the head and neck tray instruments were deemed unnecessary for breast lumpectomy cases.

Based on 2017 breast lumpectomy volume ($n = 449$), the new tray resulted in 21,103 fewer instruments being processed annually. The weight of the new breast lumpectomy tray was reduced by 41%, and the tray setup time decreased by 43% (Table).

Download English Version:

<https://daneshyari.com/en/article/8835173>

Download Persian Version:

<https://daneshyari.com/article/8835173>

[Daneshyari.com](https://daneshyari.com)