The Effectiveness of a Program to Reduce the Rate of Flash Sterilization

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Abstract: Flash sterilization of surgical instruments has been a common practice, but patient safety and quality assurance health care groups have recently recommended minimizing its use. Our goals were to describe the implementation and effectiveness of our institution's program for reducing the flash sterilization rate of instruments used for total hip and knee arthroplasties. We reviewed flash sterilization logs of all hip and knee arthroplasties from the program's implementation in July 2009 through August 2010 (N = 555) and calculated the monthly percentage of cases using flash sterilization. From the first to the last month, the amount of flash sterilization decreased significantly ($P < .05$): 6 of 34 to 0 of 41, respectively. Our results show that the rate of flash sterilization can be reduced with this strategic program. **Keywords:** sterilization, infection control, hip arthroplasty, knee arthroplasty.
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Orthopedic surgical site infections are devastating complications, resulting in prolonged initial hospital stays, increased risk of rehospitalization, additional surgical procedures, and increased mortality [1,2]. Furthermore, the cost associated with treating patients who acquire surgical site infections is approximately 4 times that of noninfected patients [2]. An effort to decrease surgical site infections requires controlling many preoperative, intraoperative, and postoperative factors [3]. Flash sterilization may be 1 such factor.

Flash sterilization is a technique that was originally designed as a means of sterilizing items that were needed immediately in surgery but that had not been expected to be used or had become contaminated [4]. However, concerns have been raised that flash sterilization is being overused to compensate for insufficient inventory, to save time, or for the sake of convenience [5]. Although the use of flash sterilization in hospitals has not been routinely monitored, organizations such as the Association for the Advancement of Medical Instrumentation [6], Association of periOperative Registered Nurses [7], and the Center for Disease Control [8] have recently recommended monitoring and reducing the use of flash sterilization, presumably as an effort to remove a potential factor in postoperative infection [9].

In response, our institution developed and implemented a program designed to accomplish this recommendation. The goals of our study were to describe the implementation and effectiveness of this program in reducing the flash sterilization rate of instruments used for total hip and knee arthroplasties at an academic medical center.

Materials and Methods

Program Development

In January 2009, a group of orthopedic surgeons, members from the orthopedic infection control committee, perioperative administrators, operating room coordinators, and individuals from central sterile processing (CSP) formed a committee to address the goal of reducing the use of flash sterilization for instruments used in total hip and knee arthroplasties at our academic medical center. Over the course of several months, the committee identified 5 factors as major contributors to flash sterilization use and delineated specific interventions to address each factor (Table 1). These strategies were implemented on July 1, 2009, and results were evaluated on a monthly basis and conveyed to staff and other groups (eg, orthopedic infection control and quality control).

Program Implementation

On July 1, 2009, we implemented the flash sterilization use reduction program using the 5 general

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Submitted June 1, 2011; accepted October 24, 2011.
The Conflict of Interest Statement associated with this article can be found at doi:10.1016/j.arth.2011.10.028.
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0883-5403/2707-0002$36.00/0
doi:10.1016/j.arth.2011.10.028

Table 1. Summary of Approaches Used to Reduce Flash Sterilization Rates

Problem	Solutions
Lack of knowledge about the importance of minimizing flash sterilization	Collect flash sterilization rate data Inform staff of current rates and reasons flash was performed Share information at monthly quality control meetings
Insufficient inventory, especially regarding sets/trays of a particular vendor	Communication between operating room and CSP regarding instrument needs and availability Prioritization of sterilization in CSP Purchase of instruments in high demand with low supply
Improper handling of items during assembly or transport resulting in tears/punctures of internal filters or outer packaging	Assess packing of trays Diminish no. of paper-wrapped trays Lessen the weight of trays
Instruments contaminated during surgery	Question the need for flash sterilization Ensure the avaialbility of peel-pack instruments
Loaner items not received in time to send through the CSP	Educate surgeons/vendors on importance of timely delivery Enforce 24-hour rule for instrument arrival before a procedure

strategies developed by our team (Table 1). The first factor, lack of knowledge, was addressed with 3 strategies: collecting data, informing staff, and sharing information. A system for documenting all instances of flash sterilization was introduced. The name of the person sterilizing, the instrument, and the reason for flashing were recorded. The goal to reduce flash sterilization was communicated to the entire team of orthopedic nurses and technicians, and everyone was encouraged to question if flash sterilization of a particular item was absolutely necessary or if an alternative solution existed (ie, using a different instrument). Flash rates were included as part of the orthopedic dashboard and discussed at monthly quality improvement meetings.

The second factor, insufficient inventory, was addressed with 2 strategies: improving communication between the operating room and CSP and prioritizing sterilization. Interventions aimed at the burden of instrument demand involved purchasing more instrument sets/trays and increased use of loaner sets/trays. In general, communication between operating room managers and CSP is absolutely necessary to ensure adequate availability of equipment for the day's cases. In addition, a method was put in place to enable CSP to prioritize sterilization of equipment that was needed in a timely manner. By anticipating the daily needs of the 4 autoclaves (2 of which are used exclusively for sterilization of camera and scope equipment), CSP was able to increase the overall efficiency of their instrument sterilization process. In addition, if a set/tray needed to be reprocessed for another case that day, it was sent to CSP with a red tag containing information about the case for which it was needed (including room number, surgeon's name, and surgery start time). However, although prioritization will ensure that the item is not waiting to begin the sterilization process, at least 3 hours must still be allowed for terminal sterilization to be completed for that item. Another intervention was improvement in surgical scheduling, with attention to limitations of instrument inventory. This strategy was achieved by improved communication among operating room managers, CSP, surgeons, and personnel who handle surgical booking. In addition, an electronic "conflict" indicator was created within the scheduling program to notify personnel when more procedures were scheduled than inventory could handle. There was also a comment area in which personnel could specify particular equipment requested by the surgeon (ie, specific vendor trays of a given instrument set) for the procedure to avoid scheduling conflicts for specialized and limited equipment.

The third factor, improper handling of trays resulting in punctures or holes in the wrappers, was addressed by 2 main strategies. We examined all of the total joint trays to remove excess and unused instruments to lessen the weight of the trays. Lighter trays produce fewer punctures of the paper wrappers. We also began to replace the wrapped trays with filterless trays so that paper was eliminated.

The fourth factor was the use of flashing for instruments contaminated during surgery. The goal of reducing this use was achieved by sterilizing instruments that are commonly contaminated in individual "peel packs." This strategy not only provided presterilized backups of commonly contaminated instruments, but it also eliminated the need to open an entire tray/set to replace 1 instrument. Personnel were educated on which items were available in individual peel packs and how they could be readily obtained.

The fifth factor, loaner items received late, was addressed with 2 strategies: surgeon/vendor education and enforcement of the 24-hour rule. Institutional policy states that all loaner items must be received 24 hours before the case to allow sufficient time for CSP. The 24-hour expectation was discussed with vendors and surgeons, and this rule was enforced with both groups to allow for adequate sterilization of all loaner sets. Instruments that did not arrive on time were not used.

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