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LEARNING OBJECTIVES

1. Compare 3-zone sterile processing workflow to traditional 2-zone design
2. Discuss the value of the 3-zone design
3. Describe the ideal facilities where 3-zone sterile processing workflow can flourish

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SELF-STUDY SERIES

3-zone sterile processing

Harness the productivity and value in this modern workflow

by Madeleine Stanton

In a consumer-driven world in which efficiency is prized and advancement is everywhere (consider Amazon® robot deliveries, self-driving vehicles and grocery home delivery services), we can't help but wonder what's next in healthcare. What efficiencies are on the horizon that improve not only our productivity as healthcare employees but also the lives and experiences of our patients in the communities we serve? At first, you may think of advances in surgical techniques and devices, but in reality, you need look no further than your hospital's sterile processing department (SPD).

This area of the hospital is not always synonymous with efficiency or synergy. The SPD is a place where soiled surgical instrumentation and devices go to be cleaned, disinfected and sterilized before being used again in surgery. Despite its less-than-elegant environment and function, the SPD is perfectly positioned to be a well-oiled, highly-productive and efficient machine. The issue many hospitals encounter is not that they're unwilling to embrace Lean-style techniques in the SPD; it's that they don't know how to harness its power and make it work for them. This is where 3-zone sterile processing workflow and design come in.

3-zone workflow, explained

The traditional 2-zone design concept is a linear design of a "dirty room" (decontamination) flowing directly into a "clean room" (preparation and packaging). Sterile storage, the area where the majority of sterilized goods are kept, is located in a separate area of the facility, which often requires recently sterilized surgical instruments to pass back through the area in which they were prepped for sterilization. Most healthcare facilities in the United States use this traditional model. While it isn't incorrect, it may not be the most efficient way to process items for sterilization. Many healthcare and design professionals don't realize there is an alternative option that may prove more beneficial to their staff and patients.

In 3-zone design, a linear workflow utilizes double-door or pass-through high temperature (steam) and low temperature

(vaporized hydrogen peroxide) sterilizers that allow a direct connection between the clean room and sterile supply/storage. In this modern workflow process, the preparation (inspecting, assembly, wrapping and containerization) of surgical instruments is performed separately from where those same instruments are removed post-sterilization. With this design methodology, SPD staff achieve a more linear, ergonomic and Lean approach to their day-to-day activities.

Why three?

How often does the question, "Are these sterilized?" come up in any given day within the SPD? While there are various external chemical indicators (like heat-sensitive tape for wrapping surgical trays) that visually tell us whether something has been put through a sterile process, those indicators aren't infallible. They can be used or stored improperly (i.e. leaving them exposed to heat and light) so they "turn" or exhibit false readouts, which makes them useless to end users. Furthermore, when there aren't obvious visual indicators of a sterile process having occurred, staff typically rely on internal workaround processes to keep track of which items have been sterilized. These manual workarounds are the very things that keep the SPD inefficient and less productive.

Technicians working in traditional SPDs remove surgical trays from automated washers, take them to assembly tables for preparation, load sterilizer carts, run sterilizer loads and then remove those same sterilized items all in the same room. Moving back and forth from one side of the clean room to the other has become so automatic to them that they may not even realize the time and productivity that is wasted.

In departments that adopt the modern 3-zone approach, staff are no longer wasting precious time on manual workarounds. In the new model, prep and pack room staff thoroughly inspect and assemble surgical devices to put through a double-door/pass-through steam or vaporized hydrogen peroxide sterilization system. Then, once the sterilizer cycle is completed, staff

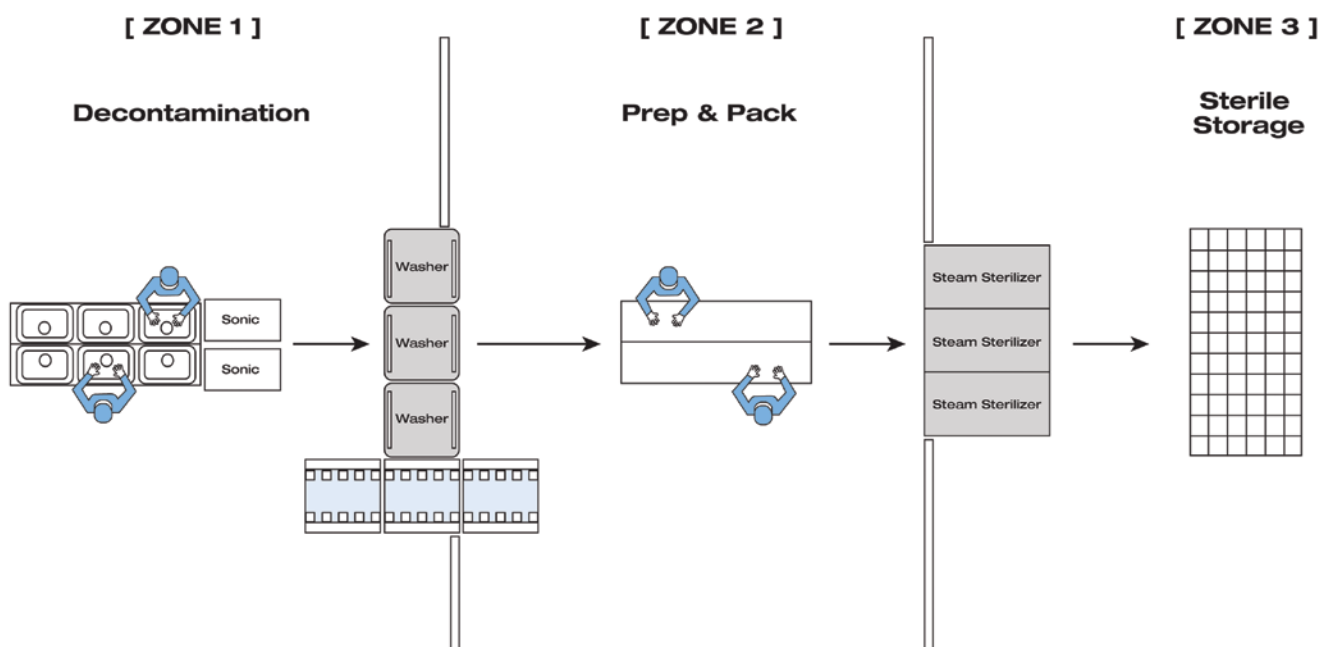


FIGURE 1: 3-zone sterile processing workflow demonstrating linear flow.

in the adjacent sterile room remove the sterilized goods, follow proper visual and documentation procedure and free up the machine to be refilled by their prep and pack counterparts. By streamlining the process and using Lean principles, departments can vastly improve productivity and achieve meaningful benchmarks that were once considered lofty goals.

Adding value to a valuable function

Lean technique, once most widely associated with the manufacturing industry, is the process of “creating more value for customers with fewer resources¹” according to the Lean Enterprise Institute. Most notably the “Toyota Way” of Lean work optimization first popularized by Toyota Motor Company* showed many industries that the principles making the automobile manufacturer so successful were just as applicable to other modalities of commerce with the underlying goal of improving service while reducing cost².

Lean techniques seek to:

- Eliminate defects
- Reduce transportation of goods
- Prevent over-producing
- Reduce inventory
- Prevent over-processing
- Eliminate wasted motion and waiting

Since their renaissance in the 1990s, Lean-style techniques have been harnessed and implemented in many industries, including various aspects of healthcare. We’ve seen Lean measures in reducing patient wait times, minimizing inventory (not only in sterile processing but in clinics, offices and

pharmacies), reducing process errors, and improving overall patient satisfaction⁶. Healthcare leaders typically invest time and resources in cost-saving and service-boosting initiatives for departments that have direct patient interaction, like admissions, surgery, financial services and patient services.

However, it’s important to note that sterile processing personnel, although they do not physically interact with patients daily, handle, clean and sterilize the reusable instruments used directly on patients during surgeries. They certainly have an indirect relationship to many of the facility’s patients. And as we know, without sterile processing activities, a hospital’s operating rooms, same-day surgery rooms and diagnostic procedure rooms, which are the main revenue generating functions in a hospital, do not function. The work done in the SPD supports the hospital’s ability to perform revenue-producing procedures, which makes it the perfect place to focus Lean initiatives.

* Toyota is a registered trademark of Toyota Motor Company

Reducing risks

In addition, optimizing sterile processing workflow and processes is inherently Lean because it can significantly reduce the clinical and financial risks of cross-contamination and potential infection-related negative surgical outcomes. Nationwide newspaper headlines and evening news anchors have been warning the public of the dangers of contaminated instruments being accidentally

used in hospitals during surgery³. More than ever, hospital administrators, infection prevention professionals and risk managers worry about the policies their facilities have in place and if they’re enough to keep their patients safe. Applying a 3-zone sterile processing workflow can be incredibly valuable to hospital leaders because, by separating where surgical trays are loaded and unloaded into sterilizers, it mitigates the risk of sending unsterilized goods to surgical sterile fields.

Achieving Lean efficiency and productivity goals

The SPD can also achieve realistic Lean goals within their healthcare ‘factory’ by moving away from traditional workflow design and antiquated sterilization technology. The 3-zone design provides a linear flow that shortens the overall distance of the processing pathway and eliminates multiple staging/cooling areas. It also reduces the quantity of wasted movement by staff in the prep and pack area as they transfer sterile items from sterilizer carts to transport carts and then move them to a separate sterile storage area.

Improving staff workload

In addition, the 3-zone set-up allows SPD staff to specialize in specific tasks and hone their skills, rather than juggling multiple tasks, which may make them more prone to errors. In a department where certified, educated and experienced employees are difficult to come by⁴ and where turnover

is high, removing a few steps from their managed objectives (MBOs) can make a world of difference in terms of staff satisfaction. Specialization also improves staff efficiency and productivity, which can also help optimize surgical scheduling and productivity.

When does a 3-zone process fit?

You may be thinking, “Why isn’t my facility implementing this yet?” The answer is, although 3-zone sterile processing workflow and design can be highly beneficial, it may not be the right fit for everyone.

This workflow design requires three distinct and adjacent rooms. Each room is separated by a wall to allow the necessary environmental controls for each space. Facilities must have the footprint that allows them to create interconnected rooms. For instance, if a traditionally-designed 2-zone SPD is in the basement and sterile storage is on another floor of the hospital, it may be cost prohibitive to move one department multiple floors to achieve a 3-zone workflow design. Additionally, small facilities or facilities that cannot create distinct rooms would not be a good fit. One example is freestanding ambulatory surgery centers. By design, these centers are significantly smaller than a standard in-patient hospital. In these facilities, square footage comes at an even higher premium, so the space needed for double-door sterilizers may not be feasible.

Another consideration is the workload or volume within the SPD and the hospital’s surgical case volume. Like many projects considered for inclusion in a hospital’s annual budget, workflow or design improvements may be hard to justify if a facility’s overall surgical volumes are down year over year. In addition, the number of new staff members needed to manage a third zone or sterile side may not be justifiable in facilities with low surgical volumes. The same can be said for smaller hospitals serving smaller communities. There may only be one or two technicians currently working in the SPD, which makes managing a 3-zone department challenging. In these cases, hiring additional staff may be possible in the future, but they’ll need to grow their surgical volume before they can justify the additional overhead.

In other cases, there may not be financial resources dedicated to a full sterile processing renovation and a hospital must make do with its current workflow model. With the recent surge in the ambulatory surgery sector, many healthcare groups are focusing their resources toward the



Figure 2:
Sterilizers showing
pass-through
installation

outpatient market before making large internal renovations. This doesn’t mean that an eventual 3-zone design isn’t possible; rather, it may be considered as an opportunity down the road.

The final consideration is the facility’s risk tolerance. Healthcare facilities with a history of oversights or errors may want to take a more proactive approach to reducing the potential of mix-ups between sterile and nonsterile loads. Many times, at-risk facilities find that implementing a 3-zone workflow is the answer.

Healthcare systems like the U.S. Department of Veterans Affairs (VA) have seen the benefit of this model and have now made it a standard in their national design guide⁵. While it has yet to become a mandatory directive, in more cases than not during VA hospital construction or renovation projects, 3-zone sterile processing is a key element of their design plans because of the benefits they have already directly experienced.

There are other facilities that may not have a history of infractions or cross-contamination incidents, but they are risk-averse and proactive in their planning. They may see the long-term benefit of 3-zone SPD design and make plans for it in the future.

If the 3-zone fits ...

There may not yet be robots with x-ray vision inspecting the cleanliness of an endoscope or the teeth of a bone retractor. We have yet to see self-sterilizing instrument trays or sets that never go missing. But healthcare providers can continue to improve their sterile processing functions. By improving when, where and how

reusable medical devices are reprocessed and stored, a hospital reduces the potential for cross contamination of sterile environments.

Implementing a 3-zone sterile processing operation may not be the right decision for every hospital around the globe. To be successful, it requires process and practice changes, square footage allocation, and collaboration by many departments and disciplines within a healthcare system. However, those facilities that find the resources to implement this modern workflow design can realize significant benefits. They may be able to help mitigate patient safety and financial risks, improve their sterile processing efficiency and productivity, empower staff,

help improve worker satisfaction, and strengthen their bottom lines. Ultimately, these improvements will help protect the patients and communities they serve. **HPN**

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CONTINUING EDUCATION TEST • NOVEMBER 2019

3-zone sterile processing

Harness the productivity and value in this modern workflow

Circle the one correct answer:

1. What are the two zones within traditional 2-zone SPD workflow called?
 - a. Dirty Room and Clean Room
 - b. Decontam and Prep & Pack
 - c. A & B
 - d. None of the above
2. In a 2-zone SPD, sterilized items often must pass back through the area in which they were prepped for sterilization.
 - a. True
 - b. False
3. How is a modern 3-zone SPD workflow different from a traditional 2-zone workflow?
 - a. It adds an ante room for SPD staff to put on their personal protective equipment (PPE) before entering the Decontam
 - b. It adds a connecting sterile room that receives items from the prep and pack/sterilization area
 - c. It adds a work zone for employees to keep track of biological monitoring
 - d. It adds a manager's office within the SPD
4. What equipment is required for the implementation of a 3-zone workflow design?
 - a. A double-door sterilizer
 - b. A double-door washer disinfecter
 - c. Two back-to-back decontamination sinks
 - d. A multi-level ultrasonic
5. What is the term used to describe the process of "creating more value for customers with fewer resources"?
 - a. High Efficiency
 - b. Do more with less
 - c. Sustainability
 - d. Lean
6. Which industry popularized the Lean methodology in the United States?
 - a. The food industry
 - b. The healthcare industry
 - c. The automobile industry
 - d. None of the above
7. Which is not a principle of Lean techniques?
 - a. Eliminate staff
 - b. Eliminate defects
 - c. Reduce transportation of goods
 - d. Eliminate wasted motion or waiting
8. Hospital Administrators, infection preventionists and risk managers find value in what aspects of 3-zone SPD workflow design?
 - a. Mitigating risk of cross contamination
 - b. Improving the efficiency, efficacy and productivity of their revenue stream
 - c. Space requirements for a 3-zone department
 - d. A & B
9. Which type of facility is not an ideal fit for 3-zone workflow design?
 - a. Large hospitals with a plethora of full-time employees
 - b. Ambulatory surgery centers
 - c. U.S. Veterans Affairs hospitals
 - d. Sterile processing departments with a history of cross contamination
10. Which of the following circumstances makes a department a great candidate for 3-zone design?
 - a. A facility using Lean principles to improve processes
 - b. SPD renovation projects focusing on improving workflow and efficiency
 - c. An over-tasked and under-supported SPD looking to improve the quality of the goods and services they deliver to their customers
 - d. All of the above

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