

## IMPLEMENTATION MODULE:

# Regulated Medical Waste Segregation and Minimization in the OR

## Regulated Medical Waste in the OR

The operating room (OR) is often the largest generator of waste within a hospital setting, and has been estimated to produce between 20-33% of the total waste generated in the hospital<sup>1</sup> despite its diminutive spatial footprint. Of the waste generated by the OR, the largest percentage is often regulated medical waste (RMW), which can cost between 5 and 10 times more than solid waste to dispose of. A 2001 study by Malcolm Grow Medical Center estimated that approximately 60% of the hospital's RMW was generated by its ORs.<sup>2</sup> National benchmarks tell us that RMW should be no more than 15% of the total waste stream,<sup>3</sup> with the best performers driving down to well below 10%. ORs are one of the most egregious departments in terms of lack of segregation of RMW, despite the fact that every piece of waste generated pre-precision (save pharmaceutical products and certain anesthesia drugs) are either clean or sterile, and certainly not biohazardous by any state definition. Instead, some ORs have large regulated medical waste containers and virtually no other trash receptacle, meaning that all waste generated in the OR—packaging, paper, plastics, surgical instruments as well as blood-soaked waste may end up in the regulated medical waste stream.

Why is disposing of waste as RMW an issue? This waste stream costs on average, eight times more per ton to dispose of than solid waste and is linked to a myriad of environmental impacts through treatment and disposal. A single ton of solid waste might cost the facility \$121 to dispose of while a ton of RMW might cost \$963—an \$842 differential per ton.<sup>4</sup> Many ORs mistakenly dispose of more than 50% of their waste as RMW. If a typical OR department were to generate 4.0 tons of RMW per month at a cost of \$963/ton and 50% of it (conservatively) could be handled as solid waste (at \$121/ton) had appropriate segregation been utilized, the differential is approximately \$1684 monthly or \$20,208 annually. Most administrators would agree that they

could find good uses for \$20,000 to be re-diverted back into patient care, especially when segregation is not about technology fix that requires capital, but rather about a behavior change. Appropriate segregation of regulated medical waste is considered low-hanging fruit in terms of green programs in the OR.

How then does a facility begin to operationalize an RMW segregation program in the OR? There are several finite steps an organization can follow to set up and implement a regulatory-compliant RMW segregation program.

## Step 1: Use a Team Approach

As with any other initiative, leadership support is critical. Make sure OR leadership are supportive of tackling this issue and provide adequate background and examples from other hospitals, so they understand the benefits. Reach out to OR staff to see who might be interested in exploring implementation strategies or championing this effort with other staff. It is not uncommon to hear OR nurses complaining about the amount of waste generated. Help them understand that making sure waste goes in the correct disposal container is a first step toward being able to actually reduce that waste. And that by diverting clean or non-infectious waste to either solid waste or recycling, they are reducing the environmental impact generated when RMW is treated and disinfected—often the most toxic aspect of its disposal. Reach out to Infection Prevention and Environmental Services. Getting these two departments on board early can really strengthen an RMW segregation and minimization program. Both can provide critical guidance in setting up a program that will work with the hospital's existing waste and infection prevention policies and guidance.

## Step 2: Assess Current Practice

Before determining how and when to roll out a new initiative, it is important to assess how the practice is currently being handled. Determining a baseline is important in order to understand later if appropriate progress is being made in reaching program implementation goals. In the case of RMW generation in the OR, there are several options for determining a baseline. First, one can do a visual audit of how OR staff are handling waste during set up, during the surgery and during breakdown after the surgery. Ask a few questions:

- How many RMW containers are present in the room?
- What size are the containers?
- Are there any OTHER waste containers in the room (solid waste, recycling, etc.)?
- Are all containers accessible to OR staff?
- How is packaging and set up waste disposed of pre-incision?
- How is waste handled during the procedure?
- How is waste handled after the patient has left the room?
- Is there any segregation guidance (stickers, labels, posters) on RMW containers?

Understand the volume of waste going out the door as RMW. Work with Environmental Services (EVS) staff to try and pinpoint as accurate a volume as possible. If the hospital uses a waste tracking system, EVS may be able to offer very exact data on the pounds of RMW generated each day in the OR. Many hospitals, however, track RMW volumes hospital-wide and not by specific department. If this is the case, work with EVS staff to see if the organization can estimate:

- The number of daily pickups
- Approximate volume of material per pick up (some docks have a floor scale that could be used to weigh a sampling of waste carts coming from the OR over a set period of time)
- Multiply the average or estimated-weight-per-cart by the number of pickups to get a rough sense of what the OR is producing in a day in terms of RMW.

Brainstorm with EVS on how best to do this audit. Ask EVS how much the organization is charged per pound or ton of RMW. Multiply waste volume generated in the OR by the cost per pound (or ton), and the organization now has a sense of both the baseline waste volume and costs of RMW generated by the OR over a set period of time. As waste disposal costs are typically tied to the EVS budget rather than departmentally, EVS may be very willing to help think about developing an accurate baseline by which to measure waste reduction and savings.

## Step 3: Understand What Material is Defined as RMW in State

To complicate matters, definitions for regulated medical waste (RMW) vary state to state, and federal guidelines through OSHA are open to interpretation. The project team should review the facility's policies, procedures and definitions for RMW handling and disposal with the organization's Infection Preventionist (IP). Connect with EVS to ensure comprehension of state-specific regulations for the proper segregation, storage and ultimate disposal of RMW. To double check the state's rules for managing RMW, visit the EPA's Healthcare Environmental Resource Center at: <http://www.hercenter.org/rmw/rmwlocator.cfm>.

## Step 4: Setting Up for Success

Work with the project team to determine the most appropriate strategy for reducing RMW in the OR. Once the organization has a clear definition of RMW in mind, the team can identify different areas across the OR that generate RMW and identify opportunities for new processes, increased standardization, appropriate receptacles, signage and training. Some of these minor tweaks and changes will go a long way toward setting up the department for success. Some ideas the team may want to consider:

- Identify a standardized approach to RMW collection containers—some ORs prefer small kickbuckets for use in the OR, while others prefer a wheeled hamper.
- Create signage that depicts proper segregation definitions and sorting procedures. Many people are visual learners and signage can reinforce proper segregation at the point of generation. Signage on the inside of hamper lids can be helpful, for example.
- Eliminate any pre-incision use of regulated medical waste containers and eliminate red bags from unnecessary locations like scrub sinks where bloody waste is not generated.
- Consider increasing solid waste receptacles to ensure adequate containment of the material appropriately diverted from RMW containers.

## Step 5: Educate Staff

Despite any increased interest, enthusiasm or resistance for the new RMW minimization program, all staff in the OR will need to be retrained with guidance on how to change their behavior to meet the new goals of the segregation program. Consider partnering with a Nurse Educator to engage the nursing staff. Run short In-Services for staff at the beginning of each shift. Include the facility's commitment to compliance, good segregation practices, and stewardship. Help staff understand new segregation goals and the reasons for the change. Staff should understand

that improper disposal of their waste has potentially serious safety threats to waste haulers and increased liability for the hospital. Make it clear to staff that it is part of their job to manage waste safely and segregate appropriately. Answer questions—address concerns. Train new employees on their first day as part of orientation. Retrain staff annually as part of annual training requirements. Notify physician leadership that the change is taking place. Pull aside those staff members who are unable to attend In-Services to ensure they understand the new program and address any language barriers to ensure comprehension.

## Step 6: Selecting a Segregation Strategy

Different hospitals select different ways to approach the segregation issue. The hospital should select the strategy that makes the most sense given its management tone, risk management perception and the level of staff comfort. There are several dominant strategies that can be used solo or in combination:

- **Diverting Non-Infectious Waste Pre-Incision** Many hospitals begin their segregation programs by implementing a focus on the diversion of non-infectious waste during set-up. During surgical set up, the case cart is unpacked, kits and supplies are opened and lots of packaging, rigid plastics, and blue sterile wrap are thrown into the trash. Ensure there is a large solid waste container (and recycling container—if applicable yet) on hand for disposal. Because the set-up is pre-incision and it is a sterile surgical environment, virtually all of the waste generated—save any pharmaceutical formulations or sharps—will be non-infectious. Some hospitals line the red RMW containers with a clear bag during set up to capture non-infectious waste and then tie off the clear bag and set it aside before the procedure starts. A focus on diverting pre-incision waste can reduce RMW in the OR considerably.
- **Segregating Non-Infectious Waste After Surgical Procedure** Some hospitals then move to ensuring that non-infectious items are properly segregated during clean-up after the procedure. Depending on the intensity of the procedure, this can include back table cover and mayo stand covers (of the disposable variety), and surgical drapes that do not meet the regulatory guidelines for infectious waste (typically soaked or saturated with blood or body fluid), as well as remaining packaging, sterile wrap and non-sharp instruments that cannot be resterilized, reprocessed or reused for another procedure. Again, these items should be placed in a clear bag (solid waste) or recycling container as appropriate. Note: any material placed in a recycling container typically should be clean and not have come into contact with the patient.



*One OR lines the regulated medical waste container with a clear bag for procedure set up—to divert clean packaging waste from the medical waste stream*

- **Segregating Non-Infectious Waste During Surgical Procedure** For hospitals that feel very comfortable with their education efforts with staff around proper segregation, the last phase is a focus on having staff continue to divert non-infectious waste during the actual procedure. This would involve having an RMW container readily accessible for infectious waste generated during the procedure, but also having alternate containers (for solid waste or recycling) accessible in the room for ongoing segregation. If the institution is a teaching hospital, it is critical to ensure that residents or visiting faculty understand proper segregation guidelines. A single bloody glove in the solid waste or recycling stream can cause big issues from a regulatory compliance standpoint. Many hospitals have been very successful at this approach but education and comprehension are key.

## Step 7: Consider Other RMW Sources in OR

Both liquid waste as well as sharps generated in the OR are typically considered RMW. Both of these waste streams have special handling guidelines that this implementation module will not cover. From a sustainability perspective, ORs should consider fluid management systems that divert liquid waste directly to the sanitary sewer as means to reduce staff exposure risks, supply costs and waste disposal costs. For sharps management, many hospitals have moved to the use of reusable sharps container systems that reduce both the volume and cost of RMW the organization generates while also reducing supply costs for disposable containers. Separate implementation modules address both of these topics.

## Step 8: Problem Identification and Resolution Plan

Every new program has its hiccups. Expect setbacks. Have a plan of action to resolve problems. Use those setbacks as an opportunity to reengage staff on the core purpose of the program. Stay connected to the EVS Director, so that he/she keeps the OR aware of any emerging issues. Finding a nurse champion for each shift has been a very successful mechanism to grow support for this operational change. Hold refresher In-Services to re-engage and retrain staff. Develop a mechanism to report concerns or problems and appropriate solutions back to all OR staff. Many hospitals have found that documenting problems with a photograph, and cataloging them according to shift or procedure works best, if possible. Demonstrating visually what should NOT be happening can also help other OR staff be on the lookout for improper segregation practices.

## Step 9: Track Progress and Recognize Success

People like to know they are achieving their goals. Work with EVS to determine a mechanism to measure reduced waste volumes. Because waste volumes and disposal costs are typically tracked in EVS rather than by department, EVS will be a key partner in helping the organization and the OR understand the value of the RMW segregation program. Celebrate success! If possible, provide

staff with real-world estimates of reduced environmental impact or waste reductions. Report reductions or cost-savings to OR manager to share with leadership. Make sure sustainability leader or green team (if applicable) knows about the success the OR is having, and includes it in any award applications or recognition opportunities. Some hospitals have even used this program as a performance improvement indicator for Joint Commission Environment of Care. Get creative and help staff feel proud of their great work. Success in one area often builds momentum to tackle harder sustainability practices.

**For More Information:** Go to [www.GreeningTheOR.org](http://www.GreeningTheOR.org) for a list of key resources that assist you in this program area. Because this list is updated often, we keep it online, so as not to date this implementation module. Also available are case studies on RMW segregation efforts in the OR. Learn from your peers!

### Endnotes

- 1 Esaki, Roy K., and Alex Macario. "Wastage of Supplies and Drugs in the Operating Room." *Medscape Anesthesiology*. WebMD LLC, 21 Oct. 2009. Web. 12 Feb. 2011. <http://www.medscape.com/anesthesiology>
- 2 United States Air Force IERA. Medical Waste Incinerator Waste Management Plan-Malcolm Grow Medical Center, Building 1056, Andrews Air Force Base, MD. June 2001. Accessed on Feb 13, 2011. Available at: [http://airforcemedicine.afms.mil/idc/groups/public/documents/afms/ctb\\_033957.pdf](http://airforcemedicine.afms.mil/idc/groups/public/documents/afms/ctb_033957.pdf)
- 3 Practice Greenhealth. Sustainability Benchmarking Report. 2010. Available at: [www.practicegreenhealth.org](http://www.practicegreenhealth.org)
- 4 Ibid.



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