

A surgeon at the University of Minnesota Medical Center-Fairview recently reduced the amount of waste generated during one of his procedures and is saving the facility \$2,000 and 80 lbs of waste annually.

Reducing waste from the operating room

The University of Minnesota Medical Center-Fairview (UMMC) is a highly-respected educational institution located on the University's Minneapolis campus. The hospital has nearly 2,000 beds and performs over 20,000 surgeries each year. Fairview's mission is to improve the health of the communities it serves.

One surgeon has linked community health to the health of the environment and has made it his mission to reduce as much waste from his procedures as possible. Dr. Rafael Andrade was concerned about the waste and pollution generated during surgical procedures and has been working to reduce that waste by minimizing unnecessary disposable items, using more reusable equipment, and minimizing toxic chemicals. For one common procedure, Dr. Andrade realized waste could be reduced with a few simple, but safe substitutions and item deletions.

Need for Change

The first procedure Dr. Andrade evaluated for waste reduction is the vascular access port placement. This procedure is done to provide easy

venous access in patients receiving chemotherapy. The ports allow easy access to a vein for medication, blood draws, and CT scan contrast injections. The ports also minimize needle sticks and help maintain vein integrity. Many surgeons at UMMC perform this procedure; it is performed over 200 times annually in UMMC's operating rooms. Dr. Andrade alone performs this surgery approximately 40 times each year.

Each set of instruments and equipment for a specific procedure, often called a pick, is prepared according to the doctor's specification. Dr. Andrade realized that following the port placement, the pick had a number of unnecessary items and redundancies. Therefore, he worked with operating room nurses and staff members to determine what items in the pick were vital to the success of the surgery (Table 1).

Waste-Reduction Opportunities

From examining his pick and determining what items were extraneous, Dr. Andrade was able to reduce the amount of items and reduce the waste from the procedure.

The new pick contains 27 items, as opposed to 44 in the old pick. The new pick also includes reusable gowns and linens and reduces the number of syringes, sutures, drapes, and dressings discarded. Dr. Andrade's pick eliminates one pound of waste and saves \$50 in supply costs per case.

Additional Waste Reducing Changes

Additional changes that Dr. Andrade has implemented include minimizing surgical prep waste, using reusable gowns, and choosing only the necessary amount of sterile saline solutions. Additionally, a recommendation has been made for the facility to start moving toward using lead-free indicator tape.

Surgical prep waste

3M's Duraprep™, a patient skin prepping solution in a self-contained applicator, is used to provide



asepsis to the area where the port is being inserted into the patient. Any leftover Duraprep™, because it contains alcohol, must be disposed of as an ignitable hazardous waste. Also, solvents such as alcohol are used to clean the iodine residue left from the Duraprep™ off of the patient’s skin, which adds to the time required for the procedure and increases costs and waste. Alternatives, such as Hibiclens™, are non-hazardous and do not need to be removed from patient’s skin, which reduces the use of additional materials and time.

Duraprep™ is sold in both 10 and 26 ml sizes. Often the 26 ml is included in surgical picks; however, it is possible that 10 ml size would suffice. For cases that do not require a large field of asepsis, a 10 ml size of Duraprep™ could be used, which can potentially eliminate the hazardous waste leftover from the procedure.

Reusable gowns

Reusable gowns that are washed and reprocessed through UMMC’s sterile processing department cost Fairview \$1.08 each to process. Each gown can be reprocessed approximately 50 times before disposal. Disposable gowns for the procedure cost the hospital \$2.39 and generate 0.5 lbs of waste each. Overall, Dr. Andrade’s choice of reusable gowns costs Fairview \$170 annually and generates no solid waste. However, using disposable gowns would cost \$287 and generate 60 lbs of waste annually.

Table 1. Picks Used for Port Placement Procedure

New Pick		Old Pick		
Pitcher sterile 1000mL		Pitcher sterile 1000mL		
Linen towel 5-pack		Linen towel 5-Pack		
Linen gown pack (3 reusable gowns)		Gown Xlg disp (disposable gown)		
Pack Minor: Bag, bedside Blade, #15 Cover, back table Cover, Mayo stand Cautery w/blade, holder Cautery, tip cleaner		Pack Angio Minor: 7 qt basin 0.67 oz Benzoin tincture Cover, back table 2 C-arm snap, large Fluid containment cup w/lid 2 oz med cup 5 oz specimen cup w/lid Drape, split		
Needle counter, 40 ct Needle, 25 g 1 ½ Sponge, 4 x 8 Syringe control, 10cc Light handles, 2 4 x 4 dressing, 2		Dressing, Tegaderm 4 x 4 ¾ Guide wire 0.035 x 145 cm Med cup, 2 oz Needle, 18 g x 7cm Seldinger Needle, 25 g x 2” injection Scalpel, #11 IV Dressing split Dressing, Tegaderm 2 3/8 x 2 3/4		
Sponge, 2 x 2 gauze 30-Sponge, 4 x 4 2 ply 2-Steri Strips ½ x 4” Stopcock, 1 way 2-Syringe 10 cc LL Syringe 10 cc control LL w/shield 2- Syringe 10 cc LS w/shield 2-Syringe, 30 cc LL				
Prep Chlorhexidine 4% 4oz	Radiation cover probe	Prep Duraprep 26mL	Suture Ethilon 3-0 PS-1 18”	Syringe ear bulb 3oz
Drape U split 74 x 120”	Suture Vicryl 3-0 SH 27”	Light Handle X1	Suture Vicryl 3-0 SH 27”	Label medication system
Drape loban incise 13 x 13”	Suture Prolene 3-0 SHDA 36”	Decanter Vial	Suture Vicryl 4-0 PS-2 18”UND	Blade clipper
ESU ground pad universal w/o cord	Suture Vicryl 4-0 PS-2 18”UND	Pad Chux underpad 30X30”	Suture PDS II 3-0 SH 27”	Sol NaCl 0.9% 10mL vial
Syringe 10mL LL w/o needle	Solution, water, 1000 mL bottle	Catheter SQP 08fr SL	Sponge Ray-Tec 4X8”	Sol NaCl 0.9% 1000mL bottle
Blade clipper	Solution, NaCl 0.9%, 1000 mL bottle	Syringe 10mL LL w/o needle	Catheter VA intr 10fr 16cm kit	

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For More Information

MnTAP has a variety of technical assistance services available to help Minnesota businesses implement industry-tailored solutions that maximize resource efficiency, prevent pollution, increase energy efficiency, and reduce costs. Our information resources are available online at <mntap.umn.edu>. Please call MnTAP at 612.624.1300 or 800.247.0015 for personal assistance.

Sterile saline solutions

Picks often have 1 liter containers of sterile saline; however, the port placement procedure uses less than 500 ml. Substituting 500 ml sterile saline for the 1 liter bottles would reduce over 20 lbs of waste save \$16 annually.

Lead-free indicator tape

Reusable gowns, as well as surgical instruments, must be wrapped and sterilized. The wrapping fabric, often called “blue wrap” is secured using indicator tape which changes color once the package has been sterilized. UMMC currently uses lead-based indicator tape. Therefore, the tape and any blue wrap that is in contact with the tape may be considered hazardous waste. To lessen the amount of hazardous waste generated by sterilization, UMMC can either move to hard cases or use copper-based indicator tape.

Impact

Currently, the new pick that Dr. Andrade has begun using reduces the waste by one pound and saves \$50 for each procedure. Changing to 500 ml bottles of saline reduces waste by an additional pound per procedure. Assuming Dr. Andrade performs 40 procedures per year, he alone saves UMMC at least \$2,000 in material costs, eliminates at least 80 lbs of waste, and reduces greenhouse gas emissions by 64 lbs.