Using Microfiber Mops in Hospitals

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JCAHO Environment of Care Standards 1.3, 2.3, 4.0

Why Consider Alternative Mopping Techniques?

Using conventional loop mops for wet mopping of patient care areas has long been the standard in floor cleaning for janitorial operations in hospitals. However, the health care industry has taken a recent interest in evaluating hard floor maintenance techniques in terms of employee, patient, and environmental health. Many floor cleaners used in hospitals contain harsh chemicals such as quaternary ammonium chlorides and butoxyethanol, which can be harmful to human health and the environment. To reduce the risk of cross-contamination for patients, conventional mopping techniques require janitors to change the cleaning solution after mopping every two or three rooms – meaning that cleaning solutions (including both chemicals and several gallons of water) are constantly being disposed of and replenished.

Some facilities have begun using a new mopping technique involving microfiber materials to clean floors. Microfibers are densely constructed, polyester and polyamide (nylon) fibers that are approximately 1/16 the thickness of a human hair. The density of the material enables it to hold six times its weight in water, making it more absorbent than a conventional, cotton loop mop. Also, the positively charged microfibers attract dust (which has a negative charge), and the tiny fibers are able to penetrate the microscopic surface pores of most flooring materials. These characteristics make microfiber an effective mopping material; the following case study provides detailed information to help your hospital evaluate the possibility of using microfiber mops.

- *Large, heavy mop head*
- *Requires frequent changing of cleaning solution*
- *High chemical and water use*
- *Labor intensive*

Conventional Wet Loop Mops

VS.

Microfiber Mops

- *Light and ergonomic*
- *Prevents dirty mop heads from contaminating cleaning solution*
- *Dense, durable fibers reach into surface pores*
- *Cost effective*

case study | ## Mopping Up Savings at UC Davis

The University of California Davis Medical Center (UCDMC) in Sacramento, CA, had three motivations for changing the way its custodial staff maintained the floors in patient care areas:

- **Reduce chemical use and disposal**. Conventional wet mopping practices require cleaning solution changes after every third room to reduce patient health risks from cross-contamination.
- **Reduce cleaning times for patient rooms**. Conventional wet mopping practices–including mopping the floor, preparing and changing the cleaning solution, and wringing the mop before and after jobs–take approximately 15 minutes for a typical patient room.
- **Reduce custodial staff injuries and workers' compensation claims**. Conventional wet mopping practices can lead to custodial staff injuries through the repeated motions of mopping and wringing.

Microfiber Mops

- *are less work-intensive than conventional mops,*
- *virtually eliminate cross-contamination during janitorial tasks, and*
- *drastically reduce chemical and water use while cleaning more effectively.*

The environmental staff at UCDMC identified MicroScrub® microfiber mops as a potential alternative to conventional mops that might reduce costs. However, before changing the floor maintenance techniques, the environmental staff had a few obstacles to overcome. For example, the custodial staff was somewhat averse to change and was unconvinced that the microfiber mops would be as effective. Other hospital personnel, such as nurses and doctors, and even patients also shared this concern.

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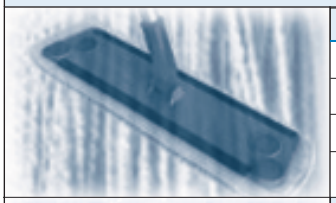
Reasons for Change

Although change is never easy, the environmental staff worked with custodial supervisors to communicate the personal benefits of using microfiber mops in place of a conventional mop. There were two characteristics that helped alleviate the concerns of the custodial staff. First, the microfiber mops weigh approximately five pounds less than conventional wet loop mops, making them much easier to use. Second, the microfiber mop head is changed after every room is mopped, benefiting the custodial staff in two ways: 1) the effort of wringing a conventional mop is eliminated, and 2) as long as the used mop head is not put back in the cleaning solution, the custodian does not have to change the solution between rooms. The latter feature was particularly attractive, as a full bucket of cleaning solution can weigh 30 pounds or more and has to be lifted an average of seven times a day. Both characteristics have significantly reduced labor costs. Moreover, because the same mop water is not being shared between rooms, microfiber mopping virtually eliminates the cross-contamination risk that floor mopping can pose for patients.

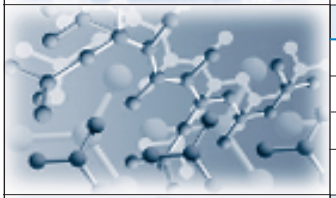
To address concerns regarding the effectiveness of the microfiber mops, the environmental staff performed demonstrations in which an area would first be cleaned with a conventional mop and then re-cleaned with a microfiber mop. In each case, the microfiber mop would capture more dust and dirt. However, when the same test was done in reverse order, the conventional mop was not able to capture more dust and dirt beyond the capabilities of the microfiber mop.

Cost comparisons between conventional wet loop mops and microfiber mops for UC Davis Medical Center.



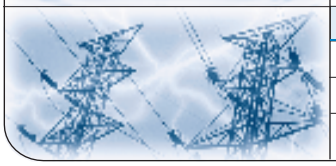
	Microfiber Mop	Conventional Wet Loop Mop
Mop Costs		
Cost:	$17.40 each	$5.00 each
Washing Lifetime:	500 to 1000[1]	55 to 200[2]
Rooms Cleaned Per Washing:	1	22
Cost Total:	$1.74 to $3.48 per 100 rooms	$.11 to $.41 per 100 rooms

Labor Costs		
Rooms Cleaned Per Day:	22 per eight hour shift	20 per eight hour shift
Labor Cost:	$12 per hour	$12 per hour
Cost Total:	$436 per 100 rooms	$480 per 100 rooms



Chemical Costs		
Quantity of Chemical:	0.5 ounce per day	10.5 ounces per day
Cost of Chemical:	$.22 per ounce	$.22 per ounce
Rooms Cleaned Per Day:	22	20
Cost Total:	$0.50 per 100 rooms	$11.55 per 100 rooms

Water Use		
Quantity:	1 gallon	21 gallons
Rooms Cleaned:	22	20
Cost Total:	5 gallons per 100 rooms	105 gallons per 100 rooms



Electricity Usage (Washing)		
Cost:	$.030 per mop	$1.00 per mop
Cleaning Frequency:	once per room	once per day
Cost Total:	$30 per 100 rooms	$5 per 100 rooms

> > Total Costs < <	
$468 to $470 per 100 rooms per day	$497 per 100 rooms per day

> > Microfiber mops use 95% less water and chemicals < <

[1] Vendors guarantee microfiber mop heads for 500 washings; UCDMC typically used mop heads for over 1,000 washings.

[2] Vendors estimate conventional wet loop mops to last 55 washings; UCDMC replaced them after 200 washings.

Program Results

UCDMC first used the microfiber mops in a pilot test beginning in summer 1999, and within one year it completely replaced conventional loop mops with the microfiber alternative in all patient care areas. The program resulted in three measurable economic benefits:

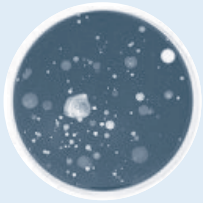
- 60% lifetime cost savings for mops
- 95% reduction in chemical costs associated with mopping tasks
- 20% labor savings per day

The initial cost to implement the program was significant, as a microfiber mop costs over three times more than a conventional loop mop. However, the manufacturer guarantees the microfiber mop head for 500 washings, while a conventional mop typically withstands only 55 washings, giving the microfiber mop a comparatively low lifetime cost. Although UCDMC uses quaternary ammonium chloride solution for other applications, switching to the microfiber mopping system reduced the amount of the chemical purchased by 46 percent, from 513 gallons in 1999 to 283 gallons in 2000. Also, because the microfiber mops are easier and faster to use, UCDMC saved 638 hours per year for each worker, or approximately $7,665 in wages.

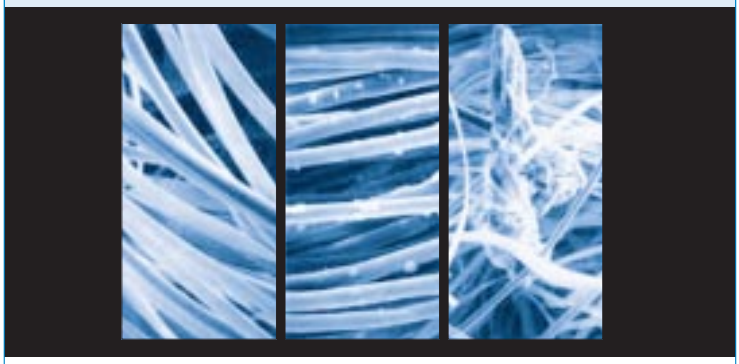
Three other economic benefits are less easily quantified and will vary by location: 1) cost savings from decreased water use, 2) reduced workers' compensation claims, and 3) potential construction savings from eliminated need for mop sinks in janitor's closets. Because janitors no longer change cleaning solution every third room, UCDMC cut its water use for mopping by 95%. Another benefit that has become apparent is the cost savings from reduced workers' compensation claims. UCDMC management has determined that the microfiber mops are easy enough to use that janitors placed on "light duty" because of an injury are tasked with mopping floors. However, because of the variety of claims made and the inconsistent associated costs, UCDMC has been unable to quantify the cost savings from reduced claims. Lastly, since microfiber mops eliminate the need to frequently change cleaning solution and rinse mop heads, the need for a mop sink in janitor's closets is eliminated. This should be taken into consideration when new facilities are built or existing facilities are remodeled.

UCDMC found in testing that microfiber materials were able to penetrate surface pores and remove dust particles that conventional mops missed.

Bacteria culture taken after a traditional wet mop cleaning — only a 30% reduction from precleaning.



Bacteria culture taken after microber mop cleaning — a 99% reduction!



These magnified photos show three stages of microfibers: the first is before using, the second shows tiny dust particles that stick to the fibers, and the third shows dirt and bacteria caught in the network of fibers after light use.

Limitations

UCDMC does not use the microfiber mops in areas contaminated with an extraordinary amount of blood or other body fluid, including certain areas of the emergency and operating rooms. In these cases, UCDMC personnel use conventional loop mops. The microfiber mops are also not used in greasy, high-traffic kitchen areas; rather, UCDMC continues to use mechanical floor cleaning machines in these areas.

The microfiber mop heads cannot be laundered in industrial washers and dryers, as the heat settings are often too high and can damage the material. To address this issue, UCDMC established a cooperative agreement with Mercy General Hospital (which also uses microfiber mops), to launder the mop heads in house. Mercy General Hospital uses a standard commercial washer and dryer with controlled heat settings and standard laundry detergent. The vendor advises against using chlorine

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The secret of microfiber

Microfiber cleaning materials are a blend of microscopic polyester and polyamide fibers which are split in such a way as to create microscopic "hooks" which act as claws that scrape up and hold dust, dirt, and grime. They are 1/16 the thickness of a human hair and can hold six times their weight in water.

bleach, which can degrade the material, and discourages washing microfiber mops with other non-microfiber materials.

How many mops do you need?

Because a clean microfiber mop head must be used in each patient room, UCDMC learned that it is important to consider the amount of time required to launder the mop heads when determining how many to purchase. If this factor is not properly evaluated, instances could occur where not enough clean microfiber mop heads are available for the day's cleaning routine. Simply put, the longer the turnaround time for laundering the mop heads, the more mop heads needed. UCDMC learned that room size affects the number of mop heads needed. Because a microfiber mop is not dipped back in the cleaning solution once the mop has been used, larger rooms may require more than one mop head. Mercy General Hospital has implemented another way to add more moisture and cleaning solution without causing cross-contamination concerns: their janitorial staff carries a spray bottle of cleaning solution to use on stubborn spots or to provide additional moisture.