Risk Services Best Practices Bulletin

Trash, Recycle, Linen Handling

Presented by Office of the President Risk Services – May 13, 2011

Throughout the UC system, custodians are among the highest occupational groups at-risk for injury. Their high frequency and severity of injury is due to the physical nature of their work that often involves awkward postures, repetition of motion, and forceful exertion.

The following Best Practices are offered to guide those responsible for supervising and/or ensuring the health and safety of these custodial workers.

Best Practices:

Reduce the frequency of manually handling trash, recycle and linen materials at all stages of collection, transportation and dumping. This can reduce the risk of injury and increase workers' productivity.

- Purchase receptacles that have venting channels to reduce force needed to overcome suction.
- Use wheeled containers to collect and transport materials. When the design of the trash enclosures or dumpster itself is such that the overall height of the dumpster is higher than 36 inches, or, if the trash is usually more than (25#), use an automated dumping device.[1,2] **Refer to Recommended Product Sheets**
- Use an extension device to push and hold the dumpster lid **o**pen. This will help eliminate holding the lid open with one arm and throwing the bag of material with the other. Train custodians to use both hands to place material in dumpster. **Refer to Recommended Product Sheets**
- When automated equipment is not available, the following considerations should be made:[3-5]
    - Provide side opening receptacles to reduce lifting above shoulder height. Empty containers more frequently to reduce weight of containers.

- Prepare to lift bag or empty receptacles. This includes testing the weight of the bag, checking for contents such as sharp objects and heavy items such as books, fluid-filled containers, or glass.
- In the wheeled container, tie off bags when they are half full (or no more than 25 pounds) and start a new bag on top of the first
- Where applicable, tip container over and pull bag out from the side to reduce force needed to overcome suction
- Consider ways to reduce the walking distance when transporting containers to dumpster. **Refer to Recommended Product Sheets**
- Avoid saving all lifting tasks to perform continuously or at the end of the shift. Physically-challenging tasks should rotate between less strenuous tasks in an effective work flow.

General Considerations

- Develop a system where the building occupants bring trash and recycled materials to a central location for custodian to transport to dumpster. This will reduce picking up materials.
- Leave a larger wheeled container in a closeable room for areas with a high volume of recycled materials. This will reduce the manual handling needed to discard and/or condense materials before transport to dumpster.
- Establish a dedicated team to reduce the number of staff exposed to trash/recycle linen handling injuries.

Equipment[5-7]

Selecting the most appropriate equipment is an important decision. Prior to purchasing:

- Contact the campus ergonomist to help with the selection process
- Include custodial staff in the selection process
- Arrange for demonstration of product by manufacturer or distributor
- Refer to the Recommended Product Sheets for applications and recommendations
- Pilot the preferred equipment for a minimum two–week trial period

During the pilot period, consider the following:

- Adjustability, size and weight of equipment to accommodate wide range of body types
- Appropriate sized casters and swivel design to allow for easy rolling and maneuverability
- Size, and type of surfaces to be cleaned
- Location of controls and ease of operation
- Noise and vibration levels
- Storage and transporting needs
- Equipment maintenance and replacement parts

- Battery life and charging time
- Need for back-up equipment

Training[5]

Initial training should be provided for new employees within the first 30 days and annually thereafter. Training is best provided in small groups with the involvement of supervisors, leads, ergonomists and vendors.

Training should include:

- Hands-on performance of job tasks and related activities
- Equipment use, maintenance, storage, safety procedures and use of personal protective equipment (PPE) as required
- Instruction in proper body mechanics
- Verbal, written and illustrative materials to accommodate non-English speaking workers

Work and Staffing Guidelines[5]

Work and staffing guidelines insure that employees are adequately trained and assigned reasonable workloads. Guidelines include:

- Staff levels that provide adequate coverage to complete assigned work tasks
- Cross-training to allow for job rotation as needed
- Staff levels to avoid overtime
- Backup staffing to accommodate unplanned absences
- Use of task and job rotation to limit repetition and fatigue
- Use of teams for heavy lifting and moving tasks
- Pre-shift exercises to warm up muscles to prepare for work
- Frequent rest breaks
- Implementation and support of a work hazard notification system to identify problems such as excessive weight in trash containers

References: (1) UC Berkeley Indoor/Outdoor Enclosure Design Criteria, September 2010. Contact mlynch@uhs.berkeley.edu; (2) Consolidated Fabricators Corporation 901 Simmerhorn Rd, Galt, Ca 95632; (3) British Columbia School Safety Association, WorkSafeBC, "A Clean Sweep, Safe Work Practices for Custodians", Available at http://www.worksafebc.com/publications/health_and_safety/by_topic/assets/pdf/clean_sweep.pdf; (4) Industrial Accident Prevention Association, "A Health and Safety Guideline for Your Workplace", 2008, pp. 1-6. Available at www.iapa.ca/pdf/manmat.pdf; (5) Cal/OSHA Consultation Service, Department of Industrial Relations, *Working Safer and Easier for Janitors, Custodians, and Housekeepers,* 2005; (6) Hansen, Steve, "Understanding Ergonomics and How it Affects Your Cleaning Business", *Custodial Workers' Resource*. Available at http://custodian.info/ergonomics.html; (7) Eastman Kodak Company, "Ergonomic Design for People at Work", Vol. 2, pp. 374 (Hand Carts and Trucks), 1986

Recommended Product Sheet

Trash and Linen Transporting

Motorized Tug

	**Criteria:**	Motorized Tug fits multiple carts using "universal coupling hitch" Custom design attachments can link or "train" multiple carts
	Application:	Transporting trash and linen container

Make	**Model**	**Comments** (Pros and Cons)	
Ergo Tug	Motorized Tug Model 4000	**PROS:** • Universal hitch system or custom hitch built to user specifications • Easily attaches to cart • Can pull up to 2,000 lbs. • Can tow multiple carts • Easily maneuverable • Meets JACHO requirements	**CONS:** • Indoor use only • Works best on smooth and level surface
	Approximate cost	$7,000	
	For more information	**North:** Joyce Rhoades joyce.rhoades@ucsf.edu **South:** David Wilson dwilson@mednet.ucla.edu	
URL:	http://www.phswest.com		

Recommended Product Sheet

Trash /Recycle Handling

Dumpster Pole

Criteria:	Assists custodians and others who carry loads to dumpsters by holding the lid open
Application:	Loading trash and recyclables into dumpsters

Make	Model	Comments (Pros and Cons)	
Flexible Scientific	Dumpster Prop®	**PRO:** • Eliminates the need to twist body while one hand holds up the lid • Reduces strain on shoulders and back	**CON:** • Need to locate storage for it near dumpster or on cart
	Approximate cost	$50.00 per pole at UC discount	
	For more information	**North:** Ira Janowitz ILJanowitz@LBL.GOV **South:** Flexible Scientific 8451 Miralani Drive, Suite A San Diego, CA 92126 Phone: 888-538-8715 Fax: 888-538-8716	
URL:	http://www.flexiblescientific.com/dumpster-prop		

Recommended Product Sheet

Handling Clean Linen

Spring-lift platform carts

	**Criteria:**	Spring-lift platform raises load up to the worker as weight is reduced
	Application:	Handling clean linen Spring-lift reduces bending over to handle linen

Make	**Model**	**Comments** (Pros and Cons)	
Maxi-Movers	Model 2914 Model M2820	**PRO:** • Reduces bending over to handle linen • Easily maneuverable • Two cart sizes (25" wide x 36" long and size 36" wide x 67" long) • 4 class ratings from 250 to 420 lbs. • Powder coated base with replaceable casters	**CON:** • Indoor use only
	Approximate cost	$500-$725	
	For more information	Jill Evans-Grinbergs jill.evansgrinbergs@ucdmc.ucdavis.edu	
URL:	http://www.maxi-movers.com		

Recommended Product Sheet

Dumping Trash and Linen

Stationary Large Load Lifter

Criteria:	Lifts multiple container sizes Dump heights 48" -70" Load capacity 2500 lbs.
Application:	Dumping large trash or linen containers

Make	Model	Comments (Pros and Cons)	
Toter	Universal Lifter 3078-XX-6000	**PRO:** • Lifts multiple container sizes • Universal adapter available for caster and two-wheel carts • Load capacity 2500 lbs. • Power supply 208/230/460V three phase, 5HP • Adapter available for caster and two wheel carts	**CON:** • Requires compatible containers • Requires storage space
	Approximate cost	$9000-$10,000	
	For more information	Joyce Rhoades joyce.rhoades@ucsf.edu	
URL:	http://www.toter.com		
Toter	Universal Lifter Low Profile 3078-LP-5000	**PRO:** • Dump height 35" • Load capacity 3500 lbs. • Power supply 208/230/460V three phase, 5HP	**CON:** • Require compatible containers • Requires storage space
	Approximate cost	$8500-$9500	
	For more information	Joyce Rhoades joyce.rhoades@ucsf.edu	
URL:	http://www.toter.com		

Recommended Product Sheet

Trash/Recycling

Mobile Container Lifters

Criteria:	Mobile power lift unloads trash and recycling into large dumpsters at various locations
Application:	Lifts various container sizes with weight capacity up to 350lbs. with a dump height range between 34" – 74" depending on the size of the container

Make	Model	Comments (Pros and Cons)	
Toter	Atlas Mobile Lifter 3081-MT-1000	**PRO:** • Mobile lifter allows for staging dumpsters at various locations & closer to the facility • Two container sizes can be used, 32 and 44 gallon • Unloads into multiple style container systems; front load, side load, and roll-off open top • Compatible with vertical/horizontal balers, self-contained and stationary compactors • Uses two 6 volt batteries • Can dump 100 lbs. for 8 hours on fully charged battery • Battery charger included	**CON:** • Requires 42" x 42" footprint
	Approximate cost	$4500-$5000	
	For more information	Joyce Rhoades joyce.rhoades@ucsf.edu	
URL:	http://www.toter.com		
Toter	Saddle Mobile Lifter 3081-MT-5000	**PRO:** • Mobile lifter allows for staging dumpsters at various locations closer to facility • Various container size can be used; 32 and 64 and 96 gallon, 2 wheel containers, 35,60,90 gallon caster • Unloads into multiple style container systems; front load, side load, and roll-off open top.	**CON:** • Requires 42" x 42" footprint

		• Compatible with self-contained and stationary compactors and vertical/horizontal balers • Uses two 6 volt batteries • Can dump 100 lbs. for 8 hours on fully charged battery • Battery charger included	
	Approximate cost	$4500-$5000	
	For more information	Joyce Rhoades joyce.rhoades@ucsf.edu	
URL:	http://www.toter.com		

Recommended Product Sheet

Transporting Recycle Containers

Powered Hand Truck

Criteria:	Powered hand truck designed for indoor, outdoor, and ramp use for transporting heavy containers
Application:	Transport large, heavy containers

Make	Model	Comments (Pros and Cons)	
Wesco	Cobra Pro	**PRO:** • Drive can be disengaged to be used in manual mode • Power drive works in 2-wheel or 4-wheel drive • 1200-pound capacity in 4-wheel mode, 600-pound capacity in 2-wheel mode • Converts easily from dolly to hand truck • Can be used indoors and outdoors • Can be used on a ramp up to 17.5 degrees	**CON:** • Battery life 6 hours • Unit weighs over 100 pounds • Maximum capacity of 950 lbs in 4-wheel mode when used on ramps
	Approximate cost	$1300	
	For more information	Kristie Elton Kristie.elton@ucr.edu	
URL:	http://www.wescomfg.com/html/hand_trucks/aluminum_cobrapro_convertible.htm		

Recommended Product Sheet

Trash/Recycling

Stationary Container Lifters

Criteria:	Power lift unloads trash and recycling into large dumpsters Designed for permanent mounting in concrete or metal pad
Application:	Lifts various container sizes with weight capacity up to 350lbs. with a dump height range between 34" – 74" depending on the size of the container

Make	Model	Comments (Pros and Cons)	
Toter	Atlas Stationary Lifter 3081-ST-1000	**PRO:** • Eliminates manual lifting of containers when unloading materials • Two container sizes can be used, 32 and 44 gallon • 115/230V single phase battery supply • Unloads into multiple style container systems; front load, side load, and roll-off open top	**CON:** • Requires transporting containers to permanent dumpster locations vs. staging locations • Requires 42" x 42" footprint
	Approximate cost	$4000-$4500	
	For more information	**North:** Joyce Rhoades joyce.rhoades@ucsf.edu **South:** Cindy Burt burt@ehs.ucla.edu	
URL:	http://www.drum-handlers-dumpers.com/Drum-Lifters-Tilters-and-Dumpers.htm		
Toter	Saddle Stationary Lifter 3081-MT-5000	**PRO:** • Eliminates manual lifting of containers for unloading materials • Containers sizes include 30-60-90 gallon 2 wheel and caster carts • 115/230Vsingle phase power supply • Designed for dumping into multiple collection systems: front load, side load and roll-off open top containers • Can be used at self-contained	**CON:** • Requires transporting containers to permanent dumpster locations vs. staging locations • Requires dedicated space of 42" x 42"

		compactors	
	Approximate cost	$4500-$5000	
	For more information	**North:** Joyce Rhoades joyce.rhoades@ucsf.edu **South:** Cindy Burt burt@ehs.ucla.edu	
URL:	http://www.drum-handlers-dumpers.com/Drum-Lifters-Tilters-and-Dumpers.htm http://toter.com		

Risk Services Best Practices Bulletin
Mopping

Presented by Office of the President Risk Services – May 13, 2011


Throughout the UC system, custodians are among the highest occupational groups at risk for injury. Their high frequency and severity of injury is due to the physical nature of their work that often involves awkward postures, repetition of motion, and forceful exertion.

The following Best Practices are offered to guide those responsible for supervising and/or ensuring the health and safety of these custodial workers.

Best Practices:

- General equipment considerations:
  - Automated floor cleaning equipment can work in a variety of locations and will reduce physical risks associated with manual mopping
  - No-touch cleaning systems and automatic scrubbers can significantly reduce ergonomic risks and provide a higher level of cleaning, especially for larger areas.[1, 2] **Refer to Recommended Product Sheets** for specific model details.
  - For small, semi-private bathrooms with linoleum floors, consider using upright steam mops. **Refer to Recommended Product Sheets** for specific model details.
- When mopping by hand:
  - Provide an adjustable (telescoping) handle to accommodate different workers
  - Use light-weight mop heads, including microfiber flat, tube, and string mops. Traditional heavy cotton-loop mop heads are not recommended.
  - Consider adjustable mop handles with a curved & swiveling handle for larger areas that do not require automatic scrubbers. **Refer to Recommended Product Sheets** for specific model details.
- The following design issues should be considered with regard to bathroom mopping:
  - Adequate and functional floor drains

- The location of quick-connect hose fittings should be easily accessible to minimize bending and twisting
- Wall mounted trash receptacles with side access and light-weight liners reduce bending when floor cleaning. This design makes it easier to clean the floor than free standing trash barrels/receptacles.[2]
- Sanitary napkin disposal containers should be mounted to the stall wall to prevent rusting and reduce bending while cleaning

Equipment[3, 4]

Selecting the most appropriate equipment is an important decision. Prior to purchasing:

- Contact the campus ergonomist to help with the selection process
- Include custodial staff in the selection process
- Arrange for demonstration of product by manufacturer or distributor
- Refer to the Ergonomics Recommended Product Sheet for applications and recommendations
- Pilot the preferred equipment for a minimum two–week trial period

During the pilot period, consider the following:

- Adjustability, size and weight of equipment to accommodate wide range of body types
- Appropriate sized casters and swivel design to allow for easy rolling and maneuverability
- Size and type of surfaces to be cleaned
- Location of controls and ease of operation
- Noise and vibration levels
- Storage and transporting needs
- Equipment maintenance and replacement parts
- Battery life and charging time
- Need for back-up equipment

Training[3]

Initial training should be provided for new employees within the first 30 days and annually thereafter. Training is best provided in small groups with the involvement of supervisors, leads, ergonomists and vendors.

Training should include:

- Hands-on performance of job tasks and related activities
- Equipment use, maintenance, storage, safety procedures and use of personal protective equipment (PPE) as required
- Instruction on safe postures and body mechanics
- Verbal and/or written materials to accommodate non-English speaking workers

Work and Staffing Guidelines[3]

Work and staffing guidelines insure that employees are adequately trained and assigned reasonable workloads. Guidelines include:

- Staff levels that provide adequate coverage to complete assigned work tasks
- Staff levels to avoid overtime
- Backup staffing to accommodate unplanned absences
- Use of task and job rotation to limit repetition and fatigue
- Use of teams for heavy lifting and moving tasks
- Pre-shift exercises to warm up muscles to prepare for work
- Frequent rest breaks
- Implementation and support of a work hazard notification system to identify problems such as excessive weight in trash containers

References: (1) Kaivac, Inc., "Removing Soil: A Comparison of Cleaning Methods", *Cleaning & Maintenance Management Online*, Vol. 46, Issue 10, October 2009, www.cmmonline.com (2) Goggins, R., "Hazards of Cleaning – Strategies for Reducing Exposures to Ergonomic Risk Factors", *Professional Safety*, March 2007, pp 23-24, www.asse.org ,(3) Cal/OSHA Consultation Service, Department of Industrial Relations, *Working Safer and Easier for Janitors, Custodians, and Housekeepers*, 2005; (4) Hansen, Steve, "Understanding Ergonomics and How it Affects Your Cleaning Business", *Custodial Workers' Resource*. http://custodian.info/ergonomics.html

Recommended Product Sheet

Floor cleaning

Automatic Scrubbers

	**Criteria:**	Automatic (cylindrical walk behind, self propelled walk behind, stand on, or ride on) floor scrubber for chemical (or non chemical) cleaning
	Application:	Flat or tiled floor cleaning of small or larger areas

Make	**Model**	**Comments** (Pros and Cons)	
Tennant	Walk behind: T1	**PRO:** • An automated bucket and mop replacement • Has good maneuverability in smaller areas • Folds down to small footprint • Cylindrical brush cleans grout and tiled surfaces • Adjustable handle • Easy fill and dump tanks • Unlimited use time (corded)	**CON:** • Needs electric outlet; Cord presents a trip hazard and limited mobility • Increased noise compared to battery operated scrubbers (72dBA)
	Approximate cost	$2,000-3,000	
	For more information	Mallory Lynch mlynch@uhs.berkeley.edu	
URL:	http://www.tennantco.com/equipment/scrubber---walk-behind/t1--compact-low-profile-floor-scrubber/overview		
Advance	Walk behind: Micromatic 14E Scrubber	**PRO:** • An automated bucket and mop replacement • Good maneuverability in smaller areas • Cylindrical brush cleans grout and tiled surfaces • Adjustable handle	**CON:** • Needs electric outlet • Limited mobility and trip hazard due to cord and trip hazard

		• Easy fill and dump tanks • Unlimited use time (corded)	
	Approximate cost	$2,000-2,500	
	For more information	Greg Ryan gryan@uhs.berkeley.edu	
URL:	http://www.advance-us.com/products/scrubbers.aspx		
Tennant	Walk behind: T3, T5	**PRO:** • T3 is good for medium sized areas (20'' pad) • T5 is good for larger areas (24, 28, and 32'' pads) • EC-H2O chemical free option • Battery powered: less noise, no cord	**CON:** • If using chemicals, must use Tennant's • Limited run time and must be charged • Need storage space with electric outlet to charge battery • Changing pads requires kneeling to the ground
	Approximate cost	$2,000-3,000	
	For more information	**North:** Greg Ryan gryan@uhs.berkeley.edu **South:** Cindy Burt burt@ehs.ucla.edu	
URL:	http://www.tennantco.com/equipment/scrubber---walk-behind		
Advance	Walk behind: SC750, SC800	**PRO:** • SC750 (26 and 2 inch pads) is good for medium to large sized flat surfaces • SC750 (28 inch cylindrical brush) good for larger tiled and grouted surfaces • Easy to remove pads and brushes • Eco-flex system for green cleaning and the flexibility of heavy scrubbing • Battery powered: less noise, no cord	**CON:** • Limited Run time and must be charged • Need storage space and electric outlet to charge battery operated models • Changing pads requires some effort
	Approximate cost	SC750 $9,000-9,500 SC800 $9,500-10,000	
	For more information	Greg Ryan gryan@uhs.berkeley.edu	
URL:	http://advance-us.com/products/scrubbers/sc750%20sc800/sc750%20sc800.aspx		

Windsor	Stand-on: Chariot iScrub 20, 24, 26	**PRO:** • Stand on models are good for large areas; saves time & effort • Chariot works very well, very good visibility; small footprint for storage • Comes in 26'' cylindrical brush for tiled and grouted surfaces	**CON:** • Limited Run time and must be charged • Need electric outlet to charge battery • Changing pads require some effort
	Approximate cost	$4,000-10,000	
	For more information	**North:** Greg Ryan gryan@uhs.berkeley.edu **South:** Cindy Burt burt@ehs.ucla.edu	
URL:	http://www.windsorind.com/ViewCategories.aspx?Pid=54		
Advance	Adfinity 20ST	**PRO:** • 20-inch cleaning path with capability of cleaning next to the wall's edge • On-board charger results in cord-free operation which reduces trips • Pedal assist for removing and loading pads and brushes • Turns easily • Medium noise level at 65 dB	**CON:** • Not good for sloped surfaces • Pad assist drive system (requires more effort to push than self-propelled models)
	Approximate cost	$4,250	
	For more information	Mallory Lynch mlynch@uhs.berkeley.edu	
URL:	http://www.advance-us.com/products/scrubbers/adfinity/17st%2020st.aspx		

Recommended Product Sheet

Floor Care

Steam Mop

Criteria:	Steam mop for cleaning small, semi-private bathroom floors and small lobby areas
Application:	Sealed surface floor cleaning for small areas

Make	Model	Comments (Pros and Cons)	
Shark	Steam Pocket Mop	**PRO:** • Can be used on all sealed hard floor surfaces – including sealed hardwood, linoleum, ceramic tile, marble, and other stone floors • Uses steam for disinfecting-no chemicals • Light weight (less than 5 lbs) • Has telescopic handle on the pole to adjust the height of the unit • Eliminates need for mop bucket system	**CON:** • Should not be used on unsealed surfaces such as unfinished hardwood, unglazed ceramic floors, or unsealed stone floors • Should use only distilled water to prolong equipment life • May be hard to push the first few uses because of chemical buildup on the floor • 30-inch cord limits use to small areas
	Approximate cost	$100-175	
	For more information	Ginnie Thomas gthomas@housing.ucsb.edu	
URL:	http://www.sharkclean.com/Shark-S3505-Steam-Pocket-Mop/		

Recommended Product Sheet

Floor Care

Mopping Systems

Criteria:	Mopping systems (bucket, mop head, handle and wringer) for hand mopping of floors; includes traditional cotton, nylon and blended mops as well as micro-fiber mops.
Application:	Bathroom (and other) floor cleaning. Custodians assigned approximately 25,000 to 30,000 square feet to clean.

Make	Model	Comments (Pros and Cons)	
Rubbermaid	WaveBrake® Dual Water Mopping Combos (26, 35, and 44 quart). • 35 and 44 quart sizes available in Down Press or Side Press Combos	**PRO:** • Bucket design reduces splashing and limits cross contamination of clean and dirty water. Dirty water bucket is easily removed to empty • Durable bucket • Quiet caster design • 44 qt model has foot pedal water release system at bottom of bucket • Durable wringer • Color-coded options to reduce cross-contamination	**CON:** • Dual bucket system requires more frequent water changes • Requires floor drain to ensure no lifting of bucket to drain • Requires use of Rubbermaid carts • Down Press is recommended over Side Press wringer due to durability and ease of operation (26 quart size is available in Side Press only)
	Approximate cost	$72-130	
	For more information	Ginnie Thomas gthomas@housing.ucsb.edu	
URL:	http://www.rubbermaidcommercial.com/rcp/products/category.jsp?categoryCode=cleaning		
Unger System	SmartColor Combo 30L/15L System	**PRO:** • Bucket design reduces splashing and limits cross contamination of clean and dirty water. Dirty water bucket is easily removed to empty.	**CON:** • Good for smaller areas, not recommended for larger areas • Flat mop head press will not accommodate string mops

		• Can be used on sealed tile as well as grouted tile • Rear-mounted pour spout is at standard toilet height providing the option to dump water into the toilet rather than lift into a sink • Locking lower drain spigot allows draining into floor drains • Microfiber pads provide more hygienic cleaning . • High-profile side press promotes upright posture when pressing and requires less force to wring mop • Adjustable handle length • Fits on a standard custodial cart • Color-coded options to reduce cross-contamination.	• Must select appropriate mop head for each floor surface • Less durable than Rubbermaid and Continental systems (bucket, wringer) • Dual bucket system requires an additional wring • Flat head microfiber mopping requires significant training and cultural shift • Dual bucket system requires more frequent water changes • Wringer design requires employee to hold the mop to position and avoid breakage • Bucket is difficult to control due to caster design
	Approximate cost	$ 150 (Mop and bucket)	
	For more information	**North:** Greg Ryan gryan@uhs.berkeley.edu **South:** Kristie Elton kristie.elton@ucr.edu	
URL:	• http://ungerglobal.com/pro/admin/files/pl2011-chapter/unger-2011-3.pdf • http://ungerglobal.com/pro/us/images/stories/UNGER/download2010/SmartColor-Cleaning-BROCHURE.pdf		
Continental	Unibody Mopping System-35 quart	**PRO:** • No need to lift wringer off bucket • Bottom-mounted spigot reduces need to lift to empty. Threaded spigot empties directly into floor drain or can accommodate a hose for floor sink. • Wringer handle design improves hand position and requires less force to use • Non-marking casters	**CON:** • Requires floor drain to ensure no lifting of bucket to drain • Continental wringer not as durable as Rubbermaid.

		• Color-coded options to reduce cross-contamination	
	Approximate cost	$118-130	
	For more information	Ginnie Thomas gthomas@housing.ucsb.edu	
URL:	http://www.continentalcommercialproducts.com/prodcat.php?ID=1		
Rubbermaid	Microfiber Mopping System	**PRO:** • Removable microfiber pads eliminate wringer and need to lift mop bucket • Bottom-mounted spigot allows emptying bucket without lifting • Microfiber pads provide more hygienic cleaning • Lightweight adjustable aluminum frames and handles • Angled handle improve wrist position • Good for medical centers (removable microfiber pads and color-coded options reduce cross contamination)	**CON:** • Flat head microfiber mopping requires significant training and cultural shift • Micro-fiber mopping only • Good for small areas, limited use in corridors and larger areas • Hook-and-loop backing on pads can wear out over time and will need to be replaced • Not as durable as traditional mops
	Approximate cost	$125-150	
	For more information	Jill Evans-Grinbergs jill.evans-grinbergs@ucdmc.ucdavis.edu	
URL:	http://www.rubbermaidcommercial.com/rcp/products/subcategory.jsp?categoryCode=cleaning&subCategoryCode=cleaning_microfiber		

Risk Services Best Practices Bulletin
Bathroom Hand Cleaning

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The following Best Practices are offered to guide those responsible for supervising and/or ensuring the health and safety of these custodial workers.

Best Practices:

- No-touch cleaning systems can significantly reduce ergonomic risks and provide a higher level of cleaning.[1, 2] **Refer to Recommended Product Sheets** for specific model details.
- Applying a sealer to the tile and grout in the bathrooms 1-2 times per year reduces the effort involved in daily cleaning
- General equipment considerations:
  - Toilet brushes (Johnny mops) with angled brushes and longer handles reduce bending and awkward wrist postures when cleaning toilets. **Refer to Recommended Product Sheets** for specific model details.
  - Telescoping or adjustable handles minimize extended reaches and awkward postures when cleaning shower walls, mirrors, and bathroom walls
  - Attach the hose connector to shower head to help wash down shower walls when a no touch cleaning system is not available. **Refer to Recommended Product Sheets** for specific model details.
- The following design issues should be considered with regard to bathroom cleaning:
  - Showers fabricated with grouted tile require additional scrubbing and increase the risk of ergonomic injuries
  - There should be adequate and functional floor drains
  - Water and sustainability issues are very important to consider; however, certain types of low water, high-efficiency, dual flush toilets may require additional cleaning and

may be more difficult to clean than standard toilets. Install toilet systems that have a high Waste Removal Performance Measure (MaP[3]) rating to the amount of daily cleaning required. Consult http://www.bewaterwise.com/pdf_rebates_toilets_01.pdf or http://www.map-testing.com/about/maximum-performance/map-search.html to see ratings.

- Provide quick-connect hose fittings. The location should be easily accessible to minimize bending and twisting.
- Sanitary napkin disposal containers should be mounted to the stall wall to prevent rusting and reduce bending while cleaning
- Towel dispensers should be installed at the ADA height of 48 inches, reducing the required reach when filling
- Wall mounted trash receptacles with light-weight liners reduce required bending when cleaning the floor. This design is also easier to empty than free-standing trash barrels/receptacles. The tops of these trash receptacles should measure 36" from the floor to reduce reaching or lifting above shoulder height.
- Touchless faucets reduce the amount of cleaning required. However, recent studies have shown that water from these faucets has more bacteria than traditional faucets.[3] Touchless faucets are therefore not recommended in dining facilities or medical centers.
- Coordination between construction and facilities should exist to standardize dispensers

Equipment[4, 5]

Selecting the most appropriate equipment is an important decision. Prior to purchasing:

- Contact the campus ergonomist to help with the selection process
- Include custodial staff in the selection process
- Arrange for demonstration of product by manufacturer or distributor
- Refer to the Ergonomics Recommended Product Sheet for applications and recommendations
- Pilot the preferred equipment for a minimum two–week trial period

During the pilot period, consider the following:

- Adjustability, size and weight of equipment to accommodate wide range of body types
- Appropriate sized casters and swivel design to allow for easy rolling and maneuverability
- Size and type of surfaces to be cleaned
- Location of controls and ease of operation
- Noise and vibration levels
- Storage and transporting needs
- Equipment maintenance and replacement parts
- Battery life and charging time

- Need for back-up equipment

Training[4]

Initial training should be provided for new employees within the first 30 days and annually thereafter. Training is best provided in small groups with the involvement of supervisors, leads, ergonomists and vendors.

Training should include:

- Hands-on performance of job tasks and related activities
- Equipment use, maintenance, storage, safety procedures and use of personal protective equipment (PPE) as required
- Instruction on safe postures and body mechanics
- Verbal and/or written materials to accommodate non-English speaking workers

Work and Staffing Guidelines[4]

Work and staffing guidelines insure that employees are adequately trained and assigned reasonable workloads. Guidelines include:

- Staff levels that provide adequate coverage to complete assigned work tasks
- Staff levels to avoid overtime
- Backup staffing to accommodate unplanned absences
- Use of task and job rotation to limit repetition and fatigue
- Use of teams for heavy lifting and moving tasks
- Pre-shift exercises to warm up muscles to prepare for work
- Frequent rest breaks
- Implementation and support of a work hazard notification system to identify problems such as excessive weight in trash containers

References: (1) Kaivac, Inc., "Removing Soil: A Comparison of Cleaning Methods", *Cleaning & Maintenance Management Online*, Vol. 46, Issue 10, October 2009, Available at www.cmmonline.com (2) Goggins, R., "Hazards of Cleaning – Strategies for Reducing Exposures to Ergonomic Risk Factors", *Professional Safety*, March 2007, pp 23-24, www.asse.org (3) *"Latest Hands-Free Electronic Water Faucets Found To Be Hindrance, Not Help, In Hospital Infection Control",* Johns Hopkins Medicine online, available at www.hopkinsmedicine.org.
(4) Cal/OSHA Consultation Service, Department of Industrial Relations, *Working Safer and Easier for Janitors, Custodians, and Housekeepers,* 2005; (5) Hansen, Steve, "Understanding Ergonomics and How it Affects Your Cleaning Business", *Custodial Workers' Resource*. Available at http://custodian.info/ergonomics.html

Recommended Product Sheet

Bathroom Cleaning

No-Touch Cleaning Systems

	**Criteria:**	1. Automatic spray pump for chemical application and rinse water 2. Adjustable handle for tools 3. Wet Vacuum 4. Green Chemicals
	Application:	Bathroom cleaning

Make	Model	Comments (Pros and Cons)	
Kaivac	Cleaning System models 1250, 1750, and 2150 (Models include accessories)	**PRO:** • High powered sprayer to remove dirt (good for sealed surfaces) • Hepa wet/dry vacuum for areas without floor drains, can be used for standard vacuuming • Used with power cord for unlimited duration • Comes in 3 sizes for cleaning large and small areas • Comes with cleaning accessories • Detachable motor for ease of maintenance; can continue to use cleaning system with extra motor • Can be used with alternative cleaning chemicals	**CON:** • Sprayer may cause increased water on floor and walls and may cause water damage • Cord presents potential trip hazard and user must have access to power supply • Corded unit is louder compared to battery-operated units (68dB) • Additional accessories will incur additional costs
	Approximate cost	$2,000-3,500	
	For more information	**North:** Greg Ryan gryan@uhs.berkeley.edu **South:** Cindy Burt burt@ehs.ucla.edu	
URL:	http://www.kaivac.com/m_1-Restroom_Cleaning		
Kaivac	Cleaning System (1215, 1715 and 2115) (Models do NOT include	**PRO:** • High powered sprayer to remove dirt (good for sealed surfaces)	**CON:** • Sprayer may cause increased water on floor and walls- can cause water damage

	accessories)	• HEPA wet/dry vacuum for areas without floor drains, can be used for standard vacuuming • Comes in 3 sizes for cleaning large and small areas • Has detachable motor for ease of maintenance and can continue to use unit with extra motor • Can be used with alternative cleaning chemicals • Used with power cord for unlimited duration	• Cord is a trip hazard and must user have access to power supply • Limited cleaning accessories (however this does reduce the cost)
	Approximate cost	$1,500-3,000	
	For more information	**North:** Greg Ryan gryan@uhs.berkeley.edu **South:** Cindy Burt burt@ehs.ucla.edu	
URL:	http://www.kaivac.com/m_1-Restroom_Cleaning		
Hillyard	C3 Cleaning Companion	**PRO:** • Low powered sprayer for even chemical distribution to kill bacteria • 13 different chemical choices • Fits onto custodial cart • Wet/Dry vacuum is optional (it should be purchased if there are no floor drains). Cost is reduced without it. • Battery Powered, can be used w/o power supply, no trip hazard; 3 hour run time, 6 hour charge time, quieter than system with power cords (62 dB) • 7.5 gallon tank for smaller areas (residential halls)	**CON:** • Not enough power to remove dirt • Must be used with Hillyard chemicals • No HEPA option • Vacuum component is corded (trip hazard) • Not recommended for larger areas • The hose length is 15 feet so

			the unit cannot be left on the cart outside of the bathroom during use. A 12-ft hose extension can be purchased separately. Up to 2 hoses can be added for 39 feet of hose.
	Approximate cost	$800-1,200 $69.80 (12-ft hose extension)	
	For more information	**North:** Greg Ryan gryan@uhs.berkeley.edu **South:** Cindy Burt burt@ehs.ucla.edu	
URL:	http://www.hillyard.com/Nav.asp?x=5		

Recommended Product Sheet

Bathroom Cleaning

Hand Tools

Criteria:	Adjustable, customizable or increased length handles
Application:	Bathroom Hand Cleaning

Make	Model	Comments (Pros and Cons)	
Unger	Ergo Toilet Brush	**PRO:** • Longer Handle (26'') to reduce bending • Larger handle to decrease grip pressure • Angled handle assists with cleaning under the rim • Interchangeable nylon heads to increase friction and decrease dry time. Standard swab head also available • Bottom of holder is easy to remove	**CON:** • Removable bottom can cause contents to spill
	Approximate cost	$20	
	For more information	**North:** Greg Ryan gryan@uhs.berkeley.edu **South:** Kristie Elton kristie.elton@ucr.edu	
URL:	http://www.ungerglobal.com/pro/landing-us/index.php?site=13		
Parsons	Long handled toilet brush with cup	**PRO:** Longer Handle (30'') to reduce bending	

	Approximate cost	$12	
	For more information	Ginnie Thomas gthomas@housing.ucsb.edu Kristie Elton kristie.elton@ucr.edu	
URL:	http://www.parsonsadl.com/details.php?prod=199		
Smart Handle Pro	Scrub-All Tools	**PRO:** • Bent handle design promotes neutral wrist postures and safe body mechanics • Adjustable length to fit a variety of users • Foam grip to reduce grip pressure • Range of the length can be customized (by vendor or in-house) to fit small spaces	
	Approximate cost	$20 for the handle $40 for the handle and swivel scrub brush	
	For more information	Ginnie Thomas gthomas@housing.ucsb.edu Kristie Elton kristie.elton@ucr.edu	
URL:	http://smarthandlepro.com/scruballtools.htm		
Unger	Adjustable pole for various tool	**PRO:** • Two-section pole for lighter-weight adjustability • Multipurpose tip can fit various tools • Various models (extended length from 4' to 13')	**CON:** • Heavier than non-extension aluminum poles
	Approximate cost	$30-50	
	For more information	**North:** Greg Ryan gryan@uhs.berkeley.edu **South:** Kristie Elton kristie.elton@ucr.edu	
URL:	http://www.ungercleaning.com/p-1397-unger-2-section-extension-poles.aspx		
Rinse Ace	Shower connector and quick-connect 6-foot hose system	**PRO:** • One-time installation, easy to install • Water-saving trigger system • Eliminates using small buckets to rinse down shower walls	**CON:** • Connector is difficult to reach for shorter employees when attached to a shower/tub combo

	Approximate cost	$20-25
	For more information	**North:** Greg Ryan gryan@uhs.berkeley.edu **South:** Kristie Elton kristie.elton@ucr.edu
URL:	http://www.rinseace.com/commercial-applications	

Risk Services Best Practices Bulletin
Vacuuming

Presented by Office of the President Risk Services: May 13, 2011



Throughout the UC system, custodians are among the highest occupational groups at-risk for injury. Their high frequency and severity of injury is due to the physical nature of their work that often involves awkward postures, repetition of motion, and forceful exertion.

The following Best Practices are offered to guide those responsible for supervising and/or ensuring the health and safety of these custodial workers.

Best Practices:

Many buildings may need a combination of vacuums to safely clean all areas. It is best to identify the most efficient and practical vacuum for each area to be cleaned. Establish and enforce a regular maintenance program for all vacuums.

UPRIGHT VACUUMS – are best used in hallways, offices, residence halls and small to medium spaces. The bag inside the vacuums should be replaced regularly and the unit maintained often to keep it in good condition. These types of vacuums should:

- Provide good suction
- Be adjustable to the height of carpet pile
- Be easy to maneuver
- Be easy to service and maintain – bags are easy to replace and serviceable parts are minimal and easily accessed
- The handle component should be lightweight

- Have a magnet in front to catch paper clips or other metal objects, which may damage the vacuum and/or increase maintenance and servicing (**Refer to Recommended Product Sheets)**

BACKPACK VACUUMS – should be used to clean hard to reach areas or where upright vacuums are not practical for use, such as: stairs, chandeliers, windowsills, etc… Use of backpack vacuums in large areas should be avoided as this is inefficient and creates excessive physical load to the worker. Lighter weight models represent a trade off: less weight for less power with smaller bags and less capacity. In general, backpack vacuums should:

- Be lightweight (12 pounds or less) and provide good suction
- Use wall-mounted, "mounting-stations" where possible to facilitate getting the vacuum on and off the user
- Hose length and attachments should be appropriate for specific uses to maximize efficiency (**Refer to Recommended Product Sheets)**

LARGE AREA VACUUMS – should be used in any large, carpeted area where accessibility and maneuverability is practical. Large area vacuums significantly increase productivity and efficiency and reduce physical load to the worker.

- Use in large areas where maneuverability is practical
- Must provide adequate storage area for this equipment (**Refer to Recommended Product Sheets)**

Equipment[1, 2]

Selecting the most appropriate equipment is an important decision. Prior to purchasing:

- Contact the campus ergonomist to help with the selection process
- Include custodial staff in the selection process
- Arrange for demonstration of product by manufacturer or distributor
- Refer to the Ergonomics Recommended Product Sheet for applications and recommendations
- Pilot the preferred equipment for a minimum two–week trial period

During the pilot period, consider the following:

- Adjustability, size and weight of equipment to accommodate wide range of body types
- Appropriate sized casters and swivel design to allow for easy rolling and maneuverability
- Size and type of surfaces to be cleaned
- Location of controls and ease of operation
- Noise and vibration levels

- Storage and transporting needs
- Equipment maintenance and replacement parts
- Battery life and charging time
- Need for back-up equipment

Training[1]

Initial training should be provided for new employees within the first 30 days and annually thereafter. Training is best provided in small groups with the involvement of supervisors, leads, ergonomists and vendors.

Training should include:

- Hands-on performance of job tasks and related activities
- Equipment use, maintenance, storage, safety procedures and use of personal protective equipment (PPE) as required
- Instruction on safe postures and body mechanics
- Verbal and/or written materials to accommodate non-English speaking workers

Work and Staffing Guidelines[1]

Work and staffing guidelines insure that employees are adequately trained and assigned reasonable workloads. Guidelines include:

- Staff levels that provide adequate coverage to complete assigned work tasks
- Staff levels to avoid overtime
- Backup staffing to accommodate unplanned absences
- Use of task and job rotation to limit repetition and fatigue
- Use of teams for heavy lifting and moving tasks
- Pre-shift exercises to warm up muscles to prepare for work
- Frequent rest breaks
- Implementation and support of a work hazard notification system to identify problems such as excessive weight in trash containers

References: (1) Cal/OSHA Consultation Service, Department of Industrial Relations, *Working Safer and Easier for Janitors, Custodians, and Housekeepers,* 2005; (2) Hansen, Steve, "Understanding Ergonomics and How it Affects Your Cleaning Business," *Custodial Workers' Resource*. Available at http://custodian.info/ergonomics.html

Recommended Product Sheet

Vacuuming

Backpack Vacuums

Criteria:	• Lightweight • Easy to maneuver • Powerful suction
Application:	Use in hard to reach places such as staircases, nooks and crannies, chandeliers, bookcases etc…not for use in large areas

Make	Model	Comments (Pros and Cons)	
Pro-Team	Super Coach Backpack **10 quart capacity**	**PRO:** • Portable and lightweight (11 lbs); easy to maneuver and allows for overhead reach • Durable with low maintenance • Available accessory includes a wall-mounted, "mounting station" to facilitate getting the backpack on and off the user • Recommend an adjustable wand • Training required to learn how to put the backpack on and off, adjust for fit and move the wand	**CON:** • Although this is a lightweight backpack vacuum, the weight may be fatiguing for some employees
	Approximate cost	$350-400	
	For more information	**North:** Kitty Woldow kittyw@ucsc.edu **South:** Clyde Blackwelder cblackwe@uci.edu	
URL:	http://www.pro-team.com/pt/vacuums/default.aspx?style=1&id=100182		
Pro-Team	Super QuarterVac Backpack – **6 quart capacity**	**PRO:** • Lighter weight than the Super Coach Backpack • Portable and lightweight; easy to maneuver and allows for overhead reach • Durable with low maintenance • Available accessory includes a wall-mounted, "mounting station" to facilitate getting the backpack on and off the user • Recommend an adjustable wand	**CON:** • Although this is a lighter weight backpack vacuum, the weight may be fatiguing for some employees • Potentially less suction than the 10 quart model

		• Training required to learn how to take the backpack on and off, adjust for fit and move the wand	
	Approximate cost	$300	
	For more information	**North:** Kitty Woldow kittyw@ucsc.edu **South:** Clyde Blackwelder cblackwe@uci.edu	
URL:	http://www.pro-team.com/pt/vacuums/default.aspx?style=1&id=106070		

Recommended Product Sheet

Vacuuming

Large Area Vacuums

	**Criteria:**	• Designed for large carpeted areas • Controls are easily accessible • Built in hose and wand • Easy access to change or empty filter/collector bags
	Application:	Large Area Vacuuming

Make	**Model**	**Comments** (Pros and Cons)	
Advance	Carpetriever	**PRO:** • Easy to use • Covers a lot of space (efficient for larger areas) • Easy to maneuver • Low maintenance	**CON:** • Large and heavy; difficult to store (takes up a lot of space)
	Approximate cost	$1500 - 2500	
	For more information	**North:** Kitty Woldow kittyw@ucsc.edu **South:** Clyde Blackwelder cblackwe@uci.edu	
URL:	http://www.advance-us.com/products/vacuums/carpetriever/carpetriever.aspx		

Recommended Product Sheet

Vacuuming

Upright Vacuums

Criteria:	• Auto adjust for any surface • High performance motor • Onboard tools • High efficiency filtration • Easy to change filter bag
Application:	Upright Vacuuming

Make	**Model**	**Comments** (Pros and Cons)	
Windsor and Javelin	Sensor and Javelin Uprights (same vacuum but under different names)	**PRO:** • Lightweight and easy to maneuver • Powerful with good suction • Good maintenance record • Easy to change filter bags • Easy to change out frayed cord by removing handle	**CON:** • $150 charge to replace handle and cord
	Approximate cost	$465	
	For more information	**North:** Kitty Woldow kittyw@ucsc.edu **South:** Clyde Blackwelder cblackwe@uci.edu	
URL:	http://www.homeprovacuum.com/index.php?l=product_detail&p=87 - Windsor http://www.unisourcedirect.com/Javelin-12X-Upright-Vacuums - Javelin		

Risk Services Best Practices Bulletin
Furniture Moving

Presented by Office of the President Risk Services – May 13, 2011

Throughout the UC system, custodians are among the highest occupational groups at-risk for injury. Their high frequency and severity of injury is due to the physical nature of their work that often involves awkward postures, repetition of motion, and forceful exertion.

The following Best Practices are offered to guide those responsible for supervising and/or ensuring the health and safety of these custodial workers.

Best Practices: Moving and lifting heavy furniture represents a significant risk. Team lift policies should be established and proper moving equipment should be provided. The setting-up and tearing-down of furniture to accommodate various events demands frequent moving of furniture specifically designed for this use. This type of furniture should be lightweight, easy to move, easy to stack and store.

GENERAL FURNITURE MOVING

For general furniture moving, a variety of moving assists should be available. Consider usage of any and all of the options listed below:

- Strap-dollies, flat-bed dollies, gliders or carts
- Use appropriate moving equipment for the furniture involved; consider weight capacity, size of the load, straps to stabilize the load, lockable casters on the carts etc.
- For heavy furniture that needs to be moved, consider permanently installing casters or gliders to make it easier to maneuver the furniture
- Use mechanical assists and team-lifts with heavy, extra large or awkward loads

MOVING OF FURNITURE FOR EVENT SET-UP

Furniture in use for this purpose should be:

- Lightweight
- Easily and efficiently stackable
- It is best if furniture is accompanied by wheeled storage carts specifically designed for this use, for easy transport and efficient storage (**Refer to Recommended Product Sheets)**
- When event set-up demands moving heavy loads, greater than 50 lbs, "team lift" procedures should be standard policy

Equipment[1, 2]

Selecting the most appropriate equipment is an important decision. Prior to purchasing:

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- Include custodial staff in the selection process
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- Noise and vibration levels
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Recommended Product Sheet

Furniture Moving

Lightweight Tables & Chairs

Criteria:	• Lightweight • Easy to break down, transport and set-up • Stackable
Application:	Event Furniture Set-up

Make	Model	Comments (Pros and Cons)	
Mity Lite	Lightweight Tables	**PRO:** • Lightweight and easy to stack • Sturdy • Recommend only half-tree or single stackable carts • Recommend lockable casters on carts to help secure on slopes	**CON:** • Not aesthetically pleasing; best used with table cloths
	Approximate cost	Varies by model. Refer to Mity Lite website (see below)	
	For more information	**North:** Greg Ryan gryan@uhs.berkeley.edu **South:** Clyde Blackwelder cblackwe@uci.edu	
URL:	http://www.mitylite.com/folding-tables.html		
Mity Lite	Lightweight Chairs	**PRO:** • Lightweight • Easy to stack • Sturdy (rated to support over 1000 lbs)	
	Approximate cost	Varies by model. Refer to Mity Lite website (see below)	
	For more information	**North:** Greg Ryan gryan@uhs.berkeley.edu **South:** Clyde Blackwelder cblackwe@uci.edu	
URL:	http://www.mitylite.com/chairs.html		
Mity Lite	Carts	**PRO:** • Carts provide efficient portability of furniture	CON: • Recommend not stacking chairs above 48 inches

	Approximate cost	Varies by model. Refer to Mity Lite website (see below)
	For more information	**North:** Greg Ryan gryan@uhs.berkeley.edu **South:** Clyde Blackwelder cblackwe@uci.edu
URL:	http://www.mitylite.com/carts.html	