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JAN 24 2012

OCCUPATIONAL SAFETY AND HEALTH
STANDARDS BOARD

RE: *Petition for Promulgation of a Safety and Health Standard
for the Protection of Hotel Housekeepers*

Dear Ms. Hart:

On behalf of Petitioner UNITE HERE, please find enclosed herewith a petition for the Occupational Safety and Health Standards Board to promulgate a safety and health standard to address the occupational hazards faced by housekeepers in the hotel and hospitality industry.

Petitioner is a labor organization that represents thousands of California workers who are employed in the hotel and hospitality industry through its affiliated local unions. Petitioner is fully prepared to assist in the presentation of testimony and evidence in favor of the proposed petition. The contact persons on behalf of the Petitioner will be:

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Marley Hart
January 23, 2012
Page 2 of 2

Petitioner requests that public hearings in this matter be conducted in the Los Angeles area. This is because there are substantial numbers of housekeepers particularly in the Los Angeles area who have indicated their desire to participate in these proceedings as observers and, as necessary, as witnesses. Conducting public hearings in the Los Angeles-area will serve to maximize public understanding and participation in the rulemaking process, and assist the Standards Board in gathering information necessary to devising an effective rule.

Should you have any questions concerning this petition, please contact Mr. Peterson or Ms. Vossenas. You may also reach them through me.

Very truly yours,



Eric B. Myers

CC: Marty Morgenstern
Secretary
State of California Labor & Workforce Development Agency

Christine Baker
Director
Department of Industrial Relations

Ellen Widess
Chief
Division of Occupational Safety and Health

Kurt Petersen
Pamela Vossenas

STATE OF CALIFORNIA
DIVISION OF INDUSTRIAL RELATIONS
OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

UNITE HERE,)	Petition for the Promulgation of
)	a Safety and Health Standard
Petitioner)	For the Protection of
_____)	Hotel Housekeepers

Pursuant to California Labor Code Sections 142.2, 142.3 and 142.4, UNITE HERE petitions the Occupational Safety and Health Standards Board (OSHSB) for the promulgation of a safety and health standard to address the occupational hazards faced by housekeepers in the hotel and hospitality industry.

I. Introduction

Hotel housekeepers are exposed to serious occupational risks in the course of their normal work duties. Housekeeping duties include changing bed linen, scrubbing bathroom floors and fixtures, polishing, dusting, vacuuming, and pushing heavy linen carts. These tasks are frequently performed under great time pressure. The majority of housekeepers are women, people of color, and/or immigrants. These groups have been repeatedly identified as having excessive exposure to occupational risks.¹

Housekeepers suffer the highest injury rate among all classifications of hotel employees.² They are more likely to suffer musculoskeletal disorders than all other hotel employees.³ They are injured at a rate far exceeding the average injury rate for employees in the service sector as a whole.⁴ These injuries decrease employee productivity and increase workers compensation costs for employers. They diminish the quality of life for housekeepers.

Both the hotel industry and academic researchers have recognized hazards associated with hotel housekeeping going back several years. More recently, worker protection agencies, including Cal-OSHA, have recommended simple solutions and systems already in place in other industries and by certain hotel employers who are investing in safe workplaces. But existing

occupational safety standards do not adequately address the unique hazards that lead to high injury rates among these employees.

The proposed standard comprises a balance of performance and prescriptive requirements to address the factors that contribute to occupational injuries among housekeepers. It focuses on the opportunity for employee input and training to promote best practices in the industry. Adoption of the standard is critical to prevent the often debilitating injuries suffered by housekeepers and to contain the financial costs that these injuries impose on employers, insurers, and society-at-large.

II. The Growing Occupational Hazards Faced by Housekeepers

Hotel housekeeping is a physically arduous task. Workers in this industry have long confronted occupational hazards attributable to the array of cleaning tasks they perform. The situation has grown more critical in recent years. During the past decade, hotel operators have increasingly competed on the basis of the level of luxury of their room offerings. This includes luxury bedding consisting of oversize mattresses and opulent bed linen, together with other upgraded room and bathroom amenities.

One industry observer has aptly described the competition to introduce more luxurious beds and room amenities as the “bed-race.”⁵ The trend started in the late nineties when Starwood Hotel Corporation introduced the “Heavenly Bed” at its Westin-branded properties. Other companies followed suit with their own luxury bedding programs: Hyatt the “Grand Bed,” Marriott the “Marriott Bed,” Radisson the “Sleep Number Bed,” Hilton the “Serenity Collection,” and others. Although first confined to upper-end hotels, the new bedding and room packages are now commonplace throughout the hotel industry.

The new bedding packages are characterized by heavy, plush mattresses weighing in excess of 100 pounds. They typically feature a bulky “duvet” or quilted comforter, triple sheeting using flat (instead of a fitted) bottom sheet, up to six pillows on a bed, pillow cases that fit tightly over plump pillows, and other amenities such as decorative pillows and blankets.

Major players in California’s hotel and lodging industry have acknowledged the hazards that the new bedding packages pose to housekeepers:

In March 2011, HEI Hotels & Resorts and Cadence Keen Innovations Inc. announced the introduction at HEI hotel properties of a tool designed to alleviate the physical strain and risk of injury during bedmaking. (Exhibit 1.) The statement noted the “serious and often disabling repetitive motion injuries that are associated with changing linens on beds that now weigh in excess of 115 pounds on average.” It read:

Mattress lifting, by nature, puts the back in its weakest position and the repeated lifting required for a housekeeper can stress the upper-body’s muscles, joints and tendons. Without enough time between exertions for the body to heal itself, muscles, tendons and joints can be damaged. In fact, recent studies indicate housekeepers are 48% more likely to be injured than any other job in the service sector and are 50% more likely to incur serious, disabling injuries. According to Jim Stover, Vice President of Loss Prevention for AJ Gallagher Hospitality Division, repetitive motion injuries account for nearly “29% of all housekeeping injuries” and cost the hospitality industry more than \$500 million in compensation claims and lost workdays every year.⁶

In 2009, Hyatt Hotels Corporation was awarded a patent for a device to assist housekeepers in the arduous task of lifting heavy mattresses to tuck sheets. (Exhibit 2.) In its patent application, the product designers (including one of Hyatt’s occupational safety specialists) described the hazards of bedmaking as follows: “the process of making a bed, including lifting a bed mattress and/or tucking in bed covers between the bed mattress and box spring mattress, or other support structure, can be physically taxing.” Current bed-making methods—including making beds unaided by any tool—“requir[es] strenuous bed-making activity potentially resulting in fatigue and injury, requir[es] excessive time to make the bed, lead[s] to poor quality made-beds, and/or other types of problems.”⁷

In 2005, Hilton Hotels Corporation performed an ergonomic analysis on its then-new bedding package. (Exhibit 3.) The report concluded that “[t]here is excessive lifting of the bed corners to tuck in sheets and blanket;” “there is excessive handling of the sheets and blankets;” and “[t]here is excessive walking from one side of the bed to the other.” The report concluded that the “new bed components added additional handling to a job that already requires repetitive activity.”⁸ The Hilton study advised that housekeepers should avoid spreading bed sheets by using a “fluffing” or throwing motion with their shoulders and arms, but instead should lay the sheets on the bed and unfold them. One Hilton property manager explained that the hotel did not

enforce these corporate recommendations because housekeepers “complain that it takes too much time to do all the unfolding.”⁹ As discussed below, the problem of housekeepers not having sufficient time to work safely is a major factor in housekeeper injury and is part of the employer’s legal responsibility to provide a safe workplace.

In addition to equipping hotel rooms with heavier and more luxurious beds, the hotel industry has made other upgrades to room packages that pose new occupational hazards to workers. For example, hotel operators have equipped hotel bathrooms with larger and heavier bath linen. The new linen is more labor intensive to fold and handle, leading to greater and more frequent exertions. The new linen also occupies more space on the typical linen cart, requiring housekeepers to load their carts more heavily or to make more frequent trips to the linen room to replenish their stock. Hotel operators have also equipped rooms with a greater number of amenities that require cleaning. These include numerous and larger mirrored surfaces, chrome-plated amenities such as ice buckets or tissue holders, large flat-screen televisions, and other items that require greater cleaning by the housekeeper.

The combined effects of these changes have been to increase the occupational hazards associated with room cleaning, leading to a high frequency of occupational injuries among this classification of employees.

III. Occupational Hazards Lead to Housekeeper Injuries

Housekeeping exposes housekeepers to risk of a range of injuries. Housekeepers must frequently adopt unsafe body postures as they twist their torsos to lift mattresses, bend to gather heavy linen, or get down on their hands and knees to scrub bathroom floors. Housekeepers balance precariously on unsecure surfaces such as tub rims as they reach to scrub walls or remove shower curtains. They rush over wet surfaces or around items left on the floor. They push and turn heavily-laden linen carts over uneven surfaces. All these tasks are performed under time pressure, often with insufficient rest breaks and without proper tools, thereby increasing the likelihood of injury. They are also performed under the pressure of discipline for not performing well enough or quickly enough.

Predictably, these factors contribute to a high rate of injuries among housekeepers. Housekeepers suffer the highest overall injury rate and the highest rate of musculoskeletal injury

among all classifications of hotel employees. Their injury rate far exceeds the average injury rate for employees in the service sector.¹⁰

The following examples taken from the OSHA 300 logs of a Los Angeles-area Hyatt property from 2006 through part of 2010 demonstrate the spectrum of injuries that housekeepers can suffer and illustrate the circumstances that lead to them:¹¹

Date of injury	Description	In the job transfer or restriction (days)	Away from work (days)
8/29/2010	<i>Left ankle sprain due to missing a step on stairs</i>		2
5/25/2010	<i>Right wrist sprain, due to lifting a mattress</i>		36
4/25/2010	<i>Contusion on left side of face fell on stool</i>		
4/25/2010	<i>Contusion left hand due to cleaning a tub</i>	7	
2/6/2010	<i>Left knee contusion/strain due to slip and fall</i>		205
1/14/2010	<i>Left shoulder strain due to improper lifting</i>	5	18
8/5/2009	<i>Lumbar and right knee strain from bending while cleaning guestroom</i>	29	
6/1/2009	<i>Overuse syndrome of both hands - from making beds</i>	54	
3/24/2009	<i>L knee strain from repetitive bending and walking</i>	57	
3/15/2009	<i>Contusion to L elbow - vacuuming and hit elbow on the door</i>	72	
3/11/2009	<i>Left arm and left wrist sprain - struck with on cart linen hook</i>	110	
1/10/2009	<i>Right knee contusion tripped over sheets</i>		
12/17/2008	<i>EE picked up hair from floor and cut her 3rd finger with glass that was on the floor</i>	12	

12/10/2008	<i>EE tried locking panel door but was too hard to move. She closed the panel door and sprained her L thumb.</i>	6	
10/14/2008	<i>Sprain to the left wrist due to lifting and tucking in bed sheets</i>	14	
9/21/2008	<i>Contusion to the left knee from hitting a chair while making the bed</i>	22	
8/24/2008	<i>Fracture to right 4th finger from being caught in the door</i>	42	
8/21/2008	<i>Fracture to the left foot from tripping and rolling down the ramp twice</i>		105
8/10/2008	<i>Sprain/strain to the left knee due to making a bed and cleaning the bathtub</i>	39	
6/20/2008	<i>Contusion on head from entry door</i>	10	
5/12/2008	<i>Puncture to left thumb from a small needle stick to a piece of tape at the bottom of trash can</i>	0	
1/23/2008	<i>Left foot sprain from having phone cord wrapped around ankle</i>	35	
12/27/2007	<i>Kneeling on the floor making a bed and strained her left ankle</i>	4	
12/12/2007	<i>Making beds and caused a strain in her left hand</i>	10	
12/12/2007	<i>Stocking the Housekeeping carts and a very small object cut under her left ring finger fingernail</i>	0	
12/10/2007	<i>Both wrists strain from doing normal duties</i>	21	
12/7/2007	<i>Head contusion from door hitting her</i>	4	
11/21/2007	<i>Pushing a chart and sprained her left shoulder</i>	40	
10/19/2007	<i>Lumbar strain due to improper moving of a bed</i>	1	
9/24/2007	<i>Left eye bone contusion due to hitting toilet handle</i>	1	
9/7/2007	<i>Strain/sprain right arm due to lifting a mattress</i>	17	

9/7/2007	<i>R knee sprain due to kneeling</i>	17	
8/31/2007	<i>Low back strain due to improper lifting of mattress</i>	25	
8/29/2007	<i>Fell in AB stairwell north side by laundry. Resulted in a low back strain</i>		
6/30/2007	<i>Needle stick injury</i>		
5/22/2007	<i>Sprain right wrist while tucking in the bed sheets</i>	54	126
4/29/2007	<i>Trip and fell backwards on a vacuum cord. Tail bone contusion</i>	58	
4/27/2007	<i>Strain to right knee while going down the stairs</i>	7	
4/11/2007	<i>Strain right shoulder while sorting linen</i>	14	
4/10/2007	<i>Strain left foot by walking prolonged time and bending</i>	15	
3/11/2007	<i>Contusion left knee while moving a rollaway</i>	0	
2/22/2007	<i>Strain left leg and hip while making the beds</i>	14	166
2/7/2007	<i>Strain/right shoulder/arm repetitive work</i>	180	
1/24/2007	<i>Repetitive motion injury right wrist/hand</i>	48	
1/16/2007	<i>Repetitive motion injury right shoulder strain</i>	174	6
1/9/2007	<i>Lumbar strain/left knee sprain due to removing sheets</i>	165	
12/17/2006	<i>3rd finger, left hand sprain</i>	19	
12/8/2006	<i>Lumbar sprain and right wrist sprain due to improper lifting of the mattress</i>	23	
11/27/2006	<i>EE was drying the tub and slipped resulting in a sprain to the right foot</i>	8	
11/2/2006	<i>Sprain due to improper lifting of a mattress</i>	2	

10/18/2006	<i>EE hit an ottoman and has a contusion and sprain</i>	2	
9/21/2006	<i>EE slipped in bath and has a lumbar sprain</i>	6	
8/20/2006	<i>R wrist sprain due to lifting a mattress improperly</i>	5	
8/18/2006	<i>R wrist sprain due to lifting a mattress improperly</i>	10	
8/2/2006	<i>Mild R wrist sprain due to improper lifting</i>	12	
7/27/2006	<i>EE was changing the trash and got pricked with a needle. Puncture of skin on left index finger</i>	0	
6/22/2006	<i>R thumb sprain due to slip and fall</i>	4	
6/20/2006	<i>R wrist sprain due to lifting a mattress improperly</i>	5	
6/7/2006	<i>Carpel Tunnel syndrome from repetitive motion</i>	38	88
3/28/2006	<i>Sprain/strain due to a fall in the elevator</i>		14
3/24/2006	<i>Lumbar sprain due to cleaning a bathroom</i>	1	
3/9/2006	<i>Lumbar sprain from lifting mattress</i>	15	
2/11/2006	<i>Right wrist sprain, due to lifting a mattress</i>	41	
1/30/2006	<i>Laceration of left thumb due to guest razor on sink</i>	0	

Reviewing OSHA 300 logs does not fully disclose the scope of the problem because many housekeepers suffer persistent pain that they do not report as injuries. But the prevalence of pain and discomfort among employees can lead to a loss of productivity and job satisfaction that impose substantial costs on both employees and employers alike.

IV. Scientific Recognition of the Occupational Hazards of Housekeeping

A growing body of academic literature deriving from scientific fields ranging from epidemiology to human biomechanics has shed significant light on the occupational hazards of hotel housekeeping.

- A 2010 peer-reviewed study published in the *American Journal of Industrial* examined the incidence of hotel worker injury at fifty properties operated by five major hotel companies.¹² The study determined that housekeepers suffer the highest rate of injuries of all kinds (7.9 per 100 worker-years) and the highest rate of musculoskeletal disorders (3.2 per 100 worker-years) among all classifications of hotel workers. (Exhibit 4.)
- In a 1999 study, researchers at the University of California at San Francisco conducted a survey of over two hundred room cleaners. They reported that more than 75% of room cleaners experienced work-related pain. Of those reporting pain, the pain was severe enough for 73% to visit a doctor and 53% to take time off work to recover.¹³
- The San Francisco study's results were reaffirmed in a 2002 survey of nearly one thousand Las Vegas room cleaners.¹⁴ This study found that in a given month:
 - 95% of housekeepers reported physical pain;
 - 47% of housekeepers reported severe or very severe physical pain;
 - Severe or very severe pain was most often reported in the lower back (63%), followed by upper back (59%) and neck (43%);
 - 84% of housekeepers reported having taken medication for pain suffered at work;
 - 83% of the participants reported constant time pressure.
- An Australian government-sponsored evaluation of hotel work showed that the physical stress on workers' backs from hotel bedmaking tasks is equivalent to the "ultimate compressive strength" for lower back movements defined in the study as "the limits of human tolerance." The researchers argued, "Where possible, tasks should be performed slowly, without rapid movement."¹⁵
- Dr. William Marras, Professor and Director of the Institute for Ergonomics at Ohio State University, examined the hotel housekeeper job using a unique technology that combines both the tasks performed and the speed at which they must be performed into one analysis. Using a patented tool called the Lumbar Motion Monitor, he found that the

likelihood that a housekeeper is at high risk for lumbar injury is greater than any of the 20 manufacturing jobs—including auto and truck assembly—that he also studied. The risk also exceeds that of nursing/patient handling.¹⁶

- The Canadian Center for Occupational Safety and Health, the federal government's primary information center on workplace safety, reports that:

A hotel housekeeper changes body positions every three seconds while cleaning a room. If we assume that the average cleaning time for each room is twenty-five minutes, we can estimate that a housekeeper assumes 8,000 different body postures every shift. In addition, forceful movements while using awkward body positions include lifting mattresses, cleaning tiles, and vacuuming every shift. Housekeeping is a physically demanding and very tiring job.¹⁷

- In Canada, the British Columbia Workers Compensation Board found that among hotel workers, “overexertion” was responsible for 27% of worker compensation claims, the single largest cause. It also found that housekeepers accounted for 39% of overexertion cases—more than any other job title.¹⁸

CalOSHA and federal OSHA have recognized the scope of the problem through both enforcement actions and consultative services.

- In 2011, Cal-OSHA issued hazard alert memoranda to the Hyatt Century Plaza and the Hyatt Andaz—West Hollywood in Los Angeles, California, after identifying instances of housekeepers who suffered injuries while making beds and cleaning bathroom floors on hands and knees. Cal-OSHA recommended that Hyatt consider implementing fitted sheets and tools among other measures to prevent such injuries to housekeepers. (Exhibit 5.)
- In 2011, the Hawaii Occupational Safety and Health Division (HIOSH) issued a hazard alert letter to the Hyatt Regency Waikiki Beach Resort & Spa. (Exhibit 6.) The letter was based upon an ergonomic evaluation of the room cleaning operation. It identifies several of the control options that are set forth in this proposed standard including motorized carts.

- Cal-OSHA issued citations to at least two hotel operators alleging violations of the repetitive motion standard, Title 8, Section 5110. These include the Hilton LAX in Los Angeles in 2007 and the Hyatt Fisherman's Wharf in San Francisco in 2011.
- Cal-OSHA Consultation Service/Research and Education Unit has recognized many of the hazards associated with hotel housekeeping in its publication *Working Safer and Easier for Janitors, Custodians, and Housekeepers* (California Dept of Industrial Relations 2005) (Select pages attached as Exhibit 7.) It identifies several of the controls set forth in this proposed standard.

V. The Hazards That an Industry-Specific Housekeeping Standard Should Address

A comprehensive standard is necessary to mitigate the industry specific hazards that housekeepers confront. The standard must address the following issues: safe bedmaking, safe cleaning practices for bathrooms and guest rooms, workload and work pacing, and safe linen carts. It must also provide opportunities for employee involvement, training, protection of employee rights, access to information, and other elements common to occupational health standards. The proposed standard accomplishes all of these objectives.

A. Safe bed-making practices

To make a bed, the housekeeper first removes dirty linens, gathering them on the bed and lifting them off. This frequently requires the housekeeper to separate the heavy duvet from the entangled bed sheets by grasping and pulling one away from the other. These duvets can weigh 14 pounds or more, are bulky, and require great exertion to manipulate. The housekeeper removes dirty pillow case by grasping the pillows firmly and pulling them away from the case grasped firmly in the other hand, a motion which housekeepers note causes pain in the hands and fingers. The housekeeper applies clean linen onto the bed in layers, with each layer tucked in beneath the heavy mattress on both sides and at the foot of the bed with "hospital style" corners. First, she applies a bottom sheet, often snapping it out onto the bed using a throwing motion, spreading it, and pulling it so that it hangs from the edges of the bed. Many hotels require hospital folds that must be tucked tightly beneath the mattress. In order to tuck the linen, the housekeeper typically lifts the heavy mattress at various places with one arm, and—as she is doing so—twisting and driving the linen beneath the mattress using her other arm and hand.

After the bottom sheet is applied, the housekeeper applies a second sheet, which is spread, pulled and tucked in the same manner as the bottom sheet. The housekeeper then lays on the duvet and a top covering, which at some hotels are spread, pulled and tucked beneath the mattress. The housekeeper applies new pillow linen by grasping the pillow in some manner (sometime by the knees) and pushing or pulling the tight case over the pillow until it fits. The housekeeper applies the pillows and the decorative blanket to the assembled bed. The task of bed-making involves numerous lifts using the back and waist, and continuous exertions using the arms, shoulders, hips, wrists and hands.

The proposed standard addresses the hazards associated with bedmaking in a number of ways. It requires employers to perform a hazard assessment evaluation by an appropriately trained professional to identify hazards and to consider proper engineering and administrative controls with respect to bedmaking. It requires employers to adopt a safe housekeeping plan to address these hazards. It requires all employers to adhere to certain practices to reduce the exposure to bedmaking hazards. These consist of the following:

- Elimination of unsafe bedmaking practices. The proposed standard eliminates the practice of laying on and removing bed linen through the use of forceful exertions and extended, awkward postures of the lower and upper extremities. It minimizes the number of mattress lifts necessary to change the bed as described below.
- Use of a properly sized fitted bottom sheet. Some hotels use flat sheets and require housekeepers to make “hospital folds” instead of using a fitted bottom sheet. The use of a properly sized fitted bottom sheet eliminates as many as four to eight mattress lifts per bed change, reduces awkward postures associated with mattress lifting, and avoids unnecessary manipulation of bed linen to make hospital corners. Cal-OSHA and HIOSH have both recommended the use of flat sheets as bottom sheets.¹⁹
- Elimination of practice of tucking top duvet assembly under the mattress. Some hotels that use duvet/comforters require housekeepers to tuck the duvet under the mattress. Allowing the duvet assembly and top sheet to hang off the side of the beds eliminates several mattress lifts per bed change and reduces the risk of injury

to fingers, hands and wrists while tucking the duvet. It is a stylistic choice already adopted by many hotel operators.²⁰

- Elimination of the practice of shaking the duvet to spread it out on the bed. Duvets can weigh over 14 pounds and are often applied with the use of several snapping movements to fluff them evenly on the bed, causing strain to the shoulders and arms. The duvets are required to be placed on the bed and unfolded.
- Elimination of tight-fitting pillow cases. Housekeepers must frequently stuff pillows into tight-fitting pillow cases or tug at pillows to remove them from the cases. There are as many as six pillows on a bed in luxury bedding programs. Pillow cases should be sized so that they may be readily removed and put on.²¹
- Requirement for adequate clearance between beds and obstacles that prevent housekeepers from adopting neutral positions in changing the bed. Beds positioned too close to walls or furniture cause housekeepers to perform lifts or manipulate linen with their trunks twisted in awkward positions. Adequate clearances should be maintained to avoid such body mechanics.²² Adequate clearance is also required for the placement of rollaway beds that result in bedmaking in tight spaces.

B. Safe cleaning practices for bathrooms and guest rooms

To clean bathrooms, the housekeeper must scrub the floor, shower walls and glass doors, tub, toilet and sink. In order to reach high areas, the housekeeper extends her arms high while performing scrubbing motions, sometimes balancing preciously on the tub, sink or toilet. In order to clean low areas, the housekeeper often bends her back or gets down on hands and knees, again using reaching and scrubbing motions with her arms. At times, housekeepers do not have long-handled tools such as mops or scrub brushes to perform their work, forcing them to get down on their hands and knees to clean the floors or climb up on fixtures to clean the shower walls. Even when they are provided with the option to use a swiffer or similar device, housekeepers often feel compelled to work on hands and knees for fear of discipline should they miss any item that needs cleaning.

To clean the guest room, the housekeeper must engage in a diversity of actions. She may have to move furniture to their correct location. She may have to move a rollaway bed to its

proper position. She cleans glass surfaces such as mirrors, pictures, patio doors, and large screen televisions by reaching with her arms and performing a polishing motion. She cleans amenities such as trays and holders. She cleans table and desk surfaces and polishes wood armoires. She cleans other room amenities such as telephones, remote control devices, and other items. She vacuums the entire floor surface, often having to move furniture along the way.

Bathroom and room cleaning exposes housekeepers to numerous hazards as they adopt awkward body mechanics to clean hard-to-reach areas, particularly when they do so without the use of proper equipment. The proposed standard addresses these hazards by eliminating the requirement for housekeepers to stoop, kneel, reach, or adopt other awkward body positions to clean bathrooms and guest rooms. Instead, it requires the availability of appropriately designed safe housekeeping equipment, including ergonomically designed long reach, adjustable tools, dusters and vacuum cleaners. In doing so, the proposed standard adopts the recommendations of Cal-OSHA and HIOSH for the elimination of unsafe cleaning practices and the utilization of appropriately designed equipment.²³

C. Safe workload and work pacing

Work pacing is a significant factor in the hazards of housekeeping. Tasks that may be less hazardous when performed at a moderated pace become more hazardous when performed under intense time pressure. The introduction of new bedding and amenity packages has frequently exacerbated these time pressures because it now requires more work to clean the same number of rooms. Intense time demands increase the risk of injury because housekeepers do not have the time to adopt safe body positions. Housekeepers also face an unacceptable risk of injury caused by slips, trip and falls [to same level], and harmful contact with objects owing to accelerated work pacing. Pushing heavy linen carts down hall ways and onto and off of elevators is another source of injury that is exacerbated by time demands.

Despite the increasing difficulty of cleaning a hotel room brought on by the new bed and room amenities, the industry's response has been inconsistent. While some employers have modified work expectations to account for the increase in the complexity of room cleaning tasks, other employers have implemented cleaning protocols that have actually increased the number of rooms and beds that housekeepers must clean on a daily basis. For example, under its so-called "Refresh Program," Hyatt requires housekeepers at some of its properties to clean as many as 30

rooms per day. This is as much as twice the top number of rooms that housekeepers clean at hotels where such programs are not in place.

The proposed standard addresses the need for safe work pacing in two ways. First, it requires employees to perform a written evaluation with the opportunity for employee input to determine what the appropriate expectation should be for room credits considering an array of factors, including the number of check out versus stay over rooms, the number of rooms requiring additional work, and other factors that contribute to work load variation. The evaluation will be repeated when conditions such as mattress style, linen style, room amenities or other changes to the room layout or complement are effectuated. The proposed standard adopts the recommendation of HIOSH in this regard.²⁴

Second, the proposed standard also places a ceiling of 5,000 square footage of total room space that an employer may regularly assign housekeepers to clean during an 8-hour shift. This requirement is prorated for housekeepers who work shifts of less than 8-hours, and is reduced when the housekeeper has additional factors such as a high number of checkout rooms or rooms with cots and rollaway beds to clean. This square footage equates to 15 rooms for hotels with rooms sizes of 325 square feet. For many employers, this limitation will impose no practical difference since the work assignments are already at or below this threshold. For a few, it will eliminate the practice of assigning room quotas that require housekeepers regularly to clean in excess of 20 and as many as 30 rooms in a day. This will allow housekeepers exposed to these conditions greater time to clean rooms safely while limiting their exposure to hazards.

D. Safe linen carts

Housekeepers use linen carts to transport supplies to the rooms that they will clean. They supply their carts in a linen room. This requires folding of numerous items of bath and bed linen so that the necessary work material fits tightly onto the cart. Other cleaning items are loaded onto the cart as well, such as vacuum cleaners, dusters, rags, chemical sprays and other cleaning supplies. The cart also transports guest items such as soaps, shampoos, and other room amenities. Time pressure creates an incentive for the housekeeper to load the cart as full as possible to avoid having to make repeat trips from the guest room to the linen room to replenish supplies. Linen carts, fully loaded, are heavy and cumbersome to wheel over carpeted surfaces. The new linen program has added a significant burden in this regard because the larger and thicker linens

take up more space than the old linen, thus requiring hotels to provide larger linen carts (with added weight), over-loading their carts, or hurrying back and forth to the linen room more often. The hazard of cart handling is increased by the ongoing problem of lack of wheel maintenance and the use of poorly designed carts—constructed of heavy materials, either too high or too low, fixed shelving—which add additional risks as housekeepers repeatedly bend to find items on the shelves.

The proposed standard addresses the hazard by requiring employers to use motorized linen carts, a recommendation made by HIOSH.²⁵ Available on the market and in use at hotels for many years, motorized linen carts eliminate the exertion involved in pushing linen carts over carpeted areas and ease the effort to turn them around as needed. These carts are highly maneuverable and easily steered by housekeepers and come with the latest ergonomic features such as adjustable shelving and built-in trash receptacles. Included in the Cal-OSHA citation against the Hyatt San Francisco Fisherman's Wharf, was a recommendation for improved cart design.²⁶

E. Monitoring, Training, and Employee Rights

The proposed standard emphasizes the importance of three factors to reduce risk of injuries among housekeepers.

First, it requires the employer to develop, implement, and monitor a safe housekeeping plan to reduce injuries that is based on a housekeeping job hazard assessment. It requires the employer to obtain input from housekeepers both in the development and the implementation of the plan. It establishes the requirement for a safe housekeeping committee to conduct annual evaluations of the employer's performance under the plan. It requires the identification of a competent person who is especially trained to address hazards that housekeepers face.

Second, the proposed standard emphasizes employee training into the requirements of the standard; the employer's safe housekeeping plan; the risk factors for housekeeping-related injuries and injury prevention; safe body mechanics for housekeepers; the use of safeworking practices; use of safe housekeeping equipment; and reporting protocols.

Third, the proposed standard guarantees housekeepers specific rights not to perform housekeeping duties using unsafe work practices as defined in the standard, as well as rights to

bring forward concerns to the employer or to a Cal-OSHA inspector during the course of an investigation without threat or fear of retaliation.

VI. CONCLUSION

The OSHSB should adopt the proposed standard that is included here as Appendix A. The proposed standard addresses the hazards discussed above through an appropriate mixture of performance standards and prescriptive requirements. It involves employee input and involvement in the development of safe housekeeping programs, and it provides for appropriate employee training. The standard will serve to reduce the risk of injuries suffered by housekeepers, thereby improving their productivity and wellbeing. It will reduce the financial costs that these injuries impose upon employers, insurers and society-at-large. It should be adopted.

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² Buchanan S, Vossenas P, Krause N, Moriarty J, Frumin E, Shimek J, Mirer F, Orris P, Punnett L. Occupational injury disparities in the US hotel industry. *American Journal of Industrial Medicine*. 53: 116-125 (2010). The study calculated the housekeeper injury rate at 7.9 per 100 worker-years over a three-year period. The injury rate for hotel workers was 5.8 per 100 FTEs during 2004, the mid-year of the dataset used in the study.

³ *Id.*

⁴ The average service sector injury rate was 4.2 per 100 FTEs in 2004.

⁵ Gabi Bauman, *The Bed Race, Hotel Companies Everlasting Pursuit of Differentiation*, HVS International (April 13, 2006).

⁶ Hotel Interactive, *HEI Hotels & Resorts Raises its Safety Standards Literally With the Bed MadeEZ Mattress Lifter By CKI Solutions—HEI Institutes New Bed Making Safety Guidelines Using CKI Solution’s Innovative Bed MadeEZ Mattress Lifter, Designed to Alleviate the Strain and Risk of Injury While Making the Bed* (March 24, 2011), available at <http://www.hotelinteractive.com/article.aspx?articleid=20151>. See also http://www.facebook.com/CkiSolutions?sk=app_7146470109.

⁷ United States Patent 7,596,822, assigned October 6, 2009 to Hyatt Corporation of Chicago, IL, and PreCare, Inc. of Sonoma, CA.

⁸ Memorandum from Hilton Corporation to Hilton properties, April 28, 2005.

⁹ October 24, 2007 letter from Hilton LAX Human Resource Director to Cal-OSHA.

¹⁰ Buchanan, *et al.*

¹¹ The cases descriptions were recorded on OSHA 300 logs from the Hyatt Regency Century Plaza in Los Angeles, California from January 2006 through August 2010.

¹² Buchanan S, Vossen P, Krause N, Moriarty J, Frumin E, Shimek J, Mirer F, Orris P, Punnett L. Occupational injury disparities in the US hotel industry. *American Journal of Industrial Medicine*. 53: 116-125 (2010).

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¹⁴ Krause N, Scherzer T, Rugulies R. Physical workload, work intensification and prevalence of pain in low wage workers: results from a participatory research project with hotel room cleaners in Las Vegas. *American Journal of Industrial Medicine*. 2005. 48: 326-37.

¹⁵ Milburn, PD, Barrett, RS. *Lumbosacral loads in bedmaking*. *Applied Ergonomics*. 1999; 30: 263-73.

¹⁶ Marras, WS. Filed applications of the lumbar motion monitor. 2006. *Biodynamics Laboratory, Department of Industrial and Systems Engineering*, Ohio State University. Available at <http://biodynamics.osu.edu/research.html#tools>; downloaded April 2, 2006.

¹⁷ Canadian Centre for Occupational Health and Safety. *Occupations & workplaces: Hotel housekeeping*. Available at: http://www.ccohs.ca/oshanswers/occup_workplace/hotel_housekeeping.html.

¹⁸ Worker’s Compensation Board of British Columbia. *Preventing Injuries to Hotel and Restaurant Workers*. 1998.

¹⁹ See Cal-OSHA Memoranda to Hyatt Regency Century Plaza and Hyatt Andaz—West Hollywood; HIOSH letter to Hyatt Regency Waikiki, p. 7; Cal-OSHA Consultation Services, *Working Safer and Easier for Custodians, Janitors and Housekeepers* (Cal-OSHA, 2005), p. 29.

²⁰ HIOSH letter to Hyatt Regency Waikiki, p. 7.

²¹ *Id.*, p. 4.

²² *Id.*, p. 6.

²³ Cal-OSHA Memoranda to Hyatt Regency Century Plaza and Hyatt Andaz—West Hollywood; HIOSH letter to Hyatt Regency Waikiki, p. 3; *Working Safer and Easier for Custodians, Janitors and Housekeepers*, pp. 23-24, 27-28.

²⁴ HIOSH letter to Hyatt Regency Waikiki, p. 9.

²⁵ HIOSH letter to Hyatt Regency Waikiki, p. 8.

²⁶ Inspection Number 312690969, Citation 2, Item 1.

Attachment

A

Proposed Standard

§ 0001 Scope and application

This Article applies to any person, firm, corporation or other entity that operates or manages a hotel, motel, inn, or other short-term or transitional lodging with more than twenty-five guest rooms and that employs housekeepers to clean such rooms.

This Article applies to any operator, owner or manager of such establishments described above, whether the operator, owner or manager directly employs housekeeping employees or contracts for such employees through another entity such as a leasing firm or temporary agency.

Entities covered by this standard shall be referred to in this section as “employer.”

§ 0002 Definitions

Safe housekeeping practices. “Safe housekeeping practices” refers to processes that use a combination of hazard controls such as engineering and administrative controls including, but not limited to, safe housekeeping equipment; safe work practices; safe work loads; and work organization methods to reduce musculoskeletal and other injuries as a result of hotel room cleaning.

Safe housekeeping equipment. “Safe housekeeping equipment” includes adjustable long-handled cleaning tools such as mops, scrubbers and dusters; fitted sheets; laundry hampers on wheels; motorized carts; carts with adjustable-height shelves in carts; ergonomically-designed vacuum cleaners and other equipment that reduces awkward postures, forceful lifting, forceful exertions, and extended reaches.

Housekeeping. “Housekeeping” refers to the activity of cleaning guest rooms, including bed-making, room cleaning, bathroom cleaning, furniture moving, stocking and transporting linen, supplies and cleaning tools (e.g. dusters, vacuum cleaners) on linen carts, and related activities such as scrubbing, dusting, mopping, polishing, vacuuming, and folding and unfolding linen.

Housekeeping employees. “Housekeeping employees” are employees whose assigned tasks includes cleaning guest rooms, or assisting those who clean guest rooms, and includes such job titles as housekeepers, maids, room attendants, guest services attendants, runners, housemen, inspectors and inspectresses.

Safe bedmaking practices. “Safe bedmaking practices” means bed making practices that allow

for the application and removal of bed linens through the use of neutral body postures by the housekeeping employee or which reduce the need for forceful exertions and extended, awkward postures of the upper and lower extremities, shoulder and/or trunk to perform these actions.

Checkout room. “Checkout rooms” mean rooms in which the guest staying the prior night has departed or will depart, and which must be cleaned for a new incoming guest.

Stayover room. “Stayover rooms” mean rooms in which the guest staying the prior night has not departed or will not depart during the ensuing day.

High hazard room. “High hazard rooms” mean rooms that due to the size and purpose of the room contain additional hazards than a standard guest room with a king-size bed, e.g. a room with two double beds or suites that include additional furniture such as sofa beds or additional square footage that contains kitchens, extra bathrooms, floor space or patios all of which require extra work.

Unsafe bedmaking practices. “Unsafe bedmaking practices” means the use of forceful exertions and extended, awkward postures of the upper and lower extremities, shoulder and/or trunk to remove or apply bed linens to beds. It also includes stylistic practices that result in the aforementioned hazards such as tucking duvets beneath the mattress instead of allowing them to hang freely off the bed.

Safe Vacuuming Practice. “Safe vacuuming practice” means that housekeepers will have sufficient time to clean a room that allows them to move furniture first and then vacuum so as to prevent unsafe straining and postures as a result of combining furniture moving tasks with vacuuming tasks. Housekeepers will be trained in the correct postures for use with vacuums and as needed, vacuum models that are ergonomically-designed will be the preferred safe equipment purchased for this task.

§ 0003 Housekeeping Job Hazard Assessment

- (a) Each employer shall perform a written evaluation of the tasks involved in housekeeping to identify potential hazards that may cause housekeepers to suffer musculoskeletal injuries and other foreseeable injuries. The evaluation shall include an identification of those tasks that require housekeepers regularly to engage in the following body mechanics: bending of the back, bending of the trunk, twisting of the back, twisting of the trunk, side to side motion of the back and/or trunk, forward extension of the arms, upward or lower extension of the arms, kneeling, squatting, forceful exertions and lifting, pushing heavy objects, and pulling heavy objects. The evaluation shall identify engineering and/or administrative controls that the employer has determined are

necessary or appropriate to mitigate the risk of injury posed by the identified tasks. The evaluation shall be performed by a person professionally qualified to identify hazards known to cause musculoskeletal disorder injuries (MSDs).

- (b) Such an evaluation shall consider engineering and/or administrative controls such as but not limited to:
 - (i) workload and work organization;
 - (ii) safe housekeeping equipment;
 - (iii) elimination of unsafe bedmaking and room cleaning practices;
 - (iv) evaluation of design features and weights of materials housekeepers work with daily such as vacuum cleaners, duvets, number of bed pillows in consideration of increased risk of musculoskeletal disorder such factors pose;
 - (v) implementation of safe housekeeping practices; and
 - (vi) recommendations of injury control experts knowledgeable about causation and control of musculoskeletal injuries and other related injuries of housekeeping work.

§ 0004 Safe Housekeeping Plan to Reduce Injuries

As part of the injury and illness prevent programs required by Section 3203, employers shall adopt a written injury prevention plan for the protection of housekeeping employees. This plan shall:

- (a) Incorporate the written hazard assessment described in Section 0003.
- (b) Provide for the purchase, use, and maintenance of safe housekeeping equipment in an adequate supply and in adequate condition; and identify the procedure for housekeeping employees to report lack of safe housekeeping equipment or the need for repairs.
- (c) Identify a timeline for regular training of housekeeping employee(s) per the requirements described in Section 0009.
- (d) Require the employer to obtain housekeeping employee input on:
 - (i) identification of hazards of hotel housekeeping work;
 - (ii) selection of safe housekeeping practices and safe housekeeping equipment appropriate to address the hazards identified; and
 - (iii) continued compliance with section (b) above.

- (e) Require the creation of a Safe Housekeeping Committee that will:
 - (i) meet quarterly with advanced notice to all housekeeping employees;
 - (ii) make recommendations on the purchase, use, and maintenance of an adequate supply of appropriate safe housekeeping equipment;
 - (iii) make recommendations on training of housekeepers and other affected workers on use of safe housekeeping equipment and on safe housekeeping practices;
 - (iv) conduct annual evaluations of the employer's performance under the safe housekeeping plan and recommend changes thereto; and
 - (v) when remodeling of hotel rooms is planned by the hotel, evaluate if new designs will allow for safe housekeeping practices and work organization methods or if such designs will increase housekeeping work hazards; if there is a collective bargaining agent, then agent shall be notified at the same time as the safe housekeeping committee.

- (f) Require the identification of a "competent person". A competent person shall be a housekeeping employee who is knowledgeable about this standard and about the employer's Safe Housekeeping Plan; who is capable of identifying site-specific workplace hazards; who has received specialized training on the types of injuries suffered by housekeepers and the adoption of safe housekeeping and bedmaking practices to avoid such injuries; and who has authority to take corrective actions when unsafe practices are identified. The competent person shall be a member of the Safe Housekeeping Committee.

§ 0005 Requirements:

In addition to complying with its safe housekeeping plan described in section 0004, covered employees shall also comply with the following requirements:

- (a) Housekeepers shall not be required to regularly clean more than 5,000 square footage of room space in an eight hour workday. Square footage refers to the entire square footage of the room, including areas beneath beds and furniture, as measured by the perimeter dimensions of the room. For any room cleaner working less than eight full hours per day, this maximum floor space shall be prorated evenly according to the actual number of hours worked. When a room cleaner is assigned in an eight-hour workday to clean any combination of seven or more checkout rooms or rooms with additional beds such as cots or rollaways, this maximum floorspace shall be reduced by 500 square feet for each such checkout or additional bedroom over six.

- (b) Housekeepers shall not be required to clean bathroom floors, toilets, walls and other

bathroom surfaces in a stooped, kneeling, extended reach, or other awkward body position. Appropriately designed safe housekeeping equipment shall be available for use at all times.

- (c) Housekeepers shall not be required to stand on any uneven surface to perform cleaning tasks, including tub rims, sink tops or toilets. Appropriately designed safe housekeeping equipment shall be available for use at all times.
- (d) Housekeepers shall not be required to clean guest room walls, mirrors, headboards, and other surfaces in a stooped, kneeling, extended reach, or other awkward body position. Appropriately designed safe housekeeping equipment shall be available for use at all times. Safe vacuuming practices will be applied at all times.
- (e) Housekeepers shall not be required to lift bed mattresses in a trunk-twisted or other awkward body position. Adequate clearance between the side of the bed and other surfaces such as walls and furniture shall be maintained to eliminate such practice.
- (f) A fitted sheet shall be used in lieu of a flat sheet as the bottom sheet on all mattresses.
- (g) Housekeepers shall not be required to use unsafe bedmaking practices in order to complete their room quota. Unsafe bedmaking practices include the use of forceful exertions and extended, awkward postures of the upper and lower extremities, shoulder and/or trunk to remove or apply bed linens to beds. It shall be the sole responsibility of the hotel employer and its managers, supervisors, and housekeeping supervisors to ensure that safe bedmaking practices are in use. A safe bedmaking practice includes that bed linens should be regularly laid on the bed and pulled towards the edge of the bed rather than regularly shaken out using hands and arms. Bed linens should be removed in a similar process by having the linens removed from one side of the bed by worker standing at same side of the bed, then walk to the opposite side of the bed and remove the linens and finish by standing at the foot of the bed to gather up the linens in a bundle while maintaining neutral postures. This prevents the unsafe practice of standing at one side of the bed and over reaching by the trunk and arms using forceful movements to tug the sheets off the bed.
- (h) Duvets and comforters (or similar top covering) shall not be shaken out but shall be placed on the bed and unfolded. Duvets, comforters (or similar top covering) and top sheets shall be allowed to hang off the sides of beds and shall not be tucked beneath the mattress
- (i) Pillows shall not be encased in tight-fitting pillow cases where more than minimal force is required to remove the pillow from the case or to insert the pillow into the case. Pillow cases shall be sized so that pillows are easily removed and inserted into the case.

- (j) Motorized or self-propelled linen carts shall be provided. Linen carts shall be kept in good working condition to ensure that wheels function properly with adjustments made for traversing carpeting. Linen carts shall include adjustable shelves.
- (k) Housekeepers shall not be required to move heavy furniture by oneself such as armoires, sofa beds; instead teams of two shall perform the move and where possible, safe lifting techniques and appropriate moving equipment such as dollies and/or addition of coasters or rolling wheels placed on bottom of furniture shall be utilized with proper training provided before use.

§ 0006 Administrative Controls

Each employer shall perform a written evaluation to determine what the appropriate expectation should be for the number of room credits assigned to housekeeping employees during a work shift. The evaluation should consider the impact on a housekeeper's workload of daily variations in room assignments and work organization such as the effect of number of check out rooms versus stay over rooms, the number of high hazard rooms versus rooms with one king-size bed, the number of different floors to which the housekeeper must travel, do-not-disturb requests and other events that contribute to workload variations. The evaluation must be based upon input from employees or their authorized collective bargaining agent where such agent exists. The evaluation must be repeated when conditions such as the mattress style, linen style, room amenities, or other changes to the room layout or complement are effectuated; and when changes due to hotel renovation or when changes to current hotel policies occur or new policies are implemented such as green policies that impact housekeeper's workload, work organization or job task are also effectuated.

§ 0007 Light Duty Assignments

An employer shall provide alternative light duty opportunities for housekeeping employees who have suffered musculoskeletal injuries as a result of housekeeping duties wherever possible. Such light duty assignment duties shall be less demanding than regular work so as to not aggravate the employee's injury.

§ 0008 Monitoring and Evaluation

- (a) Each employer will engage in quarterly monitoring to ensure that it is in compliance with the requirements of its plan and this Article.
- (b) The employer will evaluate the effectiveness of the plan on an annual basis with input from the safe housekeeping committee. The results will be reported to the committee and made available to employees.

§ 0009 Communication and training

- (a) Each employer shall provide regular training to housekeepers concerning:
 - (i) the requirements of this Article;
 - (ii) the definitions in § 0002;
 - (iii) the hazards identified in § 0003;
 - (iv) the employer's plan described in § 0004;
 - (v) safe work practices designed to reduce the risk of musculoskeletal injuries and other housekeeping-related injuries including:
 - 1. risk factors for housekeeping-related injuries and injury prevention;
 - 2. neutral postures and body mechanics for housekeeping tasks;
 - 3. how to use safe working practices related to bedmaking and room cleaning and how they prevent injuries; and
 - 4. the use of safe housekeeping equipment; reporting mechanisms for the lack of available equipment; and reporting mechanism for the repair and maintenance of such equipment;
 - (vi) how to report injuries suffered as a result of housekeeping activities.
- (b) Training shall occur:
 - (i) when a housekeeping employee is hired; and
 - (ii) when a hotel employee is transferred into the housekeeper job title; and
 - (iii) when new equipment arrives at the hotel or when new safe work practice is identified; and
 - (iv) when changes due to hotel renovation or when changes to current hotel policies occur or new policies are implemented such as green policies that impact housekeeper's workload, work organization or job task are also effectuated.
 - (v) annually thereafter.

§ 0010 Recordkeeping

Each employer shall maintain records showing its compliance with the requirements of this Article. Copies of such records shall be made available to employees or their authorized collective bargaining representative upon request.

§ 0011 Employee Rights

- (a) A housekeeping employee who refuses to perform housekeeping tasks because of the employer's failure to provide appropriate tools or the employer's requirement to engage in unsafe housekeeping practices shall not, based upon the refusal, be the subject of disciplinary action by the employer or its agents.
- (b) Housekeeping employees shall be allowed to inspect the worksite at reasonable times in order to identify hazardous conditions and bring their concerns to the employer or its agents, to the competent person, or to the Safe Housekeeping Committee.
- (c) During any inspection conducted by the Division, housekeeping employees shall have the right:
 - (i) to speak with an inspector outside the presence of the employer or its agents either on or off property;
 - (ii) to accompany an inspector during an inspection to provide input into hazards that exist in the housekeeper's work area;
 - (iii) to receive copies of documents the employer or its agents provides to the Division concerning the existence or non-existence of hazardous conditions in their work areas.

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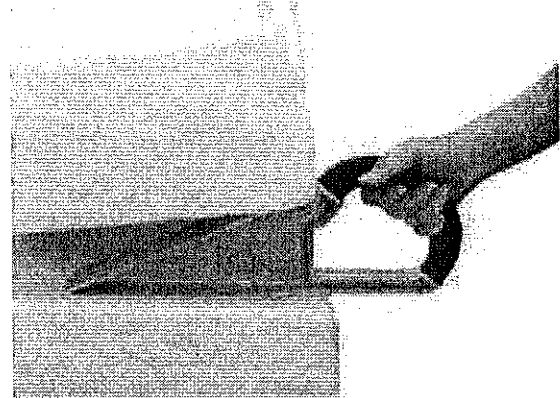
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HEI Hotels & Resorts Raises Its Safety Standards Literally With The Bed MadeEZ Mattress Lifter By CKI Solutions

HEI Institutes New Bed Making Safety Guidelines Using CKI Solution's Innovative Bed MadeEZ Mattress Lifter, Designed To Alleviate The Strain And Risk Of Injury While Making The Bed.

Thursday, March 24, 2011

Cadence Keen Innovations, Inc. (dba CKI Solutions), a leading provider of mattress accessories to the hospitality industry, is pleased to announce its participation in HEI Hotels & Resorts' ABCs of Safety program for 2011. Designed to enhance the safety of HEI associates and reduce costs related to Workers' Compensation claims, the ABCs of Safety program Provides HEI managers and associates additional tools that further enhance safety in the workplace. As a part of the program, HEI, in partnership with CKI, has issued the Bed MadeEZ Mattress Lifter to all of its 700 housekeepers among its 36 properties as well as developed standard operating procedures, training materials and promotional collateral aimed at educating and training hotel management and staff on the importance and usage of the Bed MadeEZ during bed making activities.



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"As part of our ongoing efforts to improve associate wellness, HEI Hotels & Resorts is proud to introduce our ABCs of Safety program for 2011," states Alec Fomin, Corporate Director of Operations for HEI Hotels & Resorts. "The tools implemented in the program such as the Bed MadeEZ, safe cutting tools and tools to reduce the likelihood of slips and falls were chosen to enhance general safety awareness and/or assist specifically to make certain tasks safer to perform."

Mattress lifting, by nature, puts the back in its weakest position and the repeated lifting required for a housekeeper can stress the upper-body's muscles, joints and tendons. Without enough time between exertions for the body to heal itself, muscles, tendons and joints can be damaged. In fact, recent studies indicate housekeepers are 48% more likely to be injured than any other job in the service sector and are 51% more likely to incur serious, disabling injuries. According to Jim Stover, Vice President of Loss Prevention for AJ Gallagher Hospitality Division, repetitive motion injuries account for nearly "29% of all housekeeping injuries" and cost the hospitality industry more than \$500 million in compensation claims and lost workdays every year.

Bed MadeEZ utilizes a unique, wedge-shaped ergonomic design that easily inserts between the mattress and the box spring, creating an automatic lift as it slides in. The mattress then stays in a raised position, eliminating the need for repeated lifting as the linens are changed. Applauded by leading doctors, risk management specialist, chiropractors and ergonomic specialists, the patented Bed MadeEZ significantly reduces and can even eliminate the serious and often disabling repetitive motion injuries that are associated with changing linens on beds that now weigh in excess of 115 pounds on average.

"With over 36 hotels under 12 luxury brands, HEI Hotels & Resorts has quickly established itself as a leader

in the hospitality industry. We're very pleased to be working with such a reputable partner that recognizes the value of employee safety and chose to make the Bed MadeEZ a part of their ABCs of Safety program," states Sam Montross, founder and president of CKI Solutions.

Additional benefits of the Bed MadeEZ include:

- Automatic mattress lift as the device is inserted between the mattress and box spring.
- A sturdy, 2"-wide base on which the mattress can rest, allowing plenty of room for the hands to move under the mattress to change linens.
- The ergonomically-shaped rubberized handle allows the user to grasp the device at multiple positions for maximum grip and comfort.
- The tough, injection-molded plastic withstands weight in excess of 350 lbs.
- The smooth, rounded surfaces ensure no tearing or damage to the mattress or bedding

For more information on Bed MadeEZ or other CKI Solutions products, please contact Steven Gordon at 888.222.2217 or visit www.cadencekeen.com.

About Cadence Keen Innovations

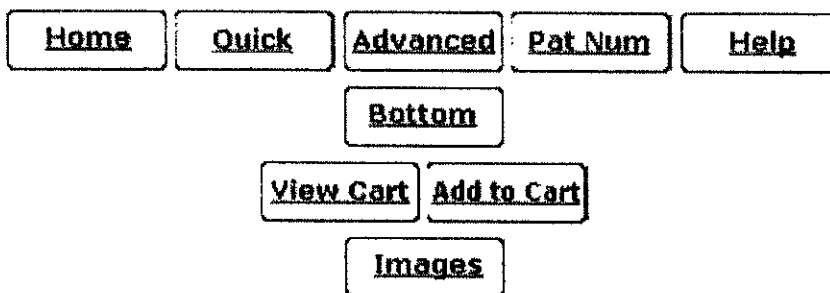
Headquartered in Ft. Lauderdale, Fla., Cadence Keen Innovations, Inc. (dba CKI Solutions) is a leading provider of sleep solutions to the hospitality, retail and health care industries. Originally founded by Sam Montross as China Horse, Inc. in 1996 with the introduction of the first bed doubler system, CKI Solutions offers a comprehensive line of mattress care and sleep accessory products. In addition to bed doublers, CKI Solutions also designs and manufactures cutting edge waterproof mattress protectors and encasements for mattresses, pillows and box springs. For more information, please visit www.cadencekeen.com or call 888.222.2217.

About HEI Hotels & Resorts

HEI Hotels & Resorts, headquartered in Norwalk, Connecticut, is a leading hospitality investment firm that acquires, develops, owns and operates full-service, upper upscale and luxury hotels and resorts throughout the United States under such well-known brand names as Marriott, W, Westin, Le Meridien, Sheraton, Embassy Suites and Hilton. For more information, please visit www.heihotels.com.

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USPTO PATENT FULL-TEXT AND IMAGE DATABASE

(1 of 1)

United States Patent
Sakaldasis , et al.

7,596,822
October 6, 2009

Apparatus and methods for lifting bed mattresses and/or tucking in bed covers

Abstract

The invention discloses differing embodiments of apparatus, and methods for their use, which are designed to aide in lifting bed mattresses and tucking in bed covers. In some embodiments, kits are disclosed which include wedge apparatus for lifting bed mattresses, and tuck apparatus for tucking in bed covers. In other embodiments, wedge apparatus for lifting portions of bed mattresses are disclosed. In still other embodiments, tuck apparatus for tucking in bed covers are provided. Additional embodiments disclose methods for using the kits, wedge apparatus, and tuck apparatus.

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PreCare, Inc. (Sonoma, CA)

Appl. No.: **11/464,719**

Filed: **August 15, 2006**

Current U.S. Class:

5/658 ; 5/482

Current International Class:

A47C 31/00 (20060101)

Field of Search:

5/658,482 29/239,253 254/104

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Primary Examiner: Cuomo; Peter M.
Assistant Examiner: Kelleher; William
Attorney, Agent or Firm: Wildman, Harrold, Allen & Dixon LLP

Claims

We claim:

1. A kit for tucking at least a portion of one bed cover under a mattress of a bed comprising: a wedge apparatus comprising a wedge member for lifting a portion of said mattress of said bed, said wedge apparatus comprising a bottom surface and a sloped surface, wherein the bottom surface and the sloped

surface form an acute angle and first and second side surfaces are disposed between and along said bottom surface and said sloped surface, a first handle member connected to the wedge member, and at least one substantially planar stabilizing surface extending perpendicularly from at least one of said first and second side surfaces in a direction away from both of said first and second side surfaces; and a tuck apparatus comprising a tuck member for tucking said portion of said bed cover under said mattress of said bed comprising at one end of said tuck member at least one tucking surface, and a second handle member connected to said tuck member; and wherein at least one of said first and second handle members is oriented in non-parallel relationship with respect to said bottom surface of said wedge member and said tuck member respectively.

2. The kit of claim 1 wherein the wedge apparatus further comprises a mattress receiving surface oriented in non-parallel relationship with respect to said sloped surface.

3. The kit of claim 2 wherein said sloped surface ends at said mattress receiving surface, and said mattress receiving surface is adapted to be oriented in a substantially horizontal plane when said sloped surface of said wedge member is slid under said mattress.

4. The kit of claim 3 wherein said bottom surface is disposed in a horizontal direction below both of said sloped surface and said mattress receiving surface when said first handle member is pointed in a vertical direction.

Description

BACKGROUND OF THE INVENTION

The process of making a bed, including lifting a bed mattress and/or tucking in bed covers between the bed mattress and box spring mattress, or other support structure, can be physically taxing. Most often, beds are made manually without the aide of bed-making apparatus. Many of the known bed-making apparatus and methods of use experience one or more problems. Some representative problems with these bed-making apparatus and methods may include: requiring strenuous bed-making activity potentially resulting in fatigue and injury, requiring excessive time to make the bed, leading to poor quality made-beds, and/or other types of problems.

Bed-making apparatus and methods for their use are needed which may solve one or more problems in one or more of the existing bed-making methods and apparatus.

SUMMARY OF THE INVENTION

In one aspect of the invention, a kit is provided for tucking at least a portion of one bed cover under a mattress of a bed. The kit includes a wedge apparatus which comprises a wedge member for lifting a portion of the mattress of the bed. The wedge member includes a bottom surface and a sloped surface which form an acute angle. A first handle member is connected to the wedge member. The kit further includes a tuck apparatus. The tuck apparatus comprises a tuck member for tucking the portion of the bed cover under the mattress of the bed. At least one tucking surface is at one end of the tuck member. A second handle member is connected to the tuck member. At least one of the first and second handle members is oriented in non-parallel relationship with respect to the bottom surface of the wedge member and the tuck member respectively.

In another aspect of the invention, a method is provided of tucking a portion of a bed cover under a

mattress of a bed. In one step, a sloped surface of a wedge apparatus is slid under the mattress of the bed in order to lift at least a portion of the mattress. In another step, a tucking surface of a tuck apparatus is pressed against a surface of the bed cover. In yet another step, the tucking surface is slid under the mattress in order to tuck the portion of the bed cover under the mattress.

These and other features, aspects and advantages of the invention will become better understood with reference to the following drawings, description and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of one embodiment of a bed-making kit under the invention;

FIG. 2 is a partial, perspective view showing the step of positioning the wedge apparatus of FIG. 1 with respect to a bed mattress under one method embodiment for making a bed under the invention;

FIG. 3 is a partial, perspective view showing the step of sliding the wedge apparatus of FIG. 2 under the bed mattress under one method embodiment for making a bed under the invention;

FIG. 4 is a partial, perspective view showing the step of positioning a tuck apparatus with respect to the bed mattress of FIG. 3 under one method embodiment for making a bed under the invention;

FIG. 5 is a partial, perspective view showing the step of sliding the tuck apparatus of FIG. 4 under the bed mattress under one method embodiment for making a bed under the invention; and

FIG. 6 is a partial, perspective view showing the step of sliding the tuck apparatus of FIG. 5 under and along one side of the bed mattress under one method embodiment for making a bed under the invention.

DETAILED DESCRIPTION OF THE INVENTION

The following detailed description is of the best currently contemplated modes of carrying out the invention. The description is not to be taken in a limiting sense, but is made merely for the purpose of illustrating the general principles of the invention, since the scope of the invention is best defined by the appended claims.

In one embodiment of the invention, as shown in FIG. 1, a kit 10 is provided for tucking at least a portion of a bed cover under a bed mattress. For purposes of this application, the word "tucking" or "tuck" is defined as locating and/or positioning a portion of a bed cover under a bed mattress. The kit 10 may include a wedge apparatus 12 and a tuck apparatus 14. The wedge apparatus 12 may be adapted to aid in lifting a portion of a bed mattress in an upwardly direction off a box spring mattress in order to make it easier for a person making the bed to tuck in one or more bed covers between the bed mattress and box spring mattress. In other embodiments, the wedge apparatus 12 may be adapted to lift a portion of a bed mattress off other types of supporting structures. The tuck apparatus 14 may be adapted to tuck one or more portions of one or more bed covers under a bed mattress.

The wedge apparatus 12 of the kit 10 may comprise a wedge member 16 having a bottom surface 17, a sloped surface 18, and a first handle member 20 connected to the wedge member 16. The bottom surface 17 and the sloped surface 18 may be adjoining, and may form an acute angle 19 which facilitates the sloped surface 18 engaging a surface of a bed mattress, and facilitates lifting of the bed mattress. The wedge member 16 may be adapted for lifting a portion of a bed mattress. Two holes 22 and 24 may define the wedge member 16, and may extend horizontally through a cross-section of the wedge member 16. The holes 22 and 24 may be used to reduce the weight of the wedge apparatus 12, and may be

circular or in other configurations, shapes, or quantities. A first connecting member 26 may connect the first handle member 20 to the wedge member 16. In other embodiments, the first handle member 20 may be connected to the wedge member 16 directly, or through other means. The first connecting member 26 may be substantially rectangular, round, oval, or in other configurations or shapes. For ergonomic reasons, the first handle member 20 may be in non-parallel relation with respect to the first connecting member 26, bottom surface 17, wedge member 16, and/or other portion of wedge apparatus 12. The first handle member 20 may be at an angle 28 with respect to the first connecting member 26 in substantially the range of 30 degrees to 120 degrees. In other embodiments, angle 28 may be substantially in the range of 60 to 90 degrees. A grip member 30 may cover one or more portions of the first handle member 20. The grip member 30 may be made of foam, rubber, or other materials.

Sloped surface 18 may be substantially linear, may begin at an end 32 of the wedge member 16, and may end at a mattress receiving surface 34. The mattress receiving surface 34 may be oriented in non-parallel relation with respect to sloped surface 18. The wedge member 16 may include a substantially planar stabilizing surface 36 having a width 38 wider than a width 40 of the sloped surface 18, and/or other portion of the wedge member 16. One or more portions 41 of the substantially planar stabilizing surface 36 may be curved. Both the mattress receiving surface 34 and the substantially planar stabilizing surface 36 may be adapted to be oriented in substantially horizontal planes when the sloped surface 16 is slid under a bed mattress and/or above a box spring mattress. The substantially planar stabilizing surface 36 may be oriented in parallel alignment with the mattress receiving surface 34. The first handle member 20 may be oriented in non-parallel alignment with both the substantially planar stabilizing surface 36 and the mattress receiving surface 34. In other embodiments, the wedge apparatus 12 and/or wedge member 16 may include one or more stop members (not shown) which may prevent the wedge member 16 from slipping out of a position in between a bed mattress and/or a box spring mattress.

When the wedge member 16 is upright, as shown in FIG. 1, so that it is oriented in a substantially vertical plane, the sloped surface 18 of the wedge member 16 may be adapted to be slid in between a bed mattress and a box spring mattress, locating one or more portions of the sloped surface 18 under the bed mattress and above the box spring mattress. In such manner, the bed mattress may be lifted upwardly off the box spring mattress due to the bed mattress being forced to slide up the sloped surface 18 of the wedge member 16. The described movement of the wedge member 16 may be achieved by a person grasping the first handle member 20 to apply a force to the wedge member 16 in order to slide the sloped surface 18 under a bottom surface of the bed mattress and above a top surface of the box spring mattress. The substantially planar stabilizing surface 36 may be slid on top of the box spring mattress forcing the bed mattress to be slid up the sloped surface 18 until the bed mattress comes to rest on top of the mattress receiving surface 34. In such manner, the bed mattress may be stabilized in a raised position on top of the mattress receiving surface 34 due to the use of the wedge apparatus 12.

The use of the wedge apparatus 12 may reduce the force required to lift the bed mattress off the box spring mattress. In some embodiments, the force required to lift the bed mattress off the box spring mattress may be reduced substantially in the range of 10 to 90 percent. In other embodiments, the force may be reduced by varying percentages.

The wedge apparatus 12 may be made of plastic or other types of materials. In other embodiments, the wedge apparatus 12 may be of varying shapes, sizes, configurations, and orientations, with differing numbers and types of sloped surfaces 18.

The tuck apparatus 14 of the kit 10 may comprise a tuck member 42 having a tucking surface 44, and a second handle member 46 connected to the tuck member 42 by a second connecting member 52. The tuck member 42 may be adapted for tucking a portion of a bed cover under a bed mattress. In other embodiments, the second handle member 46 may be directly connected to the tuck member 42, or

connected by other means. The second handle member 46 may be in non-parallel relation with respect to tuck member 42, or other portion of tuck apparatus 14. The tuck member 42 may comprise a substantially planar, triangular surface 48. The tucking surface 44 of the tuck member 42 may lie at one end 50 of the tuck member 42, may be substantially linear, and may be substantially perpendicular to the second connecting member 52. A width 54 of the tucking surface 44 may be wider than a width 56 of the second connecting member 52 in order to allow contact with a greater portion of the bed cover being tucked in. The second connecting member 52 may be substantially rectangular, round, oval, or in other configurations or shapes. For ergonomic reasons, the second handle member 46 may be at an angle 58 with respect to the second connecting member 52 and/or tuck member 42 in substantially the range of 30 degrees to 120 degrees. In other embodiments, angle 58 may be substantially in the range of 60 to 90 degrees. A grip member 60 may cover one or more portions of the second handle member 46. The grip member 60 may be made of foam, rubber, or other materials.

When the sloped surface 18 of the wedge member 16 of the wedge apparatus 12 is located under a bed mattress and the tuck member 42 is oriented in a substantially horizontal plane, the tucking surface 44 of the tuck apparatus 14 is adapted to be pressed against one or more surfaces of one or more bed covers overhanging the bed mattress. While in this position, the tucking surface 44 may be adapted to be slid under a surface of the bed mattress and above a surface of the box spring mattress, in order to force a portion of the bed cover in between the box spring mattress and mattress, thereby tucking in that portion of the bed cover. Movement of the tucking surface 44 in such manner may be achieved by a person grasping the second handle member 46.

The use of the tuck apparatus 14 and/or wedge apparatus 12 may reduce the force required to tuck a portion of the bed cover under the bed mattress into a position in between the mattress and box spring mattress. In some embodiments, the force required to tuck the portion of the bed cover under the mattress may be reduced substantially in the range of 10 to 90 percent. In other embodiments, the force may be reduced by varying percentages.

The tuck apparatus 14 may be made of plastic or other types of materials. In other embodiments, the tuck apparatus 14 may be of varying shapes, sizes, configurations, and orientations, with differing numbers, types, and configurations of tucking members 42 and tucking surfaces 44.

In another embodiment, a method is disclosed for tucking at least a portion of at least one bed cover under a mattress of a bed. The method may be used to tuck the bed cover in between a bed mattress and a box spring mattress, or other support structure. In one step of the method, as shown in FIG. 2, the wedge apparatus 12 of FIG. 1 may be positioned adjacent to one or more bed covers 62 overhanging a bed mattress 64 and a box spring mattress 66, or other support structure. In this position, a wedge member 16 of the wedge apparatus 12 may be aligned for engagement with a bottom surface of the bed mattress 64 and a top surface of the box spring mattress 66. In other embodiments, the wedge apparatus 12 may be positioned adjacent bed and box spring mattresses 64 and 66 without the presence of bed covers 62. The wedge apparatus 12 may be positioned adjacent a substantially center area 65 of a side portion 67 of the bed mattress 64. In other embodiments, the wedge apparatus 12 may be positioned at different areas of the bed mattress 64, such as the corners or other areas of the bed mattress 64. The wedge apparatus 12 may comprise any of the wedge apparatus embodiments disclosed within this specification.

In another step of the method, as shown in FIG. 3, a sloped surface 18 of the wedge apparatus 12 may be slid under the bed mattress 64, and above the box spring mattress 66 or other support structure, in order to lift at least a portion of the bed mattress 64 upwardly. The sloped surface 18 of the wedge apparatus 12 may be slid under the substantially center area 65 of the side portion 67 of the bed mattress 64. In other embodiments, the sloped surface 18 of the wedge apparatus 12 may be slid under different areas of

the bed mattress 64 in order to lift different portions of the mattress 64 upwardly. For instance, the sloped surface 18 of the wedge apparatus 12 may be slid, at separate times, into substantially center areas of three different sides of the bed mattress 64 in order to aide in tucking in bed covers 62 on three sides of the bed mattress 64. In other embodiments, the sloped surface 18 of the wedge apparatus 12 may be slid into varying areas of any side of the bed mattress 64. The wedge apparatus 12 may be slid by a person grasping and applying a force to a first handle member 20 of the wedge apparatus 12 and sliding the sloped surface 18 under a bottom surface of the mattress 64 and above a top surface of the box spring mattress 66 or other support structure.

During this step, as shown in FIG. 3, the wedge member 16 of the wedge apparatus 12 may be oriented upright in a substantially vertical plane, and both a mattress receiving surface 34 and a substantially planar stabilizing surface 36 of the wedge apparatus 12 may be oriented in substantially horizontal planes. As the sloped surface 18 of the wedge apparatus 12 is slid under the bed mattress 64, the insertion of the sloped surface 18 may force a portion of one or more bed covers 62 overhanging the bed mattress 64 to be tucked between the bed mattress 64 and box spring mattress 66 in the area where the sloped surface 18 is inserted. After the sloped surface 18 of the wedge apparatus 12 is slid under the bed mattress 64, the bed mattress 64 may abut against the mattress receiving surface 34 of the wedge apparatus 12, which may be oriented in a substantially horizontal plane 36 to stabilize the mattress 64 in its position against the wedge apparatus 12. Similarly, after the sloped surface 18 of the wedge apparatus 12 is slid under the bed mattress 64, the box spring mattress 66 may be abutted against the substantially planar stabilizing surface 36 of the wedge apparatus 12, which may be oriented in a substantially horizontal plane to stabilize the wedge apparatus 12 in its position against the box spring mattress 66.

In yet another step of the method, as shown in FIG. 4, after the wedge apparatus 12 is slid under the bed mattress 64, a tuck member 42 of a tuck apparatus 14 may be oriented in a substantially horizontal plane, and a tucking surface 44 of the tuck apparatus 14 may be positioned adjacent and pressed against a surface of one or more of the bed covers 62 overhanging the bed mattress 64 and box spring mattress 66, or other support structure. The tucking surface 44 of the tuck apparatus 14 may be positioned adjacent and pressed against a substantially center area 65 of the side portion 67 of the bed mattress 64, just to the side of the location of the inserted wedge apparatus 12. In other embodiments, the tucking surface 44 of the tuck apparatus 14 may be positioned in a variety of positions with respect to the bed mattress 64, bed cover 62, and/or wedge apparatus 12. In still other embodiments, the tucking surface 44 of the tuck apparatus 14 may be positioned adjacent and pressed against different surfaces of the bed covers 62 along different areas of the bed mattress 64 in order to place the tucking surface 44 in position to tuck different portions of the bed covers 62 under different areas of the mattress 64. For instance, the tucking surface 44 of the tuck apparatus 14 may be positioned adjacent and pressed against, at separate times, substantially center areas on three different sides of the bed mattress.

Movement of the tucking surface 44 of the tuck apparatus 14 may be accomplished by a person grasping a second handle member 46 of the tuck apparatus 14. When the tucking surface 44 of the tuck apparatus 14 is positioned adjacent and pressed against a surface of one or more of the bed covers 62, the tuck member 42 may be oriented in a substantially horizontal plane. In other embodiments, the tuck member 42 may be oriented in various configurations or orientations. For instance, the tuck member 42 may be oriented in a substantially vertical plane and/or horizontal plane and the tucking surface 44 may be positioned adjacent and pressed against a portion of bed cover 62 lying in between a bed headboard (not shown) and the bed mattress 64. It should be noted that the tuck apparatus 14 may comprise any of the tuck apparatus embodiments disclosed within this specification.

In another step of the method, as shown in FIG. 5, after the wedge apparatus 12 is slid under the bed mattress 64, the tucking surface 44 of the tuck apparatus 14 may be slid, while the tuck member 42 is oriented in a substantially horizontal plane, under the bed mattress 64 and above the box spring mattress

66 or other support structure, in order to tuck a portion of the bed covers 62 in between the bed mattress 64 and box spring mattress 66 in the area where the tucking surface 44 is inserted. The tucking surface 44 of the tuck apparatus 14 may be slid under a substantially center area 65 of the side portion 67 of the bed mattress 64, just to either side of the location of the inserted wedge apparatus 12. In other embodiments, the tucking surface 44 of the tuck apparatus 14 may be slid under varying portions of the bed mattress 64 in varying positions relative to the placement of the wedge apparatus 12. For instance, the tucking surface 44 of the tuck apparatus 14 may be slid under, at separate times, substantially center areas on three different sides of the bed mattress in order to tuck in different portions of the bed covers 62 at different areas of the bed mattress 64. In another embodiment, the tucking surface 44 may be slid in between a bed headboard (not shown) and the bed mattress 64 in order to tuck a portion of bed cover 62 in between the bed headboard and bed mattress 64. Movement of the tucking surface 44 may be accomplished by a person grasping the second handle member 46 of the tuck apparatus 14 in order to move the tucking surface 44 as described.

In still another step of the method, the tucking surface 44 of the tuck apparatus 14 may be slid, while the tuck member 42 is oriented in a substantially horizontal plane, under and along one side of the bed mattress 64 from its position shown in FIG. 5 to its end position 69 under the bed mattress 64 shown in FIG. 6. In such manner the bed covers 62 may be tucked in between the bed mattress 64 and box spring mattress 66, or other support structure, along the entire length of the bed mattress 64 that the tucking surface 44 is slid. In order to tuck in bed covers 62 along varying sides of the bed mattress 66, the tucking surface 44 of the tuck apparatus 14 may be slid along various sides of the bed mattress 66. For instance, the tucking surface 44 of the tuck apparatus 14 may be slid, at different times, from substantially center areas of three side portions of the mattress to three respective end portions of the mattress 64 in order to tuck in the bed covers 62 along three different sides of the mattress 64. In other embodiments, the tucking surface 44 may be slid into and along different areas of varying sides of the bed mattress 66. For instance, the tucking surface 44 may be slid in between, and along, a bed headboard (not shown) and the bed mattress 64 in order to tuck bed cover 62 in between the bed headboard and bed mattress 64.

The wedge apparatus 12 and tuck apparatus 14 may be used in conjunction with each other to tuck in bed covers 62 around the entire mattress 64. For instance, a portion of the wedge apparatus 12 may be slid under a portion of the mattress 64 on one side of the mattress 64. The tuck apparatus 14 may be pressed against a portion of the bed covers 62 on that side of the mattress 64. The tuck apparatus 14 may then be slid under and along that side of the mattress 64 in order to tuck in the bed covers 62 along that side of the mattress 64. Subsequently, the wedge apparatus 12 may be removed from that side of the mattress 64 and slid under a portion of the mattress 64 on a second side of the mattress 64. The tuck apparatus 14 may be pressed against a portion of the bed covers 62 on the second side of the mattress 64. The tuck apparatus 14 may then be slid under and along the second side of the mattress 64 in order to tuck in the bed covers 62 along the second side of the mattress 64. This process may be repeated to tuck in bed covers 62 along as many sides of the bed mattress 64 as desired in order to fully make the bed.

In another embodiment, the invention may comprise the wedge apparatus 12 shown in FIG. 1 without the tuck apparatus 14. The wedge apparatus 12 may allow a portion of a bed mattress 64 to be lifted off a box spring mattress 66, or other support structure. The structure of the wedge apparatus 12 may comprise any of the wedge apparatus 12 embodiments disclosed within this specification.

In still another embodiment, the invention may comprise the tuck apparatus 14 shown in FIG. 1 without the wedge apparatus 12. The tuck apparatus 14 may allow one or more portions of one or more bed covers 62 to be tucked in between a bed mattress 64 and box spring mattress 66, or other support structure. The structure of the tuck apparatus 14 may comprise any of the tuck apparatus embodiments

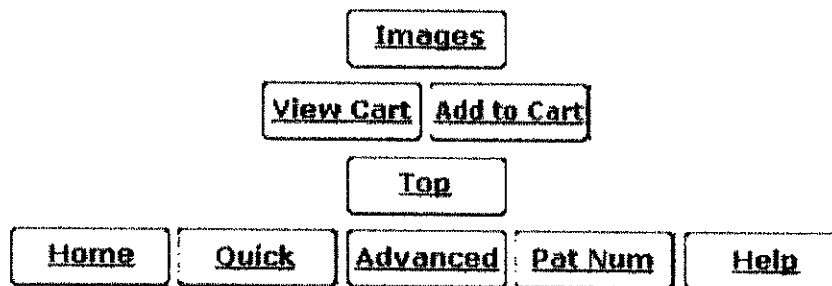
disclosed within this specification.

In yet another embodiment, the invention may comprise a method of sliding the wedge apparatus 12 of FIG. 1 under a bed mattress 64 in order to lift one or more portions of the mattress in an upwardly direction off a box spring mattress 66 or other support structure. The method may not include use of tuck apparatus 14. The structure of the wedge apparatus 12 may comprise any of the wedge apparatus embodiments disclosed within this specification. Similarly, the method of use of the wedge apparatus 12 may comprise any of the methods of use of the wedge apparatus as described in this specification.

In an additional embodiment, the invention may comprise a method of tucking a portion of at least one bed cover 62 under a bed mattress 64 utilizing the tuck apparatus 14 of FIG. 1, without the use of wedge apparatus 12. The structure of the tuck apparatus 14 may comprise any of the tuck apparatus embodiments disclosed within this specification. Similarly, the method of use of the tuck apparatus 14 may comprise any of the methods of use of the tuck apparatus as described in this specification.

One or more embodiments of the disclosed wedge and tuck apparatus and/or methods of the invention may solve one or more problems in lifting bed mattresses and/or tucking in bed covers. The invention may make it less difficult to make a bed, may decrease the force required to make a bed, may decrease the fatigue a person experiences in making a bed, may decrease the likelihood of injury a person may experience in making a bed, may improve efficiency in making a bed, may improve the quality of the made bed, may improve the accuracy, repeatability, and consistency of making a bed, and/or may address other types of problems known in the art.

It should be understood, of course, that the foregoing relates to exemplary embodiments of the invention and that modifications may be made without departing from the spirit and scope of the invention as set forth in the following claims.





Operational Bedding Procedures

To ensure the safety and well being of all our team members, we are recommending all properties review, with room attendants, your current bed making procedures. The correct bending and lifting procedures will keep all of us safe and injury free.

We worked with an Ergonomics Nurse at one of our properties to review our procedures and came up with several recommendations which we encourage you share with your entire team. For the full report, please contact Michelle Pike, Corporate Director of Housekeeping, and she would be happy to send it to you.

Observations:

1. There is excessive lifting of the bed corners to tuck in sheets and blanket. The bending activity of lifting the bed corners is performed by bending at waist rather than bending the knees. Additionally, the down blanket is bulky to fold under the mattress.
Recommendation:
 - a. Wait to tuck in the bottom sheet until all the sheets and blanket have been applied to the bed. This will remove one-half of the mattress lifting activity.
 - b. Consider a "foot pocket" fold. This creates a fold at the bottom edge of the bed which lifts the down blanket enough to remove the end from being folded under the mattress and allows for foot room at the end of the bed.
 - c. A refresher course on good body mechanics while bending. Also consider training to equalize use of the hands for all cleaning activities. This may reduce overuse of the dominant hand, arm and shoulder.

2. There is excessive handling of the sheets and blanket.
Recommendation:
 - a. Consider folding the down blanket in half vertically and in thirds horizontally, then lifting off the bed to another surface. When the down blanket is re-applied to the bed, it can be placed in the appropriate spot and unfolded. This would decrease the amount of handling to straighten the down blanket.
 - b. The sheets are currently folded vertically in fourths, consider unfolding the sheets to the middle of the bed, rather than fluffing, to decrease the handling of the sheets to straighten them.

3. There is excessive walking from one side of the bed to the other.
Recommendation:
 - a. Consider applying the sheets and down blanket on one side of the bed and then moving to the other side of the bed to complete.

4. The fluffing of the sheet increases the amount of fabric dust placed in the air.
Recommendation:
 - a. Unfold the sheets, rather than performing the fluffing maneuver.
 - b. The bed skirt may require additional lifting of the mattress to straighten.
Recommendation:
 - c. There is an ongoing project of applying either Velcro or upholstery pins to reduce capturing the bed skirt when tucking in the sheets.

To: Hilton Hotels
Attn: Michelle Pike
Corporate Director of Housekeeping

Re: Housekeeping Staff

Request: I was requested to observe and analyze the bed changing techniques of the housekeeping staff. I observed eight members of the staff as they changed the beds.

Materials used:

1. small green blanket
2. king and double size down blankets
3. king and double size sheets – three per bed
4. king and double size pillows – six per bed

Process Description:

Each employee is assigned fourteen suites. There are eleven suites that contain a king size bed and three suites that contain two double size beds, which results in a total of seventeen beds. On Monday, Wednesday, and Friday all occupied rooms have their linens changed. On these days the number of suites to be completed by the staff is dropped by one, resulting in thirteen suites to be completed. Additionally, there may be additional fold away beds that require changing.

In recent months the linen components have changed.

1. the mattresses now have a pillow top which has increased the depth of the bed.
2. one sheet has been added
3. sheet length has increased
4. sheet fabric components has changed to 50% poly and 50% cotton (because the sheets are new and longer, they are heavier than the previous, frequently washed sheets)
5. the acrylic blanket has been replaced by a down blanket
6. a pillow has been added
7. a small blanket has been added to the end of the bed

The following is the process I observed.

1. Linen removal
 - a. green blanket is removed – placed on floor
 - b. top sheet is stripped off – placed on floor
 - c. down blanket is stripped off – placed on floor
 - d. remaining two sheets stripped off – placed on floor
 - e. pillow cases are removed – placed on floor
2. Linen application
 - a. bottom sheet is unfolded by "fluffing" (the sheet is held by one side and thrown up in the air to completely unfold the sheet) – many employees pull the top of the mattresses down to create a larger gap at the top (between mattress and headboard) into which the bottom sheet can be more easily tucked in)

- b. the bottom sheet is placed on the bed the top, sides and end are tucked in
- c. the second sheet is unfolded by fluffing and placed on the bed – the employee walks around to the opposite side to straighten
- d. the down blanket is applied to the bed– the employee walks around to the opposite side of the bed to straighten
- e. the top sheet is applied (by the same fluffing manner), folded over the down blanket
- f. the two sheets and down blanket are tucked in – the employee walks around to the second side to complete the tuck-in
- g. green blanket is folded in half and placed on the end of the bed
- h. pillow cases are applied to the pillows

Employee Concerns: These concerns were communicated to me by the staff.

- 1. the mattresses are thicker and therefore heavier
- 2. the down blanket is too bulky to easily fold under the bed – several techniques were observed to decrease the bulk. One involved folding the blanket back over itself at the head of the bed or folding the blanket back over itself at the end of the bed.
- 3. a sheet has been added and sheets are heavier
- 4. the bed skirt becomes an obstacle, when the sheet is tucked in as the skirt fabric follows the sheet when tucked in, requiring the bed to be lifted to straighten the bed skirt
- 5. in my discussion with the employees observed, their physical complaints were in the back and shoulder (predominately the one lifting the mattress)

Physical Demands:

- 1. Repetitive activities:
 - a. the employee bends a minimum of eight times to tuck corners of sheets and down blanket in
 - b. bending when the sheets and down blanket are straightened out. This particular posture requires bending over and then using the arms extending toward the center of the bed multiple times to smooth the sheets and blanket.
 - c. bending to pick up sheets that have been removed from the bed
 - d. sheets and down blanket are repetitively handled when straightening out after fluffing
 - e. repetitive walking around bed

Observations:

- 1. There is excessive lifting of the bed corners to tuck in sheets and blanket. The bending activity of lifting the bed corners is performed by bending at waist rather than bending the knees. Additionally, the down blanket is bulky to fold under the mattress.

Recommendation:

- a. Wait to tuck in the bottom sheet until all the sheets and blanket have been applied to the bed. This will remove one-half of the mattress lifting activity.
- b. Consider a "foot pocket" fold. This creates a fold at the bottom edge of the bed which lifts the down blanket enough to remove the end from

being folded under the mattress and allows for foot room at the end of the bed.

- c. A refresher course on good body mechanics while bending. Also consider training to equalize use of the hands for all cleaning activities. This may reduce overuse of the dominant hand, arm and shoulder.

- 2. There is excessive handling of the sheets and blanket.

Recommendation:

- a. consider folding the down blanket in half vertically and in thirds horizontally, then lifting off the bed to another surface. When the down blanket is re-applied to the bed, it can be placed in the appropriate spot and unfolded. This would decrease the amount of handling to straighten the down blanket.
- b. The sheets are currently folded vertically in fourths, consider unfolding the sheets to the middle of the bed, rather than fluffing, to decrease the handling of the sheets to straighten them.

- 3. There is excessive walking from one side of the bed to the other.

Recommendation:

- a. consider applying the sheets and down blanket on one side of the bed and then moving to the other side of the bed to complete.

- 4. The fluffing of the sheet increases the amount of fabric dust placed in the air.

Recommendation:

- a. unfold the sheets, rather than performing the fluffing maneuver.

- 5. The bed skirt may require additional lifting of the mattress to straighten.

Recommendation:

- a. there is an ongoing project of applying either Velcro or upholstery pins to reduce capturing the bed skirt when tucking in the sheets.

Conclusion:

The new bed components added additional handling to a job that already requires repetitive activity. In my opinion, some of the additional handling activities can be reduced by training and a organized process of linen removal and application. Consideration should also be given to the employees working in teams to clean rooms.

Occupational Injury Disparities in the US Hotel Industry*

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Background Hotel employees have higher rates of occupational injury and sustain more severe injuries than most other service workers.

Method OSHA log incidents from five unionized hotel companies for a three-year period were analyzed to estimate injury rates by job, company, and demographic characteristics. Room cleaning work, known to be physically hazardous, was of particular concern.

Results A total of 2,865 injuries were reported during 55,327 worker-years of observation. The overall injury rate was 5.2 injuries per 100 worker-years. The rate was highest for housekeepers (7.9), Hispanic housekeepers (10.6), and about double in three companies versus two others. Acute trauma rates were highest in kitchen workers (4.0/100) and housekeepers (3.9/100); housekeepers also had the highest rate of musculoskeletal disorders (3.2/100). Age, being female or Hispanic, job title, and company were all independently associated with injury risk.

Conclusion Sex- and ethnicity-based disparities in injury rates were only partially due to the type of job held and the company in which the work was performed. *Am. J. Ind. Med.* 53:116–125, 2010. © 2009 Wiley-Liss, Inc.

KEY WORDS: occupational injury; hotel workers; housekeepers; musculoskeletal disorders; health disparities

BACKGROUND

Health disparities between the sexes and between racial/ethnic groups have been documented for a wide spectrum of diseases [Satcher and Higginbotham, 2008] but research on disparities in the rates of injuries and diseases occurring in the workplace is still emerging. Recent studies have shown that Hispanic workers have the highest rate of fatal and non-fatal OSHA-reported injuries in the US, followed by black non-Hispanic workers [Richardson et al., 2003; USBLS, 2007a]. Among agricultural and hospital workers, a disproportionate burden of occupational injury is carried by women, African Americans, and Latinos [McGwin et al., 2000; Simpson and Severson, 2000; McCurdy et al., 2003]. Elevated risks among these groups are partially explained by disproportionate employment in high-risk industries and occupations, but there may also be disparities within the same industry or job classification, perhaps resulting from sex, racial, or ethnic discrimination and other factors.

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Within the US hospitality industry, hotels, and motels employ 1.8 million workers [USBLS, 2007b]. In the United States, hotel workers are nearly 40% more likely to be injured on the job than all other service sector workers. Hotel workers also sustain more severe injuries resulting in more days off work, more job transfers, and more medically restricted work compared to other employees in the hospitality industry [USBLS, 2005].

Approximately 25% of hotel workers are employed in housekeeping departments [USBLS, 2007b]. Housekeepers constitute the single largest occupational group in the hotel industry and include room cleaners (maids or room attendants) and housemen. Many room attendants are immigrant or minority women, with a majority being either Asian, Latin American, or African American [Wial and Rickert, 2002]. Thus, they belong to several groups that have been repeatedly identified as having excessive occupational risks: women [Stellman, 1999; NIOSH, 2002; Kauppinen et al., 2003; Messing, 2004; Treaster and Burr, 2004], immigrants [Improving Health and Safety Conditions for California's Immigrant Workers, 2002], ethnic/racial minorities [Frumkin et al., 1999], and low-wage workers [Frumkin and Pransky, 1999]. However, very little is known about occupational injuries among hotel housekeepers; the US Bureau of Labor Statistics (BLS) does not provide rates of occupational injury and illness for single occupations. Among Las Vegas hotel room cleaners, the prevalence of self-reported pain associated with work was 75% during the previous year [Scherzer et al., 2005]; 63% had had severe or very severe low back pain just in the prior month [Krause et al., 2005].

In 1996, the first National Institute for Occupational Safety and Health (NIOSH) research agenda ("NORA") called for innovative occupational health research to determine the extent and severity of disease and injury among special worker populations [NIOSH, 1996]. Ten years later, the revised NORA research agenda targeted the service sector, which accounts for 80% of the US workforce. Hotel workers have been repeatedly identified as an under-researched population with significant problems such as musculoskeletal injuries; even less is known about dishwashers, cooks, and other food service workers.

This study analyzes the rates of OSHA-reported injury within the hotel industry for four leading hotel job categories (hotel housekeepers, cooks/kitchen workers, stewards/dishwashers, and banquet servers), and examines disparities in injury risk by race/ethnicity and sex.

METHODS

Study Population

Institutional Review Board approval was obtained from the University of Illinois at Chicago under the "exempt" classification. The study population consisted of non-

supervisory hotel workers employed for a minimum of 2 weeks in at least 1 year during the study period of 2003–2005, at full-service hotels operated by the five largest hotel companies in the United States. For this study, full-service hotels are defined as properties with at least 100 guest rooms and with a minimum of 10,000 square feet of conference space. These criteria were intended to increase the likelihood that job classifications and workplace exposures to ergonomic and safety hazards would be similar. Luxury chains were excluded because the design and pace of work varies significantly at these properties.

The five companies operate several hotel chains that together make up over 70% of the full-service hotel rooms nationwide, with each company establishing its own standards of service. According to information found on the companies' public websites in February 2007, these companies operate 964 hotel properties in the US that meet the study's definition of full-service hotels. UNITE HERE, the largest hospitality workers union in North America, represents workers at many of these hotels.

Hotel Sampling

Upon request from the union, 71 of the hotels with collectively bargained contracts provided data, which could be utilized for this study. The two largest companies represented an unbalanced proportion of the sample, so a random number generator [Research Randomizer, 1997–2008] was used to select 12 hotels from each of these two. All hotels from the three other companies were included in the data analysis. This produced a sample of 50 hotels with sufficient data from 2003 to 2004 and 45 from 2005 (Table I). Study hotels were dispersed across the country with concentrations in large urban areas including New York City, Chicago, San Francisco, Los Angeles, and Honolulu.

Job Classifications

Job titles are numerous within hotel departments and vary from employer to employer. The authors in collaboration with

TABLE I. Hotel Company Distributions of US Full-Service Hotels and Hotels in the Study Sample

Company	Full-service hotels		Study sample	
	No.	%	No.	%
Company 1	334	35	12	24
Company 2	95	10	12	24
Company 3	10	1	5	10
Company 4	319	33	9	18
Company 5	206	21	12	24
Totals	964	100	50	100

experienced union field staff familiar with the specific job titles, grouped the jobs that share similar tasks and exposures to workplace hazards (e.g., “dishwasher” and “pot washer,” “housekeeping attendant” and “room attendant”). Five key job categories were created—housekeepers, banquet servers, stewards/dishwashers, cooks/kitchen workers, and “other.” Housekeepers perform guest room cleaning including making beds, vacuuming floors, cleaning shower walls and bathroom fixtures, dusting furniture, and pushing carts. Banquet servers provide food service such as carrying plated food from the kitchens to the customers, dispensing drinks, and supplying food to cafeteria and buffet services. Stewards retrieve, sort, load/lift, unload, and return dishes, glasses, pots, utensils and silverware, and provide these items by pushing carts to cafeteria and buffet lines. In addition, stewards maintain cleanliness in food preparation areas. Cooks lift, weigh, measure, mix, cut and grind food ingredients; they cook these ingredients and compose salads and other food for serving [USBLS Occupational Outlook Handbook, 2008–2009]. All remaining jobs were categorized as “other.” Jobs classified as “other” were those that did not share similar job tasks or exposures with the other four key job categories. These included lobby attendant, cashier, door person, host/hostess, among others.

Database Creation

Employee rosters and OSHA 300 log data were provided to the union by the five hotel companies for the period 2003–2005. The employee rosters provided employee name, department, job title, date of birth, date of hire, termination date, sex, and race/ethnicity. Race/ethnicity was defined by the employer based on employee self-report as one of the following five mutually exclusive categories: American Indian, Asian, Black, Hispanic, and White.

The OSHA 300 logs included employee name, department name or location where injury event occurred, job title, date of injury, injury description, days away from work, and days on restricted duty. These data were matched to the employee rosters using employee name and date of birth. The final dataset included a single record for each employee. Up to three injury or illness incidents during the 3-year study period were abstracted for each individual. Employee names were removed from all datasets before data analysis began. A record number was assigned to each injury incident and was subsequently used in all data analyses.

Injury Coding

Nature of injury data was constructed from the injury description section of OSHA log entries and were grouped by the authors into four categories: musculoskeletal disorders (MSDs), acute trauma injuries, other, and not classifiable. MSDs were coded according to the US BLS definition: “an

injury or disorder of the muscles, nerves, tendons, joints, cartilage, or spinal discs. MSDs do not include disorders caused by slips, trips, falls, motor vehicle accidents, or similar accidents” [USBLS, 2007c]. Back pain or pain at other body locations and strain or sprain injuries were coded as MSDs unless the entry referenced stairs or ladders, or the employer-reported description of the injury referenced a slip or fall. “Acute trauma” cases included contusions, fractures, lacerations, heat burns, and sprain or strain injuries with evidence of an injury mechanism that involves acute contact with outside objects (e.g., hit by, struck against) that were not otherwise categorized as an MSD. “Other” incidents included chemical exposures, foreign bodies in the eye, and all other cases. “Not classifiable” injuries had insufficient information to determine the nature of injury.

Statistical Analysis

All data were analyzed using SAS (SAS v. 9.1, 2007. SAS Institute, Cary, NC) and Excel (Microsoft Office 2003, Seattle, Washington). Injury rates and risk ratios were calculated to compare the injury experience of hotel workers by sex, race/ethnicity, and job title for the entire study population and by company. The denominator for all calculations was calculated from the number of workers who met the inclusion criterion of employment for a minimum of 2 weeks during each year of study. As individual employees may be counted in more than one study year, the denominators represent total worker-years of observation. The available data did not provide information on part-time/full-time status. The race and ethnicity characterization was left blank on the employee rosters for <1% of the sample. Therefore, this race/ethnicity “not classified” group was excluded from all data analyses.

Age was computed by subtracting birth date from the last day of the year being analyzed (e.g., in 2003, Age = 12/31/2003 – birth date) divided by 365.25. Only employees aged 18–70 years were included in the analysis. A job tenure variable was similarly created by subtracting termination date from hiring date.

Risk ratios were calculated using the following referent groups: males, whites, and “other” job title. For analyses by hotel company, Company 1 was chosen as the referent group on the basis of the level of union presence at its hotels, thereby a measure of labor and management’s negotiation of working conditions.

Because we had injury count data and repeated measures (multiple years per subject), we performed multivariable Poisson regression modeling (Loomis et al. 2005) with generalized estimating equations (GEE) using SAS Proc Genmod with a Poisson distribution, unstructured correlations and log link to estimate relative risk. Regression models included age (18–27 years, 28–37 years, 48–57 years, 58–70 years), sex, race/ethnicity, job title, job tenure (0–10

TABLE II. Demographic Breakdown of Hotel Workers* Employed 2003–2005 in 50 Unionized Full-Service Hotels (n = 55,327)

	Total		Housekeeper		Banquet server		Steward/dishwasher		Cook/kitchen worker		Other jobs	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Male	31,135	56.4	269	2.3	3,406	66.8	2,948	85.1	3,269	72.0	20,280	69.2
Female	24,048	43.6	11,320	97.7	1,693	33.2	518	14.9	1,271	28.0	9,008	30.8
White	11,187	20.3	982	8.4	2,137	36.8	286	8.1	882	19.3	6,898	23.3
Asian	13,352	24.2	3,109	26.7	909	15.6	594	16.9	1,202	26.3	7,538	25.4
Black	12,252	22.2	3,439	29.5	712	12.3	962	27.3	872	19.0	6,267	21.1
Hispanic	18,392	33.3	4,118	35.3	2,047	35.3	1,678	47.7	1,622	35.4	8,927	30.1
American Indian	144	<1	12	<1	32	<1	7	<1	10	<1	83	<1
Total (%) ^a	55,327	100.0	11,660	21.1	5,837	10.5	3,527	6.4	4,588	8.3	29,713	53.7

*Total person-years observed, not total employees.

^aTotal excludes race "not specified" (<1% of total).

years, 11–20 years, 21–30 years, 31–40 years, 41–52 years), and hotel company as independent variables. In addition, cross tabulation and regression modeling were performed within the subset of female housekeepers. Similar analyses were not conducted within other subsets of other job classifications; female housekeepers were a particularly large subset.

RESULTS

There were a total of 55,327 worker-years of observation in the sample. Fifty-six percent of the sample was male and 44% female (Table II). By job title, 21% of the employees were housekeepers, 11% were banquet servers, 6% were stewards/dishwashers, 8% were cooks/kitchen workers, and 54% had other jobs. Most of the workers were non-white (Black, Asian, Hispanic), comprising 80% of the sample. American Indians and male housekeepers were very few in number. Hispanics comprised the largest proportion of three job titles: housekeepers, stewards, and cooks. The mean age of the study population was 44.5 years (SD 13.5). The mean job tenure was 9.61 years (SD 8.8).

There were 2,865 injuries recorded on the OSHA 300 logs in 2003–2005 (Table III), for an injury rate of 5.2 injuries per 100 worker-years. Acute trauma accounted for 52% of the injuries, 39% were musculoskeletal injuries, and 9% were "other" or "not classifiable." Women workers had a higher overall injury rate (6.3) than men (4.3).

Housekeepers had the highest overall injury rate and the highest rate of MSDs, at 7.9 and 3.2 per 100 workers, respectively. Acute trauma rates were highest in cooks/kitchen workers and housekeepers. Banquet servers had the lowest injury rates. Excluding the six injuries among American Indians, among housekeepers (Table IV), Hispanic workers had the highest overall injury rate at 10.6, the highest rate of MSDs (4.4), and the highest rate of acute traumas

(4.9). Among cooks (not shown), Asians had the highest rate: 8.4% for all injuries, with 7.9% among males and 10.1% among females.

In each job title of interest (housekeepers, etc.), injuries of the upper extremity were the most common, followed by back injuries and lower extremity injuries. By nature of injury, over 40% of MSDs involved the back, 22% distal upper extremities, and 13% the shoulder. In contrast, 44% of acute traumatic incidents were to the upper extremity, especially the hand.

Women workers overall and Asian and Hispanic men were about 1.5 times more likely to have been injured than their referent groups (Table V). Female American Indians fared the worst, although the number of injuries were so few that the confidence intervals are relatively wide. Hispanic women had almost double the risk of injury than their white female counterparts. Within job categories, non-white female cooks/kitchen workers fared poorly compared to their white counterparts as did non-white male banquet servers. Female housekeepers had about three times the risk of injury than male housekeepers, and Hispanic housekeepers were 70% more likely to be injured than white female housekeepers.

When analyzed by hotel company, the overall injury rates differed markedly by company, with companies 2, 3, and 4 in particular having almost twice the rate of Company 1 (Table VI). Company 2 had the highest rate of injury for housekeepers (10.4). This overall effect was consistent in analysis by injury type, with the lowest rates for both MSDs and acute trauma injuries in Company 1. These same patterns by company were also evident for key demographic groups within the four key jobs. Of the 15 job/race/sex groups with sufficient cases for comparison, Companies 2 and 3 had the highest injury rates for five of them and Company 4 had almost as many. Company 1 had only one such group, and Company 5 had none.

TABLE III. Injury Incidence and Rates* for the Hotel Worker Study Population, by Sex and Job Title, 2003–2005

	Total		Male		Female		Housekeeper		Banquet server		Steward/dishwasher		Cook/kitchen worker		Other jobs ^a	
	Inj no.	Rate	Inj no.	Rate	Inj no.	Rate	Inj no.	Rate	Inj no.	Rate	Inj no.	Rate	Inj no.	Rate	Inj no.	Rate
MSDs	1,117	2.02	525	1.68	592	2.46	368	3.16	63	1.08	70	1.99	80	1.74	536	1.82
Acute trauma	1,497	2.71	709	2.28	788	3.28	456	3.91	94	1.62	116	3.30	182	3.98	649	2.19
Other injuries	251	0.45	110	0.35	141	0.59	93	0.80	7	0.12	24	0.68	12	0.26	115	3.88
Total injuries	2,865	5.19	1,344	4.32	1,521	6.32	917	7.87	164	2.82	210	5.97	274	5.99	1,300	4.92

*Injury rate is number of cases per 100 person-years.

^aInjuries that were "not classifiable" were collapsed into "other" jobs.

The regression analyses of all hotel workers (Table VII) confirmed the higher injury risk for housekeepers and Hispanic workers, and the lower risk in Company 1, after adjusting for demographic characteristics. Comparison of univariable and multivariable models showed that some of the apparent excess risk in Black, Hispanic, and Asian workers was reduced after adjustment for job title and hotel company. This was consistent with the fact that Blacks were most likely (30%), and Whites least likely (8%), to be employed as housekeepers rather than in other jobs, and that Company 1 had fewer Black and Asian employees. Job tenure had a slight inverted-U effect (risk was highest for 21–30 years of seniority and then decreased) but it was dropped from the multivariable models because the coefficient was very small, the confidence intervals wide, and the type 3 (GEE) score statistics indicated that the variable did not contribute any explanatory power. Among female housekeepers, the predictors of injury were quite similar to those for all hotel workers, with increased risk for being Hispanic or employment at Companies 2, 3, and 4.

DISCUSSION

Several studies have shown that cleaning tasks in various industries demand a high level of physical effort, including high aerobic strain and repetitive movements [Hagner and Hagberg, 1989]; high static muscular loads [Milburn and Barrett, 1999]; high frequency of unsatisfactory postures such as stooping and crouching [Woods et al., 1999]; and subjective experience of strenuous work [Sogaard et al., 1996; Seifert and Messing, 2006]. In hotel workers specifically, guest room cleaning work is marked by time pressure, low job control, low wages, increasing use of contingent employees without job security, and few opportunities for career advancement [Parker, 1999; Lee and Krause, 2002; Wial and Rickert, 2002; Bernhardt et al., 2003; Krause et al., 2005]. The present study is one of the first to quantify the incidence, rates, and risk of injury among hotel workers.

We found that women were more often injured than men and that housekeepers in general suffered the highest injury rate among the four job titles of interest. Moreover, our results show an alarming injury rate among housekeepers in general and Hispanic housekeepers in particular. While close to half of the total workers here are women, they were heavily grouped in the housekeeping category, a set of jobs with very high physical demands. This study strengthens the evidence that job gender stereotyping within the American economy remains a potent defining factor for the workforce and potentially a substantial risk factor for injury [Mergler, 1995; Messing et al., 1998, 2003; Punnett and Herbert, 2000].

Socioeconomic status (SES) in general, and income inequality, education, and job-specific occupational hazards in particular, have all been proposed as possible explanations for racial/ethnic as well as gender health disparities. There is

TABLE IV. Injury Incidence and Rates* for Housekeepers by Race/Ethnicity, 2003–2005

	All injuries		MSDs		Acute trauma		Other/not classifiable	
	Inj no.	Rate	Inj no.	Rate	Inj no.	Rate	Inj no.	Rate
Asian	228	7.33	102	3.28	106	3.41	20	0.64
Black	189	5.50	58	1.69	113	3.29	18	0.52
Hispanic	435	10.56	183	4.44	203	4.93	49	1.19
White	62	6.31	24	2.44	32	3.26	6	0.61
American Indian	6	50.00	1	8.33	5	41.67	None	
Total ^a	920	7.89	368	3.16	459	3.94	93	0.80

*Injury rate is number of cases per 100 person-years.

^aTotal excludes race "not specified" (<1% of total).

consistent epidemiologic evidence that low status jobs are associated with a high burden of disease, injury, and disability [Robinson, 1989; Krause et al., 1997, 2001; Amick et al., 1998; Borg and Kristensen, 2000; Pransky et al., 2000; Berkman and Kawachi, 2002; d'Errico et al., 2007]. This burden falls disproportionately on workers who are multiply disadvantaged in society and who have been under-represented and under-served in occupational health research. Female immigrant cleaners are a typical example of a minority population at the low end of the well-established SES gradient.

As yet, there has been no evaluation of the causes of differential injury rates by race/ethnicity within job title in this industry. One must question whether discrimination in the treatment of such workers—in the form of disproportionate assignment to high-risk jobs, refusal to fix unsafe conditions, or workers' disempowerment—resulting in unwillingness to speak up about such conditions, is at fault. As Murray [2003] noted, previous studies have observed informal systems of work assignments to non-white workers resulting in greater exposures to the hazards therein. Moreover, US BLS has already found that disproportionate employment of Hispanics in specific jobs is not associated with increased risk of injury after controlling for such employment patterns [Richardson et al., 2003]. In essence, race/ethnicity itself is not an indicator of increased risk.

The injury rate for the workers in this sample was 5.19 per 100 workers. For 2004, the US BLS reported a rate of 5.8 per 100 FTEs in hotel workers and 4.2 per 100 FTEs in the service sector overall. The lower overall injury rate reported in our sample may be due to the inability to identify the proportion of part time workers in this sample or that unionized employees work under conditions defined by collective bargaining agreements, which are intended to improve workplace safety. The study sample included only unionized workers, whereas the majority of US hotel employees do not belong to unions. Since unions function as the bargaining agent between the employer and the employee, it is likely that non-unionized hotels, in which

workers do not have a formal means to gain better working conditions, would have even higher injury rates than those reported in this study. Further, it is possible that hotels not providing data were those at which workplace safety is less of a priority and which have higher injury rates than those reported here.

These results also need to be seen in the context of the tendency of many workers not to report their injuries, especially if they are non-unionized, immigrants, or otherwise politically vulnerable [Azaroff et al., 2002, 2004; Brown et al., 2002; Scherzer et al., 2005]. Non-reporting of injuries may be due to language barriers, fear of retaliation, or lack of understanding of legal rights under Workers Compensation laws and OSHA standards. Although our data represent unionized workers who reported their injuries, the results may still represent an under-estimation of the true injury risk.

Other possible limitations to this study include quality of the data, coding, and job grouping errors. Injury data obtained from OSHA 300 logs may have contained inaccuracies. The individual responsible for completing these logs varies by workplace and is not always well trained in correct recording procedures. There may well be systematic differential approaches to OSHA 300 log completion by different hotel companies. Nevertheless, we saw no evidence of frequent recording errors or systemic bias in recording through regular quality control checks as well as consultations with experts on the coding and grouping criteria. Although the high rate of acute injuries in housekeepers may suggest coding errors, the OSHA logs frequently included event/exposure data such as contact with furniture, tripping over sheets, slips in bathtubs, etc. Furthermore, coding error is possible since some acute injuries in housekeeping may have been MSDs. However, the patterns of injury we found are also seen in US BLS data.

The hotels in this study sample were included based on number of rooms and size of meeting space in order to ensure similarity in job task burden among workers in the sample. Working conditions in full-service hotels are determined and standardized in major part by corporate-level policies such as

TABLE V. Injury Rate Ratios* for the Hotel Worker Study Population by Job Title, Sex, and Race/Ethnicity, 2003–2005

Job title	Males					Females			
	All females RR (95% CI)	American Indian RR (95% CI)	Asian RR (95% CI)	Black RR (95% CI)	Hispanic RR (95% CI)	American Indian RR (95% CI)	Asian RR (95% CI)	Black RR (95% CI)	Hispanic RR (95% CI)
All hotel workers	1.46 (1.35–1.57)	0.41 (0.06–2.87)	1.52 (1.28–1.82)	1.07 (0.87–1.32)	1.54 (1.30–1.82)	2.19 (1.08–4.46)	1.39 (1.15–1.67)	1.14 (0.94–1.38)	1.91 (1.6–2.27)
Housekeepers	3.19 (1.53–6.64)	n.a.	n.a.	n.a.	n.a.	4.00 (1.65–9.67)	1.19 (0.87–1.62)	0.87 (0.63–1.20)	1.70 (1.26–2.29)
Banquet servers	1.38 (1.00–1.89)	n.a.	1.65 (n.a.)	1.87 (n.a.)	2.02 (n.a.)	n.a.	0.66 (n.a.)	1.20 (n.a.)	1.14 (n.a.)
Stewards/ dishwasher	1.42 (1.00–1.97)	n.a.	1.29 (n.a.)	1.46 (n.a.)	1.78 (n.a.)	n.a.	n.a.	0.42 (n.a.)	0.45 (n.a.)
Cook/kitchen worker	1.34 (1.04–1.72)	n.a.	1.42 (n.a.)	0.51 (n.a.)	0.89 (n.a.)	n.a.	2.77 (n.a.)	2.20 (n.a.)	1.94 (n.a.)
Other workers	1.05 (0.93–1.19)	0.75 (0.11–5.21)	1.39 (1.12–1.73)	0.95 (0.74–1.22)	1.48 (1.21–1.81)	1.88 (0.70–5.09)	1.11 (0.82–1.50)	1.00 (0.73–1.37)	1.44 (1.08–1.93)

n.a., insufficient data.

*Referent groups: Males are referent group for females; white males are referent group for American Indian, Asian, Black, and Hispanic males; white females are the referent group for American Indian, Asian, Black, and Hispanic females. Statistically significant results are shown in bold.

TABLE VI. Injury Incidence Rate*, and Rate Ratio for the Hotel Worker Study Population, by Job Title and Hotel Company, 2003–2005

Job titles	Company 1 ^a		Company 2			Company 3			Company 4			Company 5		
	# Inj	Rate	# Inj	Rate	RR (95% CI)	# Inj	Rate	RR (95% CI)	# Inj	Rate	RR (95% CI)	# Inj	Rate	RR (95% CI)
Housekeeper	211	5.47	276	10.36	1.93 (1.59–2.34)	86	9.67	1.78 (1.37–2.32)	211	9.44	1.74 (1.41–2.13)	135	6.18	1.13 (0.89–1.43)
Banquet Server	5	n.a.	56	3.69	n.a.	14	3.97	n.a.	69	4.33	n.a.	20	4.25	n.a.
Steward/ dishwasher	51	4.63	60	7.15	1.55 (1.04–2.31)	32	11.19	2.48 (1.48–4.14)	45	9.15	1.99 (1.29–3.08)	22	2.60	0.56 (0.34–.93)
Cook/kitchen worker	47	3.90	88	7.48	1.94 (1.35–2.79)	26	12.32	3.29 (2.01–5.40)	59	6.54	1.68 (1.15–2.46)	56	4.94	1.27 (0.86–1.89)
Other workers	258	2.72	317	5.72	2.10 (1.77–2.50)	140	6.23	2.31 (1.84–2.89)	354	5.54	2.04 (1.72–2.42)	232	3.72	1.37 (1.13–1.65)
All jobs	572	3.26	797	6.79	2.10 (1.87–2.36)	298	7.48	2.33 (1.99–2.72)	738	6.36	1.95 (1.74–2.20)	465	4.28	1.31 (1.15–1.49)

n.a., insufficient data.

*Injury rate is the number of injuries per 100 person-years.

^aCompany 1 is the referent group for all other companies.

Statistically significant results are shown in bold.

TABLE VII. Regression Models of Injuries Per Year* to US Unionized Hotel workers, 2003–2005: Risk Ratios and 95% Confidence Intervals

	Unadjusted models (all hotel workers)		Multivariable model (all hotel workers)		Multivariable model (all hotel workers)		Multivariable model (female housekeepers)	
	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI
Age	1.07	1.04–1.09	1.08	1.05–1.11	1.09	1.06–1.12	1.10	1.03–1.18
Job tenure	1.08	1.04–1.12						
Female	1.46	1.35–1.58	1.24	1.12–1.37	1.21	1.09–1.34		
American Indian	1.35	0.67–2.72	1.33	0.68–2.61	1.15	0.60–2.22	2.54	1.05–6.13
Asian	1.46	1.29–1.67	1.25	1.10–1.42	1.11	0.97–1.26	0.97	0.71–1.33
Black	1.15	1.00–1.32	0.97	0.84–1.11	0.85	0.74–0.98	0.75	0.54–1.03
Hispanic	1.70	1.50–1.92	1.50	1.33–1.70	1.42	1.26–1.61	1.50	1.11–2.02
Housekeeper	1.80	1.65–1.97	1.50	1.34–1.68	1.52	1.36–1.70		
Banquet server	0.64	0.54–0.77	0.60	0.50–0.72	0.56	0.47–0.67		
Steward/ dishwasher	1.37	1.17–1.61	1.30	1.11–1.53	1.31	1.12–1.54		
Cook/kitchen worker	1.38	1.20–1.58	1.34	1.17–1.54	1.31	1.15–1.51		
Company 2	2.10	1.87–2.36			2.17	1.94–2.44	1.94	1.59–2.35
Company 3	2.33	1.99–2.72			2.41	2.07–2.81	1.84	1.41–2.39
Company 4	1.95	1.74–2.20			2.06	1.83–2.32	1.74	1.41–2.14
Company 5	1.31	1.15–1.50			1.37	1.20–1.56	1.19	0.94–1.50

Male is the referent group for female; White is the referent group for Black, Hispanic, Asian, and American Indian; "Other jobs" is the referent group for housekeeper, banquet server, steward, and cook/kitchen worker; Company 1 is the referent group.

* Up to three injuries per year per employee; denominators = 55,311 person-years of observation for all hotel workers and 11,375 person-years for female housekeepers.

job task lists and the use of branded products such as luxury beds. Hotels with fewer than 100 rooms would be less likely to have standardized room quotas, which might affect workload pressure and therefore injury risk among housekeepers. Thus, we believe that the inter- and intra-hotel variations in work tasks among job title groups are likely to be minimal in our sample of properties.

There were substantial and consistent differences in injury rates among the five companies. These differences persisted for all injuries, for injuries by job title, and by demographic groups. As this study sought to standardize job tasks between companies, this differential suggests the influence of management policies and practices, meaning that workplace intervention has a significant ability to modify the risks identified in this study. These marked differences between companies demonstrate the potential for sharp improvement by individual companies in injury rates. They also underscore the need for companies with high rates to investigate whether discriminatory workplace practices contribute to these disparities—in order to remedy the discrimination and reduce the injury risk accordingly.

CONCLUSION

Injury rates for hotel workers are higher than those in the service sector as a whole. Characteristics that increased the

injury risk among the workers in our study included female sex, Hispanic ethnicity, housekeeper job title, and hotel company. Hispanic banquet servers had the highest risk amongst men, and American Indian housekeepers had the highest risk among women. Hispanic female housekeepers suffered more injuries than other female room cleaners. Immediate action is needed with respect to the control of hazards to housekeepers, especially those stressing the upper extremities, and to food service workers with respect to acute trauma. The ethnic, gender, and employer differentials deserve further exploration to adequately understand the interaction of social forces with ergonomic and safety hazards in the workplace. Large differences of injury rates between employers indicate a substantial potential for injury prevention in the hotel sector.

ACKNOWLEDGMENTS

Financial support for the data analysis was provided by UNITE HERE. The following individuals contributed to this study: Christopher E. Mason, PhD, employee hiring list data preparation; Emily Perry, BA, research on full service hotel sector; and John M. Halpin, MD, MPH, housekeeper injury analysis of earlier version of dataset. We are grateful to Rebecca Gore, PhD for statistical advice.

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INFORMATION MEMORANDUM

EMPLOYER: Andaz West Hollywood
 Attn: Julie Shepard, Human Resources Director
ADDRESS: 8401 Sunset Blvd.,
 Los Angeles, CA. 90069

Page: 1 of 2

An inspection or investigation of a place of employment located at 8401 Sunset Blvd in Los Angeles was conducted by Natalie L. Daleo on 11/23/2010. This Information Memorandum is intended to direct your attention to the following conditions which can be potentially hazardous to the safety and health of employees in the future. If these conditions were not corrected before employees are exposed, violations of safety and health standards would occur and you would receive one or more citations covering these violations, which will entail a civil penalty. In addition, one or more of the citations may be classified as willful based on the information contained in the memorandum.

Item No.	No. of Instances	Description of Potential Hazard
1	1	<p>At the time of inspection and as requested, the employer provided copies of their 2008-2011 OSHA 300 Logs and selected Supervisor's Accident Investigation reports, Employer's First Report of Occupational Injury or Illness (5020), and the Worker's Compensation Claim Form (DWC-1). A review of the records found that two room attendants in the Housekeeping Department on separate occasions reported injuries to the employer that occurred while they were performing bed making activities. The injuries were subsequently objectively diagnosed by a licensed physician as occupational repetitive motion injuries. The dates of reporting are as follows:</p> <ul style="list-style-type: none"> 1) Employee 1 December 6, 2009 2) Employee 2 March 9, 2011 <p>Also, the records and reports show that on February 24, 2010, another room attendant reported an injury from repeatedly cleaning the bathroom floor on her knees. The injury was also subsequently objectively diagnosed by a licensed physician as an occupational repetitive motion injury.</p>

Division Engineer/Industrial Hygienist: Natalie L. Daleo
 District Manager: [Signature]

Date: 5-20-11
 Date: 5-20-11

Item No.	No. of Instances	Description of Potential Hazard (<i>continued</i>)
		<p>The employer should conduct an evaluation of the work tasks and procedures associated with bed making and cleaning to identify the potential exposures and recognized ergonomic risk factors. The employer should consider engineering and/or administrative controls such as, but not limited to:</p> <ul style="list-style-type: none"> a) Work load & organization of work; b) Using tools and/or fitted sheets, c) Eliminating the need to pull the blanket into the duvet cover; and/or d) Recommendations of a person who is knowledgeable in ergonomic concepts, to further minimize the risk of injury. <p>The employer should also develop and implement a training program designed to provide employees information on the risk factors of RMIs and how to prevent them as well as the importance of adhering to established safe work practices associated with bed making and cleaning, and encourage employees to report their symptoms and injuries to the employer in a timely manner.</p> <p><i>Reference BCCR §5110</i></p>
2	1	<p>At the time of inspection and as requested, the employer provided a copy of their written "Confined Space Entry" program. The employer's written program does not have all of the elements and procedures as required by this section if employees are to enter confined spaces.</p> <p>The employer's hotel and restaurant operations are subject to the definitions and requirements of Title 8 CCR §5157 – Permit Required Confined Spaces. To this end, the employer must evaluate the workplace by using the decision flow chart in Appendix A of Title 8 CCR §5157 to determine if the confined spaces at the facility, such as boilers, pits, compartments, ducts and/or vaults will be entered by its and/or other employees and/or if they can be reclassified to non-permit required confined spaces.</p> <p>If the employer determines that its employees and or other employees will enter a permit-required confined space, the employer must then develop a compliant program that will address the hazards of the confined spaces that they intend to enter, provide training to each affected employee and practice making permit space rescues, as required.</p> <p><i>Reference BCCR §5157</i></p>

INFORMATION MEMORANDUM

EMPLOYER: Hyatt Regency Century Plaza
Attn: Nicole Leier Messier, Director of Human Resources

Page: 1 of 2

ADDRESS: 2025 Avenue of the Stars
Los Angeles, CA. 90067

An inspection or investigation of a place of employment located at 2025 Avenue of the Stars in Los Angeles was conducted by Natalie L. Daleo on 01/04/2011. This Information Memorandum is intended to direct your attention to the following conditions which can be potentially hazardous to the safety and health of employees in the future. If these conditions were not corrected before employees are exposed, violations of safety and health standards would occur and you would receive one or more citations covering these violations, which will entail a civil penalty. In addition, one or more of the citations may be classified as willful based on the information contained in the memorandum.

Item No.	No. of Instances	Description of Potential Hazard
1	1	<p>At the time of inspection and as requested, the employer provided copies of their 2008-2011 OSHA 300 Logs and selected Supervisor's Accident Investigation reports, Employer's First Report of Occupational Injury or Illness (5020), and Worker's Compensation Claim Forms (DWC-1). A review of the records finds that on October 14, 2008, one room attendant in the Housekeeping Department reported an injury to the employer that occurred while they were performing bed making activities. The injury was objectively diagnosed by a licensed physician as an occupational repetitive motion injury.</p> <p>The employer should conduct an evaluation of the work tasks and procedures associated with bed making and cleaning to identify the potential exposures and recognized ergonomic risk factors. The employer should consider engineering and/or administrative controls such as, but not limited to:</p> <ul style="list-style-type: none">a) Work load & organization of work;b) Using tools and/or fitted sheets, and/ord) Recommendations of a person who is knowledgeable in ergonomic concepts, to further minimize the risk of injury.

Division Engineer/Industrial Hygienist: Natalie Daleo

Date: 6/22/11

District Manager: Hassan Khan

Date: 6/22/11

Item No.	No. of Instances	Description of Potential Hazard <i>(continued)</i>
		<p>The employer should also develop and implement a training program designed to provide employees information on the risk factors of RMIs and how to prevent them as well as the importance of adhering to established safe work practices associated with bed making and cleaning, and encourage employees to report their symptoms and injuries to the employer in a timely manner.</p> <p><i>Reference BCCR §5110</i></p>
		<p>At the time of inspection and as requested, the employer provided a copy of their written "Confined Space Entry" program. The employer's written program, dated May 2007 lists several permit and non-permit confined spaces; however, the program references 29CFR 1910.146 and describes both permit procedures for the Hyatt Regency Scottsdale personnel and personnel of an Environmental Health and Safety Department, which may not be applicable to the operations at the Hyatt Regency Century Plaza hotel in Los Angeles.</p> <p>The employer's hotel and restaurant operations are subject to the definitions and requirements of Title 8 CCR §5157 – Permit Required Confined Spaces. To this end, the employer must evaluate the workplace by using the decision flow chart in Appendix A of Title 8 CCR §5157 to determine if the confined spaces at the facility, such as boilers, pits, compartments, ducts and/or vaults will be entered by its and/or other employees and/or if they can be reclassified to non-permit required confined spaces.</p> <p>If the employer determines that its employees and or other employees will enter a permit-required confined space, the employer must then develop a compliant program that will address the hazards of the confined spaces that they intend to enter, provide training to each affected employee and practice making permit space rescues, as required.</p>



**STATE OF HAWAII
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS
HAWAII OCCUPATIONAL SAFETY AND HEALTH DIVISION**

830 PUNCHBOWL STREET, ROOM 425
HONOLULU, HAWAII 96813
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Email: dllr.hiosh@hawaii.gov

August 22, 2011

Bob Hester
Director of Human Resources
Hyatt Regency Waikiki Beach Resort & Spa
2424 Kalakaua Ave.
Honolulu, HI 96815

Dear Mr. Hester:

The Hawaii Occupational Safety and Health Division (HIOSH) performed an ergonomic evaluation during the inspection of Hyatt Regency Waikiki Beach Resort & Spa.

The ergonomic evaluation was for the housekeeping operations at Hyatt Regency Waikiki Beach Resort & Spa, videos were taken on March 14 and March 15, 2011 and was analyzed by a Certified Professional Ergonomist. In your previous letter it was revealed to HIOSH that your housekeeping staff may have to lift beds range from 66 pounds (Full size bed) to 95 Pounds (Hotel King Size beds) to performing their housekeeping duties.

The inspection disclosed the following ergonomic hazards to which that your housekeeping staff were exposed:

Description of the Housekeeper task:

House keepers are responsible for cleaning rooms and changing linens in the various guest rooms. Their work is assigned based on a credit system. Interviews indicate that house keepers clean up to 14 rooms during an 8 hour shift.

A checkout room requires a linen change. Linen change involves removing the sheets and changing out all towels, robes, and slippers. A refresh generally involves making the bed with the current sheets and only changing those towels or pillow cases that have a visible stain or if they are left on the floor. Suite living rooms may require removal of trash such as bottles or cups, vacuuming, dusting, repositioning cushions and replenishment of room amenities. Both evaluated rooms were checkouts and it is assumed that the time to clean the room and the amount of work involved would be somewhat less when dealing with a stay over. It was stated that employees are required to do bed bug checks on a monthly schedule. This reportedly requires



Bob Hester
August 22, 2011
PAGE 2

pulling the mattress from the wall lifting the bed skirt and visually inspecting all areas of the mattress. Documentation of this process was not evaluated but it is assumed additional time must be spent to accomplish this task. There are probably variations in the way the house keepers clean rooms but the supplied documentation generally showed the task performed in the following manner.

The housekeeper announces her presence and enters the room. The trash is collected in a plastic bag from the bath and main rooms. The housekeeper then moves to the main bedroom and takes care of the bed. If this is a check out all linens are removed. During change out the comforter and any decorative throws or pillows are removed and placed on the desk or dresser, the pillow cases are taken off and placed in the middle of the bottom flat sheet. The bedding consists of a plain bottom flat sheet, a plain top flat sheet, a comforter, and a top embossed sheet that is used as a bed spread. Then the embossed top sheet and the plain top sheet are also bundled together in the middle of the bottom sheet. When cleaning a room with two double beds or rooms with a roll-away all the linens from the other beds are gathered up and placed on the flat sheet of the first bed. After all beds are stripped the linens are gathered up in the sheet and placed in rolling tubs positioned around the hallways of the hotel.

The beds are then remade by placing a new plain flat sheet on the mattress and all four corners are tucked under the mattress. A second plain flat sheet is then placed on the bed, followed by a comforter, followed by an embossed top sheet. After all have been aligned and smoothed out the material at the head of the bed is tucked under the side of the mattress, then the material at the foot of the bed is tucked under the mattress in a "hospital corner". The hospital corner requires that the mattress at the foot of the bed is lifted, the bedding at the end of the bed pushed under, the bedding on the side of the bed is then folded back under itself and is tucked in under the raised mattress. The house keeper then goes around the bed and makes sure all bedding between the corners is tucked under the mattress. The pillows are then placed in a pillow cases, the ends of the pillow case are tucked inside the case and placed on the bed. Double beds get 3 pillows and queens get 4 pillow. All beds have a decorative pillow and a decorative throw which are placed on the bed after it is made.

The room is then dusted and sanitized by wiping down all horizontal surfaces and other selected items such as pictures, frames, bed headboards, phones, lamps, TV, and windows if necessary. Drawers are checked and all electronics are turned on to make sure they work.

The house keeper then returns to the bathroom where the sink, tub, and toilet are scrubbed. If necessary the wall surrounding the tub is scrubbed. The shower curtain is inspected for visible contamination and replaced if any is detected. The mirror, faucet handles, soap dish, outside of toilet, and vanity are wiped down and dried. Expendables are replaced and new linens brought in. The trash cans are wiped down and disinfected.

Bob Hester
August 22, 2011
PAGE 3

If necessary the room will be vacuumed if there is visible lint, nail clippings, or other debris left around and sprayed with a carpet freshener. Some furniture is moved to provide access for vacuuming. This is especially prevalent in VIP rooms which have more furniture that must be moved. Most items in the regular rooms are stationary. Video documentation recorded a checkout room with a double bed which took about 48 minutes and a king check out which took about 52 minutes

Recognized Hazard:

Employees are exposed to extended reaches and repetitive and repeated torso bending when cleaning bath tubs, tub walls, and mirrors. They must reach to the far side of the bath tub and the wall which requires full arm extension, and reach up in excess of 6 feet to access areas at the top of the tub wall. While it was not observed on the video documentation workers also must reach to elevated positions when removing and replacing shower curtains. Elevated and extended reaches can also occur when cleaning areas of the bedroom such as headboards or the top of pictures and when shaking out sheets for placement onto the bed and when shaking pillows out of or down into the pillow case. These postures and motions increase the risk of development of musculoskeletal disorders (MSDs) of the shoulder and back.



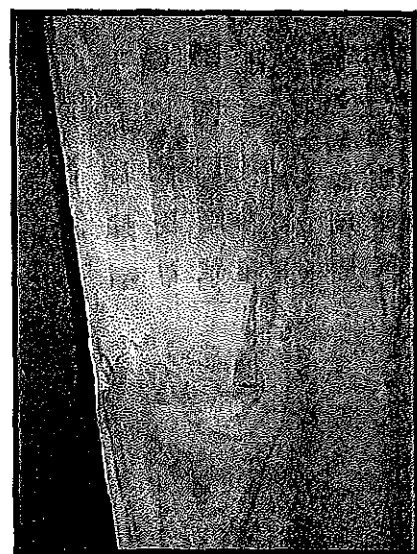
Possible Control Options:

- ✓ Minimize reaching and bending when cleaning. Place a towel in the bottom of the tub and perform all tub and wall cleaning tasks from within the tub instead of standing outside on the floor. Tub cleaning tasks should also be performed from inside the tub if scrubbing with significant hand force is necessary.
- ✓ Use long handled, adjustable tools to perform cleaning tasks instead of reaching and performing the task with a rag in the hand. The use of tools allows the work to be done with the elbows in close to the torso.



Bob Hester
August 22, 2011
PAGE 4

- ✓ Provide ergonomic training concerning basic body mechanics to all house keeper staff. Provide job specific training instructing them to use long handled tools or to move closer to the work by positioning themselves inside the tub to perform cleaning tasks.
- ✓ Provide a light step stool or ladder to housekeepers. This should be kept on their cart for access to elevated areas especially during shower curtain change. The schedule will need to be adjusted accordingly since obtaining the stool, using the stool, and putting the stool back on the cart will take additional time.
- ✓ Assign shower curtain change to house men or maintenance or to other specialty workers. Provide them with step stools or ladders so the task can be performed without the used of extended and elevated reaches.
- ✓ Replace current shower curtains with models that limit the amount of elevated reaching. Several other hotels use a shower curtain that has a removable lower half that is at about shoulder level on a housekeeper. This lets the housekeeper remove the potentially soiled liner without performing elevated reaches to remove the entire curtain.
- ✓ Look into the use of microfiber towels or wash rags to do most cleaning with. These are reported to absorb more moisture and to do a better job of cleaning than a standard cotton cloth. This should reduce the amount of time and number of motions that are performed with awkward postures.
- ✓ Minimize the use of forceful and extended arm postures when shaking out sheets and comforters for placement on beds. Unfold sheets as much as possible before shaking them out so they lay across the bed. Do not shake out comforters since their increased weight places more stress on the shoulders and back. Place them towards the middle of the bed and pull the ends toward the edge of the bed.
- ✓ Match pillows and pillow cases to minimize the force required to place, and subsequent, shaking required to get the pillow into the case. The pillow cases in this facility seemed to be particularly tight and required considerable shaking for both removal and insertion.



Recognized Hazard:

Workers kneel on hard surfaces, especially in the bathroom, to perform cleaning tasks. This can create a contact trauma to the knee potentially resulting in tendinitis, inflammation, and pain.

Bob Hester
August 22, 2011
PAGE 5

Possible Control Options:

- ✓ Instruct workers to use long handled tools whenever possible to perform cleaning tasks. Most tasks can be performed with a rag on the end of the tool, or using a sticky roller, or using a swifter type product. Some interviewed workers said that they felt they needed to scrub on hands and knees to properly clean the floor. Most workers observed used long handled tools most of the time. Proper training will provide insight into managements requirements concerning proper cleaning specifications.
- ✓ Provide knee pads or foam pads, such as those used in gardening, that can be easily carried around for use when kneeling tasks must be performed.
- ✓ Instruct housekeepers to kneel on one knee when performing kneeling tasks. This posture reduces force placed on the knees.

Recognized Hazard:

Employees repeatedly lift the mattress when making the beds. They generally perform at least 2 lifts at each corner of the foot of the bed and an additional lift at the top corners and can perform one or two more along the side. Lifting the corner of a bed requires a varying amount of force depending on the height the mattress is lifted. Measurements performed at other sites on a double bed showed that a lift of about 4 inches can require about 26 pounds of force. Lifts of a king bed at about the same height can weight as much as 30 pounds.



The house keeper observed on the submitted documentation usually bends at the waist and twists the torso while lifting to tuck sheets under mattresses. In some cases the edge of the bed was close to the wall which does not allow adequate space for house keepers to position themselves to use proper body postures when performing the bed making task.

Preliminary evaluations of the lifting task using the Revised NIOSH Lifting Equation indicate that the Cumulative Lifting Index for the bed making task is approximately 2. Other lifting tasks which are typical in this process were considered in this calculation. These included items such as; moving furniture, lifting quilts off of and on to the bed, lifting bundles of soiled linens, and lifting light items such as towels or wastebaskets. A value greater than 1 indicates an increased

Bob Hester
August 22, 2011
PAGE 6

risk of injury for some percentage of the work population. A CLI of 3 or greater will likely present a hazard to most of the working population. Repeated lifting of these loads especially when bending and twisting is consistent with the development of MSDs to the back and shoulders.

Additionally, it was reported, but no video was analyzed, that there was a bed bug checking procedure performed where there was more manipulation of the mattress than was necessary in the standard bed making procedure. While it is difficult to quantitate the hazard created by this task it is reasonable to suspect that there could be significant risk for employees especially if this is added as an additional task to normal housekeeping duties. Moving and sliding the mattress can create shear force on the spine as well as compressive forces which have been shown to increase the risk of injury to the low back. Additionally, lifting the mattress higher than is common for bed making increases the amount of weight that must be supported and increases the risk of development of MSDs to the back and shoulder.

Possible Control Options:

- ✓ Attempt to rearrange rooms to provide adequate space for proper body positioning. There should be enough space between the sides of the bed and walls, or other furniture, so workers can face the task and squat or kneel without reaching to the side or twisting. The elbows should remain in close to the torso, the back should remain straight with no twisting.
 - Move beds closer to each other in rooms that have two beds and inadequate space between the bed and wall. Placement of a smaller night stand between the beds may provide more room between the wall and bed.
 - Replace double beds with single King beds in those rooms that are found to have inadequate clearances between the bed and other interferences such as walls or furniture.

- ✓ Evaluate rooms to determine the level of risk from making beds in constrained spaces. Identify those rooms that are particularly problematic based on the space available between the bed and wall, or other interferences, while performing bed making tasks.
 - Ensure that rooms identified as high hazard are occupied only after all other rooms that present a lesser hazard are full.
 - Modify task assignment so there are not multiple high hazard rooms on the schedule of a single house keeper and if this is unavoidable attempt to make sure that they are not assigned to be cleaned back to back.
 - Modify room assignments so the same house keeper does not get a larger percentage of high hazard rooms over an extended period of time.
 - Develop schedules that intersperse high hazard rooms throughout the day. This will provide periods of working rest

Bob Hester
August 22, 2011
PAGE 7

- ✓ Use fitted sheets to reduce the amount of mattress lifting performed in each shift. Since the mattress does not need to be lifted when using a fitted sheet this change could eliminate at least 4 to 8 lifts per bed.
- ✓ Experiment with different bed making techniques that reduce the amount of repetitive lifting of mattresses and tucking sheets and blankets along the side of the bed. It may be appropriate for these techniques to be applied only in those rooms that have been identified as high hazard rooms if it is determined that the alternate technique is not appropriate for the entire hotel. Several hotels tuck the end in under the mattress and let the sides hang down. This still gives a finished crisp look without undue work being performed on the sides of the beds. Other hotels do not tuck the bed covers at all. Either of these modifications will reduce the overall number of lifts performed.
- ✓ Train workers in proper lifting technique. They should lift the mattress only far enough to get the sheets under the mattress. Experiments conducted at another hotel shows there can be significant reductions in force depending on the height a mattress is lifted. Lifting a mattress 6" can require 30 pounds of force, while lifting only 3" uses only 22 pounds and lifting only an inch requires about 14 pounds. They should kneel on one knee and get as close as possible to the mattress during the lift.
- ✓ Employees should be instructed to use a safer technique when performing the task. One that has been successful at other facilities incorporates a process where the employee gets down on their knee, faces the mattress and mostly pushes the material under with minimal lifting.
- ✓ Provide special teams to perform bed bug checks. If there is significant movement of mattresses the task should be performed using a team lift. It should not be part of the normal housekeeping tasks unless there is a reduced production standard.

Recognized Hazard:

Workers exert force to push and pull items throughout the room cleaning process. Furniture is often moved around the rooms to facilitate vacuuming. This is often done using one hand since they continue to hold the vacuum while they are moving furniture. Force necessary to move furniture can be significant.

Workers also push a fully loaded cart during the much of the work shift. Measurements taken during other investigations indicate that initial forces to get a cart moving can be from the mid teens to the mid twenties with the force to sustain movement being somewhat less. Workers provide robes and slippers to rooms which increases the amount of material that is on carts or requires frequent trips to supply closets. This can increase the force which must be exerted by

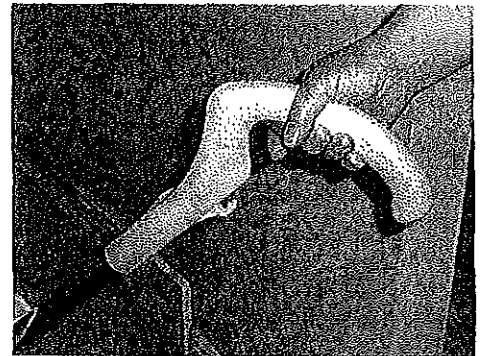
Bob Hester
August 22, 2011
PAGE 8

increasing the weight of the cart. While cleaning a room carts are placed in front of the room doors. During positioning the swivel, steering wheels can get turned 90 degrees to the direction of cart travel. This situation can infrequently require the exertion of large forces to get the wheels to swivel around to an in-line travel position.

Employees used force to push and pull the vacuum during the cleaning process. The force needed for this task is fairly low if done in a smooth and slow manner. Measurements at other hotels using similar equipment show that it takes about 6 pounds to push or pull. But to complete the task in a faster manner the process is often done in a fast and jerky manner which can significantly increase the force used to move the machine. Measurements show that the force necessary can increase significantly when done in this manner. Exerting repetitive and sometimes strenuous push and pull forces in the postures observed can be consistent with the development of MSDs of the back, arm, hand, and shoulder.

Possible Control Options:

- ✓ Instruct schedulers to minimize travel distances that worker must move carts. The risk of injury increases the farther a cart is moved.
- ✓ Provide self propelled carts for cleaning routes that require long transport distances. A formal evaluation should be performed to determine an appropriate room rate based on the tasks that must be performed.
- ✓ Have housemen or other staff members bring robes and slippers to rooms.
- ✓ Add either roller casters or carpet casters to furniture legs to facilitate movement.
- ✓ Train workers to release the vacuum and use two hands to move furniture especially if the pieces are heavy or not easily accessed with proper body postures.
- ✓ Train workers to reposition cart wheels so they are rolling freely in the line of travel before exerting maximum force.
- ✓ Utilize two worker teams in rooms, such as suites, which have furniture that must be moved during vacuuming. One worker can move furniture while the other vacuums.
- ✓ Train workers to use slower, smoother strokes when vacuuming since these require less force to stop and start the momentum of the machine.



Bob Hester
August 22, 2011
PAGE 9

- ✓ Ensure that there is proper cart wheel maintenance. The wheels on all carts should be checked proactively on a regular schedule rather than waiting until there are complaints.
- ✓ Provide housekeepers with vacuums that have a handle that promotes neutral postures. This reduces the stress placed on tendons and muscles in the hand.

Recognized Hazards:

Scheduling can be a critical factor in the overall fatigue of the task. The time to complete a room as calculated from the submitted video footage was about 47 minutes and 52 minutes. This is somewhat longer than the times observed at other hotels in the chain with a check out requiring about 30 to 40 minutes. The rooms observed in the submitted video footage had additional square footage that had to be cleaned due to the presence of a fairly large lanai and additional cleaning tasks such as roll away beds. Cleaning the lanai space typically took about 5 to 7 minutes. If the room rate does not take this into account the additional space and other tasks such as roll away beds it may require workers to perform at a pace that will produce unacceptable levels of fatigue making them more susceptible to injury from other sources.

Possible Control Options:

- ✓ A formal evaluation should be performed on a regular basis to determine what the appropriate expectation should be for the number of credits earned during a work shift. This study should be repeated when conditions such as the style of bed, linens use or other room layouts are changed. The expectation should be based on parameters such as hotel regional differences, types of rooms, square footage and the condition and amenities provided in the room. For instance some accommodation should be made for locals in colder areas that use heavier bed linens or specialty hotels that may have more furniture or peculiar room arrangements.
- ✓ Additional variations in the type of room, number of guests, and general condition of the room should be incorporated into the room credit system. For instance, there is more work involved in a stay over than a refresh and more work involved in a double with both beds used than a single King. Likewise there is more work involve in a messy room than one that is kept relatively clean. These variations should be considered when developing room rate expectations. These expectations should ideally be created in conjunction with experienced staff to get a true representation of the variety of possible scenarios.

Potential Hazard

Bob Hester
August 22, 2011
PAGE 10

Workers use short handled tools to sweep the lanai. This requires bent torso postures and awkward hand and wrist postures to grab and use the tool.

Possible Control Options

- ✓ Provide workers with adjustable handled tools which can be used with both hands. This will reduce the hand force that must be used and allow the task to be performed with neutral wrist and torso postures.

Since there is no HIOSH standard that applies to ergonomics, and we are not invoking Section 12-60-2(b)(2)(A) of the Hawaii Occupational Safety and Health Standards, no citations will be issued for these hazards at this time. In the interest of workplace safety and health, however, we recommended you voluntarily take necessary steps to eliminate or materially reduce your employees' exposure to the hazard listed above.

The following are control strategies, which we feel will be effective in reducing the ergonomic stressors:

1. Follow the recommended possible controls options as stated above.
2. Use the engineering methods to eliminate or control the lifting hazards, and or used additional personnel to help lift the beds.
3. Provide lifting training.

Overall, management's commitment and employees' involvement are important to assure that the above efforts are implemented in an effective manner. You may voluntarily provide HIOSH with progress reports on your efforts to address these hazards.

The following resources are available and should be of assistance to you in preventing work-related injuries and illnesses in the workplace:

1. Free consultation, including on-site visits, from consultation and Training Branch of HIOSH;
2. OSHA's internet web page on ergonomics at:

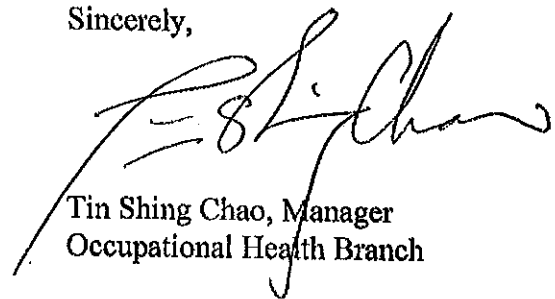
<http://www.osha.gov/SLTC/ergonomics/index.html>

Bob Hester
August 22, 2011
PAGE 11

3. Free publications on ergonomics from the National Institute for Occupational Safety and Health (1-800-35-NIOSH)

If you have any questions, please feel free to call me at 808 586-9090.

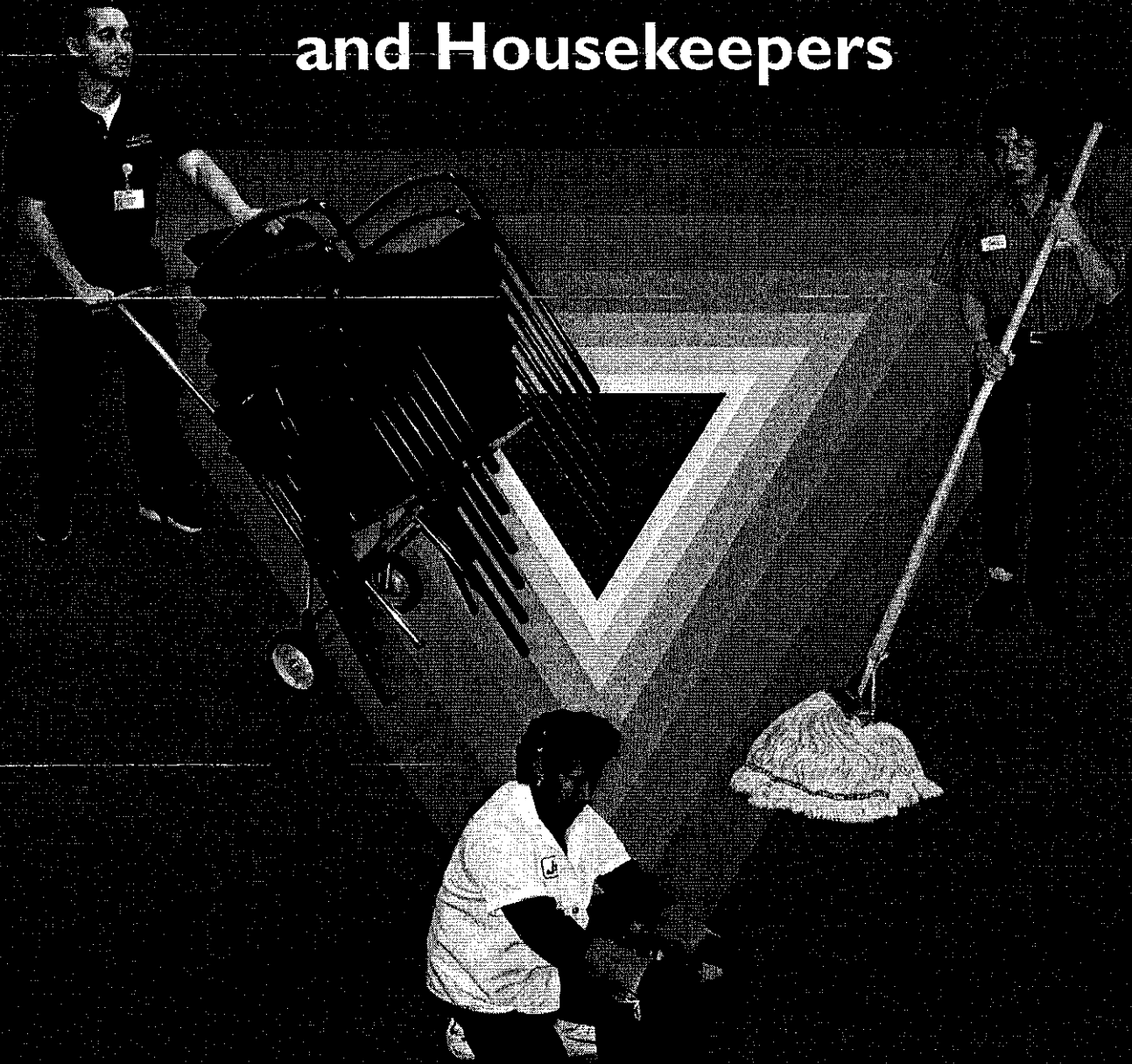
Sincerely,



Tin Shing Chao, Manager
Occupational Health Branch

WORKING SAFER AND EASIER

for Janitors, Custodians,
and Housekeepers



Department of Industrial Relations
Cal/OSHA Consultation Service
Research and Education Unit



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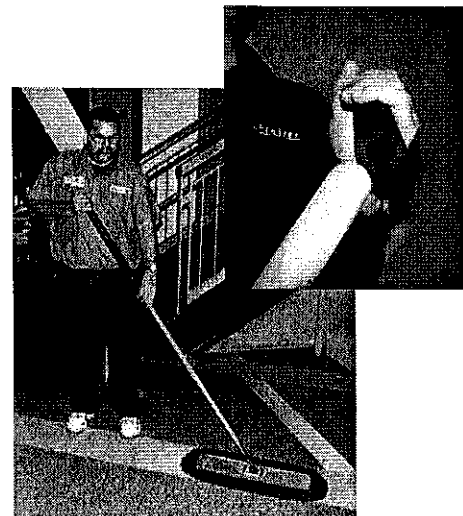
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In Memory of Douglas Binion

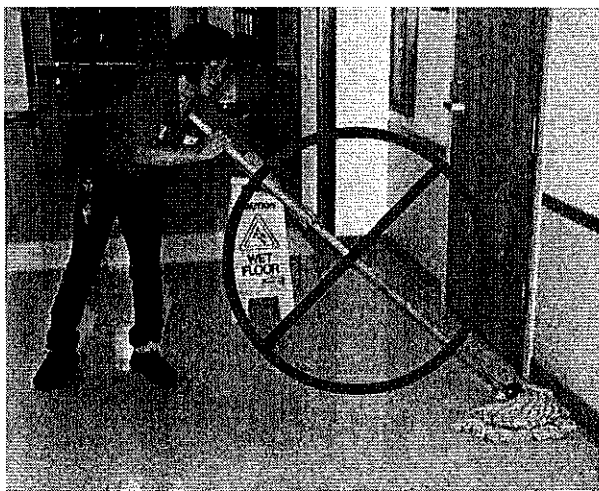
A worker who cleans floors by hand uses rapid and repetitive hand movements while kneeling, crouching, or crawling. There is also sustained bending of the upper body and neck.

Tips and improvement ideas

- Place a "Caution: Wet Floor" sign in the area.
- Use knee pads if you have to kneel.
- Select mop heads that do not readily shed loose threads.
- Consider smaller mop heads. They are lighter when wet, and easier to squeeze.
- Adjust the length of telescopic mop handles to the height of your forehead to reduce bending.
- Avoid extreme reaches to the right and left and twisting.
- Avoid excessive bending of wrists.
- Alternate mopping styles. Swing mop in a horizontal figure 8 direction.
- Pad the handle or use a padded mop handle to cushion and improve your grip.



Pad the handle.



Avoid extreme reaches to the right and left.



Stand upright and keep elbows close to your body.

Cleaning by hand while kneeling is forceful work done again and again with awkward arm and hand movements. The trunk of the body and neck are bent and are often in fixed positions.



Tips and improvement ideas

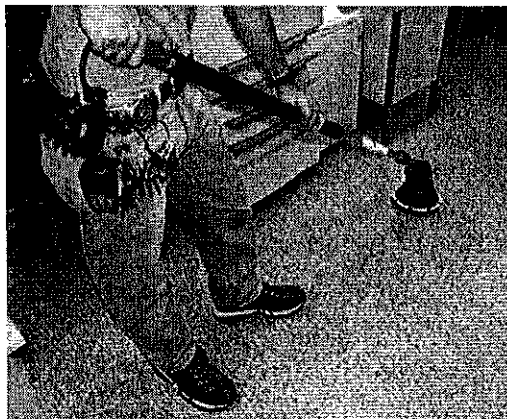
- Use a long-handled scrub brush.
- Avoid extreme bending of wrists and hands: up and down and to the sides.
- Alternate tasks between right and left hands.
- Get closer to the work. Walking as you scrub the tub or floor will reduce excessive stretching and reaching.



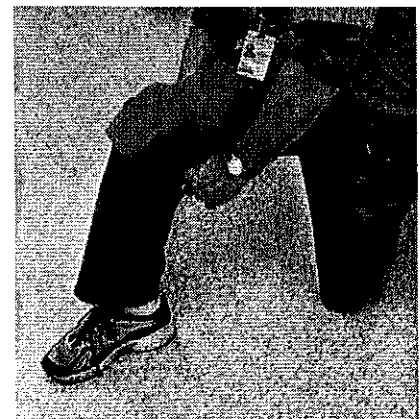
Use adjustable long handled scrubbers with pivoting heads. They allow workers to remain upright. Bending, extended reaches, and twisting are minimized.



Use tools with padded nonslip handles for better grip and greater efficiency.

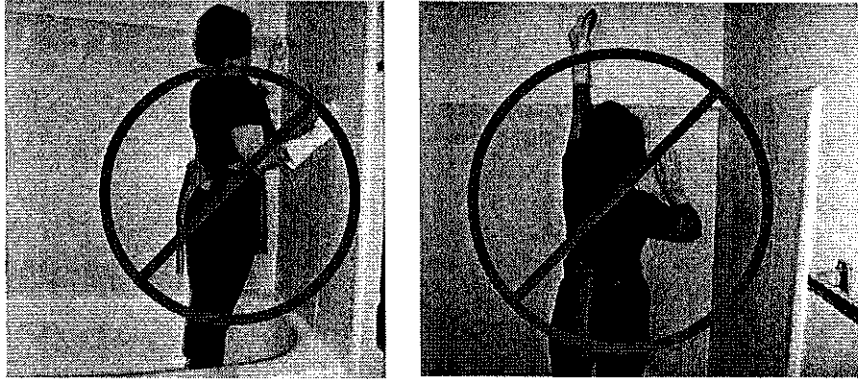


Use a power scrubber.



Use knee pads to reduce prolonged contact stress when kneeling or crawling.

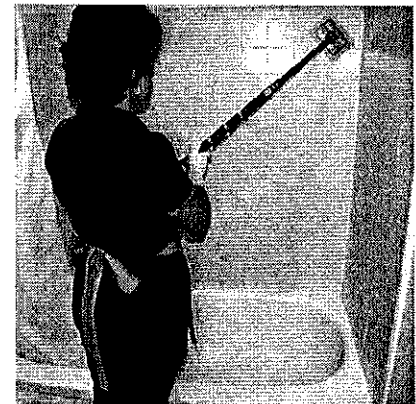
Housekeepers often step into the tub, overreaching and twisting to wash and wipe the tile around the bathtub. Ladders are frequently used and increase the risk of slips and falls.



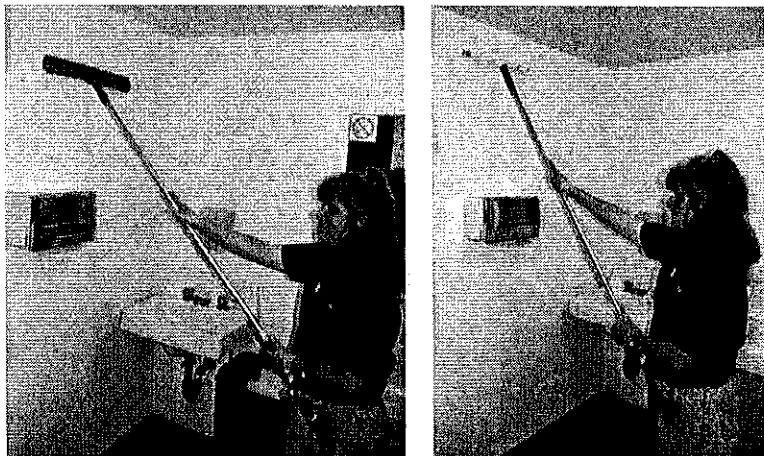
Avoid stepping into the tub and overreaching.

Tips and improvement ideas

- Do not step into the tub or use a ladder.
- Adjust the length of a telescopic handle to minimize awkward bending and overreaching.
- Stand upright and use a lightweight long-handled mop or squeegee.
- Switch from the right to the left hand at the top of the pole.
- Use your legs, not just your arms, to generate force.



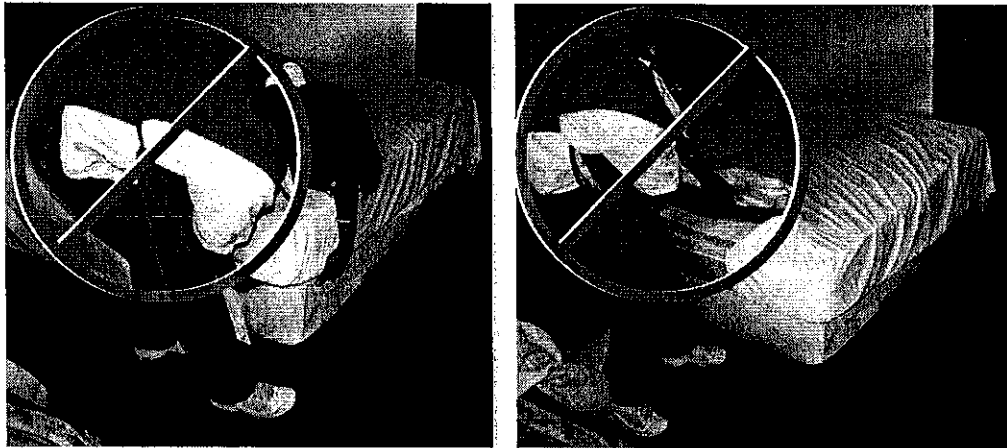
Using a long handled tool allows for efficiency and improved body posture.



Attach a long-handled pole to a mop or a squeegee.



Housekeepers forcefully lift and hold each mattress corner with one hand and tuck in the bedsheet with the other. This work is done again and again while the worker is in awkward body postures such as forward bending and twisting.



Prolonged and repetitive bending is hard on your back.

Tips and improvement ideas

- Position the bed away from the wall, if possible.
- In health care settings, be sure to raise the bed before making it.
- Do not stretch to overreach. Walk around the bed to get as close as possible to the work.
- Use a fitted bottom bedsheet over the mattress.
- Do not stoop or bend your back. Instead, bend your knees and crouch briefly while pulling the corner of the bedsheet over the mattress. Also, bend your knees to minimize bending of your back as you lift the mattress corner and tuck in the top bedsheet.
- Purchase a lighter-weight mattress, if feasible.
- Assign a team of two people to make beds.



Bend your knees and crouch as you tuck in the bedsheet.



Use fitted bedsheets.

Reaching up while holding a duster for long periods of time requires awkward and fixed positions of the arms, shoulders, and neck. This task can lead to pain and stiffness in the neck, shoulders, arms, and upper back.

Tips and improvement ideas

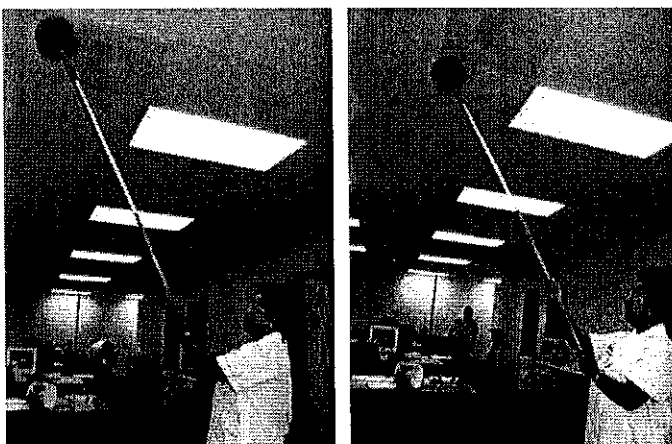
- Wear face/eye protection.
- Use a lightweight telescopic handle. There is no need to stand on tiptoes or use ladders.
- Lengthen the duster handle to keep the elbows close to the body and minimize overreaches.
- Stand at an angle and not directly under the dusting area.
- Switch your right and left hands at the end of the pole handle.
- Consider a backpack-style vacuum cleaner with extensions.
- Limit the time spent on over-the-shoulder work activities.
- Alternate high dusting with work that does not require reaching high.
- Be sure to allow for more frequent breaks.



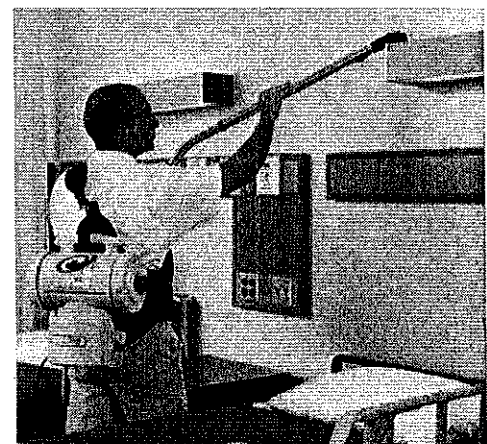
Standing directly under the area forces the neck to tilt back.



Standing at an angle allows improved body posture.



Alternate left and right hands at the top of the handle.



A backpack style vacuum cleaner also allows improved body posture.