

# PHARMMA

## Patient Handling and Movement Assessments: A White Paper

*Prepared by the*  
**2010 Health Guidelines  
Revision Committee  
Specialty Subcommittee  
on Patient Movement**

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# APPENDIX I

## Ceiling Lift Coverage Recommendations by Clinical Unit/Area

Determining ceiling lift coverage for clinical units/areas can be accomplished by using Table I-1 and/or by calculation (see second head below).

### Determining Ceiling Lift Coverage Using the Table

Table I-1 can be used to make ceiling lift coverage recommendations that stipulate the percentage of patients who should be covered on a particular unit or area. Remember, insufficient coverage will result in increases in the risk of staff and patient injury.

### Calculating Ceiling Lift Coverage

(Use only for units/areas assigned ranges of coverage in Table I-1.)

Because the patient characteristics of clinical units/areas vary widely, it is critical to base ceiling lift purchase decisions on these characteristics. Unit ceiling lift coverage is based on the type of unit/area; the dependency levels of the patient/resident population; and the number of private, semi-private, three-bed, or four-bed rooms on the unit.

**Note:** Patient dependency level is based on physical limitations and dependency. It is not the same as clinical acuity or patient acuity.

**Step 1:** Determine the average percentage of patients requiring ceiling lift system coverage.

Add the average percentage of totally dependent patients on the unit to the average percentage of patients needing extensive assistance. (Use Table H-1: Physical Dependency Levels of Patient Population in Appendix H to determine the numbers of patients at each dependency level on the unit; the total for the five categories should equal 100 percent.)

Average % totally dependent patients on unit  
+ Average % extensive assistance patients on unit  
Average % patients requiring ceiling lift coverage

**Step 2:** Determine the number and configuration of rooms requiring ceiling lift systems per unit.

Use the average percentage of patients requiring ceiling lift coverage to calculate the number of rooms needing ceiling lifts:

*For units w/ only private patient rooms:*

Number of patients  
 $\times$  Average % patients requiring ceiling lifts  
Number of private patient rooms with ceiling lifts

*For units with only semi-private rooms:*

Number of patients divided by 2  
 $\times$  Average % patients requiring ceiling lifts  
Number of semi-private patient rooms with ceiling lifts

*For units with a mix of room configurations:*

For cost-effectiveness in existing construction, and if appropriate for the unit, begin calculations with ceiling lifts placed in most or all larger wards (three- and four-bed wards), then as appropriate in smaller rooms (private and semi-private).

**Example:** This sample calculation is for a medical/surgical unit that accommodates 30 patients and has four private rooms, 10 semi-private rooms, and two three-bed rooms. Approximately 70 percent of the patients on the unit will require the use of ceiling lifts. Therefore, the unit should have coverage for 21 patients (70 percent  $\times$  30 patients). For cost-effectiveness, and if appropriate for unit needs, ceiling lift coverage may be as follows: ceiling lifts in two three-bed rooms (covering 6 patients), seven semi-private rooms (covering 14 patients), and one private room (covering one patient) in order to have ceiling lift coverage for 21, or 70 percent, of the patients.

**Table I-1: Ceiling Lift Coverage Recommendations by Clinical Unit/Area**  
(Based on Veterans Health Administration patient populations)

CLINICAL UNIT/AREA	CEILING LIFT PATIENT/BED COVERAGE	PREFERRED TRACK CONFIGURATION
Medical/surgical unit	50–100%*	Traverse
Post-surgical unit <i>Provide one supine sling and hanger bar system for unit.</i>	50–100%*	Traverse
Rehab unit <i>Consider installing straight track down hallway for ambulating patients.</i>  <i>Provide one supine sling and hanger bar system for unit.</i>	50–100%* <i>(If unit is primarily neuro rehab, provide a minimum of 70% coverage.)</i>  <i>(For new construction or rooms large enough for ambulation within rooms, provide 100% coverage to assist in gait training, etc.)</i>	Traverse
MICU	100%	Traverse
SICU	100%	Traverse
CCU	50%	Traverse or straight
ICU <i>(Combined MICU/SICU/CCU)</i>	100%	Traverse
Nursing home/long-term care	70–100%* <i>(Less coverage may be provided for primarily dementia units.)</i>	Traverse <i>(Into bathroom)</i>
Hemodialysis <i>(Ceiling lift coverage is needed over areas where lateral transfers from stretchers or inpatient beds to dialysis beds occur.)</i>	50–100%*	Straight or traverse <i>(One straight track over several bays in a row would be appropriate.)</i>
Radiology (X-ray, CT, etc.) <i>(Overhead/ceiling lift system must be compatible with ceiling-mounted radiological equipment.</i>  <i>Careful coordination is required to avoid conflicts between ceiling lift tracks and gantries in radiology rooms with traverse ceiling-mounted equipment.)</i>	50%	Traverse or straight
MRI	100%	Straight <i>(Located in adjacent MRI patient transfer area)</i>
Nuclear medicine	50%	
Procedure areas <i>(GI, cystoscopy, etc.)</i>	100%	100% <i>(Positioned as needed)</i>
Cath lab	100%	Traverse or straight
PACU	100%	Straight <i>(If possible, extended over all beds in a row using one lift system per row)</i>

CLINICAL UNIT/AREA	CEILING LIFT PATIENT/BED COVERAGE	PREFERRED TRACK CONFIGURATION
Operating room (Ceiling- or wall-mounted equipment in ORs requires careful coordination between lift tracks, traversing lift motors, and other equipment suspended from or mounted on ceilings and walls.)	100%	Traverse
Physical therapy clinics	100%	<i>Preferred design:</i> Traverse system covering the entire area possibly using two or more motors simultaneously (on the parallel bars and at any treatment tables)  <i>Alternate design:</i> Straight track installed over parallel bars, traverse track system covering treatment tables and activity areas
Spinal cord injury	100%	Traverse into bathroom
Outpatient SCI clinic exam/treatment rooms	100%	Traverse
Outpatient/primary care clinics	Depending on patient population, one or more regular and/or one expanded capacity/bariatric lift	Traverse
Emergency department Urgent care exam rooms <i>Provide one supine sling and hanger bar system for unit.</i>	50–100%*	<i>Preferred design:</i> Traverse over multiple bays in a row or in private rooms <i>Alternate design:</i> Straight track over several bays in a row or in private rooms
Ambulance bay	Depending on patient population, one regular or one expanded capacity/bariatric lift under canopy in ambulance bay	Traverse (Ensure proper coordination of ceiling lift track with entrance doorways.)
Dental	Depending on patient population, one regular and/or one expanded capacity/bariatric lift	Straight or traverse
Pediatrics	20%	Traverse
Morgue (Expanded capacity lift with minimum weight capacity of 600 lbs. or greater depending on patient population characteristics. Include supine lift frame in purchase.)	100%	Traverse or straight (Lift system should be able to assist in inserting and extracting trays into cooler as well as lifting and moving bodies into and within autopsy suite.)
Nurse training area	One	Straight

\*For those clinical units/areas with a range for required lifts (e.g., 30–100 percent), determine coverage using patient characteristics as instructed in the directions above the table.

# APPENDIX J

## Floor-Based Lifts Coverage Determination

To determine the number of floor-based lifts required for a unit or facility, the general rule of thumb is one portable lift per 8–10 patients. For example, the number of sit-to-stand lifts needed for a unit with 30 patients, 30 percent of whom are categorized as requiring partial assistance, (n=9) is one lift. The number of floor-based, full-body sling lifts required in a unit with no ceiling lifts in place and 30 patients, 60 percent of whom are considered fully dependent or require extensive assistance (n=18), is two lifts.

When deciding how much portable equipment to purchase, consider peak patient handling and movement times/loads during each shift. Note that the number of portable, floor-based lifts will be reduced with the introduction of fixed lift systems, such as ceiling-mounted systems.

Table J-1 can be used to determine the number of floor-based lifts—both full-body sling lifts and sit-to-stand lifts—needed for each clinical area/unit.

### ■ Floor-based sling lift recommendations.

These are based on ceiling lift coverage as specified and calculated using Table I-1 in Appendix I.

- If ceiling lift coverage is less than that in Table I-1, the need for floor-based sling lifts will increase, requiring more storage space. Use the rule of thumb of one per 8–10 dependent patients not covered by ceiling lifts (from the NIOSH article referenced in Table I-1).
- With full ceiling lift coverage as in Table I-1, floor-based sling lifts may be shared by units on one or more floors, decreasing the number required.

### ■ Sit-to-stand lift recommendations

- The recommendations shown in Table J-1 apply when there is no other means of risk control for the patient characteristics and activities being addressed (toileting, dressing, peri-care, vertical transfers, etc., of partially dependent patients).
- Now that ambulation slings with ceiling lifts are used more often to assist in ambulating and vertical transfers, the quantity of sit-to-stand lifts needed (and associated space requirements) will decrease when other ceiling lift adaptations or technology are used and/or available.

**Table J-1: Portable/Floor-Based Lift Minimal Coverage by Clinical Area/Unit**

CLINICAL UNIT/AREA	RECOMMENDED COVERAGE	
	Sit-to-Stand Lifts	Floor-Based Sling Lifts <sup>2</sup>
General medical unit	One per 8–10 partially weight-bearing patients <sup>1</sup>	One per floor or unit
Medical/surgical unit	One per 8–10 partially weight-bearing patients <sup>1</sup>	One per floor or unit
Post-surgical unit	One per 8–10 partially weight-bearing patients <sup>1</sup>	One per floor or unit
Rehab unit	One per 8–10 partially weight-bearing patients <sup>1</sup>	One per floor or unit
MICU	One per 8–10 partially weight-bearing patients <sup>1</sup>	One per floor or unit
SICU	One per 8–10 partially weight-bearing patients <sup>1</sup>	One per floor or unit
CCU	One per 8–10 partially weight-bearing patients <sup>1</sup>	One per floor or unit
ICU (Combined MICU/SICU/CCU)	One per 8–10 partially weight-bearing patients <sup>1</sup>	One per floor or unit
Nursing home/long term care	One per 8–10 partially weight-bearing patients <sup>1</sup>	One per floor or unit
Geri-psych	One per 8–10 partially weight-bearing patients <sup>1</sup>	One per floor or unit
Psychiatry	One per 8–10 partially weight-bearing patients <sup>1</sup>	One per floor or unit
Emergency dept./urgent care	One	One
Radiology/diagnostics (X-ray, CT, nuclear medicine, MRI) <i>(If possible, specify diagnostic tables without pedestals or with pedestal design that accommodates placement of portable/floor-based lifts under table and around pedestal.)</i>	One per entire radiology/diagnostic area <i>Note: Tables must accommodate lift bases.</i>	One per entire radiology/diagnostic area <i>Note: Tables must accommodate lift bases.</i>
Physical therapy clinics	One per clinic	One per clinic
OR	None	None
PACU	None	None
Procedure areas (GI, cystoscopy, cath lab, etc.)	One per floor/unit	One per floor or unit
Spinal cord injury unit	None or one <i>(Depending on patient population)</i>	One per floor or unit
Outpatient SCI clinic exam/treatment rooms	None or one <i>(Depending on patient population)</i>	None
Outpatient/primary care clinics <i>Exam tables must accommodate lift base.</i>	One <i>(May need additional lifts if clinics are not in close proximity to one another)</i>	One <i>(May need additional lifts if clinics are not in close proximity to one another)</i>

CLINICAL UNIT/AREA	RECOMMENDED COVERAGE	
	Sit-to-Stand Lifts	Floor-Based Sling Lifts <sup>2</sup>
Hemodialysis <i>Chair design must accommodate lift base.</i>	One <i>(Depending on typical patient population and whether using chairs and/or beds)</i>	None
Dental <i>Dental chairs must accommodate lift base.</i>	One	None
Pediatrics	One	One
Nurse training area	One	One
Morgue	None	If no ceiling lift, provide "morgue lift."

1 J. Collins et al., *Safe Lifting and Movement of Nursing Home Residents* (DHHS [NIOSH] Publication Number 2006-117, 2006).

2 These recommendations are based on ceiling lift coverage as shown in Table I-1 in Appendix I.



# APPENDIX A

## High-Risk Manual Patient Handling Tasks by Clinical Area

### **Nursing Home or Other Long-Term Care Facility**

- Transferring a patient between toilet and chair
- Transferring a patient between chair and bed
- Transferring a patient from bathtub to chair
- Transferring a patient from chair lift to chair
- Weighing a patient
- Lifting a patient up in bed
- Repositioning a patient in bed from side to side
- Repositioning a patient in a chair
- Changing an absorbent pad
- Making an occupied bed
- Undressing a patient
- Tying supports
- Feeding a bedridden patient
- Making an unoccupied bed

### **Critical Care Units**

- Transporting a patient in a bed or stretcher, frequently with heavy monitors and multiple lines
- Laterally transferring a patient from bed to stretcher
- Lifting a patient to the head of a bed
- Transferring a patient on and off a cardiac chair
- Repositioning a patient in bed from side to side
- Making an occupied bed
- Moving heavy equipment and accessing electrical outlets
- Providing patient handling tasks in a crowded area, where multiple lines and monitoring equipment force caregivers into awkward positions
- Performing cardiopulmonary resuscitation or other procedures when many team members are present and it is impossible to have the bed at the right height for every staff member
- Applying anti-embolism stockings

### **Medical/Surgical Units**

- Transferring a patient from bed to chair or stretcher
- Moving an occupied bed or stretcher

- Making an occupied bed
- Bathing a confused or totally dependent patient
- Lifting a patient up from the floor
- Weighing a patient
- Applying anti-embolism stockings
- Repositioning a patient in bed
- Making extensive dressing changes

### **Operating Room**

- Standing for long periods of time
- Adopting unnatural positions in order to work effectively or leaning over a patient for protracted periods
- Lifting and holding a patient's extremities
- Holding retractors for extended periods of time
- Transferring a patient on and off OR beds
- Reaching, lifting, and moving equipment
- Repositioning a patient in an OR bed

### **Home Care**

- Providing patient care in a bed that is not height-adjustable
- Providing care in a crowded area, forcing awkward positions
- Toileting and transfer tasks without proper lifting aids
- Having no assistance for tasks

### **Psychiatry**

- Restraining a patient
- Escorting/toileting/dressing a confused or combative patient
- Toileting a confused or combative patient
- Dressing a confused or combative patient
- Picking a patient up from the floor
- Bathing/showering a confused or combative patient
- Performing bed-related care

**Rehabilitation/Spinal Cord Injury Units**

- Transferring a patient from toilet to chair
- Transferring a patient from wheelchair to bed
- Repositioning a patient to the head of a bed, or side to side
- Repositioning a patient in a wheelchair
- Making an occupied bed
- Dressing/undressing a patient
- Feeding a bedridden patient
- Ambulating a patient at high risk for falls
- Showering a patient or providing a bed bath
- Applying anti-embolism stockings

**Trauma/Emergency** (limited research regarding high-risk tasks)

- Transferring patients into and out of personal vehicles

**Orthopedic Units**

- Turning an orthopedic patient in bed (side to side)
- Vertically transferring a postoperative total hip replacement patient
- Vertically transferring a patient with an extremity cast/splint
- Ambulating a patient
- Lifting or holding a limb with or without a cast or splint

**Note:** Except for the section on orthopedic units, the information for this appendix is adapted from A. Nelson, "Variations in high-risk patient handling tasks by practice setting," in *Handle with Care: Safe Patient Handling and Movement*, A. L. Nelson, ed. (New York: Springer Publishing Company, 2006). The information for orthopedic units is from National Association of Orthopaedic Nurses, "Safe patient handling in orthopaedic nursing," *Orthopaedic Nursing*, Supplement to 28, no. 2 (2009). The latter is available at [www.orthopaedicnursing.com](http://www.orthopaedicnursing.com).

# APPENDIX L

## Storage Requirements for PHAM Equipment

This appendix provides information to help determine how much storage space is needed for several types of patient handling and movement (PHAM) equipment.

### Lift Storage Space Requirements

- Use average (non-expanded base) dimensions (given below or from the lift manufacturer) to determine the minimum space necessary for the required number of both types of lifts.
- Space requirements will vary with lift weight capacities. The footprint of bariatric floor-based lifts will be greater than that of the non-bariatric lifts given below.
- Space requirements will depend on the storage arrangement (side by side, end to end, or a combination).

### Lift Footprint/Dimensions

Consult with staff and/or the lift manufacturer for true dimensions.

- Average sit-to-stand lift =  
27 in. wide x 43 in. long (~8 sf)  
(Expanded base width = ~ 50 in.)
- Average floor-based sling lift =  
27 in. wide x 54 in. long (~10 sf)  
(Expanded base width = ~ 60 in.)

### Example (NHCU)

One sit-to-stand (STS) lift is recommended for every 8–10 partially weight-bearing patients/residents, and one floor-based sling lift (FBSL) is recommended for each unit or floor. On an NHCU with 60 beds and an average of 25 residents who are partially weight-bearing, storage accommodations for 3 STS lifts and one FBSL will be needed. Using the above average non-expanded base dimensions to determine space necessary for these 4 lifts, 34 sf should be allotted for these 4 lifts.

STS space requirements:

$$27 \text{ in.} \times 43 \text{ in.} = 8 \text{ sf} \times 3 \text{ STS} = 24 \text{ sf}$$

FBSL space requirements:

$$27 \text{ in.} \times 54 \text{ in.} = 10 \text{ sf} \times 1 \text{ FBSL} = \frac{10 \text{ sf}}$$

**Total** space requirements:  $\frac{34 \text{ sf}}$

### Calculating Storage Space Requirements for Floor-Based Lifts

The recommendations given here are based on a unit or facility's ceiling lift coverage, as mentioned elsewhere in this white paper.

Space requirements are based on the following:

- The type of clinical unit
- The number of patients on the unit
- Footprint/dimensions of floor-based lifts

To determine minimum space requirements for storing portable/floor-based lifts on each unit:

1. Multiply the number of sit-to-stand (STS) lifts required for the unit/area (as derived from Table J-2) by the space requirements for the lift(s) in use or to be purchased (for information about determining the lift footprint, see the sidebar).

$$\# \text{ STS lifts/unit} \times \text{lift footprint dimensions} = \text{sit-to-stand lift space requirement (sf)}$$

2. Multiply the number of floor-based sling lifts (FBSL) required for the unit/area (as derived from Table J-2) by the space requirements for the lift/s in use or to be purchased (see sidebar).

$$\# \text{ FBSL/unit} \times \text{lift footprint dimensions} = \text{FBSL Space requirement (sf)}$$

3. Add the space requirements for the sit-to-stand and floor-based sling lifts to obtain the minimum storage space requirements for the portable/floor-based lifts.

$$\text{FBSL} + \text{STS lift space requirements} = \text{TOTAL storage space requirements for portable lifts}$$

**Storage for Lift Accessories and Other Equipment**

Storage space must also be provided for lift accessories and other related equipment.

**Sling and Hanger Bar Storage**

Surplus slings should be stored in the same location as floor-based lifts. Provide hooks for hanging slings and/or shelving for storage of folded slings. Standard shelving is acceptable for storing an assortment of slings (see Figure L-1) and extra lift hanger bars (see Figure L-2).

In patient rooms, provide hooks for storing patient-specific slings. Slings assigned to a specific patient should be stored in the patient room to provide instant accessibility and ensure use compliance.

**Battery-Charging Equipment**

Storage spaces for patient handling and movement equipment often include locations for charging batteries. For more information, refer to the requirements for battery charging in Guidelines text 1.2-5.2.2.2, quoted in Chapter 2 of this white paper.



**Figure L-1: Sling Style**



**Figure L-2: Lift Hanger Bar Styles**

### Other Equipment

Standard shelving is used to store other patient handling and movement equipment, such as friction-reducing devices (Figure L-3) and air-assisted lateral transfer aids with a motor (Figure L-4).

### Storage for Infrequently Used Equipment

An equipment bank located in the basement or other out-of-the-way area of the health care facility is helpful for storing large, infrequently used equipment such as bariatric beds, portable bariatric (gantry) lifts, floor-based full body sling lifts with an eight-point hanger bar for a supine sling, and extra lifts. Such an area would need an electric supply for charging batteries.



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**Figure L-3: Friction-Reducing Devices**



Slipp® (©Wright Products Inc.)



Hovermatt (©HoverTech)

**Figure L-4: Air-Assisted Lateral Transfer Device with Motor**  
(Air mattress folds into smaller size)