



# Visiting Nurses Thrift Shop

October 2003



# **Visiting Nurse Thrift Shop**

## **Ergonomics demonstration project report**

### **Introduction**

In August 2002, the Visiting Nurses Foundation in Chehalis, WA and the Washington State Department of Labor and Industries (L&I) began an ergonomics demonstration project. The purpose of the project was to perform an ergonomics review of current warehouse and retail operations at their thrift shop in Chehalis, WA, and to document existing use of risk reduction equipment, methodologies, etc. Any observed hazardous exposures would also be identified. This report provides examples of ergonomics methods of risk reduction in the thrift shop retail industry and their benefits to employee health and safety at work.

### **About the Visiting Nurses Foundation and Thrift Shop**

The Visiting Nurses Association is a not-for-profit, community-based home health care organization with operations in Washington State. This report reviews warehouse and retail tasks performed at the Visiting Nurses Foundation's thrift shop in Chehalis, WA.

Thrift shop tasks include receiving/unloading customer donations of clothing, household goods, furniture, etc., at a receiving area, moving donations from the receiving area to the processing area, processing donations (sorting, cleaning, pricing, folding, hanging clothes, evaluating/testing other items), moving processed items from the processing area to the retail sales area or to storage, retail sales and customer assistance, and loading of customer purchased items into their vehicles. Back office administrative and management functions are also performed.

Warehouse/retail processing and sales of customer donated thrift shop items, as described in this report, requires manual handling and processing of a large number of clothing and other small household items. A small number of large/heavy furniture items are also received and processed. Some clothing donation processing tasks are highly repetitive and, if done for extended amounts of time without rotation to other less repetitive tasks, would likely exposure workers to hazardous levels of repetitive motions or neck/back bending. Similarly, unloading or moving of heavy furniture can expose workers to hazardous levels of heavy or awkward lifting. These hazardous exposures can lead to work-related musculoskeletal disorders (WMSDs).

The thrift shop provides employees with basic equipment, such as work tables, carts, and display racks, used to process and display items for sale. Much of this equipment is acquired through donations (such as used shopping carts and storage racks) or is "home-made" (such as a wood frame, carpeted dolly for moving heavy furniture). Use of low-cost equipment and work methods are the only options available to this not-for-profit employer for WMSD risk reduction.

This report describes ergonomics applications to thrift shop warehouse/retail operations that reduce the need for lifting, neck and back bending, and highly repetitive motions. These include the use of work tables of various heights that accommodate workers of different heights, material handling equipment such as carts and dollies, and established work procedures such as cross training and task rotation.

Table 1 summarizes the Ergonomics Rule-related risk factors observed at the thrift shop, and typical tasks associated with those risk factors.

“Other” ergonomics-related risk factors observed at the thrift shop are also listed. (risk factors not covered by the Ergonomics Rule – these are included for information purposes only)

Table 2 lists the warehouse and retail tasks that occur in thrift shop operation, identifies potential Ergonomics Rule-related risk factors for each task, and suggests possible risk reduction methods for each.

“Other” ergonomics-related risk factors for each task are also listed. (risk factors not covered by the Ergonomics Rule – these are provided for information purposes only)

**Table 1. Summary of Ergonomics-related Risk Factors Observed**

(Warehouse and Retail Operations)

*Ergonomics Rule-related risk factors*

<b>Risk Factor of Concern</b>	<b>Job/Task</b>
<b>Heavy Lifting</b> (furniture, mattresses, rugs)	Receiving customer furniture donations Moving furniture around warehouse or sales area Loading customer furniture purchases
<b>Awkward Lifting</b> (storage boxes)	Placing storage boxes in stacked piles or on shelves
<b>Neck or back bent forward</b> (sorting, pricing, tagging clothing)	Processing clothing donations
<b>Highly repetitive motions</b> (sorting, pricing, tagging clothing)	Processing clothing donations

*Other ergonomics-related risk factors*

(risk factors not covered by ergonomics rule – for general information only)

<b>Risk Factor of Concern</b>	<b>Job/Task</b>
<b>Push/Pull Forces</b> (furniture, mattresses, rugs)	Rolling furniture onto cart Sliding furniture around warehouse or sales area Note: Pushing/pulling of furniture is encouraged vs. lifting, but can be a risk factor if required worker exertions are high
<b>Standing (in one place) – long durations</b> (standing work at a table) (standing cash register sales)	Processing area tasks (sorting, folding, pricing, etc.) Cash register sales
<b>Awkward Shoulder Reaching</b> (sorting, pricing , tagging clothing)	Reaching behind the body for clothing on racks while seated processing clothing

The following table (Table 2) summarizes potential risk factors for the different warehouse/retail work areas.

**Table 2. Warehouse and Retail Operations**

Possible Ergonomics (WMSD) Risk Factors

*Ergonomics Rule-related risk factors*

Work Area / Activity	Potential Risk Factors (Ergo Rule limits shown)*	Risk Reduction Methods (for use where hazards exist)
<p><b>Receiving Area</b> Assist customer unloading of heavy and/or awkward donations Receive donations left overnight Piling/storing unusable donations for pickup</p>	<p><i>Caution Zone limits</i> * Heavy Lifting &gt; 75 lbs (once per day)</p> <p><i>Hazard Zone limits</i> For lifting limits: See Ergonomics Rule, Appendix B: Heavy, Frequent or Awkward Lifting</p>	<ul style="list-style-type: none"> <li>* Post notice requesting customers <u>not</u> leave items without speaking to an attendant</li> <li>* Customer drop off of heavy furniture items at front door of store (furniture sales area), rather than at receiving area at rear of store</li> <li>* Reject donations of unwanted heavy items</li> <li>* Dollies, carts, pry bars, hand trucks</li> <li>* Customer assistance with unloading when possible</li> <li>* Two person lifting of heavy items</li> <li>* Slide, not lift, heavy/awkward donations wherever possible</li> <li>* Lift one end of a heavy item at a time (typically 1/2 the weight of the whole item)</li> </ul>
<p><b>Moving Donations from Receiving Area to Processing Area</b>  <b>(or to Retail Area – for furniture)</b> Pick up/carry clothing, household items, furniture, etc.</p>	<p><i>Caution Zone limits</i> * Heavy lifting &gt; 75 lbs (once per day)</p> <p><i>Hazard Zone limits</i> For lifting limits: See Ergonomics Rule, Appendix B: Heavy, Frequent or Awkward Lifting</p>	<ul style="list-style-type: none"> <li>* Dollies, carts, hand trucks, cars/trucks (moving furniture to front of store)</li> <li>* Customer drop off of furniture items at front of store (furniture sales area)</li> <li>* Two person lifting of heavy items</li> <li>* Slide, not lift, heavy/awkward donations wherever possible</li> </ul>

continued

Work Area / Activity	Potential Risk Factors (Ergo Rule limits shown)*	Risk Reduction Methods (for use where hazards exist)
<p><b>Processing Area</b> Sorting, cleaning, testing, pricing, tagging, folding, hanging items.</p> <p>Storing items – e.g., seasonal items.</p>	<p><i>Caution Zone limits</i> * Neck or back bent forward &gt; 30 degrees (more than 2 hours total per day)</p> <p>* Highly Repetitive Motions (&gt; 2 total hours per day)</p> <p>* Awkward Lifting &gt; 25 lbs (above the shoulders, below the knees, or at arms length, &gt; 25 times per day)</p> <p><i>Hazard Zone limits</i> * Neck bent forward &gt; 30 degrees (&gt; 4 hours per day), or * Neck bent forward &gt; 45 degrees (&gt; 2 hours per day)</p> <p>* Highly Repetitive Motions (&gt; 6 hours per day), or with wrists bent and high hand force (&gt; 2 hours per day)</p> <p>For lifting limits: See Ergonomics Rule, Appendix B: Heavy, Frequent or Awkward Lifting</p>	<p>* Variable height table work surfaces, or several tables of different heights * Seated workstations / tables * Job/task rotation (e.g., to less repetitive tasks, such as moving items to retail sales area)</p> <p>* Limiting storage box size and weight * Use of standardized boxes that stack/store easily * Using steps, platforms, ladders, etc., to store heavy boxes so workers do not have to reach up over shoulder level * Storing heavy storage boxes at knee to waist height * Lifting heavy boxes starting from between knee and shoulder height. * Filling boxes on table or another box, where possible (avoid picking up boxes from floor level)</p>
<p><b>Moving Processed Donations to Retail Area or to Storage</b> Clothing Miscellaneous household items  Furniture, mattresses, rugs</p>	<p><i>Caution Zone limits</i> * Heavy Lifting (&gt; 75 lbs) (once per day)</p> <p><i>Hazard Zone limits</i> For lifting limits: See Ergonomics Rule, Appendix B: Heavy, Frequent or Awkward Lifting</p>	<p>* Rolling clothing racks * Carts</p> <p>* Dollies (for furniture, mattresses, other heavy items)</p>
<p><b>Retail Sales Area – non furniture</b> Cash register use Arranging/straightening shelves/racks Assisting customers</p>	<p>None observed</p>	<p>N/A</p>

Work Area / Activity	Potential Risk Factors (Ergo Rule limits shown)*	Risk Reduction Methods (for use where hazards exist)
<p><b>Retail Sales Area – furniture</b> Assist customer loading of heavy and/or awkward purchases</p>	<p><i>Caution Zone limits</i> * Heavy Lifting &gt; 75 lbs (once per day)</p> <p><i>Hazard Zone limits</i> For lifting limits: See Ergonomics Rule, Appendix B: Heavy, Frequent or Awkward Lifting</p>	<p>* Dollies, carts, pry bars, hand trucks * Slide, not lift, heavy/awkward donations wherever possible * Two person lifting of heavy items * Customer assistance with loading when possible</p>
<p><b>Administrative/Management Area</b>  Bookkeeping, payroll  Thrift Shop management</p>	<p>None Observed</p> <p>(Possibilities for similar employers):</p> <p><i>Caution Zone limits</i> * Intensive keying (&gt; 4 total hours per day) (e.g., typing, data entry)</p> <p>* Highly Repetitive Motions (&gt; 2 total hours per day) (e.g., filing)</p> <p><i>Hazard Zone limits</i> * Intensive Keying (&gt; 7 total hours per day), or (&gt; 4 total hours per day with bent wrist posture) (See Ergonomics Rule, Appendix B)</p>	<p>Good Ideas:</p> <p>* Task rotation (e.g., typing, filing, copying, phone, etc.)</p>

\* See Ergonomics Rule for further details on Caution Zone and Hazard Zone limits associated with these risk factors.

**Table 2 (cont'd). Warehouse and Retail Operations**

Possible Ergonomics (WMSD) Risk Factors

*Other Ergonomics-related risk factors  
(risk factors not included in the Ergonomics Rule)*

Work Area / Activity	Potential Risk Factors	Risk Reduction Methods (for use where hazards exist)
<p><b>Receiving Area</b></p> <p>Assist customer unloading of donations Receive donations left overnight Piling/storing unusable donations for pickup</p>	<p><i>Other Risk Factors</i></p> <ul style="list-style-type: none"> <li>* Push/Pull forces</li> </ul>	<p>Good Ideas:</p> <ul style="list-style-type: none"> <li>* Dollies, carts, pry bars, hand trucks</li> <li>* Slide, not lift, heavy/awkward donations wherever possible</li> <li>* Two person lifting of heavy objects</li> <li>* Get customer to assist with unloading or loading when possible</li> </ul>
<p><b>Processing Area</b></p> <p>Processing clothing</p>	<p><i>Other Risk Factors</i></p> <ul style="list-style-type: none"> <li>* Awkward shoulder posture (reaching backwards, behind the body)</li> </ul>	<p>Good Ideas:</p> <ul style="list-style-type: none"> <li>* Arrange clothing racks and seating to reduce reaching behind the back</li> <li>* Job/task rotation to other tasks that don't require awkward shoulder posture (e.g., receiving, other processing tasks, sales)</li> </ul>
<p><b>Retail/Sales Area – non furniture</b></p> <p>Cash register use Arranging/straightening shelves/racks Assisting customers</p>	<p><i>None observed</i></p> <p>(Possibilities for similar employers):</p> <ul style="list-style-type: none"> <li>* Standing (in one place) – long durations</li> </ul>	<p>Good Ideas:</p> <ul style="list-style-type: none"> <li>* Task rotation (e.g., cash register operation to customer assistance, warehouse tasks, etc.)</li> <li>* Chair/stool for cash register</li> <li>* Chairs/stools for arranging/straightening tasks (where appropriate)</li> <li>* Chair/stool available for rest pauses in retail area</li> <li>* Foot rest bar on chair</li> <li>* Anti-fatigue mats</li> </ul>
<p><b>All Areas</b></p> <p>Moving Items Between Areas</p>	<p><i>Other Risk Factors</i></p> <ul style="list-style-type: none"> <li>* Carrying – heavy or awkward items (fatigue, upper body stress)</li> </ul>	<p>Good Ideas</p> <ul style="list-style-type: none"> <li>* Dollies, carts, racks, hand trucks</li> </ul>



## Caution Zone vs. Hazard Zone level exposures

Table 1 identified the following Ergonomics Rule-related risk factors that were observed at the thrift shop:

- Heavy or awkward lifting
- Neck or back bending
- Highly repetitive motions

The table also listed typical thrift shop tasks associated with these risk factors.

Table 2 provided further detail on specific thrift shop tasks and their associated (possible) risk factors. Both Caution Zone and Hazard Zone exposure limits are listed in this table, to help determine whether the jobs/tasks exceed Ergonomics Rule exposure limits.

Based on observation of the Chehalis, WA thrift shop activities, it appears that these tasks can exceed the Caution Zone limits listed in Table 2. Typically the Caution Zone limits are exceeded if furniture that weighs too much weight is lifted (even once), if storage boxes that are too heavy or awkward are lifted overhead frequently, or if workers spend too much (total) time during the work shift on repetitive motion tasks without rotating to other non-repetitive types of tasks.

Note: The Ergonomics Rule requires risk reduction for Hazard Zone level exposures, but not for Caution Zone level exposures. (Caution Zone level exposures require only that ergonomics awareness training be given to workers performing those tasks (and their supervisors) and that further evaluation of Caution Zone tasks be performed to determine if Hazard Zone level exposures are present.)

These same thrift shop tasks can reach Hazard Zone exposure levels if furniture or storage boxes are too heavy, or if repetitive motion clothing processing tasks are performed for too many (total) hours per day.

Note: The Ergonomics Rule Appendix B lifting calculator can be used to analyze lifting scenarios to see if they are hazardous.

Appendix 1 of this report contains a copy of this one-page calculator.

The calculator is also available at the WISHA ergonomics website: [www.lni.wa.gov/wisha/ergo](http://www.lni.wa.gov/wisha/ergo) (look under the link “Evaluation Tools”). (available in three formats: on-line (interactive), PDF, Word)

The following section further discusses the risk factors associated with the various thrift shop tasks and possible ideas for risk reduction.

## Warehouse/Retail Operations at the Visiting Nurses Thrift Shop

This section provides further detail on thrift shop tasks, risk factors that may be present, and possible risk reduction ideas. Several of the rolling dollies and carts currently in use at the thrift shop are shown.

### Receiving Area

#### *Tasks:*

Unloading furniture (or other heavy donated items) from customer cars/trucks (estimate 5 pieces per week)

*Risk Factors:* Heavy Lifting

#### *Risk Reduction:*

Heavy lifting of a small number of furniture, mattresses, rugs, and similar items each week is required. Workers should focus on having furniture carts available for lifting/carrying, and to limit the amount of weight lifted per worker by getting help from another worker or customer, by sliding, rolling, or tipping heavy pieces onto carts. Reducing heavy lifting wherever possible is a management policy that needs to be clearly understood by workers and enforced by management.

Useful equipment for reducing heavy lifting/carrying.



Figure 1. Carpeted furniture dolly with couch and chairs on it

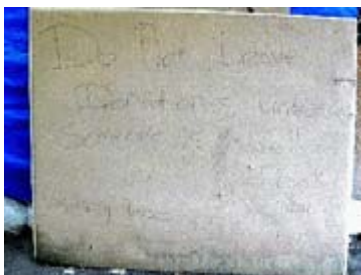


Figure 2. Sign at Receiving Area: “Do Not Leave Donations Unless Someone is here!!”



Figure 3. Trash can dolly, and miscellaneous items cart, in receiving area.

*Other Ideas:*

- \* Consider sorting donations in receiving area, rather than in processing area  
 (reduce redundant handling of items)  
 (This would require having additional carts/bins so they could be available in the receiving area)  
 (Also requires that a worker be stationed in the receiving area, or readily available by buzzer/bell, call box, or similar alert)

**Moving donations from receiving area to processing area**

*Tasks:*

Picking up/carrying unsorted clothing, household items, furniture, etc. from the receiving area to the processing area

*Risk Factors:* Heavy Lifting

*Risk Reduction:*

Lifting of a small number of heavy furniture, mattresses, rugs, and similar items each week is required. Workers should focus on having furniture carts available for lifting/carrying, and to limit the amount of weight lifted per worker by getting help from another worker or customer, by sliding, rolling, or tipping heavy pieces onto carts. Reducing heavy lifting wherever possible is a management policy that needs to be clearly understood by workers and enforced by management.

*Other Ideas:*

- \* Require that customers drop off furniture items at the front door of the store (furniture sales area).  
 (reduce lifting/carrying of heavy/awkward furniture)
- \* Use carts, shelves, hand trucks, etc., to reduce hand carrying of donations

Useful equipment for reducing heavy lifting/carrying.



Figure 4. Shopping cart, rack cart, platform cart.

(Note: These types of carts are used for this and other tasks that require items to be moved between work areas at the thrift shop.)

## Processing Area

### *Tasks:*

Sorting, cleaning, testing, pricing, tagging, folding, hanging items

Storing items – e.g., seasonal items

*Risk Factors:* Neck or back bent forward, highly repetitive motions, awkward lifting.

### *Risk Reduction:*

Workers should focus on avoiding bent neck or back postures by using tables and other work surfaces that are appropriate for their height and the task (several work surfaces of different heights should be available)

When a large task has to be done that requires highly repetitive motions (e.g., clothing sorting, folding, pricing) workers should rotate during the same day to other tasks that are less repetitive (e.g., receiving customer donations, sorting donations, moving items to the retail area)

Storage boxes should be used that are of reasonable size and weight, and workers should focus on using steps, platforms, ladders, etc., to avoid having to lift boxes above shoulder levels. Consider using of platforms, steps, folding ladders, or a rolling ladder (where aisle space permits) for placing items on high storage shelves.



Figure 5. High shelves require something sturdy to stand on to effectively reach or place boxes on upper shelves without excessive reaching up over shoulder level.

Workers should avoid lifting heavy boxes from floor level, where possible. Boxes can sometimes be filled on a table or on another box, to avoid having to pick up the box from floor level.

*Other Ideas:*

\* Arrange racks, tables, etc. to minimize the need to reach awkwardly when transferring items from one rack to another.



Figure 6a). Possible awkward shoulder task – reaching back with left arm for clothes on rack behind the body. (to transfer clothes from rack to rack)



Figure 6b). Reaching across with right arm rather than back with left arm would be better. It may also be possible to re-arrange the location of the two racks.

### **Moving processed donations to retail area (or to storage)**

*Tasks:*

Moving racked items, individual loose items, furniture to sales area  
Moving seasonal items, or other items, to storage

*Risk Factors:* Heavy Lifting (furniture)

*Risk Reduction:*

Workers should avoid the need to move heavy furniture by having the furniture dropped off at the front door of the store (furniture area).

Clothing racks, carts, dollies, hand trucks, etc., should be used to transfer clothing and other miscellaneous processed items to the retail area, to reduce fatigue and upper body stress resulting from hand carrying of heavier items (or piles of items).

### **Retail Sales Area – non furniture**

*Tasks:*

Cash register use  
Assisting customers  
Arranging donations on shelves/racks and straightening up shelves/racks

*Risk Factors:* None Observed

*Risk Reduction:*

N/A

*Other:*

Workers should have chairs, stools, etc, available, as needed, to avoid fatigue from long-term standing. If long-term standing is required, then rotating to other seated tasks during the workday is recommended.

**Retail Sales Area – furniture**

*Tasks:*

Loading customer-purchased furniture into cars/trucks

*Risk Factors:* Heavy Lifting

*Risk Reduction:*

Heavy lifting of a small number of furniture, mattresses, rugs, and similar items is required. Workers should focus on having furniture carts available for lifting/carrying customer purchases to their vehicles, and to limit the amount of weight lifted per worker by getting help from another worker or customer, and by sliding, rolling, or tipping heavy pieces off of carts. Reduce heavy lifting wherever possible.

**Administrative/Management Area**

*Tasks:*

Bookkeeping, payroll  
Thrift shop management

*Risk Factors:* None observed

(intensive typing or highly repetitive motions (e.g., filing) may be a risk factor for some similar employers)

*Risk Reduction:*

N/A

*Other:*

Task rotation is recommended (between typing, filing, copying, phone, etc.) to avoid prolonged exposure to intensive keying or highly repetitive motions during the same workday.

## Other significant activities

### Design of the storage layout

The design of storage layout is important for reducing potential exposures to WMSD hazards as well as for enhancing overall productivity. Storage and processing area layouts that include ready access to in-process items by both workers and carts or dollies can reduce redundant or awkward worker handling of processed items, including a reduction in the need for lifting and carrying.

### Good housekeeping

Good housekeeping in the warehouse/retail environment reduces potential for injury from ergonomics and safety-related hazards, such as trips and falls, redundant motions, and awkward postures while lifting. On-going efforts to keep receiving, processing and storage work areas free of obstacles can reduce hazards and increase productivity. Warehouse work space is limited, and large quantities of donated items are processed, so good housekeeping is a challenging, but useful, goal.

Temporary storage of donated items in shopping carts, boxes, bins, etc, for future processing reduces clutter, and improves access to donated items (see Figure 7). The use of stackable standardized boxes, and/or shelving, would be beneficial, but any boxing, etc., of small sized donated items assists in reducing clutter and making materials more readily available for movement and further processing.



Figure 7 a). Shopping carts.



Figure 7 b) Boxes.

### Move to new location

The Visiting Nurses Foundation has relocated the current Chehalis, WA warehouse/retail operation to a new location in Centralia, WA. Lessons learned from the current location were used by the floor manager and other employees to design the workplace layout and work methods for the new warehouse/retail location.

## Appendix 1

### Washington State Ergonomics Rule Appendix B: Lifting Calculator

(following page)

# Appendix B: Calculator for analyzing lifting operations

Company

Job

Evaluator

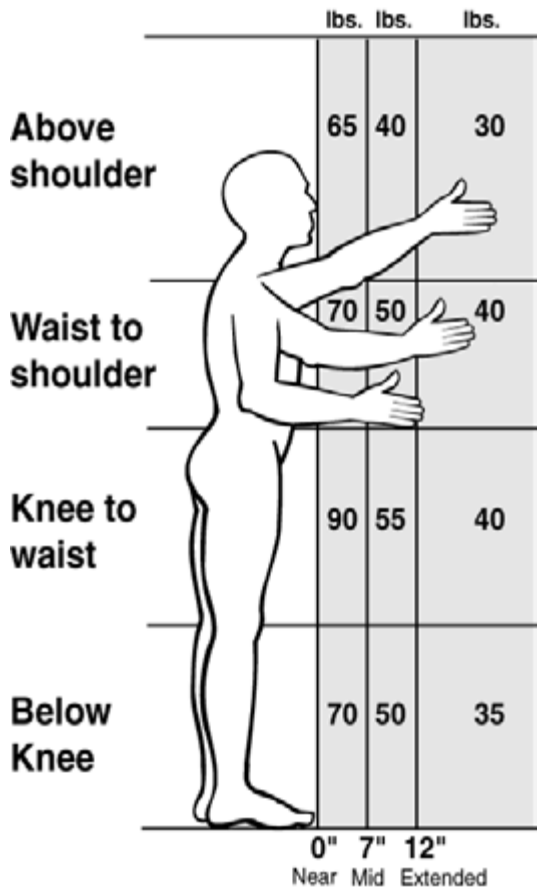
Date

**1** Enter the weight of the object lifted.

Weight Lifted

lbs.

**2** Circle the number on a rectangle below that corresponds to the position of the person's hands when they begin to lift or lower the objects.



**3** Circle the number that corresponds to the times the person lifts per minute and the total number of hours per day spent lifting.

**Note:** For lifting done less than once every five minutes, use 1.0

How many lifts per minute?	How many hours per day?		
	1 hr or less	1 hr to 2 hrs	2 hrs or more
1 lift every 2-5 min	1.0	0.95	0.85
1 lift every min	0.95	0.9	0.75
2-3 lifts every min	0.9	0.85	0.65
4-5 lifts every min	0.85	0.7	0.45
6-7 lifts every min	0.75	0.5	0.25
8-9 lifts every min	0.6	0.35	0.15
10+ lifts every min	0.3	0.2	0.0

**4** Circle 0.85 if the person twists 45 degrees or more while lifting.

0.85

Otherwise circle 1.0

**5** Copy below the numbers you have circled in steps 2, 3, and 4.

lbs.	X	Step 2	X	Step 3	X	Step 4	=	Lifting Limit
Step 2		Step 3		Step 4		Step 4		lbs.

**6** Is the Weight Lifted (1) less than the Lifting Limit (5)

**Yes – OK**  
**No – HAZARD**



Note: If the job involves lifts of objects with a number of different weights and/or from a number of different locations, use Steps 1