

## Slip, Trip and Fall Prevention

### Background

The average person takes between 3,000 and 5,000 steps a day (do the math – that adds up to over 1 million steps a year). Usually, most of these steps are taken at the workplace. Employees walk over varying surfaces and changing elevations. It makes sense that statistically, they would eventually experience a fall at some point in their life. It also makes sense that we should expect some of these to happen at work.

**Problem:** One of the leading loss drivers for many healthcare facilities is slips, trips and falls. Almost half of these have the word “slip” in the short accident description. This is not isolated to food service employees and therefore we should not limit our focus to this area. Potentially all areas of a workplace present the exposure to employee falls.

**Solution:** *Identify, Evaluate and Control*

### Identify

In order to properly address this exposure, it is important to identify slip, fall and trip exposures. This can be done in a variety of ways.

- ⇒ Perform a loss trend analysis.
- ⇒ Perform an audit of facilities. Look for areas:
  - Subject to contamination, whether with solid materials or liquids
  - With uneven surfaces or exposure to different levels (including floor openings)
  - Indoor and outdoor exposures
  - Where lighting may be poor at times
  - Where the walking surface itself may create hazards
  - Where equipment, machinery or processes may create hazards, such as ice making machines
- ⇒ Survey employees, asking questions about areas that get wet, present uneven surfaces and have caused “slips, trips or falls” in the past. It may be helpful to use a “push pin” diagram of the facility to provide a visual reference for where these incidents occur.
- ⇒ If necessary, perform a walking surface audit to determine the Coefficient of Friction (COF), or more simply put the traction of the walking surface. This can be accomplished by contacting the manufacturer or your PMA Risk Control Consultant.

### Evaluate

The evaluation of the exposures is essential in determining how to prioritize the problem. All of the exposures identified need to be reviewed to determine the likelihood that a loss will occur and, if the loss occurs, the severity of the outcome. This may require the involvement of various personnel in the organization.

## Control

What you do with your findings is the most important part of the process. Controls include engineering, administrative, and personal protective equipment, as follows:

### Engineering

It would be wonderful if you were able to start from scratch and make sure the walking surface in place was selected specifically to prevent slips. If possible, select floor surface materials that are appropriate for the conditions that will be present. Wet environments should have a floor surface that will provide a COF of at least .5 when wet—as it is realistic that the surface of a healthcare facility could get wet. If the surface being installed will not meet this criterion on its own, or if you have to deal with an existing floor surface, consider the maintenance and cleaning of the surface. This may be done by implementing floor treatment/cleaning systems intended to improve traction. These following examples may provide desired results, when used properly\*:

<a href="http://www.astantislip.com">www.astantislip.com</a>	<a href="http://www.diamond-safety.com">www.diamond-safety.com</a>	<a href="http://www.noskidding.com">www.noskidding.com</a>
<a href="http://www.slipandfallsolutions.com">www.slipandfallsolutions.com</a>	<a href="http://www.treadsafe.com/index.html">www.treadsafe.com/index.html</a>	<a href="http://www.tractionplus.com">www.tractionplus.com</a>
<a href="http://www.safetydirectamerica.com">www.safetydirectamerica.com</a>	<a href="http://www.y-slip.com">www.y-slip.com</a>	<a href="http://www.sliptech.com">www.sliptech.com</a>

### Administrative

Adequate cleaning and maintenance of the floor surfaces is the next control tactic. Facilities should review cleaning procedures to verify they are having a desired impact on the walking surfaces. Issues to review include frequency of cleaning, adequacy of the cleaning procedures (are mop buckets being emptied frequently while mopping), quality and compatibility of cleaning products, use of wet floor signs, and reporting and cleaning spills. Regular inspections must be performed—an inspection checklist is available at the end of this document to aid in this process.

A new instrument in the housekeeping tool chest is microfiber products. The use of microfiber cleaning products presents a shift in the traditional cleaning process. According to an EPA article on microfiber products, *“Microfiber cleaning materials are a blend of microscopic polyester and polyamide fibers which are split in such a way as to create microscopic “hooks” which act as claws that scrape up and hold dust, dirt, and grime. They are 1/16 the thickness of a human hair and can hold six times their weight in water.”*<sup>1</sup> This allows the materials to provide a greater quality cleaning with less effort.

The traditional wet mop process consists of filling a mop bucket with clean water (to a fill level line) and adding an adequate quantity of cleaning agent. A cotton (or cotton blend) mop head is dipped into the cleaning solution, wrung out to remove excess solution, and applied to the floor surface. With microfiber pads, a much smaller amount of solution is used on a clean pad that is used for an entire area without re-dipping (potentially cross contaminating the floor surface). Studies show this change in process yields several benefits. These include:

- More effective removal of contaminants
- Improved infection control
- Reduction of harsh chemicals
- Conservation of water
- Less labor intensive process

<sup>1</sup> *Environmental Best Practices for Hospitals: Using Microfiber Mops in Hospitals* EPA Region 9, November 2002  
[http://www.epa.gov/region09/cross\\_pr/p2/projects/hospital/mops.pdf](http://www.epa.gov/region09/cross_pr/p2/projects/hospital/mops.pdf)

Some other benefits may include reduced employee injuries and illnesses. Naturally, the process uses less water and thus requires less force. Dirty mop buckets no longer need to be lifted into slop sinks. The quality of cleaning, reduction of overall floor contaminants, and quicker dry time will also help reduce slips and falls.

Another key is properly identifying and communicating wet floor situations. Some innovative products have been invented to help with this. One product is the Hurricane ([www.hurricane.com](http://www.hurricane.com)), a floor sign that dries the floor with a built-in high velocity fan. There are also signs with flashing lights, contrasting color schemes, and the capability of being linked together, creating a barricade.

Additional consideration should be made for administrative controls in specific areas with their own special hazards. Entrances and exits may need additional controls, such as the use of signage, umbrella bags/stands, and walk off carpets and mats. Outside areas need special procedures to address snow/ice removal, standing water, mud, and other contaminants.

### Personal Protective Equipment (PPE)

People do not usually think of “shoes” as PPE unless they are steel toed or have metatarsal guards. One of the best tools to protect employees from injuries related to slips, trips and falls is adequate and appropriate footwear! The market for slip resistant footwear has improved greatly over the past five years. Unfortunately, as more companies offer products, more “bad” products are out there competing with the good. You have to consider your selection of footwear suppliers with the same scrutiny as you would for suppliers of any other safety sensitive equipment. Establish requirements for footwear such as meeting slip resistant testing requirements (where appropriate—remember no one sole design is best for all conditions), adequate replacement periods, and securing the footwear (no open backed shoes or wearing them with shoe strings flapping). Make your footwear policy specific, detailing the requirements, and addressing special situations. Educate employees regarding the difference between “slip resistant” and “non-slip” or “non-skid.” These terms do not mean the same thing. It is encouraged that you look for footwear that is tested to meet the ASTM testing requirements and provides supporting material to verify the test results. Some example slip resistant footwear links may include\*:

<a href="http://www.srmax.com">www.srmax.com</a>	<a href="http://www.shoesforcrews.com">www.shoesforcrews.com</a>	<a href="http://www.skidbustershoes.com">www.skidbustershoes.com</a>
<a href="http://www.keukafootwear.com">www.keukafootwear.com</a>	<a href="http://www.kmshoes.com">www.kmshoes.com</a>	<a href="http://www.jordandavid.com">www.jordandavid.com</a>
<a href="http://www.shoeflydirect.com">www.shoeflydirect.com</a>	<a href="http://www.workshoecity.com/noslip.htm">www.workshoecity.com/noslip.htm</a>	

In addition to providing proper traction, footwear should not present other hazards. There are many new styles of footwear being marketed as improving posture, health, weight loss, and comfort. Some of these shoes have been identified as causing problems with gait, balance, and support. Employers should consider prohibiting employee use of new footwear styles that may contribute to slip, trip, and fall injuries until studies are performed to determine the safety of the footwear.

### Other Solutions

Another solution includes proper winter maintenance. Some devices can be used to provide adequate warning of freezing surfaces, such as [www.icealert.com](http://www.icealert.com), a system of signs that change color when the temperature is low enough to cause freezing. Still, wearing proper footwear while clearing the walks is an essential part of fall prevention. If you think about it, you ask winter maintenance staff to risk a slip and fall to help prevent others from slipping and falling! It makes sense to provide them with some protection from falls. Some example products for this may include\*:

<a href="http://www.yaktrax.com">www.yaktrax.com</a>	<a href="http://www.jordandavid.com">www.jordandavid.com</a>	<a href="http://www.polarcleats.com">www.polarcleats.com</a>
<a href="http://www.duenorthproducts.com">www.duenorthproducts.com</a>	<a href="http://www.32north.com">www.32north.com</a>	<a href="http://www.spiky.com">www.spiky.com</a>
<a href="http://www.kakoicecleats.com">www.kakoicecleats.com</a>		

Keep in mind, most snow removal efforts are focused on emergency snowfall and removal. These primary efforts are essential to keeping the facility running during the snowfall, but many falls occur after the initial snowfall. Secondary efforts should take a high priority to clean up residual snow and ice, focusing on areas of high traffic and areas where melted snow may accumulate and refreeze.

Also, during the winter, walking surfaces may heave or become damaged as the result of snow removal activities. Inspections should be performed constantly. If an identified problem cannot be repaired, barricades, signs and other warning should be utilized.

For additional information or assistance, please contact your PMA Risk Control Representative.

\*Please note, PMA Companies does not endorse any of the companies, products, or services mentioned in this bulletin, but provide weblinks for informational purposes only to aid in your effective risk management considerations. PMA Companies does not make any warranty, express or implied, as to the merchantability or fitness of these websites, companies, or products or services offered.

**IMPORTANT NOTICE** - *The information and suggestions presented by PMA Companies in this risk control technical bulletin are for your consideration in your loss prevention efforts. They are not intended to be complete or definitive in identifying all hazards associated with your business, preventing workplace accidents, or complying with any safety related or other laws or regulations. You are encouraged to alter the information and suggestions to fit the specific hazards of your business and to have your legal counsel review all of your plans and company policies.*

## Checklist: Walkways and elevated surfaces self-inspection

Slips, trips and falls are a contributing factor in a large number of occupational accidents. While accidents will happen, safety managers can help make sure they don't happen quite as often by instituting walking surface safety protocols.

This checklist, from the OSHA Office of Training and Education, is by no means all-inclusive. You should add to it or delete portions or items that do not apply to your operations; however, carefully consider each item as you come to it and then make your decision. You will also need to refer to OSHA standards for complete and specific standards that may apply to your situation.

<b>Walkways</b>	<b>Yes</b>	<b>No</b>
Are aisles and passageways kept clear?		
Are aisles and walkways marked as appropriate?		
Are wet surfaces covered with non-slip materials?		
Are holes in the floor, sidewalk or other walking surface repaired properly, covered or otherwise made safe?		
Is there safe clearance for walking in aisles where motorized or mechanical handling equipment is operating?		
Are materials or equipment stored in such a way that sharp projectiles will not interfere with the walkway?		
Are spilled materials cleaned up immediately?		
Are changes of direction or elevation readily identifiable?		
Are aisles or walkways that pass near moving or operating machinery, welding operations or similar operations arranged so employees will not be subjected to potential hazards?		
Is adequate headroom provided for the entire length of any aisle or walkway?		
Are standard guardrails provided wherever aisle or walkway surfaces are elevated more than 30 inches above any adjacent floor or the ground?		
Are bridges provided over conveyors and similar hazards?		
<b>Floor and wall openings</b>	<b>Yes</b>	<b>No</b>
Are floor openings guarded by a cover, a guardrail, or equivalent on all sides (except at entrances to stairways or ladders?)		
Are toeboards installed around the edges of permanent floor openings (where persons may pass below the openings)?		
Are skylight screens of such construction and mounting that they will withstand a load of at least 200 pounds?		
Is the glass in the windows, doors, glass walls, etc. which are subject to human impact, of sufficient thickness and type for the condition of use?		
Are grates or similar type covers over floor openings such as floor drains of such design that foot traffic or rolling equipment will not be affected by the grate spacing?		
Are unused portions of service pits and pits not actually in use either covered or protected by guardrails or equivalent?		

Are manhole covers, trench covers and similar covers, plus their supports designed to carry a truck rear axle load of at least 20,000 pounds when located in roadways and subject to vehicle traffic?		
Are floor or wall openings in fire resistive construction provided with doors or covers compatible with the fire rating of the structure and provided with a self-closing feature when appropriate?		
<b>Stairs and stairways</b>	<b>Yes</b>	<b>No</b>
Are standard stair rails or handrails on all stairways having four or more risers?		
Are all stairways at least 22 inches wide?		
Do stairs have landing platforms not less than 30 inches in the direction of travel and extend 22 inches in width at every 12 feet or less of vertical rise?		
Do stairs angle no more than 50 and no less than 30 degrees?		
Are step risers on stairs uniform from top to bottom?		
Are steps on stairs and stairways designed or provided with a surface that renders them slip-resistant?		
Are stairway handrails located between 30 inches and 34 inches above the leading edge of stair treads?		
Do stairway handrails have at least 3 inches of clearance between the handrails and the wall or surface they are mounted on?		
Where doors or gates open directly on a stairway, is there a platform provided so the swing of the door does not reduce the width of the platform to less than 21 inches?		
Where stairs or stairways exit directly into any areas where vehicles may be operated, are adequate barriers and warnings provided to prevent employees stepping into the path of traffic?		
Do stairway landings have a dimension measured in the direction of travel, at least equal to the width of the stairway?		
<b>Elevated surfaces</b>	<b>Yes</b>	<b>No</b>
Are signs posted, when appropriate, showing the elevated surface load capacity?		
Are surfaces elevated more than 30 inches above the floor or ground provided with standard guardrails?		
Are all elevated surfaces (beneath which people or machinery could be exposed to falling objects) provided with standard 4-inch toeboards?		
Is a permanent means of access and egress provided to elevated storage and work surfaces?		
Is required headroom provided where necessary?		
Is material on elevated surfaces piled, stacked, or racked in a manner to prevent it from tipping, falling, collapsing, rolling or spreading?		
Are dock boards or bridge plates used when transferring materials between docks and trucks or rail cars?		