

Slip, Trip, and Fall Prevention

University of Tennessee Safety Guide GS-040

Document Contact: EHS-General Safety

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Purpose

This guideline has been developed to address falls and fall accidents that occur on the same walking surface, (interior and exterior) at the University of Tennessee, Knoxville.

Slip, trip and fall accidents are a common type of accident for all employers and can result in significant injury, especially for older individuals. A proactive approach to preventing these accidents includes identification of hazards, investigation of injuries, and correction of noted hazards.

Scope and Applicability

This guide should be used to protect students, staff, visitors and contractors from injury while on the UT premises or while on premises under the control of UT.

Excluded from this plan are ladders, scaffolding, or elevated walking surfaces.

Abbreviations and Definitions

Abbreviations

SGA – Student Government Association

Roles and Responsibilities

Employees, students and visitors shall:

- Wear proper footwear based on the work environment.
- Use prescribed exterior walkways and not take short cuts (e.g. down banks).
- Report any slip, trip or fall hazards to their immediate supervisor or Principal Investigator.
- Eliminate slip, trip and fall hazards where feasible. Examples include, moving a power cords that crosses a walkway, cleaning up spills, removing clutter, etc.

Environmental Health and Safety shall:

- Eliminate or mark fall hazards where feasible.
- Provide technical assistance to departments regarding slip, trip and fall hazards.
- Investigate complaints involving slips, trip and fall hazards.
- Investigate accidents that involve a fall and where there may have been a contributing environmental factor such as missing handrail, slippery walking surface. Note that the Fall Hazard Investigation form (Appendix B) may be used to guide and document a fall investigation.
- Update and revise UT's Slip, Trip and Fall policy periodically.
- Inspect facilities to identify fall hazards inside the building on an annual basis.

Note that the exterior walking surfaces immediately adjacent to the building are inspected during this survey.

Other exterior walking surfaces such as parking lots and sidewalks that are remote from the building are inspected annually by the SGA Safety Walk and by EHS on a triennial basis. Note deficiencies found during the annual inspection are communicated to the appropriate individual

Department Heads and Supervisors shall:

- Identify work locations that are “Higher Risk Areas.”
- Properly address slip, trip and fall hazards promptly and consulting with EHS if a slip, trip and/or fall hazard cannot be abated.
- Ensure appropriate training is provided for all employees who will be working in higher risk areas where slip, trip and fall hazards are prevalent.
- Evaluate employees’ compliance with safe work practices.
- Eliminate slip, trip and fall hazards that fall under their control and have been reported

Procedures

Slip, Trip, & Fall Hazards:

Slips occur when there is insufficient friction or traction between a person’s feet (foot wear) & walking/working surface, resulting in loss of balance.

Trips occur when the foot or lower leg hits an object and the upper body continues moving, resulting in loss of balance and also when stepping down to lower surface and losing balance.

Falls occur when too far off center of balance

Two types

1. **Fall at same level:** Fall to same walking or working surface, or fall into or against objects above the same surface
2. **Fall to lower level:** Fall to level below the walking or working surface

Slips, trips and falls are the 2nd leading cause of accidental death (behind motor vehicle accidents). Over 17% of all disabling occupational injuries that occur in the U.S. result from falls

Factors, such as the ones listed below, all contribute to an increased risk of slip, trip and fall injury.

- Failing eyesight &/or visual perception
- Age
- Physical condition & fatigue
- Stress or illness
- Medications, alcohol & drug effects
- Carrying or moving cumbersome objects or simply too many objects at one time
- Not paying attention to surroundings or walking distracted
- Taking unapproved shortcuts
- Being in a hurry and rushing

Common slip, trip and fall hazards result from:

- Wet or contaminated floors (e.g. grease, liquids, ice, oil, dust fine powders, etc.).

Contaminant	Source(s)
Rain water	<ul style="list-style-type: none"> • Transmitted internally from open external doors or from the feet, coats or umbrellas of pedestrians • Building leaks
Water, other fluids	<ul style="list-style-type: none"> • From spills, plumbing leaks, cleaning, ice machines
Floor cleaning products	<ul style="list-style-type: none"> • Resulting from failure to follow appropriate cleaning protocol
Body fluids	<ul style="list-style-type: none"> • Blood, vomit
Condensation	<ul style="list-style-type: none"> • Variations in temperature
Dusts	<ul style="list-style-type: none"> • Natural or from stored materials
Debris	<ul style="list-style-type: none"> • Bags, paper, food residues, soil, cardboard boxes

- Uneven walking surfaces, holes, changes in level, broken or loose floor tiles, defective or wrinkled carpet or uneven steps/thresholds.
- Mats or rugs not lying flat on the floor.
- Obstructions and accumulation of objects in walkways (e.g. hoses, cords, cables, debris, etc.).
- Unguarded platforms, walkways, and work areas 30 inches above ground.
- Inadequate illumination

Higher Risk Areas:

For purposes of this policy, an area where slip, trip, or fall hazards may likely arise during a typical work shift, is considered a “higher risk area”. Examples of higher risk areas include:

- Dining hall kitchens – wet floor
- Locker rooms – wet floor
- Loading docks – elevated locations

Inspections

Inspections to identify slip, trip and fall hazards are recommended at least annually. For higher risk areas, a formal inspection is recommended at least quarterly; more frequently depending on the likelihood for changing conditions. A sample inspection form is contained in Appendix A.

Recommended inspections should minimally include evaluation of the following:

- Condition of floors, carpets, and steps
- Floor maintenance protocol
- Housekeeping practices
- Lighting levels
- Presence and condition of guardrails/ handrails at elevated work surfaces.

Hazard Control Measures

General Housekeeping Procedures / Safe Work Practices

The following housekeeping procedures and safe work practices must be followed to prevent accidents associated with slip, trip and fall hazards:

General Safety

- Avoid running or walking too fast, especially in higher risk areas.
- Avoid carrying items that will obstruct one's view of their walking pathway.
- Avoid walking through potential slip, trip and fall hazards.
- Use extra caution when traveling both outdoors and indoors during/ following wet weather.

General Housekeeping Procedures

- Clean up spills immediately. For greasy liquids, use suitable cleaning agent.
- Do not leave floors wet after cleaning – clean them to a completely dry finish if possible. If "clean-to-dry" is not possible, then use barriers and "wet floor" warning signs to keep people off the wet area.
- Use cleaning methods that do not spread the problem. Small spills are often better dealt with using a paper towel instead of a mop that wets a larger area of floor.
- Do not use cardboard to soak up spills.

Slip Hazards

- Floors, platforms, and walkways shall be maintained in good repair, and reasonably free of oil, grease, or water. Mats, grates, or other methods that provide equivalent protection shall be used on areas where operation requires walking on slippery surfaces.
- Slip-resistant floor coatings should be used in areas that are likely to be wet or subject to frequent spills.
- Slip hazards must be identified and removed promptly.
- Warning signs or other equally effective means (barricades) should be used as a warning system in areas where a slip hazard is present.

Trip Hazards

- Platforms and walkways shall be free of obstructions and dangerous projections (e.g. extension cords, power cables, hoses, carts, boxes, debris).
- Position equipment to avoid cables crossing pedestrian routes; use cable covers securely affixed to surfaces, or consider use of cordless tools.
- Surfaces in poor repair (i.e. holes, surface upheaval, and broken tiles) shall be repaired or guarded by readily visible barricades, rails or other equally effective means.
- Ensure floor mats and rugs lay flat and do not have curling edges.

Floor Mats and Other Floor Treatments

Where work processes are expected to create wet floor surfaces, such surfaces shall be protected against slipping by using mats, grates, cleats, or other methods that provide equivalent protection.

Where wet processes take place, drainage shall be maintained and false floors, platforms, mats, or other dry standing places provided.

Floor mats

- Floor mats shall be placed at building entrances and higher risk areas where walking-working surfaces may be wet.
 - Examples of these areas include:
 - Areas adjacent to food counters and food preparation areas
 - Cooking areas
 - Dishwashing areas
 - Frying stations
- The design of floor mats should have the following features:

- Slip resistant surface on both top and bottom sides.
- Beveled edges, flat edges or similar design to help reduce the likelihood of workers tripping on the mat's edges.
- Slots or similar design to help promote drainage and prevent accumulation of water & grease.
- Antibacterial treatment or similar design to help prevent the growth of mold and mildew.
- Floor mats should not be installed and used in a way where the mat itself becomes a slip or trip hazard.

Other Treatments:

- Other floor treatments may be used to reduce slip hazards associated with wet floors.

Slip-Resistant Footwear

Employees who work in potentially slippery higher risk areas should consider slip-resistant footwear. When selecting slip-resistant footwear, the following should be considered:

- Level of slip-resistance (i.e. Polyurethane and microcellular urethane soles are more slip-resistant compared to nitrite and styrene rubber).
- Tread design, tread hardness, and shape of sole and heel. (i.e. High elastic soles with raised-tread and cross-hatch patterns are more slip-resistant compared to rough and flat soles. Tread patterns should cover the whole sole and heel area.)
- Proper support and comfort.

NOTE: The use of slip-resistant footwear alone is not adequate in preventing slip-related accidents. General housekeeping procedures, safe work practices, and matting/ floor treatments (as necessary) must be used.

Floor Maintenance Procedures

A floor maintenance procedure must exist where routine or occasional floor cleaning is performed by departmental staff. Consulting with floor cleaner product manufacturer for guidance on suggested cleaning procedures is recommended. The following should be considered when developing a floor maintenance procedure:

- The type of floor finish products used, including slip-resistant polymer finishes, strippers, degreasers and general cleaners.
- Proper application methods for products, including proper dilution and time schedules for each component or process.
- Proper warning system used during floor maintenance operation to alert building occupants of the presence of potential slip, trip and fall hazards.
- Documentation of products used, including Safety Data Sheets, and specifications regarding the slip-resistance level of the product.
- Periodic review of maintenance program, especially after a report of an employee "near miss" or actual accident.

Training

For employees working in higher risk areas, training should be provided to ensure employees are in compliance with safe work practices. Department-specific training may be arranged upon request by contacting EHS at 974-5084.

All employees who may be required to work in a higher risk area should be trained on the following:

- Recognition of potential hazards associated with working in a higher risk area.
- The use of control measures to prevent slip, trip and fall related accidents.

The frequency of training provided to the employees is to be determined by the supervisor and EHS.

Recordkeeping

EHS shall maintain the following record related to falls

- Accident reports and investigations (minimum five years) based on OSHA requirements
- Inspection reports, which include information on slip, trip and fall hazards for at least five years
- Complaints involving fall hazards for at least five years

References

ANSI - various

OSHA 29 CFR 1910 (General Industry) – Various sections

OSHA 29 CFR 1926 (Construction) – Various sections

EHS Safety Manual - Ladder Safety (GS-045)

Stanford University Slip, Trip and Fall Prevention Guide

Appendices

Appendix A: Inspection Form

Appendix B: Fall Investigation Form

Disclaimer

The information provided in these guidelines is designed for educational use only and is not a substitute for specific training or experience.

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Appendix A: Inspection Form

Slip, Trip and Fall Hazards – Inspection form

Building:		Floor:	Area/ Room#:		Higher Risk Area Yes <input type="checkbox"/> No <input type="checkbox"/>	
Floor Condition		YES	NO	N/A	COMMENTS	
1.	Floor is kept free from slip hazards such as food or liquid spills, and other debris.					
2.	Walkway is kept free from trip hazards such as torn carpets, electrical cords, fallen articles, broken tiles, etc.					
3.	Carpet/rugs are in good condition & secured to the floor.					
4.	Floors are properly designed to allow for good drainage.					
5.	Floors drains are not plugged/ allow adequate drainage.					
6.	Floor mats are in good condition, free of grease, and used appropriately (i.e. mat is not a trip hazard).					
7.	Floor mats have beveled edges, and where appropriate, are grease resistant and promote drainage.					
Others		YES	NO	N/A	COMMENTS	
1.	Portable signs, and equipment used for spills cleanup are available for use.					
2.	Slip-resistant footwear is worn by employee.					
3.	Illumination is adequate.					
4.	Stepladders are in good condition and have non-skid feet.					
Building perimeter / Stairways/Special Areas		YES	NO	N/A	COMMENTS	
1.	Sidewalks & ramps are free of defects (e.g. cracks, breaks, holes).					
2.	Sidewalks & ramps do not show signs of surface upheaval or unevenness.					
3.	Stairway's surface and nosing (leading edge of stair tread) are free of defects (e.g. broken steps, cracks).					
4.	Handrail is present and secured at stairways & ramps.					
5.	Guardrails are present and secured on working surfaces that are more than 30 inches above floor or other working areas (Exception: loading dock).					
6.	Restroom floors free from defects and properly maintained. No evidence of plumbing leaks.					
7.	Other:					
Other Comments/ Notes						
Inspected by:				Date:		

Appendix B

Fall Hazard Investigation Guide

The following guide should be used to investigate falls that occur on the same-level walking-working surface including stairs on UTK property. It shall not be used to investigate falls from elevated surfaces.

Type of Walking Surface

Carpet	Concrete	Metal	Wood
Asphalt	Brick	Synthetic	Tile (ceramic)
Sheet vinyl	Tile (Vinyl)	Other (specify)	

Illumination

Adequate	Natural	Artificial	Foot-Candles:
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Slip and Trip Hazards

Oil	Water	Lubricants	Cords
Projections	Storage	Elevator Landing	Other (specify)

Stairs and Handrail Dimensions

Tread depth c	Riser Height (in)	Handrail Height (in)	Nosing depth (in)
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Other Factors

Did the person have a medical condition that could have contributed to the fall? _____

Was the person distracted by an electronic device or otherwise distracted? _____

Was the person wearing corrective lenses? _____

Was the view obstructed? _____

Footwear sole material: _____ Footwear heel style: _____

Ramp or inclined walking surface: _____ Walk-off mats: _____

* Use the back of this sheet for additional details or comments. Include photos where possible.