**FALL FACTORS:**
***Understanding & Preventing Slips, Trips & Falls***

This easy-to-use Leader's Guide is provided to assist in conducting a successful presentation. Featured are:

**INTRODUCTION**: A brief description of the program and the subject that it addresses.

**PROGRAM OUTLINE:** Summarizes the program content. If the program outline is discussed before the video is presented, the entire program will be more meaningful and successful.

**PREPARING FOR AND CONDUCTING THE PRESENTATION:** These sections will help you set up the training environment, help you relate the program to site-specific incidents, and provide program objectives for focusing your presentation.

**REVIEW QUESTIONS AND ANSWERS:** Questions may be copied and given to participants to document how well they understood the information that was presented. Answers to the review questions are provided separately.

**INTRODUCTION**
Slips, trips and falls result in more than 15 million workplace injuries each year; and unfortunately, injuries related to falls are the second leading cause of on-the-job fatalities. Falls are also the third leading cause of disability among employees. The good news is that these mishaps can be prevented. By understanding how "fall factors" such as balance, gravity, friction and momentum contribute to these incidents, we can take preventative measures to prevent falls. That's the purpose of this program—to prevent fall-related incidents by providing viewers with an understanding of the factors involved in every fall as well as the common hazards and unsafe actions that make a fall much more likely. Also reviewed are the techniques and safe work practices that we can use to control the factors that contribute to slip, trips and falls.

***PROGRAM OUTLINE***

**BACKGROUND**

- Slips, trips and falls result in more than 15 million workplace injuries each year; and unfortunately, injuries related to falls are the second leading cause of on-the-job fatalities.

- While you might think that most fall fatalities occur from falling from a great height, the reality is that many deaths occur from same level falls or falls of a very short distance, such as from a step stool or down a few stairs. Even a small fall can be very painful and cause serious injury.

- Falls are the third leading cause of disability among employees.

- Of course, falls don't only happen at work. Falls which occur off the job account for many injuries and fatalities each year; however, the good news is that slips, trips and falls can be prevented.

**THE BODY'S CENTER OF GRAVITY'S ROLE IN MAINTAINING BALANCE**

- So exactly why do we fall? The simple answer is we lose our balance. One key to maintaining balance is to control the location of the body's center of gravity relative to its base of support.

- When standing normally, the base of support for our body is created by our feet, while our center of gravity is located near our lower back. Connecting these points graphically creates a triangle which can be referred to as the "stability triangle."

- When our center of gravity is directly over our base of support, in this case the feet, we will be stable and balanced.

• Once we lean forward or backward and allow our center of gravity to move beyond our base of support, we will quickly lose our balance and fall unless we move our center of gravity back over our base, or we move our base of support so that it remains under our center of gravity.

• In fact, the simple act of walking is really just the repetitive act of controlled falling. Walking is achieved by leaning forward until your center of gravity shifts beyond the base of support causing a momentary loss of balance which is corrected by moving a foot forward, shifting the base of support and re-establishing stability, at least until the next step.

• In other words, walking is a series of controlled, momentary losses of balance. Unfortunately, it doesn't take much to interfere with this process, preventing us from regaining stability and leading to a fall.

**FALL FACTORS**

• There are a few factors which are involved in every fall. We like to refer to them as "fall factors."

• Balance is one fall factor which we have already discussed.

***Gravity***

• Another fall factor is gravity. Gravity is a constant force that pulls us downward and gravity is not gentle.

• Gravity accelerates objects towards the ground at a rate of 32 feet per second squared. With the force of gravity always pulling us downwards, it's no wonder that even a small fall can cause big injuries.

***Friction***

• In addition to balance and gravity, another fall factor is friction, or more specifically, a lack of friction. Friction is the force which resists the movement of one solid object relative to another.

• For example, friction prevents this block from sliding down the slope; however, adding a slippery substance reduces friction and allows the brick to slide easily.

• Anytime we step, turn or stop while walking or running, we depend on friction between the sole of our footwear and the traveling surface to prevent our feet from sliding.

• A loss of friction, also called a loss of traction, can cause our feet to slip. When this occurs, our base of support is no longer under our center of gravity, leading to a loss of balance and a possible fall.

• Maintaining sufficient friction or traction while walking is critical to preventing falls. This is why friction is a fall factor which must be controlled.

***Momentum***

• The last fall factor we will discuss is momentum. Momentum is a function of an object's mass and speed. An object's momentum determines how much force is required in order to bring the object to a stop.

• One way to think about momentum is to remember Sir Isaac Newton's first Law of Motion: An object in motion tends to stay in motion.

• For example, a person walking at a normal pace can easily stop when confronted with an unexpected hazard. Should this same person decide to run, they will have a more difficult time stopping when confronted with the same hazard. This is because running creates more momentum than walking.

• Momentum can become a fall factor in a variety of ways. First, developing excess momentum by traveling too fast can make it difficult to stop when confronted by an unexpected hazard.

• Second, an increase in momentum also increases the amount of friction which is required to prevent our feet from slipping on the traveling surface. In other words, the more momentum we carry the more likely we are to slip and fall.

• Finally, remember that "a body in motion tends to stay in motion." When our base of support, our feet, are stopped suddenly, our center of gravity will tend to stay in motion and may extend too far past our base of support, causing a loss of balance and a fall.

**PREVENTING FALLS RESULTING FROM SLIPS**

• Slips occur when a lack of friction between our feet and the surface on which we are standing or walking results in our feet sliding. This can easily cause us to lose our balance and fall.

• There are many substances which can reduce friction and become slip hazards, including water, oil, grease, sawdust or metal shavings, ice and snow. Also, various objects which roll or slide easily such as pencils, conduit, balls and similar items are also slip hazards.

• To prevent slips, all workers must constantly be on the lookout for these types of slip hazards so they can be avoided and corrected.

• If you discover any of these hazards in your workplace, follow your company's policy for having the situation remedied. This could be as simple as cleaning up the hazard yourself or placing a warning sign next to the hazard and reporting it to the proper authority to have the hazard corrected.

• Be aware that spills of hazardous materials require a specially trained and authorized spill response team to be cleaned up. Make sure you understand your facility's plan for spill reporting.

• One common contributor to slips is apathy. Never assume that it is someone else's responsibility to take care of a hazardous situation; failing to promptly correct slip hazards causes many injuries each year.

• Of course, to avoid hazards, you must first be aware of them. Whenever traveling through the workplace, pay attention to the walking surface ahead.

• Use extra caution when walking on sidewalks and pavement outside the building or if your job requires you to work outdoors. Be on the lookout for snow, ice, loose gravel, sand and similar items when traveling outdoors.

• Be aware that entrance ways into buildings, as well as bathroom floors, are frequently slippery. Always proceed carefully in these types of areas. Wet, slippery floors are a frequent source of slips and falls.

• If you must walk across an area that could be slippery, taking short steps helps to keep your center of gravity over your base of support. Also, using a wider stance and pointing your feet slightly outward can help you remain balanced. If possible, hold onto a hand rail or other solid object as you walk to increase your stability.

• Be careful when walking on ramps and other inclined surfaces. Anytime a travel surface isn't level, a greater potential for slipping exists because one component of gravity will always be pulling you down the incline. When this is the case, good traction is required to prevent slipping.

**IMPORTANCE OF WEARING PROPER FOOTWEAR**

• We've seen the importance that traction plays in preventing slips. One way to maintain proper traction is to wear the proper footwear for the traveling surface.

• Many types of safety footwear are equipped with slip-resistant soles. Certain types of soles are designed to provide traction on specific surfaces and under specific conditions.

• Be sure you understand which type of shoes or boots have the appropriate sole composition for the areas in which you work and always wear them when required.

• Be aware that slippery substances can become stuck on the bottom of our footwear. This can also cause a reduction in friction and a slip and fall. Inspect the soles of your footwear for mud, grease or other slipping hazards and clean them off before proceeding to your work area each day.

• Pay special attention to the condition and tread wear of the heels, as most slips occur due to the lack of friction between the walking surface and the heel of your shoe.

**PREVENTING FALLS RESULTING FROM TRIPS**

• Tripping occurs when one or both of our feet are impeded while traveling. This can cause our center of gravity to move beyond our base of support, leading to a loss of balance; and, if we are traveling with too much momentum, we will be unable to recover quickly enough to avoid a fall.

• There are many items which can become trip hazards, including tools, electric cords, hoses and similar objects. In fact, any solid object which can impede our stride can become a trip hazard when encountered unexpectedly.

• To prevent trips, all workers must constantly be on the lookout for these types of objects so they can be avoided and corrected if necessary.

• If you discover a trip hazard in your workplace, especially one that is in a designated walkway, follow your company's policy for having the situation remedied.

• This could be as simple as moving the object yourself or marking it so others are aware of the hazard and reporting it to the proper authority so it can be corrected. Failing to promptly correct trip hazards causes many fall injuries each year.

• Of course, to avoid trip hazards, you must first be aware of them. Whenever traveling through the workplace, pay attention to the walking surface ahead. Scan your path of travel for hazards and move at a pace which allows you to stop easily or change direction when necessary.

• One of the main contributors to the presence of tripping hazards is poor housekeeping. When we allow our work area to become cluttered with tools, supplies and other debris, we greatly increase the chance of a tripping incident and injury.

• Be sure to keep your work area free of such clutter. The injury you prevent could well be your own.

• Also, don't use stairwells for storage and don't leave tripping hazards near doorways, even if you only intend to leave them there for a short period of time.

• When injuries related to trips and falls are investigated, there are certain types of trip hazards which seem to show up more frequently than others. One such hazard is extension cords.

• Extension cords are frequently involved in trip and fall incidents. They are particularly hazardous because they often slope down from the receptacle and then up again, creating the perfect place for a foot to become entangled. In addition, unsecured cords can move unexpectedly when pulled by the user.

• If you must use an extension cord in an area where pedestrians travel, make sure to secure it to the floor, and mark the hazard in some way. Be sure to remove the cord as soon as you no longer need it.

- Another common tripping hazard, especially in an office setting is open drawers, especially the lower drawer of filing cabinets.

- When opening drawers, get in the habit of closing them right away, even if you plan on coming back soon. An open drawer is hard to see and presents a serious hazard.

- Finally, faulty floor mats, loose carpeting and damaged floor tiles are frequently cited as the cause of tripping incidents. While we typically can't fix these items ourselves, we can report them to the proper authority so they can be repaired.

**UNSAFE ACTS**

- There is another factor which contributes to many falls which we have not yet discussed: unsafe acts committed by employees.

- We've already discussed the importance of scanning our path of travel for hazards while walking. Anything that prevents us from doing so is a distraction and should be considered an unsafe act.

- Shouting at co-workers across the facility, taking part in intense conversations, daydreaming or simply looking around at other things, and of course reading, texting or using any type of device that takes your eyes away from your path of travel is unsafe and must be avoided.

- Many slips, trips and falls occur when employees neglect to turn on the proper lighting to travel through an area. Always turn on the lights before walking through dark areas. And don't carry loads which block your vision, and prevent you from seeing your path of travel.

- Prevent falls by staying on the correct path. Marked aisle ways, conveyor crossings, pipe crossings and similar approved pathways are designed to keep you safe. Venturing into unauthorized travel areas, which are not designed for pedestrian traffic, is an unsafe act which can quickly lead to a fall injury.

- No matter what the circumstances are, never run at work. Make no mistake; running at work is committing a very unsafe act. When we run, we have much less time to scan our path of travel for hazards. When we run we have less time to react to changing conditions.

- Running increases our momentum, not only making it much easier to fall, but also increasing the force with which we hit the floor or strike objects. This can greatly increase the severity of injury.

- Another unsafe act which frequently contributes to fall injuries is horseplay. Horseplay typically involves a variety of unsafe acts: distracted workers, running and traveling beyond approved walkways, to name just a few.

- Don't be tempted to engage in this type of unsafe behavior and don't be afraid to speak up and put a stop to horseplay and other unsafe acts if you see them taking place.

- Avoiding slip, trip and fall hazards takes focus and effort under the best of conditions. Don't increase your risk by committing these types of unsafe acts.

**PREPARE FOR THE SAFETY MEETING**
Review each section of this Leader's Guide as well as the DVD or digital media. Here are a few suggestions for using the program:

Make everyone aware of the importance the company places on health and safety and how each person must be an active member of the safety team.

Introduce the program and then play it without interruption. Review the program content by presenting the information in the program outline.

**Here are some suggestions for preparing your video equipment and the room or area you use:**

Check the room or area for quietness, adequate ventilation and temperature, lighting and unobstructed access.

Check the seating arrangement and the audiovisual equipment to ensure that all participants will be able to see and hear the program.

**CONDUCTING THE PRESENTATION**
Begin the meeting by welcoming the participants. Introduce yourself and give each person the opportunity to become acquainted if there are new people joining the training session.

Explain that the primary purpose of the program is to discuss the four main fall factors and the techniques and safe work practices we can use to control them from contributing to fall-related incidents.

Introduce the program. Play it without interruption. Review the program content by presenting the information in the program outline.

Lead discussions about specific work areas and job tasks that place employees at risk of a slip, trip or fall and the precautions they should take to prevent a fall-related incident.

After watching the program, the viewer will be able to explain the following:

- How controlling our center of gravity helps us maintain our balance;
- How gravity, friction and momentum contribute to slips, trips and falls;
- What precautions to take to prevent falls resulting from slips;
- Why it is important to wear proper footwear for the traveling surface;
- What measures to take to avoid falls resulting from trips;
- What types of unsafe acts contribute to fall-related incidents.

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***REVIEW QUIZ***

**Name_____Date_____**

***The following questions are provided to check how well you understand the information presented during this program.***

1. Falls are the _____ leading cause of on-the-job fatalities.

a. first
b. second
c. third

2. When standing normally, our center of gravity is located _____.

a. between our feet
b. near our upper back
c. near our lower back

3. The simple act of walking is really just the repetitive act of controlled falling.

a. true
b. false

4. At which rate does gravity accelerate objects toward the ground?

a. 8 feet per second
b. 16 feet per second
c. 32 feet per second

5. When walking across slippery areas, using a wider stance and pointing your feet slightly _____ can help you remain balanced.

a. inward
b. outward

6. Most slips occur due to the lack of friction between the walking surface and the heel of your shoe.

a. true
b. false

7. You should only use stairwells for storage when you plan to remove the stored items before your shift ends.

a. true
b. false

8. Running at work is not considered an unsafe act.

a. true
b. false

## *ANSWERS TO THE REVIEW QUESTIONS*

1. b
2. c
3. a
4. c
5. b
6. a
7. b
8. b