



Electrical Transmission & Distribution Partnership

Continuing Education Training

-Hand Safety

Facilitator
Guide

-4th Quarter 2018

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Introduction

The Hand Safety continuing education course is a facilitator led process. The facilitator may choose to augment the material with videos, handouts or other media to enhance the learning experience. The facilitator may want to incorporate visual aids such as rubber gloves, sleeves, line hose etc. to enhance the presentation.

Using this material combined with practical experience, good presentation skills, and knowledge of adult learning techniques, the facilitator has a greater opportunity to deliver the information effectively.

Microsoft® PowerPoint® combined with good instructional skills and instructor/student dialogue help with information retention and understanding. PowerPoint® presents the information to the attendee and the facilitator summarizes the content of the slides. It is critical to engage and involve the attendee in the process. Ask open-ended questions that will elicit conversation and discussion, but be cautious to maintain control of the discussion.

Conversation and scenarios are good, but can cause the discussion to run long. If it seems like the group is losing focus during the course, the facilitator can direct the group back on track by using comments like “This is a great discussion, but let’s get back to the subject at hand”.

Another tool is the “Parking Lot” which is simply a newsprint chart or dry erase board or note pad where the facilitator records unanswered questions during the meeting and that may require more research. It is vital to capture any ongoing discussions or questions on the “Parking Lot” and follow up when the information is known.

Deliver this continuing education module in the fourth quarter of 2018. Delivery time is approximately 1 to 1.5 hours in one setting, or divided-up into three, twenty to thirty minute settings. It is critical that the facilitator makes him or herself familiar with the material prior to delivery.

At the end of this document is a handout regarding hand injury facts. The presenter can use this handout as well as relevant examples such as rubber insulating gloves and cutting tools in conjunction with the PowerPoint® presentation to augment the materials. The handout may also serve as a stand-alone document.

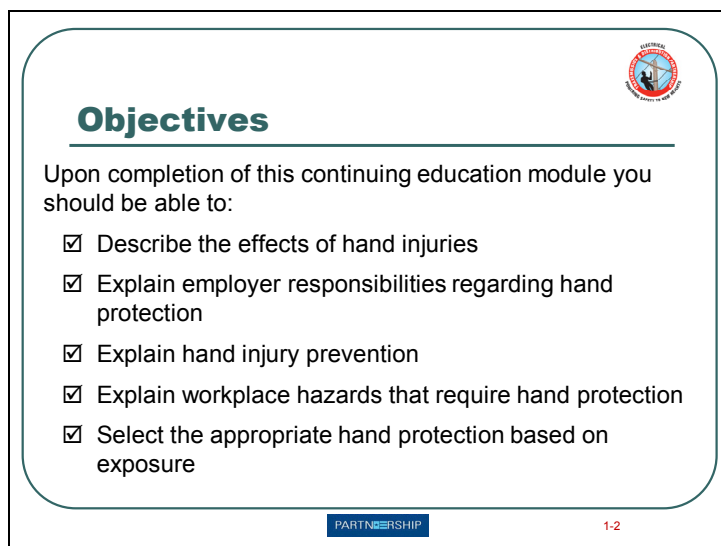
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Slide 1-1



Explain that annually each partner submits his or her OSHA 300 log data to Task Team One for analysis. The data shows that in 2017, fingers and hands were the most frequently injured body parts. Combined, they accounted for 164 of the 636 (25%) injuries reported by the partners. Of the 164 finger and hand injuries, working with knives were the top injury type with 26 events.

Slide 1-2



Explain that this continuing education module will discuss the effects of hand injuries, employer responsibilities regarding worker hand protection, how to prevent hand injuries, hazards that require hand protection, and how to select appropriate hand protection.

Slide 1-3



Your Hands

Hands are one of the most complex body parts

- ✓ They help us to be a skilled, valuable worker
- ✓ Used in almost everything we do



PARTNERSHIP

1-3

State that our hands are one of the most complex parts of your body. The dexterity of the tendons, bones, and tissue, allows us to manipulate and grip objects. Our hands help make us a skilled, valuable worker. We use our hands for almost everything we do.

Slide 1-4



Take Care of Your Hands

Use personal hygiene

- ✓ Small cuts may become infected
- ✓ Report All Hand Injuries
- ✓ Wear Your Gloves
- ✓ Protect your hands



PARTNERSHIP

1-4

Explain that you only have one set of hands. They are one of the most used body parts. Explain that we must use personal hygiene practices to take care of our hands. Small cuts may become infected and require medical treatment. It is critical to wash your hands frequently. Bacteria flourishes in warm, dark, damp environments like the inside of a lineman's rubber insulating glove. Also, keep your finger nails trimmed as failure to do so can cause discomfort when wearing rubber-insulating gloves.

Emphasize the importance of reporting all hand injuries even those that may appear minor. That way we can provide prompt medical treatment if needed. Fast treatment may minimize the severity of an injury. Always wear your gloves!

Slide 1-5



Hand Injury Facts

The average hand injury claim has now exceeded \$6,000, with individual workers' compensation claims reaching nearly \$7,500



PARTNERSHIP

1-5

Explain that hand injuries are the second leading cause of workplace injuries. 70% of workers that received a hand injury were not wearing any type of protective glove and the remaining 30% were wearing gloves that were inadequate for the hazard exposure. The average hand injury costs \$6,000!

The National Safety Council Guide:

- ✓ Direct cost of a laceration: \$10,000
- ✓ Stitches: \$2,000 plus indirect
- ✓ Butterfly: \$300
- ✓ Severed Tendon: greater than \$70,000

Note: This is a good time to pass out the attached hand injury document.

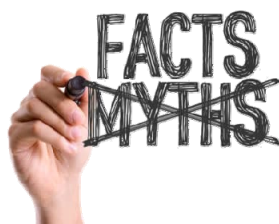
Slide 1-6



Bureau of Labor Statistics

Hand injuries accounted for 40 percent of all upper extremity injuries

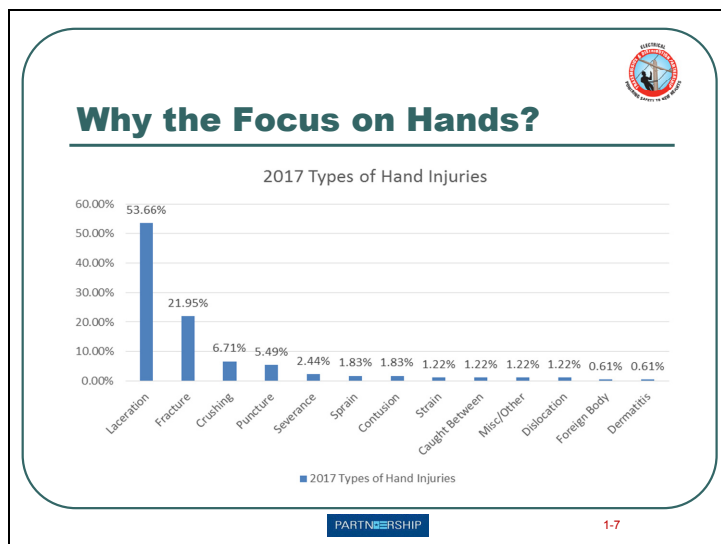
- The most among all upper extremity injuries



PARTNERSHIP
1-6

Explain that in 2014, upper extremities affected by an injury or illness accounted for 346,170 cases, or 32 cases per 10,000 full-time workers. Hands accounted for 40 percent of those cases, the most among upper extremities. See this link:
<https://www.bls.gov/opub/ted/2015/type-of-injury-or-illness-and-body-parts-affected-by-nonfatal-injuries-and-illnesses-in-2014.htm>

Slide 1-7



Partnership Total Hand Injury Events	164
• Workers on ground level	113
• Working in an Aerial Device	16
• Working while on a vehicle	12
• Lineman	42
• Apprentice Lineman	31
• Working with knives	26

Slide has animation

Say that our hands are irreplaceable. No other being in the world has hands that can move, grasp, hold, and manipulate objects like human hands. State that our hands are one of your greatest assets.

Of the 164 finger and hand injuries experienced by Partnership Member Companies;

- 113 occurred to workers on ground level;
- 16 occurred while aloft in an Aerial Device;
- 12 occurred while on a vehicle;
- Lineman and apprentice Lineman were the job classification with the most injuries 42 and 31 total 73;
- Working with Knives is the top injury type with 26 events.
- Workers in their twenties (25-29) had the most (28) injuries.

Slide 1-8



It is a Mind Set

Responsibility

- We are all responsible for not engaging in unnecessary risk at work

Accountability

- Tools, pinch points and stored energy WILL hold us accountable whether we like it or not

Authority

- You are authorized by your company to **STOP WORK** if necessary to address hazards

PARTNERSHIP

1-8



Slide has animation

Discuss and promote a culture where workers feel free and obligated to exercise Stop Work Authority.

Slide 1-9



Control Hand Injuries

Methods:

- ✓ Tailboards
- ✓ JHA's
- ✓ Work Practices
- ✓ Correct Tools
- ✓ Training



PARTNERSHIP

1-9

Explain that by performing a thorough tailboard to include who is performing what tasks, identify the hazards for each task and document the mitigation to those hazards for each employee. Question your workers and ask do we have the proper tools, hand protection, training to perform the tasks safely?



Impact of Hand Injuries

If you injured or lost your thumb how would you:

- ✓ Tie Your Shoes
- ✓ Button Your Shirt
- ✓ Sign Your Name
- ✓ Use Silverware
- ✓ Change a Fishing Lure
- ✓ Throw a Baseball



PARTNERSHIP 1-10

Ask the group to try to tie their shoes without the use of thumbs. The presenter can use rubber bands to secure the thumb to the hand. Then ask the group to tie their shoes.

End session one

Session one key points

Slide 1-11



Key Points-Session One

- Hand injuries account for _____ of all upper extremity injuries.
 - 10%
 - 20%
 - 30%
 - ☒ 40%
- The average hand injury results in an average _____ lost work days.
 - 3
 - ☒ 6
 - 9
- 70% of people that experienced hand injury were not wearing gloves.
 - ☒ True
 - False

PARTNERSHIP 1-11

The presenter should have touched on the following items when Explaining session one:

- Hand injuries account for _____ of all upper extremity injuries.
 - 10%
 - 20%
 - 30%
 - d. 40%**
- The average hand injury results in an average _____ lost workdays.
 - 3
 - b. 6**
 - 9
- 70% of people that experienced hand injury were not wearing gloves.
 - a. True**
 - False

Slide 2-1



Explain that in this section the discussion points are to review the possible casual factors that may lead to hand injuries.

Slide 2-2

Typical Incidents

Hand injuries can be divided into six general categories

- ✓ Lacerations
- ✓ Fractures and Dislocations
- ✓ Soft tissue injuries and Amputations
- ✓ Infections
- ✓ Burns
- ✓ High pressure injuries

PARTNERSHIP

2-2

Explain that intricate in design and function, the hand is an amazing work of engineering. Form follows function in the hand; therefore, any injury to the underlying structures of the hand carries the potential for serious handicap. To reduce this risk, even the smallest hand injuries require proper medical evaluation. The goal with injuries to the hand is a rapid and accurate initial evaluation and treatment. In other words, once an injury occurs, the doctor strives to begin medical treatment quickly so the short- and long-term effects on the hand can be minimized.

The hand consists of 27 bones (including the eight bones of the wrist). When the other associated structures (nerves, arteries, veins, muscles, tendons, ligaments, joint cartilage, and fingernails) are considered, the potential for a variety of injuries exists when trauma involves the hand. The most common cause of the injuries was blunt trauma, followed by injury from a sharp object.

Source: https://www.emedicinehealth.com/hand_injuries/article_em.htm#hand_injury_facts

Slide 2-3



Knives

Avoid use if possible and consider an alternative

- ✓ Keep blades sharp
- ✓ Cut away from you
- ✓ Never pry or twist
- ✓ Wear cut resistant gloves
- ✓ Change blades carefully
- ✓ Close, retract, or sheath when not in use



PARTNERSHIP

2-3

Explain that knife use is a major causal factor leading to hand injuries. Many times, a knife is not the best or proper tool to use for the task. In addition, when a knife is the best tool for the task, improper use of the knife may lead to an injury. Even though we may choose to use personal protective equipment (PPE) in the form of cut resistant gloves, they are not designed to prevent a puncture. The term resistant is used to denote that a glove offers extra durability and protection from cuts. Cuts in gloves are still possible and even the most durable glove is not completely cut proof.

Slide 2-4



Pinch Points

Recognize pinch points

- ✓ Stay focused
- ✓ Use tag lines
- ✓ Stay out of the Bite
- ✓ Proper LOTO
- ✓ Use something other than your hands



Pinch Point hazard.
Keep hands clear of this area.

PARTNERSHIP

2-4

Explain that pinch points are another casual factor for hand injuries. The key to protecting workers from pinch-point hazards is to avoid them completely. In the job task planning stage, all possible pinch-points should be identified. Once identified, the discussion should now be focused toward controlling the hazard. Either eliminate it altogether or use some method that removes the hand or other body part from the danger zone. Taglines to guide loads, tools that can reach into the danger area may be used. Ensure that any machinery is locked out and the possibility of an unintentional operation is removed. Recognize and stay out of the line-of-fire. These are some of the ways our hands and other body parts can be protected from pinch-point hazards.

Slide 2-5



Chemical Hazards

Chemical exposure

- ✓ Consult the SDS
- ✓ Substitute Products
- ✓ Follow Instructions
- ✓ Use the Right Protection



CHEMICALS

PARTNERSHIP

2-5

Explain that another causal factor for hand injuries is exposure to harmful chemicals. In our business, we may encounter chemicals that can cause damage to our hands and other body parts if there is a repeated or possibly prolonged exposure. Diesel fuel, hydraulic fluids, battery acid, other lubricants, and inhibitor compounds, just to name a few, may cause injury to our hands. Prior to use, always check the Safety Data Sheet (SDS) to determine the sign and symptoms of exposure, medical treatment, and possible required PPE use necessary for personal protection.



Electrical Hazards

Safe Work Practices

- ✓ Plan the Work
- ✓ De-energize, Test and Ground
- ✓ Use Insulated Tools
- ✓ Maintain Minimum Approach Distance
- ✓ Insulate/Isolate
- ✓ Second Points of Contact
- ✓ Use Rated PPE



PARTNERSHIP 2-6

Explain that as previously discussed; pre-job planning is an essential aspect of worker safety in terms of electrical hazards, always try to eliminate the hazard first! If elimination is not practical or feasible, then our training allows us to use protective equipment such as properly rated insulating protective equipment to perform safely the job task. If possible, de-energize, Test, Ground, and establish an equal potential workspace. Another alternative method is to use insulated live-line tools. Always maintain the proper Minimum Approach Distance (MAD) from exposed energized parts. Identify and insulate all second points of contact and where required, use the appropriately rated PPE.



Tools

Identify and Use the Best Tool for the Job

- ✓ Follow Manufacturer's Recommendations
- ✓ Ensure Proper Training
- ✓ Inspect and Keep Tools in Good Condition
- ✓ Never Modify a Tool
- ✓ Maintain Control of Tool



PARTNERSHIP 2-7

Explain that the first step in tool use safety is to select the proper tool for the task. Screwdrivers and not pry bars or punches. Inspect the tool prior to use. If it is damaged, discard or repair it. Never modify the tool and be aware of possible slip and puncture injuries.



Repetitive Motion Injuries

Caused By Doing the Same Hand or Wrist Movements for Prolonged Periods

- ✓ Pain
- ✓ Numbness
- ✓ Tingling
- ✓ Cramping
- ✓ Loss of Grip Strength

Report to a Supervisor Immediately

- ✓ Stretching, Icing and Rest may help



PARTNERSHIP

2-8

Explain that repetitive motion injuries can be caused by repeatedly doing the same hand or wrist movements for prolonged periods. The symptoms of these types of injuries may appear as pain, numbness, tingling, cramping, or loss of grip strength. Early treatment is important. Explain that if a worker suspects this type of issue they should report the symptoms to a supervisor as medical treatment might be needed. For minor symptoms stretching, icing and rest will help.

End session two

Key points session two

Slide 2-9



Key Points-Session Two

1. When using a knife, always cut _____ from your body.
 - a. Toward
 - ☒ b. Away
2. The key to avoiding pinch-point injuries is to avoid pinch-points all together.
 - ☒ a. True
 - b. False
3. Repetitive motion injuries can occur when a person performs the same hand/wrist movements for prolonged periods.
 - ☒ a. True
 - b. False

PARTNERSHIP 2-9

The presenter should have touched on the following items when explaining session two:

1. When using a knife, always cut _____ from your body.
 - a. Toward
 - b. Away**
2. The key to avoiding pinch-point injuries is to avoid pinch-points all together.
 - a. True**
 - b. False**
3. Repetitive motion injuries can occur when a person performs the same hand/wrist movements for prolonged periods.
 - a. True**
 - b. False

Slide 3-1



Explain that in this section the discussion points are to review the different types of gloves available and their strengths and limitations.

Slide 3-2

The slide has a white background with a dark green border. At the top right is a small circular logo. The title "Hand Protection" is in a dark green box. Below it is a list of bullet points: "✓ Pre-Bid risk analysis", "✓ Perform an analysis of the task", "✓ Selection of hand protection". Below the list is a paragraph: "Keep in mind that wearing rings, watches, or bracelets can cut/tear gloves and create other additional hazards". Below the paragraph is another bullet point: "✓ Must be provided by the employer". To the right of the text is a graphic of the word "PLAN" in large blue 3D letters, with a yellow crane lifting the letter "P". The slide number "3-2" is at the bottom right.

Explain that identifying hand hazards during the pre-bid will assist with giving sufficient time to order the right gloves and make them available for the work. There are many different types of hand protection available that will offer protection for most hand hazards. An analysis of the task and potential hazards will assist in identifying which type of glove will offer the best protection.

Slide 3-3



Leather Gloves

Provides protection from rough surfaces

- ✓ Many styles to pick from
- ✓ Generally available insulated for cold conditions
- ✓ Very cost effective
- ✓ Good for most hand hazards
- ✓ May not provide adequate cut protection



PARTNERSHIP 3-3

Explain that leather gloves offer some protection from rough and abrasive surfaces. They are comfortable and usually easy to put on and take off. There are many styles to pick from that have varying gauntlet lengths. They are generally available insulated styles for cold conditions and can be very cost effective and affordable. These gloves are good for most hand hazards but offer little to no cut protection.

Slide 3-4



Cut Resistant Gloves

Prevent or reduce cuts from knives or sharp edges.

- ✓ Cut RESISTANT, not Cut PROOF!
- ✓ Offer little protection from pinch points or punctures
- ✓ Available in cut levels 1-5
- ✓ Level 5 offers best protection



PARTNERSHIP 3-4

Explain that cut resistant gloves help prevent or reduce cuts from knives or sharp edges. The key point here is that these gloves are cut RESISTANT, not cut PROOF! Additionally, these gloves offer little to no protection from pinch points or punctures. These gloves are available in cut levels 1 through 5 with level 5 offering the best protection.



Chemical Resistant

Prevent direct contact with chemicals

- ✓ No glove will protect from ALL chemicals
- ✓ Chemicals will break down the glove material over time
- ✓ The thicker the glove, the more resistant it is to chemicals



PARTNERSHIP

3-5

Explain that chemical resistant gloves help to prevent direct contact with chemicals. It is critical to mention that no glove will protect from ALL chemicals and all chemicals will break down the glove material over time. It is important to mention that the thicker the glove, the more resistant it is to chemicals. Workers must reference the SDS sheet to determine what glove is appropriate for a given chemical.



Anti-Vibration Gloves

Reduce the effects of excessive vibration

- ✓ Have padding in palms and fingers
- ✓ Help absorb the vibration
- ✓ Reduces but does not eliminate
- ✓ Bulky



PARTNERSHIP

3-6

Explain that anti-vibration gloves will reduce the effects of excessive vibration from hand tools and machinery. These gloves have padding in palms and fingers to help absorb the vibration. These gloves reduce but not eliminate the exposure from vibration. These gloves may be too bulky for regular work.



Impact Resistant Gloves

Provide added protection from crushing injuries

- ✓ Impact absorbing rubber ribs and padding designed into gloves
- ✓ Usually have a cut resistant rating as well
- ✓ Provides good dexterity and grip
- ✓ Best overall option in a glove



PARTNERSHIP 3-7

Explain that impact resistant gloves are impact resistant not impact proof. The key here is to keep your hands out of the line-of-fire. These gloves provide added protection from crushing injuries. They are equipped with impact absorbing rubber ribs and padding designed into gloves. Usually have a cut resistant rating as well. They provide good dexterity and grip. They are generally best overall option in a glove.



Insulated Rubber Gloves

Voltage rated

- ✓ Must be electrically tested and stamped
- ✓ Inspected before use
- ✓ Used in conjunction with leather protective covers



PARTNERSHIP 3-8

Where appropriate for the audience, this is a good time to re-emphasize rubber insulating glove inspection steps and processes. Remind the group that rubber gloves are visually inspected and air tested before use. Consider having an example available during the discussion. Remind the attendees how to perform a “bead-roll” test to inflate the glove and check for air leaks. Consider demonstrating these steps. In addition, California requires an air and water test as part of the glove inspection.

Explain that rubber-insulating gloves protect only from the voltages within their rating. The voltage rating for rubber gloves range from 00 to class 4.

State the maximum test interval allowed by OSHA is six (6) months. As stated above, prior to use, insulating gloves must be inspected for leaks, holes, tears, cuts, and/or ozone damage. Gloves should be used with leather protective covers to help prevent damage.

Slide 3-9

Class	AC proof test Voltage	Maximum AC Use Voltage
00	2,500	500
0	5,000	1,000
1	10,000	7,500
2	20,000	17,000
3	30,000	26,000
4	40,000	36,000

PARTNERSHIP 3-9

Explain that according to OSHA, all electrical gloves have a test voltage and safe use voltage requirement. All glove manufacturers incorporate some form of production code or date coding to indicate the date of initial testing. In accordance OSHA, gloves must be electrically tested before first issue and at least every six (6) months thereafter. Gloves must also be tested upon indication that the insulating value is suspect. In addition, if the insulating equipment has been electrically tested but not issued for service, the insulating equipment may not be placed into service unless it has been electrically tested within the previous 12 months. These testing requirements can sometimes be a little confusing to interpret. Here is an example: You are considering using your electrical gloves for the first time on March 1, 2017, and notice the date stamp is February 27, 2016. Would you need to get the gloves retested before use? Yes, because you have not put the gloves into service within the allowable 12-month window. However, if the date stamp read March 2, 2016, you could use them and would not need to retest them until six months after you put them into service on March 1, 2017.



Length

One inch of rubber past the top of protector for each kV class rating

Class	Distance
1	1 inch
2	2 inches
3	3 inches
4	4 inches



PARTNERSHIP
3-10

Slide has animation. The table at the bottom of the slide appears on the next mouse click

Explain that there is a required amount of rubber cuff that extend past the leather protector. The standard distance is one-inch of rubber for each class rating. For example, class 3 gloves must have 3 inches of rubber extending past the leather protector.



Strengths & Limitations

Protective equipment can protect the user

- ✓ Must inspect it
- ✓ Must be rated for the hazard
- ✓ Must be used



PARTNERSHIP
3-11

Explain that all protective equipment, if it is not used or not used properly, it has a diminished ability to protect the user. It is important that we inspect the equipment prior to use, ensure that the equipment is suitable for the identified hazard, and most importantly, that we use the equipment. It cannot protect you in the truck bin.

End session three

Key points session three

Slide 3-12



Key Points-Session Three

1. Cut resistant gloves are also cut and puncture proof.
 - a. True
 - b. False**
2. 30 kV rated rubber insulating gloves must have _____ inches of rubber past the cuff
 - a. 2
 - b. 3**
 - c. 4
3. Rings, watches, or bracelets can cut/tear gloves and create other additional hazards
 - a. True**
 - b. False

PARTNERSHIP 3-12

The presenter should have touched on the following items when explaining session three:

1. Cut resistant gloves are also cut and puncture proof.
 - a. True
 - b. False**
2. 30 kV rated rubber insulating gloves must have _____ inches of rubber past the cuff
 - a. 2
 - b. 3**
 - c. 4
3. Rings, watches, or bracelets can cut/tear gloves and create other additional hazards
 - a. True**
 - b. False

.....HAND SAFETY.....

Hand Injury Facts & Stats

Hand injuries are the second leading cause of work-related injury.



110,000

recorded lost-time hand injuries occur each year. The Bureau of Labor Statistics cited more than 140,000 total hand injuries in 2012, with an incidence rate of 13.6 per 10,000 full-time workers.



6 days

The average time missed from work due to a reported hand injury.



\$6,000

The average claim amount of a hand injury. Each lost-time workers' compensation claim reaches nearly \$7,500.



60%

The amount that the risk of hand injury is reduced by wearing gloves. Based on this percentage, approximately 84,000 of the 140,000 hand injuries in 2012 could have been easily averted.



70%

of workers who experience hand injuries are not wearing gloves at the time of the incident.

The remaining 30% of injured workers did wear gloves, but they experienced injuries because the gloves were inadequate, damaged or the wrong type for the type of hazard present.

Gloves Source: www.bls.gov