NIOSH’s Christine Branche, Ph.D., FACE, and Matt Gillen, M.S., CIH, discuss the NIOSH/OSHA publication, “Nail Gun Safety: A Guide for Construction Contractors,” and share their recommendations for how employers and contractors can best use of this new guide.

BP: Please provide a brief description of your professional backgrounds and of your positions with CDC and NIOSH.

CB: I am Principal Associate Director of and the Director of NIOSH’s Office of Construction Safety and Health in Washington, DC. I began my career at CDC as an Epidemic Intelligence Service Officer in the Division of Injury Epidemiology and Control. From 1996 to July 2007, I was the Director of the Division of Unintentional Injury Prevention (DUIP) in the National Center for Injury Prevention and Control and was responsible for managing DUIP’s mission. I joined NIOSH in 2007 first serving as the delegated federal official for the White House-appointed Advisory Board on Radiation and Worker Health. I was also engaged in NIOSH’s program evaluation conducted through the National Academies of Science. In December 2009, I was named as the Director of NIOSH’s newly established Office of Construction Safety and Health.

MG: I am Deputy Director for NIOSH’s Office of Construction Safety and Health. Since joining NIOSH in 2000, I have worked to coordinate and plan construction research efforts and to build stronger relationships between researchers and the construction industry. I served as NIOSH Co-Chair for the National Occupational Research Agenda Construction Sector Council and serve as NIOSH representative to the OSHA Advisory Committee for Construction Safety and Health (ACCSH). I am also one of two NIOSH representatives to the ANSI A10 Accredited Standards Committee for Construction and Demolition Operations.

BP: NIOSH and OSHA recently released “Nail Gun Safety: A Guide for Construction Contractors.” Why was this guide created?

CB/MG: The guidance provides helpful background information on seven major risk factors linked to nail gun injuries. Understanding the major risk factors that can lead to nail gun injury will help prevent injuries on jobsites. The risk factors are:

• unintended nail discharge from double fire (occurs with contact triggers);
• unintended nail discharge from knocking the safety contact with the trigger squeezed (occurs with contact and single actuation triggers);
• nail penetration through lumber work piece;
• nail ricochet after striking a hard surface or metal feature;
• missing the work piece;
• awkward position nailing (occurs with all trigger types, but unintended discharges are a concern in awkward position work with contact and single actuation triggers);
• bypassing safety mechanisms.

The guidance provides additional explanations for these, defines terms, such as double fire, and provides examples of awkward position nailing.

More than half of reported nail gun injuries are to the hand and fingers. One quarter of these hand injuries involve some type of structural damage to the tendons, joints, nerves or bones. After hands, the next most common injury sites are leg, knee, thigh, foot and toes. Less common are injuries to the forearm or wrist, head and neck, and trunk.

Serious nail gun injuries to the spinal cord, head, neck, eye, inter-
nal organs and bones have been reported. Injuries have resulted in paralysis, blindness, brain damage, bone fractures and death.

**BP: How prevalent are nail gun injuries within the construction industry?**

**CB/MG:** Nail gun injuries are pretty common. For example, one study found that two out of five residential carpenter apprentices experienced a nail gun injury over a four-year period. And one person out of five was injured twice. Another way to look at it is that nail guns are also responsible for an estimated 37,000 emergency room visits each year: 68% to construction workers and 32% to consumers.

**BP: Do nail gun hazards vary depending on the type of trigger used?**

**CB/MG:** Yes, they do, and this is one of the most important messages contained in the guidance. The overall risk of nail gun injury is twice as high when using a contact trigger nail gun compared to using a sequential trigger nail gun. There are several types of triggers, and the guidance starts out with a section called “Know Your Triggers” to walk readers through the different mechanisms.

All nail guns (also called “nailers”) rely on two basic controls: a finger trigger and a contact safety tip located on the nose of the gun. Trigger mechanisms can vary based on: (1) the order in which the controls are activated, and (2) whether the trigger can be held in the squeezed position to discharge multiple nails or if it must be released and then squeezed again for each individual nail. The guide describes the four types of triggers. The guidance also points out that tool manufacturers have their own names for trigger modes. The bottom line is that contractors should check the tool label and manual for manufacturer-specific trigger names and operating information before the nailers are used on their construction jobs.

The guidance includes six steps that contractors can take to reduce nail gun injuries, and using the sequential trigger is listed as Step 1. The full sequential trigger is always the safest trigger mechanism for the job because it reduces the risk of unintentional nail discharge and double fires.

**BP: What kind of research did NIOSH and OSHA conduct prior to developing the guide? How did the agencies obtain statistics/data on nail gun use and injuries?**

**CB/MG:** As mentioned, NIOSH and OSHA relied on studies performed on nail gun injuries over the previous decade. The data are available from NIOSH-sponsored data collection on occupational injuries treated at U.S. emergency departments by the U.S. Consumer Product Safety Commission. Research findings and other data are from NIOSH researchers and from NIOSH-sponsored studies conducted by Hester Lipscomb, Ph.D., of Duke University and her colleagues Denny Patterson and Jim Nolan. The guidance mentions the key research highlights and includes references for those interested in looking at the underlying studies. At NIOSH, we are big believers in “Research to Practice” (R2P). Accordingly, we were interested in helping to package these findings in a way that contractors can use to improve safety on their job sites. That is how we make an impact with research.

**BP: What key components should a nail gun safety training program include? How can employers and contractors best update their current training programs based on NIOSH’s and OSHA’s new guide?**

**CB/MG:** Training is important; studies show that untrained workers are more likely to experience a nail gun injury than trained workers.

We think it is critical to train workers in a manner that employees can understand, with refreshers on a regular basis. We think that topics for training should include:

- How nail guns work and how triggers differ
- Main causes of injuries, especially differences among types of triggers
- Instructions provided in manufacturer tool manuals and where the manual is kept
- Hands-on training with the actual nailers to be used on the job. This gives each employee an opportunity to handle the nailer and to get feedback on topics, such as: how to load the nail gun; how to operate the air compressor; how to fire the nail gun; how to hold lumber during placement work; how to recognize and approach ricochet-prone work surfaces; how to handle awkward position work (e.g., toe-nailing and work on ladders); how best to handle special risks associated with contact and single actuation triggers, such as nail gun recoil and double fires.

It is critical to train workers in a manner that employees can understand, with refreshers on a regular basis.
Nail Gun Safety: A New Resource

NIOSH and OSHA have released Nail Gun Safety: A Guide for Construction Contractors. Nail guns are widely used on many construction jobs, especially in residential construction. While they boost productivity, they may also cause tens of thousands of painful injuries each year. This publication is intended to provide a resource for residential home builders and construction contractors, subcontractors and supervisors to prevent these kinds of injuries.

The guidance was developed in response to a unanimous motion by industry, state and labor stakeholders on OSHA’s Advisory Committee for Construction Safety and Health on the need to develop awareness and materials about nail gun risks. OSHA and NIOSH worked together to make sure the guidance reflects the most current information available. The guidance highlights what is known about nail gun injuries, including the parts of the body most often injured and the types of severe injuries that have been reported. It describes the common causes of nail gun injuries and provides six practical steps that contractors can take to prevent these injuries. The guidance includes actual workplace cases along with a short section on other types of nail gun hazards and sources of additional information. The hope is that by working together with tool gun manufacturers, safety and health professionals and other organizations, nail gun safety can be improved on jobsites.

For more information, click here.