

Installation Safety: The Ergonomics of Hardwood Flooring Installation

By Arpi Nalbandian, Associate Editor

It's no coincidence that after years of performing repetitive motions on a daily basis, a high percentage of flooring installers experience debilitating pain when trying to perform their work. How many times have installers lifted heavy boxes using our backs rather than our knees, or been bent over for prolonged amounts of time when nailing or applying adhesives? Although those are just a couple of common problems, the solution is at hand: be mindful of your body and prevent Musculoskeletal Disorders (MSDs); and implementing ergonomic installation tools in your arsenal.

During the recently held NWFA convention in St. Louis, Dr. Ann Marie Dale, assistant professor, Occupational Safety and Health Research group at Washington University in St. Louis and researcher for The CPRW (Center for Construction Research and Training), presented an eye-opening demonstration. This session, co-sponsored by *ProInstaller*, Välinge, Harris-Wood and Porta Nails, offered real world solutions to the problems wood flooring installers face on the job.

First, let's start by defining what ergonomics is and how it affects the professional wood flooring installer. **Ergonomics** is the application of scientific information (sourced from engineering, physiology and psychology) to the design of objects, systems and environment specific to human use. But what does this mean for the flooring installer and how can it be implemented to ensure your safety and health?



Dr. Ann Marie Dale presents the ergonomics session and hands-on demo during the NWFA convention.

Together with instructors from The Floor Layers Joint Apprenticeship Program of St. Louis, Dr. Dale presented real-world solutions for the flooring installation community.



Much of the pain and suffering associated with hours of bending or kneeling, lifting heavy material and tools, can be alleviated and/or diminished with ergonomics.

"Why do we care?" Dr. Dale asked NWFA conference attendees. "We care because obviously there are a lot of injuries by experienced by installers. Where are these injuries happening? It goes far beyond the knees," she added.

"Our concern is the lower back and neck. With neck injuries, the pain will transfer to the hands. With the nature of installation work, the materials and tools are causing these problems."

Obviously, wood floors need to be installed by professionally trained and certified personnel. The question is: How can we improve upon the physical effort required in this field? By recognizing the risks involved, much of the pain and suffering associated with hours of bending or kneeling, lifting heavy material and tools, can be alleviated and/or diminished. According to Dr. Dale and her extensive research, there are five primary areas of concern. They are:

- Repetition
- Awkward positions
- Forceful Exertion (carrying load as well as operating tools)
- Contact stress
- Vibrations

Common Ergonomic Risks and Concerns

As presented by Dr. Dale, the following five risks are offered alongside their optimal solutions in keeping installers healthy while continuing to deliver high-level results.

Continued

The Ergonomics of Hardwood Flooring Installation, Continued

1. Repetition:

- Pace yourself, alternate tasks or alternate hands
- Use power tools instead of manual ones
- Perform stretches, or breaks from repetitive tasks

2. Awkward Postures:

- Avoid prolonged postures: alternate tasks (work practice)
- Avoid end range of joint angle
- Extreme bent knee: Use knee saver, catcher's knee savers to reduce stress on the knee, half kneel, knee pad with additional support
- Bent wrist to trowel adhesive: Use inline trowel or angled handle traditional trowel (avoids flex/extension but increases ulnar deviation)
- Hand above head/shoulder above 90 degrees from body to hammer: Hammer handle too long, used to increase force on nail
- Bent back: Use extended handles, work on raised surface (ie cut wood)
- Raise work ideally to waist height (off floor to raised surface, stacked pallet, table saw)
- Position work for ideal worker position: Plan location of work, ladders, dollies, or carts to



Tip: Wear gloves when working on knees and avoid tools that end in the palm of the hand.

- prevent extra bending, reaching, or twisting
- Use long handles, cheater bars, use extended power tools, handles, or wands
- Preplan: Setup work area before working

3. Forceful Exertion:

- Transport heavy equipment/material- use wheels to carry equipment or material (flat surface with wheels)
- Purchase material in smaller quantities or break up loads
- Avoid double handling materials/equipment: Preplan task, position close to installation location the first time handled
- Reduce pinch/grip: Use tools (knife, scissors, scorer) to open containers
- Increase friction by adding grip on handles or wear gloves (good for viscous adhesive)
- Use manual tools that fit your hand



Tip: Use extended handles, work on raised surface (ie cut wood or laminates).

- Use power/pneumatic tools in place of manual tools (i.e. nailer)
- Sharpen blades
- Lift with your legs
- Add handles on the object to improve grip (surface carts)

4. Contact Stress:

On Knees

- Consistently wear knee pads or use floor cushions;
- Stand when able;
- Trial sitting on bucket or dollies

On hands

- Wear gloves;
- Avoid tools that end in the palm of the hand

5. Vibration: Moderate level (grinders, sanders, impact drivers, drills)

- Wear antivibration gloves
- Avoid excessively large handles
- Regular equipment maintenance to minimize vibration
- Select equipment with vibration damped mechanism or avoid hand contact with vibrating surface
- Avoid combined risk (bent back and vibratory sander; kneel/bent back with saw on floor)

Further, Dr. Dale stressed that combined risks are worse for the installer's health and well-being.

These risks include:

- Forceful lifting and bent back objects on floor
- Kneeling all fours with bent back for prolonged periods
- Bent back and forceful exertion to hammer/nail wood for long periods

Adhere to good work practices. With little effort, the results will pay in healthful dividends:

- Preplan work tasks to reduce risks
- Have ideal equipment/tools when needed
- Alternate tasks to avoid long periods of the same



Bent wrist to trowel adhesive: Use inline trowel or angled handle traditional trowel (avoids flex/extension but increases ulnar deviation).

risk (awkward posture, forceful exertion, contact stress)

- Avoid double handling or unnecessary handling of equipment or materials
- Use personal protective equipment consistently (knee pads, hearing, eye protection and others as indicated)
- Work in upright positions as much as possible

Finally, consider the following flooring material types, their installation methods, and the trade-off in avoiding ergonomic risks:

A. Float/Click

Pro: low force required to install

Con: prolonged kneeling/bent back posture

Recommendations: wear good knee pads consistently, frequently alternate racking and assembly tasks, stand upright to saw boards/retrieve material

B. Nail-Down

Pro: alternates body postures by kneeling to rack wood and stand up to nail boards

Con: combined risk to nail (bent back/forceful exertion)

Recommendations: use lightweight pneumatic nailer

C. Glue-Down

Pro: avoids impact from nailer, frequently alternates task of gluing and wood installation

Con: forceful exertion with awkward wrist postures to apply adhesive

Recommendations: use an inline or angled trowel handle with a handle that allows good friction with palm (reducing required grip force).

Ergonomic Resources:

<http://www.cpwr.construction.solutions.org/>

<http://www.cdc.gov/niosh/docs/2007-122/>

<http://www.croetweb.com/links.cfm?subtopicID=350>

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