Workplace Safety Part 5

Okay, welcome to Part 5 of the workplace safety certification program. So on to vibration right. So, how does vibration cause injury.

Repeated exposure to high levels of vibrations is known to cause injury to workers over time. Based on exactly how these exposures intersect at an individual's work environment, they are classified into two general types: hand and arm or whole body vibration.

Hand arm vibration exposure, the initials are HAV. Besides being a known contributing factor to carpal tunnel syndrome and other ergonomic related injuries, causes direct injuries to the fingers and hand affecting feelings dexterity and grip. These injuries are disability debilitating and compensable.

Whole body vibration. WBV is a consideration and when dealing with higher than expected levels of low back pain and injury in the workforce and is one of the most pervasive causes of lost time and production output according to the Journal of American Medical Association.

Some of the earliest diagnosed cases of injury directly attributed to working with handheld power tools was it the identified by Dr. Alice Hamilton in the early 20th century. And she led the way in correlating cases of Reynaud syndrome. It's often referred to as vibration white finger disease, or w VWF. They It was a first attributed to the use of pneumatic stone chipping tools using a local quarry at the time. Anyway, this opened up the door to the study of this relationship between high levels of vibration entering the body and the resulting debilitating injuries that occur, some so severe that they have resulted in a complete amputation of the fingertips.

The study of vibration and its relationship to the prevalence and severity of injuries caused by chronic exposure to workplace continues to this day. So what exactly is going on that would cause the repetitive cyclical mechanical motion of a tool aka vibration to injure someone's hands and fingers to the point of possible amputation. While it is unlikely with the tools that groomers use an individual's health or a particular person's chronic conditions could play a role in this. Don't forget that as a pre existing condition that was made worse by your job is workman's compensation.

The human body is a remarkable structure built of multiple interconnecting systems, including the vascular system, which distributes oxygen and nutrients throughout the body, right to the tissues to the nervous system, which provides sensory input to our brains, as well as the muscle control to everything from our heart to our fingertips and our toes.

Excessive levels of vibration can cause localized disruption of these functions. And a simplified way to envision this very complex biomechanical and biochemical processes that are thought to be at the root of the problem is to imagine the workings of the small structure in the vascular system. Those very small vessels and capillaries that allow oxygen rich blood cells to transfer that oxygen to the surrounding cells and tissues that need it in order to survive.

Research has shown that vibration level similar to those found in clippers, dremels, and dryers, those are handheld power tools we use can decrease blood flow in the extremities. Therefore, the body is less effective at transferring oxygen and other vital nutrients to those cells when they need it. Most. research in this field is ongoing and it continues to uncover more understanding as to how this occupational disease occurs and progresses. And researchers such as those at the CDC, NIOSH, Health Effects Laboratory Divisionin Morgantown, West Virginia are studying or actively studying the exact cause and effect relationships between different levels of vibration and the effect on different parts of the body.

So when less oxygen and fewer nutrients are transferred to the cells and tissues that need them, they can and will die, with nerve cells being, perhaps, the most vulnerable and the first to exhibit cell death, or necrosis. Ironically, then the very cells in the hand and fingers that allow us to feel in touch with great sensitivity, and grip a tool for exacting control of the first to be killed off by excessive vibration exposure. In fact, when diagnosing HAV, doctors use a system that classifies the injury for all the vascular and nerve damage components. Unfortunately, the physical effects of WBV,whole body vibration, on the lower back are more difficult to diagnose because the injury is not visible, as in the case with severe or even moderate vibration, as in the case of White finger disease .

**Risk assessment in the workplace**

Identifying the potential for injury from vibration at work is relatively simple, and estimating the level of risk is possible even though actual exposure levels on any given day are difficult to accurately quantify. Like many workplace hazards, the amount of risk is driven by the time of exposure and the magnitude of the vibration. The presence of vibration sources, typically handheld electrically powered tools such as dremels and clippers can be determined through an inventory audit of equipment use on a site and a simple study of tool utilization.

That gives a reasonable estimate of time of exposure in the resources in the woods. In the workbook. I've included links for appropriate for a vibrational calculator. As far as OSHA is concerned, daily limits have been estimated at five m/s2 for HAV and 1.15 m/s2 to WBV. Those numbers will make sense if you use a vibrational calculator.

The best way to reduce exposure is to keep your tools in good working condition, replace and maintain your equipment. And there are several groups on Facebook that help you set up a schedule and how to do it yourself. Don't grip the equipment too tightly let the motor do the work for you.

**Hearing**

Studies have shown that noisy environments result in higher accident rates. The rule of thumb is if you have to shout to talk to someone an arm's length away, it's too loud. Hearing loss can become irreversible, especially when it's repeated exposure.

And this is the Kansas State University safety database. “Noise literally wears out the ears. Sounds travel as pulsating waves of air pressure. Those waves strike the eardrum, and the vibrations travel through the bones of the middle ear, the inner ear, or the cochlea. In the cochlea, approximately 30 to 30,000 hairlike produce protrusions signal the auditory nerves to the brain. These hairs can recover from infrequent, brief exposure to intense noise. But if they are continually subjected to it, they break down and can no longer respond to sound. The nerve fibers connected to the hair cells also degenerate, leaving the central nervous system less able to adapt to sound. The damage is cumulative and irreversible.

Although modern hearing aids can significantly improve hearing experts say that a 15 minute exposure during an eight hour day to decibel ranges around 100 is considered okay. And that anything that is 85 or over could be considered hazardous for longer than15 minutes.

Most of our high velocity dryers are at that 85 decibel range, but not only the dryers the shop facts can put out those decibels as well. If you are in an enclosed areas such as a mobile or trailer, the effects are greater. Have your ears ever hurt after listening to a high pitched bark of a dog. Yeah, that's causing hearing loss as well.

In the workbook, there is a link to a phone app that you can test the decibel range at your job. Hearing protection needs to be appropriate to the level of noise in your facility. They will have a noise reduction rate in decibels for example, if you need to reduce the decibel range by 10 when the dryers are running, then you look for a 10 Db reduction in the description. Hearing loss just doesn't come from noise there are category of chemicals that are ototoxic and can cause hearing loss. You should have safety data sheets on all products used in your facility. The SDS will let you know if the product is ototoxic and the safety equipment needed while using it.

**Sustained postures**.

Static postures or static loading refers to the physical exertion and which the same posture or position is held throughout the exertion. These types of exertions put increased loads or force on the muscles and tendons, which contributes to fatigue. This occurs because not moving impedes the flow of blood that is needed to bring nutrients to the muscles and to carry away the waste products of muscle metabolism.

Examples of static posture include gripping tools that cannot be put down, holding the arms out or up to perform tasks or standing in one place for prolonged periods. The effects of the body from doing tasks that require long reaches are exacerbated when the reaches must be maintained for more than a few seconds. Holding extreme postures places very high static loads in the body resulting in rapid fatigue. Not only do static postures add to the muscular effort required to do the task, but the lack of motion impedes the blood flow that is necessary for tissue recovery. The constricted blood flow reduces the supply of nutrients to the muscles and the removals of acids and other waste products away from the tissues. Reduced blood flow also slows down the delivery of oxygen to the muscles. The longer or more frequently static load occurs, the greater the risk of injury due to overuse of muscles, joints and other tissues, such as standing in one place while combing brushing or bathing.

When awkward working positions must be maintained without support. It also increases the static load of muscles and tendons. This causes the body to fatigue even more quickly, such as when you're clipping at awkward angles. Tasks requiring employees to maintain the same position for an extended period increases the static load and forces on muscles and other tissues. The longer postures must be retained the greater the loading of muscles and other tissues. This increased force contributes to fatigue and muscle tendon strain, such as holding a pet for another groomer.

Exposure to contact stress may be a byproduct of prolonged static loading. When muscles become fatigue, look for ways to rest the affected areas. Rest your arms or wrists on a hard surface or the edges of a workstation. For example, if you're doing computer work at the end of the day, you can release static loading on the forearms and wrists by simply resting your wrist on the edge of the table. You could do this on the grooming table as well. However, the blood flow and movement of the wrists may continue to be reduced because of the contact stress.

It can be as simple as constantly holding something without putting it down for any length of time. As a result, the grasp muscles and other support muscles are constantly active or statically loaded. Tools that require the worker to maintain some level of exertion to achieve a steady flow or activity, such as combing, brushing, clipping, bathing drying, require the muscles to be constantly in tension/contraction, while applying some level of force. When workers are have to hold on to something without putting it down, they must maintain the muscles in the contraction. Over time, fatigue of muscles and inflammation of the tendons occur.

Often when the body is used to position and hold an object, the clapping part of the body maintains the same posture static posture reduces blood flow because the muscles are not moving, contracting or relaxing. The constant muscle tension can lead to swelling and pressure on nearby nerves. Static loading and high forces can lead to tears in the muscle tissue. Static loading of the tendons can also lead to inflammation and swelling to the point where motion is restricted and the swelling may put pressure on or pinch the nerves.

How do you fix this problem? First is by changing up positions throughout the day. Mobiles and house callers have more leeway here as they need to drive to locations, walk back and forth to the front doors. They institute movements throughout their day. Shop groomers should be cognizant of making time to walk during the day. Change your positions while grooming use tools and shift weight on their feet while standing.

Good quality shoes, shoes have a lifespan it's usually about six months, and they will need to be replaced. Restaurant quality ortho mats everywhere as you will be standing for any amount of time.

**Inflammation.**

What is inflammation? inflammation refers to your body's process of fighting against things that harm it such as infections, injuries, toxins, in an attempt to heal itself. In a grooming environment, inflammation can be caused by our overuse of our equipment or not using it correctly, as well as reactions to products we're using on pets and in cleaning and disinfecting supplies.

When something damages your cells, your body releases chemicals that trigger a response from your immune system. This response includes the release of antibodies and proteins as well as an increased blood flow to the damaged area. The process usually lasts for a few hours or days in the case of an acute inflammation.

What are the symptoms of chronic inflammation? Acute inflammation often causes noticeable symptoms such as pain, redness, or swelling. But chronic inflammation symptoms are usually a little moresubtler. This makes it easy to overlook. Common symptoms of chronic inflammation include fatigue, fever, mouth sores, rashes, abdominal pain, chest pain. These symptoms can range from mild to severe and can last for several months or years.

What causes chronic inflammation, there are several things including:

* untreated cases of acute inflammation, such as an infection or an injury
* auto immune disorder which involves your immune system mistakenly attacking healthy tissue
* long term exposure to irritants such as industrial chemicals or polluted air.

Keep in mind that these don't cause chronic inflammation in everyone. In addition, some cases of clear, chronic inflammation don't have a clear underlining cause. Experts also believed that a range of factors may also contribute to chronic inflammation such as smoking, obesity, alcohol, and chronic stress.

How does chronic inflammation impact the body? When you have chronic inflammation, your body's inflammatory response can eventually start damaging healthy cells, tissues and organs. Over time, this can lead to DNA damage, tissue death and internal scarring. All of these have been linked to the development of several diseases including, cancer, heart disease, rheumatoid arthritis, type two diabetes, obesity, asthma, and neuro degenerative diseases.

How is it treated? Inflammation is a natural part of the body's healing response. But when it becomes chronic, it's important to get it under control to reduce the risk of long term damage. Some of the options that have been explored for managing inflammation include:

**Non steroidal anti inflammatory** drugs, also known as NSAIDS's. They are over the counter such as aspirin, ibuprofen, and naproxen. They reduce inflammation and pain. But long term use is linked to several conditions including peptic ulcer disease and kidney disease.

**Steroids** corticosteroids are a type of steroid hormone. They decrease inflammation and suppress the immune system, which is helpful when it starts to attack out the tissue. But long term use can lead to vision problems, high blood pressure, kidney disease, and osteoporosis. This is a conversation you have a medical professional.

**Supplements**. certain supplements may help reduce inflammation. Again, a conversation with your medical professional.

Chronic inflammation happens when this response lingers, leaving your body in a constant state of alert. Over time, chronic inflammation may have a negative impact on your tissues and your organs.

Some tips for reducing inflammation in the body:

* Pay attention to equipment usage
* Take breaks
* Watch how you're holding and gripping equipment
* Use proper safety equipment when cleaning and disinfecting
* Stop using grooming products that are the causes of allergies and reactions.
* And load up on anti inflammatory foods include eat more fruits and vegetables
* Eat foods that contain the omega three fatty acid. The best sources of omega threes are Coldwater fish, such as salmon and tuna and tofu walnuts, flax seeds, and soybeans.

Other anti inflammatory foods include grapes, celery, blueberries, garlic, olive oil, tea, and some spices such as ginger Rosemary tumeric. The Mediterranean diet is a perfect example of an anti inflammatory diet. Its cuisine focuses on fruits, vegetables, fish, whole grains, and limits unhealthy fats such as red meat, butter, eggs, as well as processed and refined sugars and carbs.

* Cut back or eliminate inflammatory foods. Inflammatory foods include red meat, anything with trans fats such as margarine, corn oil, deep fried foods and most processed foods.
* Control your blood sugar limit or avoid simple carbohydrates such as white flour, white rice, refined sugar or anything with high fructose corn syrup. One easy rule to follow is to avoid white foods such as white bread, rice and pasta, as well as foods made with white sugar and flour. Start building your meals around lean proteins and whole foods that are high in fiber, such as those vegetables, fruits and whole grains, such as brown rice and whole wheat bread. Check the labels to make sure that that whole we say that quotation marks or another whole grain is actually the first ingredient.
* Make some time to exercise make time for 30 to 45 minute aerobic exercises, and 10 to 25 minutes of weight or resisting training at least four to five times a week. People who are overweight have more inflammation.
* Manage your stress. Chronic stress contributes to inflammation, use meditation, yoga, biofeedback, some guided imagery or some other methods to manage stress throughout the day.