

PREVENTING HAND INJURIES



How important are your hands?

The hand is one of the most complex parts of your body - the movement of the tendons, bones, tissues and nerves allows you to grip and do a wide variety of complex jobs

Without your hands it would be extremely difficult to do routine simple tasks, such as opening doors, using a fork, or tying your shoes

Your hands make you a skilled, valuable worker

The improper use or misuse of hand tools cause minor to serious hand injuries

Hand injuries are likely when the wrong tool is used or the right tool is used improperly

How Important Are Hands?

Practical Exercise

1. Tuck your thumbs into the palms of your hands
2. Now tie your shoes

It's not so easy is it?

Hand Injuries

- Hand injuries can be associated with working with machinery or equipment
- The materials being used or the job process might be hazardous
- Hand tools or powered hand tools may be faulty or improperly used

Hand Injuries

The most common causes of hand injuries are:

- Carelessness
- Lack of awareness
- Boredom
- Disregard for safety procedures
- Distractions

Hand Injuries

- Hand injuries are difficult to repair because of the complexity of the hand
- After a hand injury, the hand may not function as it did before the injury due to loss of:
 - Motion
 - Dexterity
 - Grip
 - Ability to complete the simplest of tasks

Hand Injuries

To avoid hand injuries:

- Know the hazards and dangers in the job to be done
- Be aware of pinch points
- Be aware of hot areas
- Be aware of rotating or moving surfaces
- Automated machinery may be controlled by remote control, or delayed timing devices that cause the machine to start automatically
- Loose clothing and jewelry may be caught up in moving machinery
- Never remove machine safeguards or operate machinery with safeguards removed

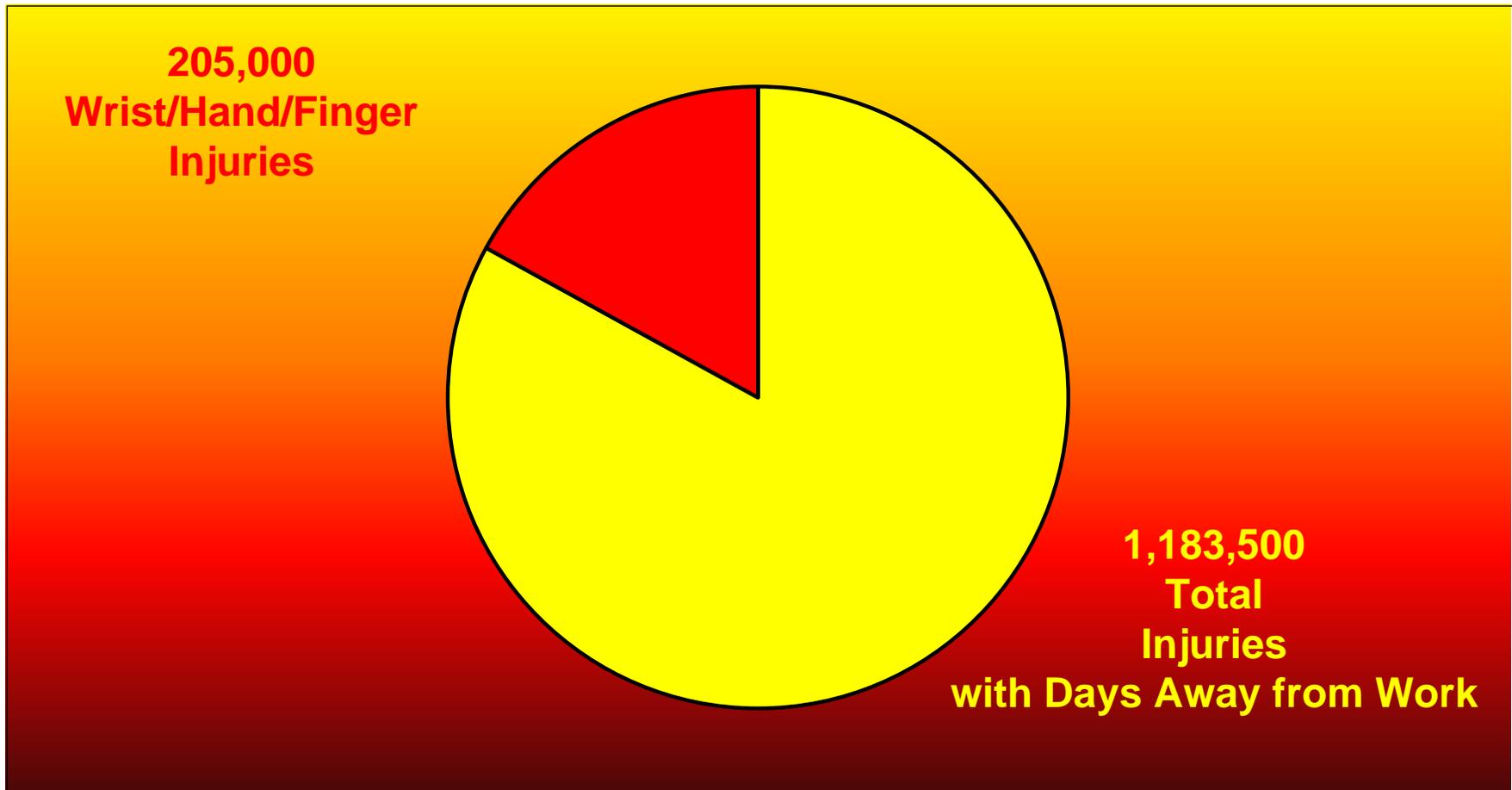
Injury Statistics

(Bureau of Labor Statistics 2006)

- Nearly 205,000 injuries and illnesses to the wrists/hands/fingers involving days away from work in 2006– 27% of the total for that year.
- Incidence rate/10,000 full-time workers:
 - All private industry = 29.6
 - Manufacturing = 65.6
 - Construction = 71.4

Injury Statistics

(Bureau of Labor Statistics 2006)



Hand Protection

Addressed in OSHA Regulation
29 CFR 1910.138 – Hand protection



29 CFR 1910.138

- States that employers shall select and require employees to use appropriate hand protection when employees' hands are exposed to hazards such as:
 - Skin absorption of harmful substances
 - Severe cuts or lacerations
 - Severe abrasions
 - Punctures
 - Chemical burns
 - Thermal burns
 - Harmful temperature extremes

Other OSHA Regulations Related to Hand Safety

- Hand and Portable Powered Tools and Equipment (29 CFR 1910.242)



- Control of Hazardous Energy – Lockout/ Tagout (29 CFR 1910.147)



- Machinery and Machine Guarding (29 CFR 1910 Subpart O)



Hand Hazards



Bee stings



Chemicals



Punctures



Blood-borne pathogen



Insect bites



Rotating equipment



Extreme temperatures



Pinch points



Cuts

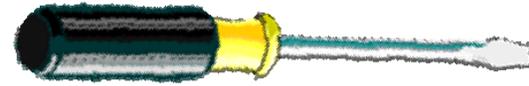


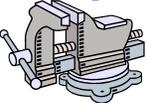
Vibrating equipment

Lines of Defense

- Awareness of Hazards and Prevention Measures
- Personal Protective Equipment (PPE)
- Good Hygiene and First Aid

Screwdrivers



- When using screwdrivers, place the object on a flat surface or in a  Don't hold it in your hand!
- Don't use screwdrivers as chisels or pry bars
- Use the correct size driver for the screw
- Don't use screwdrivers with chipped tips

Knives

- Use safety knives whenever possible
- Keep knife blades sharp
- Cut away from your body
- Do not use knife blades as screwdrivers
- Avoid working on the same object when a co-worker is using a knife



Safety Knives



Hammers



- Never use a hammer with a splintered, cracked, or loose handle
- Don't use hammers with rounded striking faces
- Use the correct hammer for the job
- Don't strike a hammer face with another hammer
- Don't use nail hammer claws as a pry bar





Hand Saws



- Use moderate pressure on hack saws to prevent blade failure
- Spray saw blades lightly with lubricant prior to use
- Keep blades sharp

Chisels

- When possible use a safety chisel
- Don't use chisels with mushroomed heads
- Use the correct chisel for the job
- Don't use chisels as pry bars



Safety chisel



Wrenches

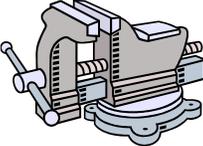


- Use the correct sized wrench for the job
- Don't use pliers with worn grooves or crescent wrenches with worn or sprung jaws
- Don't use pliers or crescent wrenches on over-tight bolts and nuts
- Pull on wrenches rather than pushing them
- Never use a cheater bar on a wrench





Portable Power Tools

- Disconnect power tools when not in use and before changing bits, blades, and other accessories
- If a power tool binds **STOP!** and reassess the job
- Wear anti-vibration gloves when using power tools that vibrate excessively
- Never remove guards!
- Ground power tools unless double insulated
- Don't wear gloves if they can get caught on rotating parts
- Secure work in a  or on a bench - Don't hold it in your hand!





Shop Tools



- Use a push stick to cut small pieces
- Unplug or Lockout tools before changing blades
- Keep tools sharp
- Never remove guards
- Use a drill press vise when drilling – Don't hold parts with your hands!



Drill press vise

Bench Grinders

- Don't wear gloves when operating bench grinders
- Never remove guards!
- Maintain proper clearances on tool rests and tongue guards
- Use vice grips when grinding small parts

Maintain tongue guard
within
 $\frac{1}{4}$ " of the wheel



Maintain tool rest
within
 $\frac{1}{8}$ " of the wheel

Don't use grinders on aluminum unless the wheel is specifically intended for use with aluminum!

Extreme Temperatures

- Use tongs or high-temperature gloves to handle hot or cold parts and equipment





Bites and Stings



- Use caution when moving debris piles or equipment which has been sitting for a long time
- Don't stick your hands in holes, crevasses and other secluded places, including work boots which have been sitting for awhile
- Avoid areas where insects nest or congregate (garbage cans, stagnant pools of water, uncovered foods and areas where flowers are blooming)
- Avoid dressing in clothing with bright colors
- Don't use scented soaps, perfumes or hair sprays



Brown Recluse



Sharps Disposal



Never dispose of used razor blades, broken glass, or other sharp objects in regular trash cans! Keep a metal can specifically for disposal of sharp objects.

Equipment Handling



- Use tag lines
- Wear leather gloves
- Never place your hand on top of the load or between the load and a fixed object
- Inspect hooks and chain slings before use
- Never hang load from the hook tip, unless it is designed for that

Jewelry

- Remove jewelry before using power tools or working on machines
- Keep sleeves buttoned



PPE - Many Gloves for Different Applications



Natural Rubber



Polyvinyl Alcohol (PVC)



Nitrile



Neoprene



Polyvinyl Chloride (PVC)



Cotton



Wire mesh



Kevlar



Welding



Leather

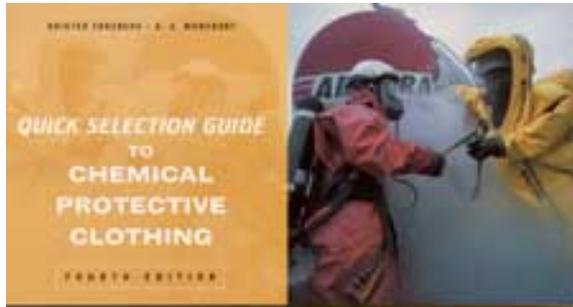


Anti-vibration

Which Glove is Best?

Glove	Uses
Cotton	Light duty material handling and cleanup work
Leather	Equipment handling, general construction, heavy cleanup, welding, moderately hot or cold material handling
Shock absorbing	Operating rotary hammers and other vibrating equipment
Kevlar or Wire mesh	Work with sheet metal, glass, or heavy cutting These gloves Do Not provide puncture protection
Rubber, nitrile, neoprene, PVC, PVA and other synthetics	Chemical gloves must be chosen for the specific chemical being used
Insulated	Extreme high and low temperatures

Chemical Glove Selection



General Guidelines for Select Chemical Resistant Glove Materials

Glove material	Generally resistant to:
Viton	Chlorinated and aromatic solvents
Butyl rubber	Aldehydes, ketones, and esters
Neoprene	Solvents, acids, caustics, and alcohols
Natural rubber (Latex)	Acids and caustics
Polyvinyl chloride	Acids, but not solvents

Consult your Safety Department and Manufacturer data for specific applications!

How Chemicals Get In!

- Permeation - Diffusion of a chemical through a material on a molecular basis
- Penetration – Chemical enters through zippers, punctures, or seams
- Degradation – Chemical causes a change in the physical properties of the material

Not all Chemical Gloves are Created Equal!

I Chemical	Glove Material						
	Butyl Rubber	Natural Rubber	Neoprene	Nitrile	Polyvinyl Alcohol	Polyvinyl Chloride	
Benzene	Red	Red	Red	Red	Blue	Red	
Diesel	Red	Red	White	Blue	White	White	
Gasoline, unleaded	Red	Red	Red	Green	Green	Red	
Kerosene	Red	Red	Green	Blue	Green	Green	
Hydrochloric Acid (37%)	Blue	Green	Green	Green	Red	Green	
Sulfuric Acid (30-70%)	Blue	Blue	Blue	Yellow	Red	Blue	
Not Recommended		Caution (1-4 hours)		Recommended (>4 hours)		Recommended (>8 hours)	Not Tested

Table adapted from: Forsberg, K. & Mansdorf, S.Z. Quick Selection Guide to Chemical Protective Clothing. 2nd Ed. Van Nostrand Reinhold, NY, NY

Chemical Glove Selection Exercise

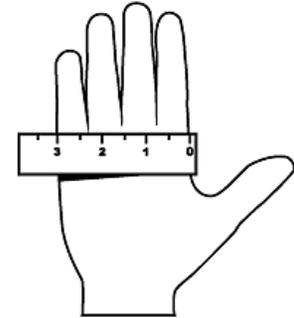
From the previous slide, select a glove for the following situations

- A glove that provide good protection for benzene
- What chemicals is a butyl rubber glove good for?
- Glove(s) that would be good choices for diesel, gasoline, and kerosene

Glove Care

- Inspect gloves before use for tears, excessive wear, and punctures
- Store in a clean, dry location
- Discard leather and cloth gloves if they become saturated with oil or other chemicals
- Leak test chemical gloves by sealing the wrist and filling the glove with air
 - Use a clean plastic tube or low pressure air line – not your mouth!

Glove Sizing



With a ruler, start at index finger and measure the width of your hand in the knuckle area

Distance	Size	
2 to 2½"	6	X Small
2½ to 3"	7	Small
3 to 3½"	8	Medium
3½ to 4"	9	Large
4 to 4½"	10	X Large
4½ to 5"	11	XX Large

Hand Care

- Avoid washing your hands with solvents, harsh soaps, or abrasives
- Clean and bandage all cuts and abrasions
- Immediately remove any imbedded foreign materials
- Wash immediately after using any chemical – Even if you did not detect leakage
- Pay attention to skin rashes—get an immediate medical evaluation
- Wear cotton gloves under rubber gloves to reduce sweating

Types of Injuries

- Cuts, fractures, punctures and amputations
 - Cuts or lacerations – May sever nerves, tendons or muscle or become infected
 - Fractures can damage nearby tissue and be difficult to repair
- Dermatitis and burns are caused by direct contact with chemicals, detergents, metals, or very hot or cold objects
 - Dermatitis may show up immediately after contact with a chemical causing the skin to become red, swollen, itchy, or burning, and may develop blisters
 - Dermatitis may develop after several contacts with chemicals known as sensitizers - Nothing happens initially, later contacts with the chemical produce an allergic reaction
- Carpal tunnel syndrome results from prolonged repetitive work with the hands - This condition can be disabling and can have a variety of temporary symptoms like swelling, tingling, numbness, and pain in the hands or fingers

First Aid

- Cuts: Apply direct pressure to a large or bleeding cut and elevate the hand above the shoulder - Clean a small cut with soap and warm water and cover it with a sterile bandage
- Burns: Immerse in cool water or run cool water over the burned area
- Broken bones: Keep the hand still and get professional help
- Amputations: Apply pressure to the injured area immediately - Preserve the amputated part in a plastic bag and put it in ice water or ice, but Do Not allow the amputated part to come in contact with the ice!
- Sprains: Apply cold compresses to reduce pain and swelling
- Chemical burns: Rinse with running water for at least 15 minutes
- Heat burns: Soak minor burns in cold water, then apply a sterile bandage - A burn that is charred or blistered requires medical attention

Hand Exercises

- *Doing a few simple exercises before work and between tasks will build hand strength and provide a rest from repetitive motions*
- Exercises:
 - Stretch fingers by spreading them wide apart for a few seconds (Repeat 3 times with each hand)
 - Stretch your thumb by holding it down gently for five seconds (Repeat 3 times with each hand)
 - Stretch your wrist by making circles with your hands (Repeat 10 times for each hand)

This could be you!



ADAM.

So watch out!!!

LeClasp Safety Products and Solutions:

Item #1350 - LeClasp Medical Alert ID Key Holder (Personalized)

MSG # **A B C D E F G**

1352 - LeClasp Key Holder with choice of PERSONALIZED Medical Alert ID Symbols. Choice 36+ conditions, allergies, meds, etc.)

Medical Conditions



Allergies



Prescribed Medications



Implants - Donors - Others



Medical Alert - Special Needs



If your medical alert identification symbols are not found above, simply supply us the details and we'll custom imprint it.

LeClasp Safety Products and Solutions:

Item #1352154 - LeClasp Medical Alert ID Key Holder (Generic)

MSG # **A B C D E F**

1352 - LeClasp Key Holder with choice of GENERIC Medical Alert ID Symbol and comes with one (1) wallet card

1354 - Emergency Contact and Medical Information Wallet Card



Emergency Contact (personne à rejoindre en cas d'urgence)
 Emergency contact (personne à rejoindre en cas d'urgence):
 1. Physician (médecin) - Spécifier (spécifier) - 30/00 (30/00)
 2. _____
 1. Family/Physician/Doctor (famille/médecin/travaill) - 30/00 (30/00)
 2. _____
 Medical Information (voir revers) - renseignements médicaux (voir verso)

Emergency Wallet Card (Carte Portefeuille d'urgence)
 Emergency wallet card (carte portefeuille d'urgence)
 (Renseignements médicaux)
 Known medical conditions, all current medications (dosage), allergies, implants, special needs, personal needs, (Renseignements médicaux, tous les médicaments prescrits (dosage), allergies, appareils/implants, besoins particuliers, demandes spéciales).
 Date (date): _____
 Signature: _____

Front Side Information

1360 - NEW Larger-Sized Medical Alert ID Card
 com for Employee Badges

Back Side Information

- Designed to be **CLIPPED ON** with
 1) Employee Photo ID/ Access/ Security swipe badges, or 2) when applicable, near equipment where employee works. (Also compliant with Membership/ School/child ID/Trade Show/ Event/etc. passes & cards.)
- Worker confidentially fills in personal Contact and Medical Information
- Recommended for workers with three (3) or more issues
- Seven lines for worker to fill in medical info including conditions, allergies, prescribed meds, etc.
- Comes with bull dog hole, compliant to ALL badge holders, incl. popular retractable clip holders, polypropylene neck wallets, vinyl badge holders, neck secure and breakaway lanyards.
- Larger size card makes emergency info easily visible (accessible) beneath badges, cards and passes by medic/sdoctor/snurses.



Actual Size - 2.5" X 4.25"

This Little Piggy...

SFC DAVID ALAN MELANCON
3rd Brigade, 1st Cavalry Division
Fort Hood, TX



Have you ever noticed most accidents happen when you least expect them? Well, there I was, just coming in from a field training exercise (FTX) and about to perform a simple task when an accident happened to me. I certainly wasn't expecting to wind up in the hospital that January day. I'm a Bradley systems maintainer and maintenance platoon sergeant for a forward-support company. We'd just completed the FTX in preparation for a deployment to the Joint Readiness Training Center and, after that, possibly Iraq. We were tired after spending 3 weeks in the field, but it was almost over—all we had left to do was clean our vehicles. At about 1700, the last of the vehicles were staged at the wash rack, so we went to work. Everything about this day was relatively normal, with one notable exception: that morning, I'd taken my wedding ring off my dog tags and slipped it back on my left-hand ring finger. I figured since our

training was over, wearing my ring was no big deal. I say this is notable because I always wear my ring around my dog tags when I'm on duty, especially in the motor pool or in the field. I'd spent a year in Iraq during Operation Iraqi Freedom II, and the only times I put on my ring were when I left for R & R leave and when my unit redeployed home. That system worked well, and thankfully I came home not only alive but with all 10 fingers! I needed to get my wet-weather gear, which was in a shelter on the back of an LMTV trailer. I climbed on the trailer, got my things, and grabbed the right side rail for balance as I prepared to climb back down. Unfortunately, my foot slipped as I stepped on the lower bumper, and I began to fall. My hand slid down the rail as I moved toward the ground, and my ring caught in one of the U-shaped grooves used for securing canvas covers on the trailer. I was horrified as I looked at my finger. The skin and most of

the tissue on my ring finger was completely gone, and the bone from the first joint just above my fingernail was missing. I called out to the other guys and said, among other choice words, "Hey, get a medic, get the aid bag—I've lost my finger!" Needless to say, I was in a lot of pain. Another Soldier got a combat lifesaver bag and pulled out a pressure bandage, which I wrapped around what was left of my finger. The commanding officer dialed 911 and had a pickup truck brought off the roadway so I could sit down and take off my helmet, weapon, and vest. We were only about 4 minutes from main post, so the ambulance arrived fairly quickly and took me to the emergency room at Darnell Army Community Hospital. The doctors there told me the damage to my finger was so extensive they didn't know if any attempted repair would work. The tissue, nerves, and vessels were torn horizontally, and reattaching my finger would require 8 to 10

hours of surgery with no guarantee of success. In fact, there was only a 20-percent chance my finger wouldn't have to be amputated even with surgery due to the nerve and vessel damage, which reduced blood circulation in the injury to zero. I faced a tough decision. The doctors told me my best course of action would be amputation because I would have a good chance of full recovery after rehabilitation. They let me decide, however, and after talking with my wife, I gave the doctors permission to amputate. They performed surgery that night, and my finger was amputated to the first joint—ironically, at the same place my wedding ring had rested just that morning.

It's been about 2 months since the accident, and I recently started rehab. I still feel a lot of pain, not just in my hand but all the way up my arm. The doctors explained some of the ligaments and tendons in my arm were pulled during the accident, and I'll experience phantom pain the rest of my life. I've lost about half the gripping power in my hand, which isn't good since I'm left-handed. I'll have to learn how to

write and type again, but I can shoot right-handed—a definite plus for a Soldier. My long-term prognosis is pretty good, though; the doctors tell me that after about 4 months of occupational therapy I should be back to normal. I share this story in the hope I'll open another Soldier's eyes and prevent them from making the same mistake. The doctors predict I'll be able to deploy back to theater with my unit later this year, but I could just as easily have lost my career that winter afternoon. Believe me, I'll do everything in my power to make sure I deploy with the Soldiers I've trained because I know they need me. I think it'll be a morale booster if my Soldiers can look at me and say, "If he lost a finger and is still here with us, we can do anything."

I'll be wearing my wedding ring on my right hand from now on, but I promise you this: I'll take it off whenever I put my uniform

on, no matter what's planned that day. You never know what might happen. I survived a year in Iraq unharmed only to come home and lose my finger because I was tired and wasn't thinking straight. Stay alert and realize even the simplest of tasks can hurt you in a big way. If it can happen to me, it can happen to you too!

Giving the Finger

This soldier injured his pinky finger while serving in Iraq during the first year of conflict. The injury itself isn't very remarkable and he made a full recovery, but notice the ring next to the injured finger. It's never safe to wear rings or other jewelry in a field or combat environment. If the ring gets caught on something, you risk either a degloving injury (i.e., all the skin peeled off) or total amputation. Both injuries hurt a lot, so keep your ring in a safe place—not on your hand—when you're on duty.

Special thanks to LTC Roman Blynsky, MD, who submitted this photo from his time with the 4th Infantry Division in Iraq.



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COUNTMEASURE **04/06** <https://cnc.army.mil>

**A Finger or a Ring?
The choice is Yours.**



Contact the author via e-mail at david.alan.melancon@us.army.mil.