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Equipment Safety for Operators



CONSTRUCTION

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Objectives

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- Illustrate simple injury exposures related to climbing on equipment
- Proper climbing and dismounting techniques and concerns.
- Costs of Injuries
- Effects of aging and obesity on climbing and dismounting from equipment
- Other training and fall prevention ideas
- Cargo securement issues

The Truth

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- Falls from equipment, trucks and trailers lead to severe injuries, knees, shoulders, legs, back, etc. and occasionally fatalities.
- **23% of falls construction Industry as a whole.**
- 50% of injuries to equipment operator result from falls, 54% of those when getting in and out of the cab.
- **40% of the work force is considered “aging” and increasing.**
- 36% of Americans are considered “obese” and increasing.

Cause of Falls

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- Exiting cab forward
- Not using hand holds
- Broken steps, ladders or hand holds
- Jumping off of equipment
- Legs stiff or “asleep” after sitting for long periods
- Foot slips off of step
- Mud, snow and ice, grease or oil on equipment walking surfaces, steps, boots or decking
- Attempting maintenance or cleaning windows

What is the number one issue that will affect all industries in the United states besides the economy?

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- The number one issue is the aging workforce in the United States
- It will effect all industries
 - Construction
 - Manufacturing
 - Warehousing
 - Food Service
 - Retail
 - Technology

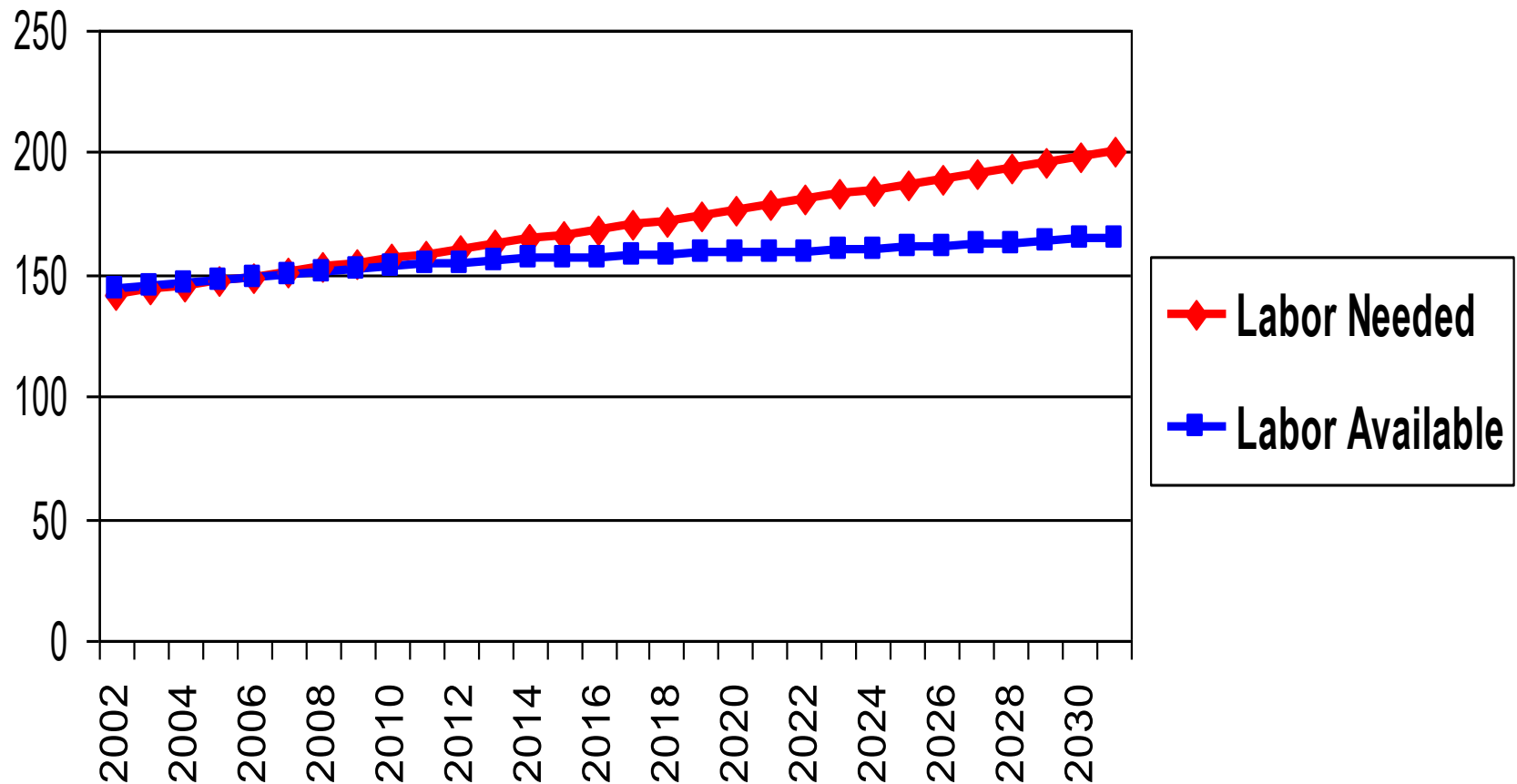
These industries will be fighting over the same employees

Growing Shortage of U.S. Workers

Expected Labor Force and Labor Force Demand

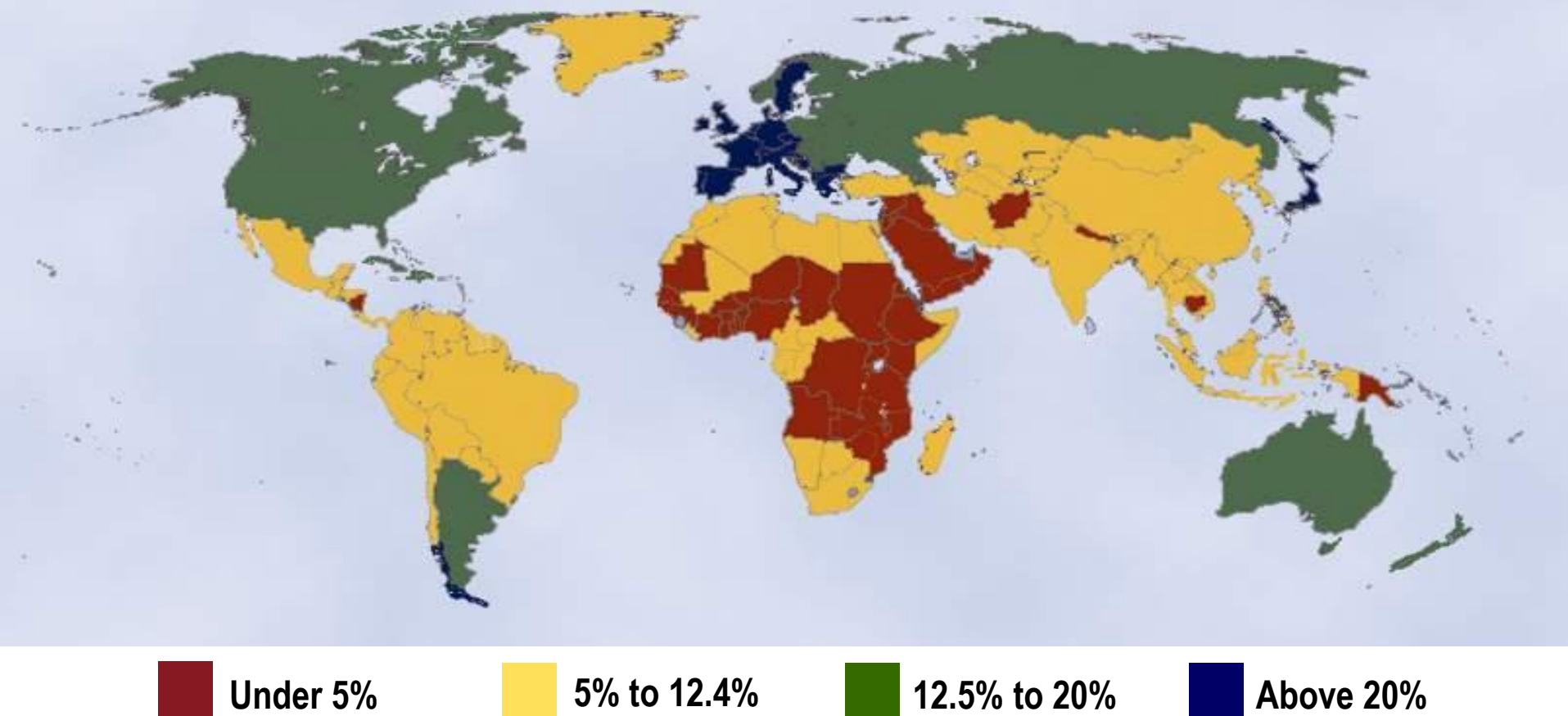
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Millions of People



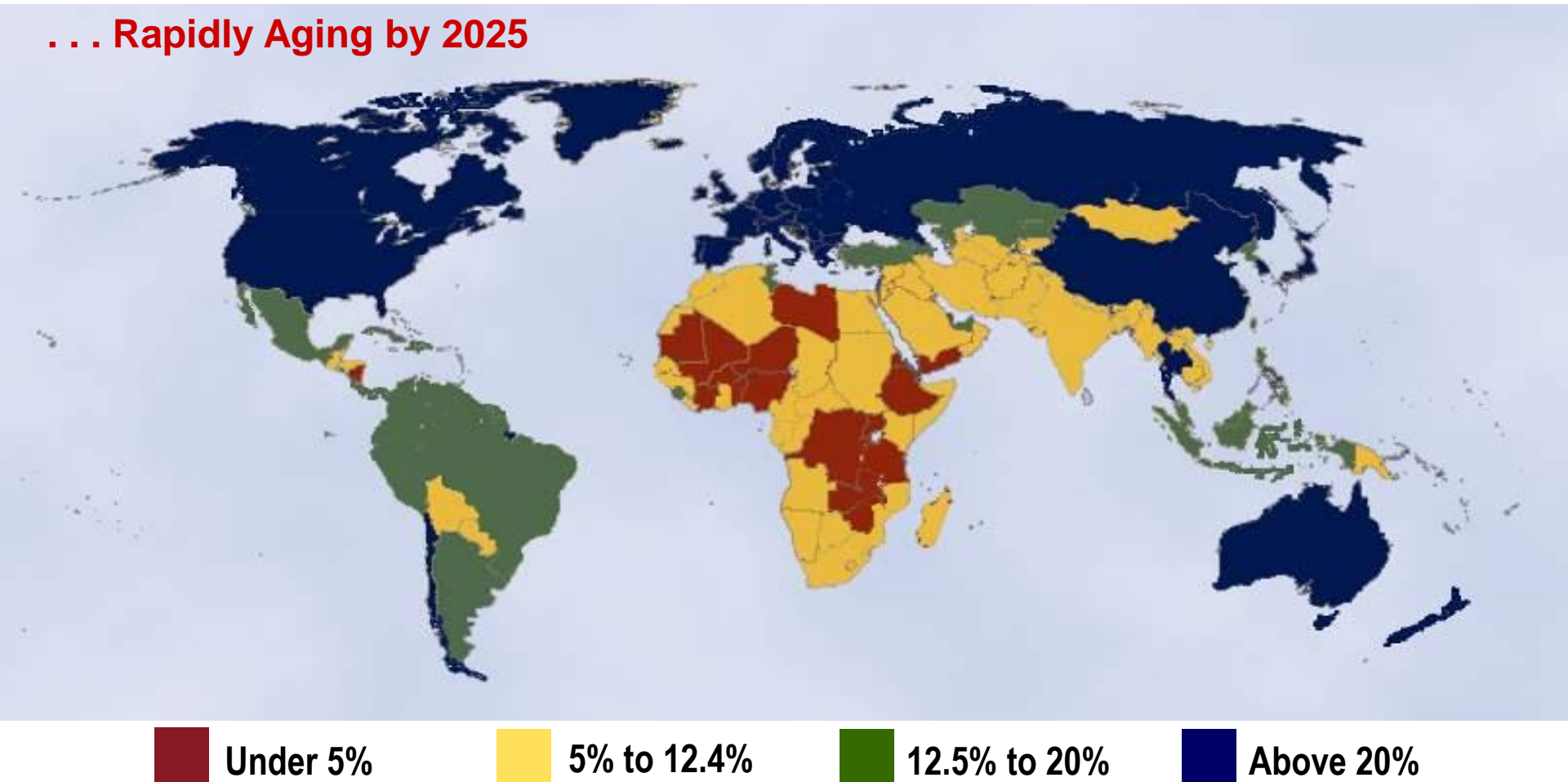
Source: Employment Policy Foundation analysis and projections of Census/BLS and BEA data.

In 2000, A Fairly “Young” World . . .



Percent of Population Age 60+ in 2000

... Rapidly Aging by 2025



Percent of Population Age 60+ in 2025

CURRENT POPULATION

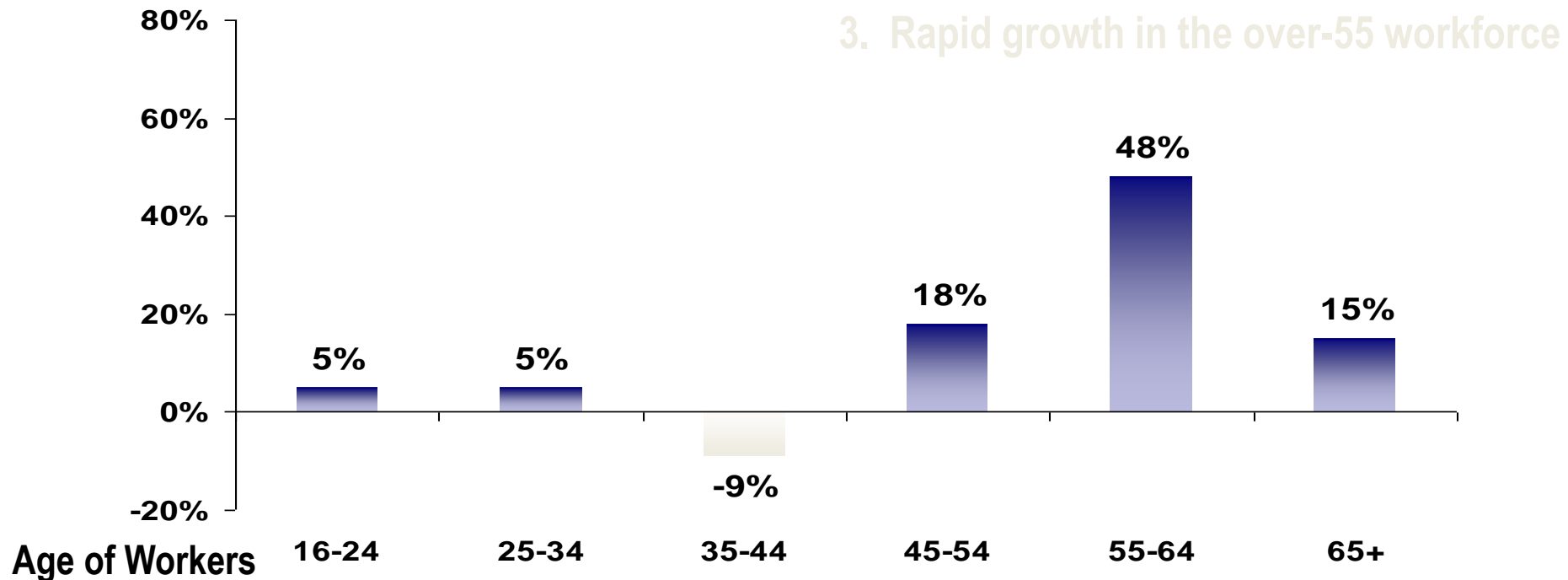
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- By 2015 – 55 million workers 45 or older
- 14 to 15 million people will be 65-69 in 2015
- Nearly half of all workers will be considered “aging” by 2015
- Those between ages 24 and 54 will only increase 5 percent.

Dramatically Different Patterns of Growth by Age

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Percent Growth in U.S. Population by Age: 2000-2010



1. Declining number of mid-career workers

2. Few younger workers entering

“Multi-Generational” Workforce

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Traditionalist



Born: 1928-1945

Boomer



Born: 1946-1964

Generation X



Born: 1965-1980

Generation Y



Born: 1980-2000

Four generations (cultures) are being asked to coexist in the early 21st century workplace

AS WE AGE

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- Maximal Strength
- Muscle Mass
- Bone density
- Visual and Auditory Acuity
- Fitness
- Aerobic Capacity
- Cognitive Speed/Function



- Obesity
- Arthritis
- High BP
- Diabetes
- Depression/Heart Disease
- Menopausal/Post Menopausal Issues



The outward physical changes that occur when we age are the most obvious. From an employer's standpoint, the major physical concerns are:

- *Strength - 25-30 percent decrease at 65 yrs*
- *Flexibility - 18-20 percent decrease at 65 yrs*
- *Balance – One-third of 65 yrs or older fall each year*
- *Sight – All aspects deteriorate*

Physical

CONSTRUCTION

- *Reaction time and speed – Decreases*
- *Hearing – One-third of 65-74 yr olds have problems*
- *Manual dexterity and tactile feedback – Motor skills deteriorate*
- *Body fat – Increases*

Physical Limitations

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- Driving and operating large equipment requires responding continuously to spatial and temporal information from the environment and equipment.
- Motor control is critical for coordinating movements of the head, neck, and upper and lower limbs.
- Motor control is also critical when using powered and non-powered tools, going up and down ladders, manually handling materials and braking, steering, and turning.

Physical Limitations *(continued)*

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- Strength decreases in older workers.
- In job site settings, workers still have to lift, lower, push, pull, and carry material.
- Many of the designs and work task setups do not take this decrease in strength into consideration. Thus, the older worker may not have the maximum strength to apply.
- We have to look at the design to take advantage of leverage, handle designs, and mechanical advantages.

Scope of the Problem

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- The most obese workers file twice as many WC claims as healthy weight workers.
- The most obese have 13 times more lost workdays than healthy weight workers.
- Workers Compensation medical claims cost are 6.8 times higher for the most obese workers.

Source: Ostbye, T. *Obesity and Workers Compensation*. Archives of Internal Medicine, April 23, 2007 Emerging Risks in Workers Compensation, Workers Compensation Educational Conference, Robert Hartwig, PHD, CPCU, President Insurance Information Institute

Scope of the Problem (*continued*)

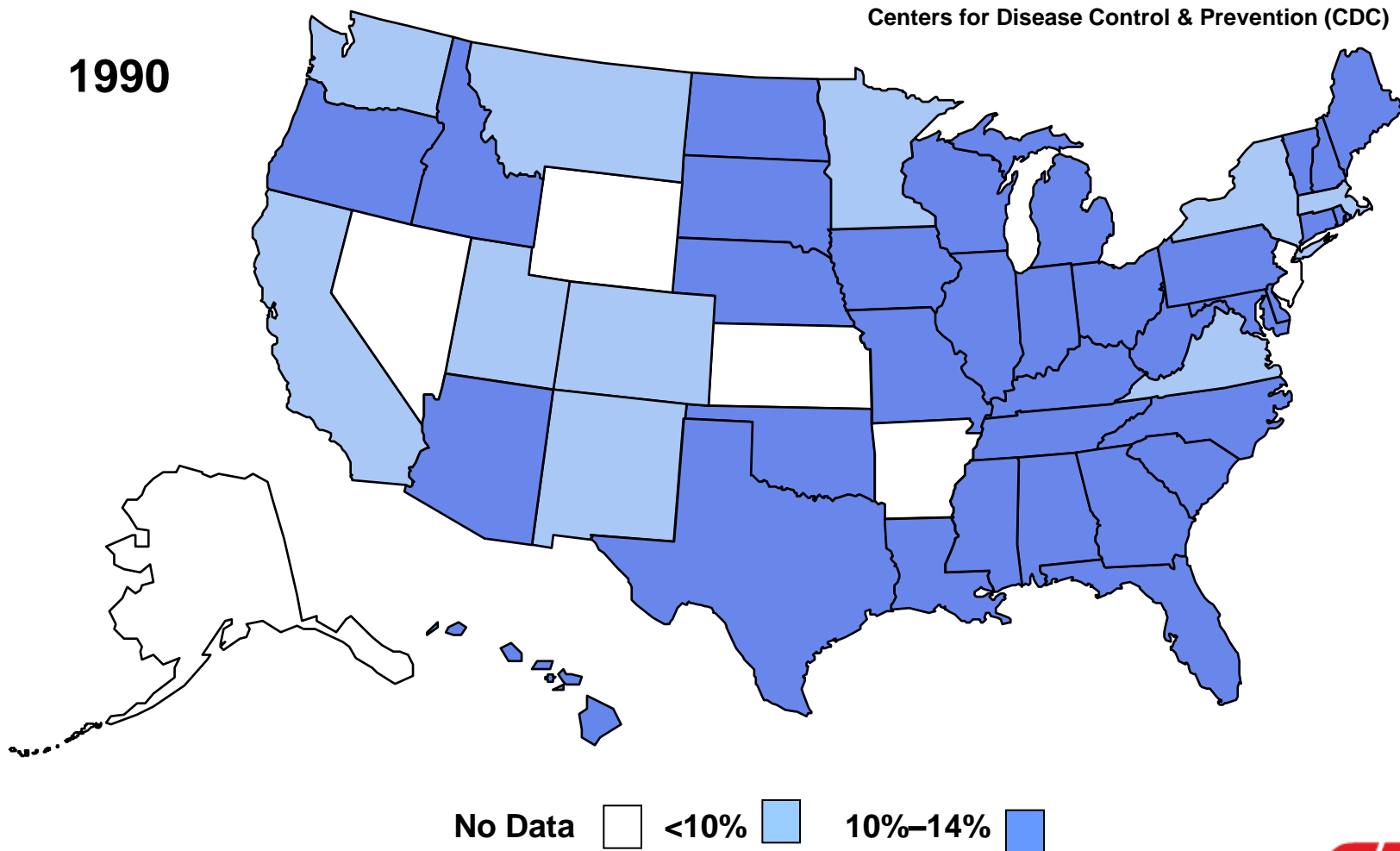
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- Indemnity costs are 11 times higher for most obese workers than healthy weight workers.
- The body parts most prone to injury are: back, lower extremities, wrist, and hands.
- The most common causes of these injuries were falls, lifting, and slipping.

Obesity Increases Workers Compensation Cost, www.medicalnewstoday.com/articles/68795.php 1/25/2010

Percent of Obese (BMI ≥ 30) in U.S. Adults

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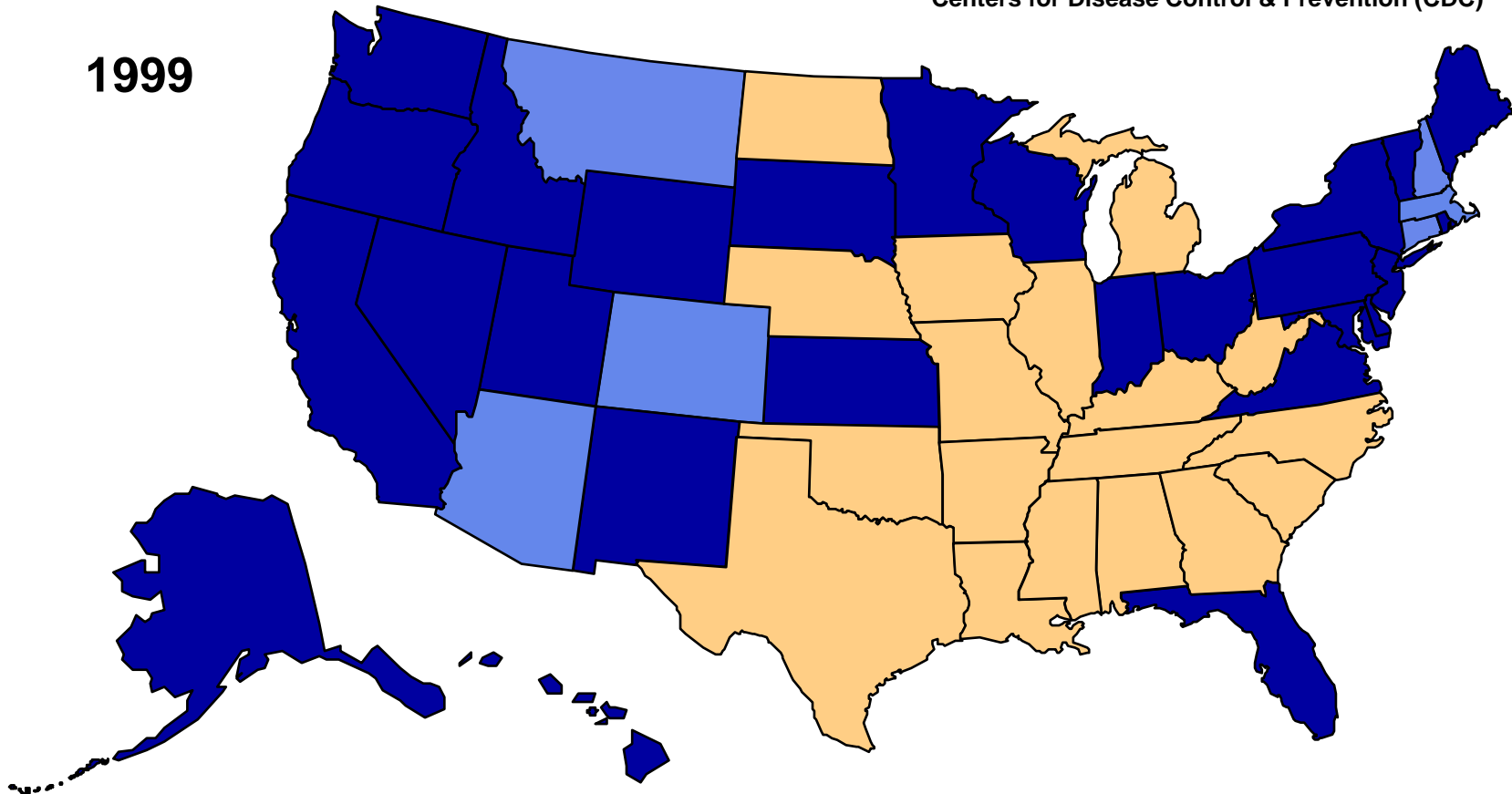


Percent of Obese (BMI ≥ 30) in U.S. Adults

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Centers for Disease Control & Prevention (CDC)

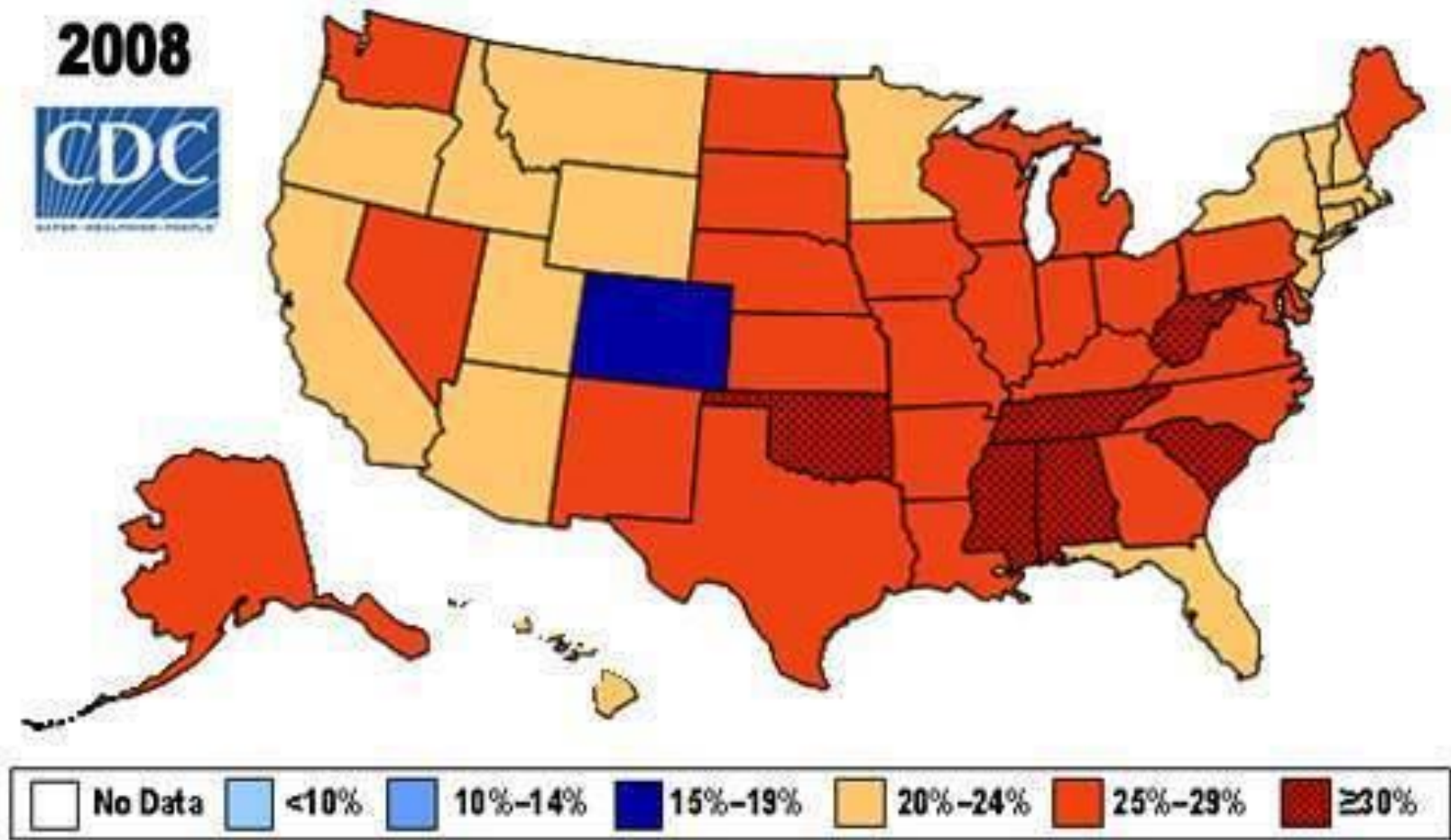
1999



No Data <10% 10%–14% 15%–19% 20%–24%

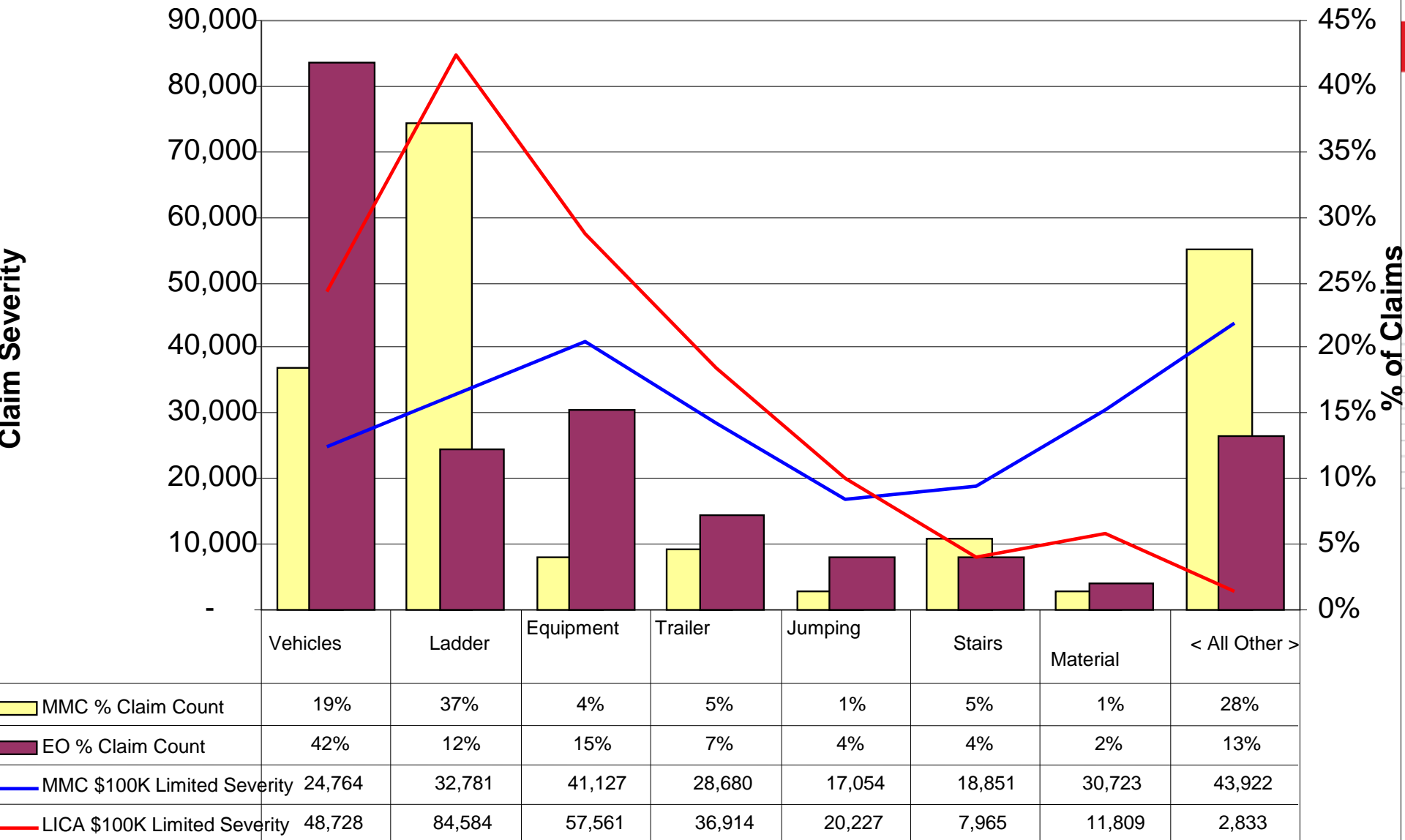
Percent of Obese (BMI ≥ 30) in U.S. Adults

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WC Fall From Elevation Claims 2009-2012

Claims and Severity by Claimant Source



Can You afford to have someone fall from equipment?



Cost of Injuries

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If your company's Profit Margin is:

Injury Cost	1%	2%	3%	4%	5%
\$1,000	\$100,000	\$50,000	\$33,000	\$25,000	\$10,000
\$5,000	\$500,000	\$250,000	\$165,000	\$125,000	\$50,000
\$10,000	\$1,000,000	\$500,000	\$330,000	\$250,000	\$100,000
\$25,000	\$2,500,000	\$1,250,000	\$825,000	\$625,000	\$250,000

Poor safety record decreases profit margin further, i.e. indirect costs and increased insurance premiums.

Actual Accidents and Their Impact on You and Your Employer

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September 29, 2010- Employee was getting out of his truck when he missed a step and started to fall. He grabbed onto the railing and twisted right shoulder and neck.

- ✓ *Shoulder strain and herniated C6-7 disc with spinal swelling*
- ✓ *Surgery- to remove a portion of the vertebrae and repair disc*
- ✓ *48 weeks off of work*

\$106,684

Actual Accidents and Their Impact on You and Your Employer

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April 1, 2012- Employee fixing hoses on his trailer stepped off into a 2" deep pothole in a driveway of a loading dock and fell.

- ✓ *Fractured wrist and sprained ankle*
- ✓ *Wrist surgery*
- ✓ *2nd surgery to fuse wrist (loss of wrist motion)*
- ✓ *Off work approx. 72 weeks*
- ✓ *Dr. indicates employee cannot work as driver due to loss of wrist function.*

\$113,312

Actual Accidents and Their Impact on You and Your Employer

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Nov. 13, 2013- A 64 year old equipment operator was in the process of washing his windows of his back hoe when he fell off, falling 4-5 feet onto frozen uneven ground, and striking his head on an outrigger.

- ✓ *Knocked unconscious*
- ✓ *Fracture skull and facial bones*
- ✓ *Intracranial hemorrhaging*
- ✓ *Post traumatic brain injury with psychotic disorder, seizures, and dementia. Now requires 24 hr supervision in long term care facility.*

Why This Didn't Have to Happen

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Witness Stated:

- ✓ *Steps and handholds were in place, **but not used.***
- ✓ *He was leaning on Fender with one foot on a muddy tire.*

What's age have to do with it?

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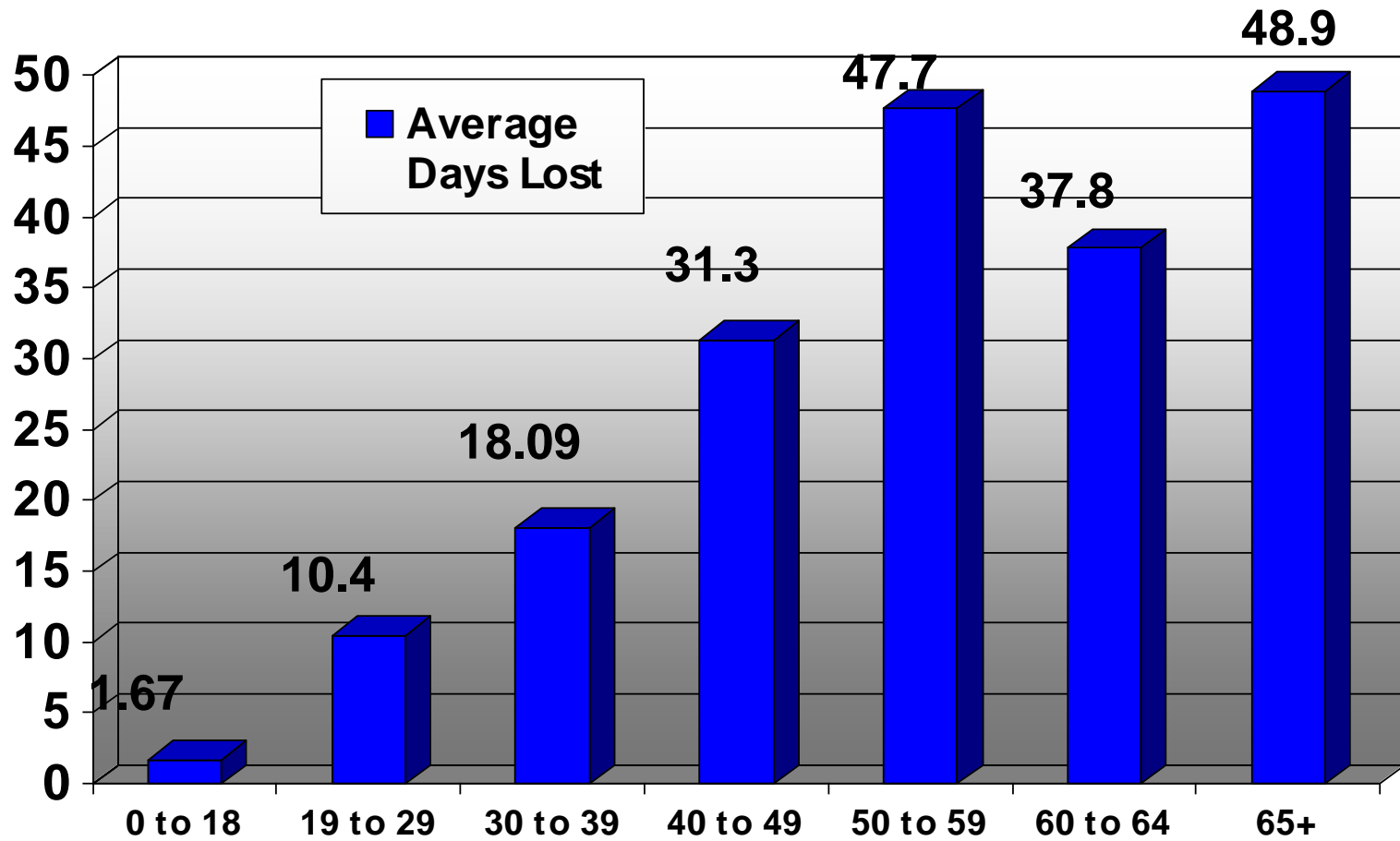
Physical Capabilities decline around 50.

As you age, you lose:

- **Strength and grip**- Holding while climbing if no hand holds
- **Range of motion**- flexibility, i.e. stiff knees
- **Balance**- equilibrium while climbing
- **Muscle Mass**- Strength required to climb
- **Bone Density**- Easier fractures from slips or jumping

Aging Trends – Average Loss Work Days

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Did You Know?

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- The most **obese workers file twice as many WC claims** as healthy weight workers.
- The most **obese have 13 times more lost workdays** than healthy weight workers.
- Workers Compensation **medical claims cost** are **6.8 times higher** for the most obese workers.
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Obesity Increases Workers Compensation Cost, www.medicalnewstoday.com/articles/68795.php 1/25/2010

Effects of Improper Falling or Jumping off of Equipment

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Your weight combined with height creates impact force.

Can your knees, back, hips and ankles withstand these forces?

Typical 250 lbs. worker jumping

From 16"-24" (trailer bed) = 395 lbs. of force

From 33" (skid steer tracks) = 1,170 lbs. of force

From 48" (truck cab) = 1,860 lbs. of force



Using Three-Point Contact

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Facing the cab.

One hand & two feet

Two hands & one foot

Getting out of the Cab

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Look to see what you will be stepping on.



Potholes
Mud
Ice
Rocks
Uneven soil



Getting in and out of the Cab

CONSTRUCTION

- ✓ **Be aware of wind when opening your door.**
- ✓ **Enter and exit cab facing steps.**
- ✓ **Use appropriate steps and hand rails.**
- ✓ **Maintain good foot grip.**



Getting in and out the Cab

CONSTRUCTION



Very little surface contact

Can result in slips and falls

**Shoulder dislocation
or strain, neck strain
or rib fractures**



Getting in and out of the Cab

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- ✓ **Use steps, not tanks.**
- ✓ **Tanks are slick and generally have fuel residue.**

- ✓ **Know where you are stepping.**
- ✓ **Watch for ground debris and potholes.**



Getting in and out of Your Cab

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**Keep hands free
maintain 3-point
contact.**



**Keep floors clear of objects
you can trip over**

Question for the Group

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- You have all seen UPS drivers correct?
- How do they normally come out of the truck?
- Can you guess what their top 3 injuries to drivers are?

- Knee
- Ankle
- Shoulder



Getting in and out of Your Cab

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NEVER jump off of any part of the equipment!



✓ Ankle Strains/Fractures

✓ Fractured hips

✓ Knee Injuries

Climbing on Trailers

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✓ **Maintain 3-point contact when connecting brake and light lines and onto trailer**

✓ **Be aware of hoses and grease on decking**

✓ **Move them aside before climbing**





Trip hazard while trying to get to ladder



New truck, but contractor had to add on steps and hand hold

Use Steps and Hand holds

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Finger tips vs. palm photo



Step Surfaces

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How good is the slip resistance?



Step Surfaces

CONSTRUCTION

Holds debris minimal flow thru



Step Surfaces



Higher slip resistance, but more surface to hold debris



Minimal slip resistance/holds debris



Good slip resistance and flow thru design



Steps Surfaces

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Good grip and flow thru, less slip potential, but extra grip can catch boots causing fall





Muddy tracks and boots

Mount boot brush on equipment platform???



Footwear Considerations



**Slick Soles
Minimal Tread**



Oil resistant, but minimal Tread

Work boots should have deep tread for traction



Avoid smooth leather soles

Flatbed Trailers

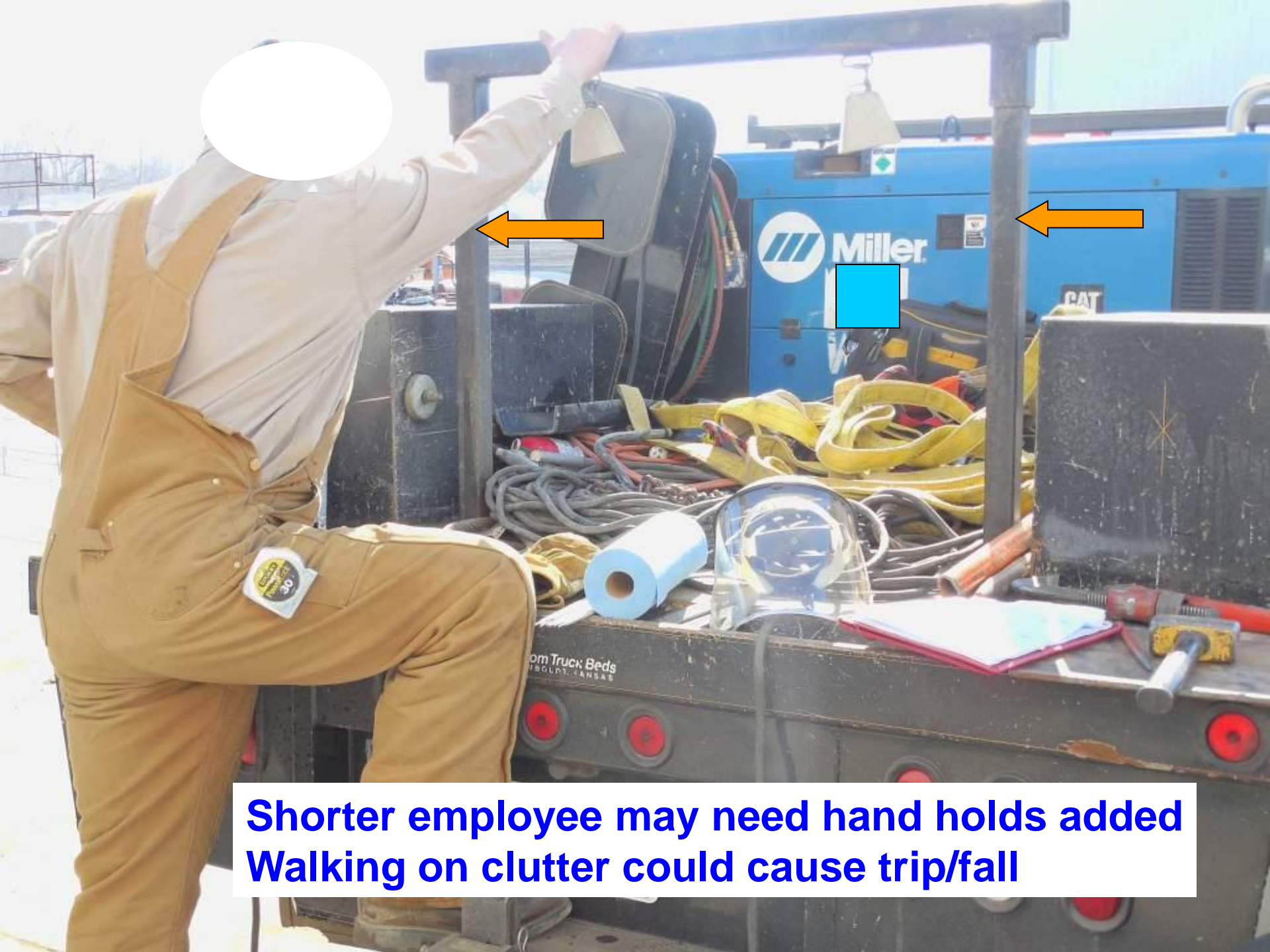


Trucks

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**Custom step slides into receiver
Should be more grated for slip resistance**



**Shorter employee may need hand holds added
Walking on clutter could cause trip/fall**



Use bumper



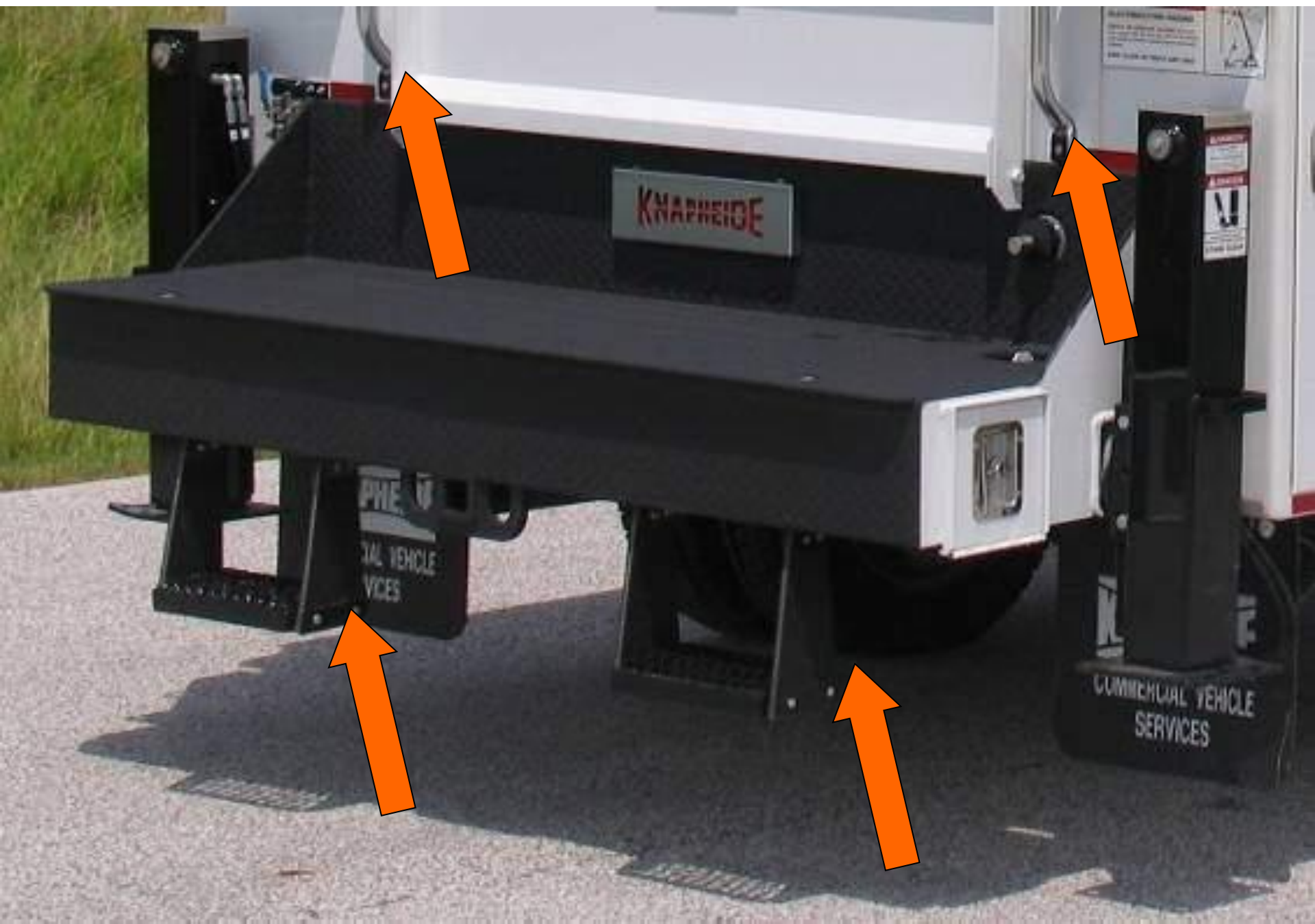
Not ball hitch



Opens to provide a step



Step could be improved if
built from flow through
grating



Water Trucks





Unstable/shin buster





Better- but could install actual step



Fall Protection Requirements

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In construction, fall protection in the form of **railings or fall arrest** is required anytime a worker is 6 feet or more above the ground or another work surface.

Fall Protection when on the Tank



- Greater than 6 feet fall protection needed
- Rails not feasible
- Fall arrest needed (Self retracting lanyard and harness)

Fall Protection when on the Tank



PHOTOS of Capital Safety tanker fall arrest



Trailers

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Skid Steer



TION

Do not climb on bucket and over rack. Use side and middle step

Dozer



- Climb up tracks- mud pack will increase risk of slip fall
- Dismount walking forward down tracks using hand holds

All Terrain Lifts



Falls from this level not as severe

Platforms Clear of Ice, Mud and Debris



- Good steps hand holds and upper railings
- Keep platform clear of mud and ice

Damaged Steps, Ladders and Hand holds

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- Survey equipment for damages to climbing equipment
- Repair any damage and replace with good slip resistant, flow-thru materials
- Install additional hand holds if needed



Damaged Steps, Ladders and Hand holds

CONSTRUCTION

- **Survey equipment for damages to climbing equipment**
- **Repair any damage and replace with good slip resistant, flow-thru materials**
- **Install additional hand holds if needed**



Damaged and missing scraper step

2010/07/15 12:19

Mini-Excavator



Must dismount facing cab or there is no footing.

Be Aware of the Wind



Wind can blow door striking operator

Summary

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1. Check all equipment for **proper steps and hand holds**.
2. **Condition of hand holds and steps**; secure and free of damage.
3. **Safety Rails** in place on large equipment such as scrapers and water trucks.
4. Provide **non-slip surface** on steps and platforms.
5. **Proper footwear**
6. Use **3-Point Contact**.
7. Provide alternate methods of access
8. If no railings provide **anchorage and fall arrest** if over 6 feet.
9. Formal **Training** with employees

Final Thoughts and Questions

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GENERAL CONTACT:
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WWW.CNA.COM

