



# SMT Safety Series



## Groundskeeping and Landscaping Safety

March 24, 2022

**BENECON**



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# Groundskeeping and Landscaping Safety

- ❖ Chainsaw Safety
- ❖ Rollover Protective Structures
- ❖ Heat Stress & Cold Stress
  - ❖ Symptoms & Prevention

# Workplace Safety



[www.smtpa.org](http://www.smtpa.org)

# Grounds & Landscaping Safety

- Chain Saw Safety
  - ROPS
- Heat & Cold Stress

# Objectives

- **Upon completion of the class, trainees will be able to:**
  - **Chain Saws:**
    - Become familiar with proper body positioning, kickback prevention, PPE, and escape route.
  - **ROPS**
    - Understand how ROPS prevent fatal rollover incidents, when ROPS are required, and what precautions must be taken on equipment with ROPS.
  - **Heat & Cold Stress**
    - Identify weather conditions that will expose them to potential injuries and illnesses.
    - Understand how to prevent heat and cold related injuries and illnesses.



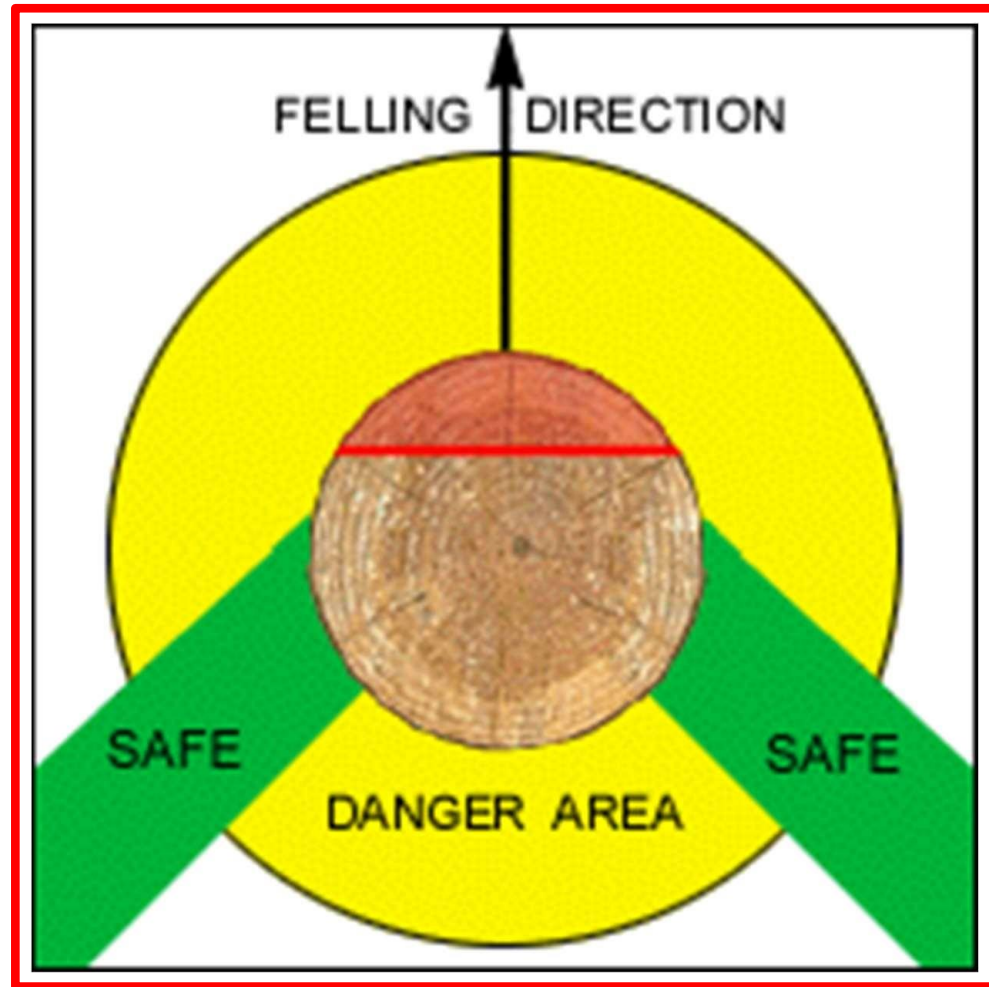
# Chain Saw Safety

- **For complete chain saw safety information, please refer to the operator safety manuals for your specific saws and for hands-on training provided by a dealer or other manufacturer qualified instructor.**



# Felling Operation

- Plan ahead
  - Look UP ↑
- Clear the area
- Escape Route
  - 45 degrees
- Make it safe



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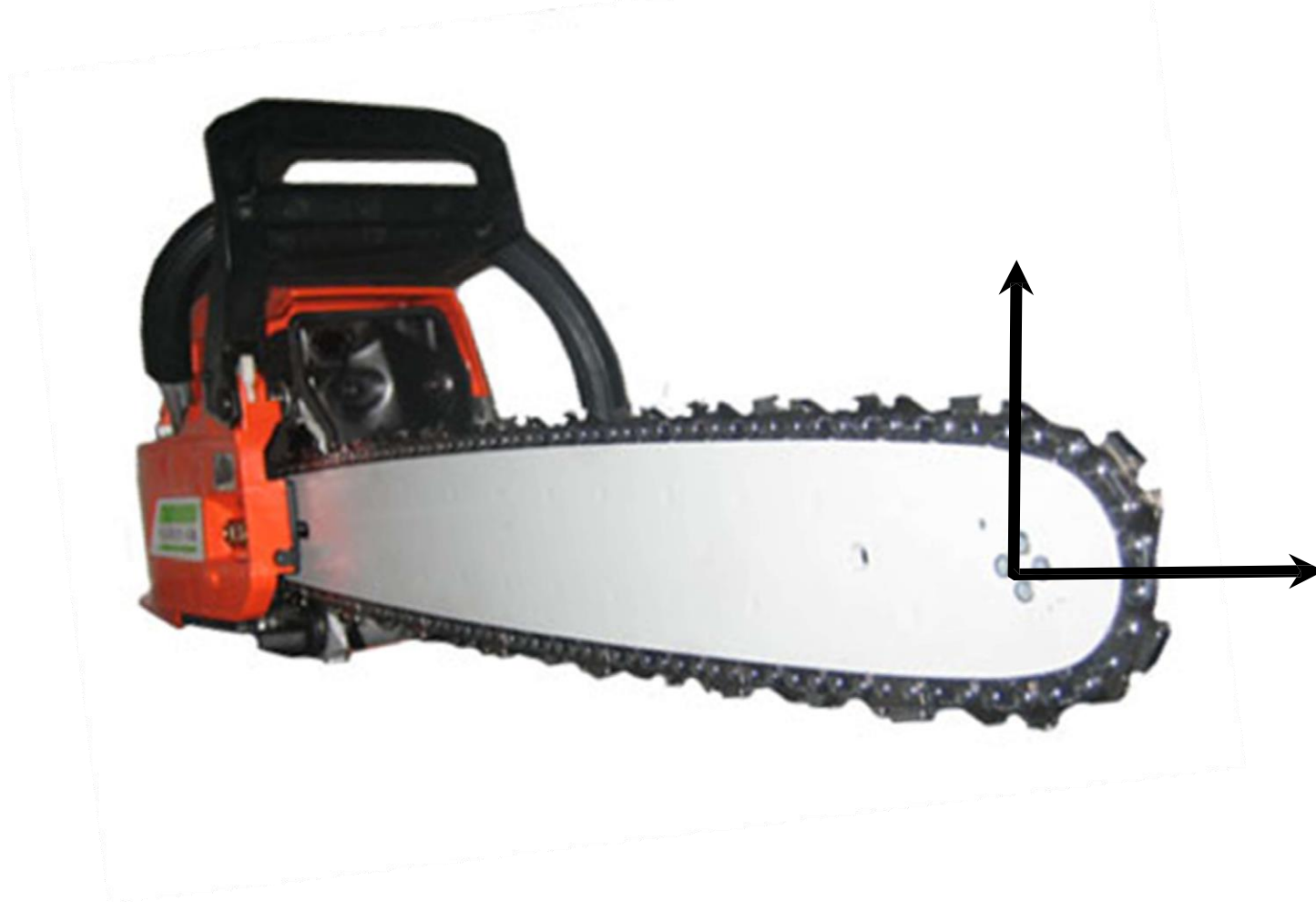


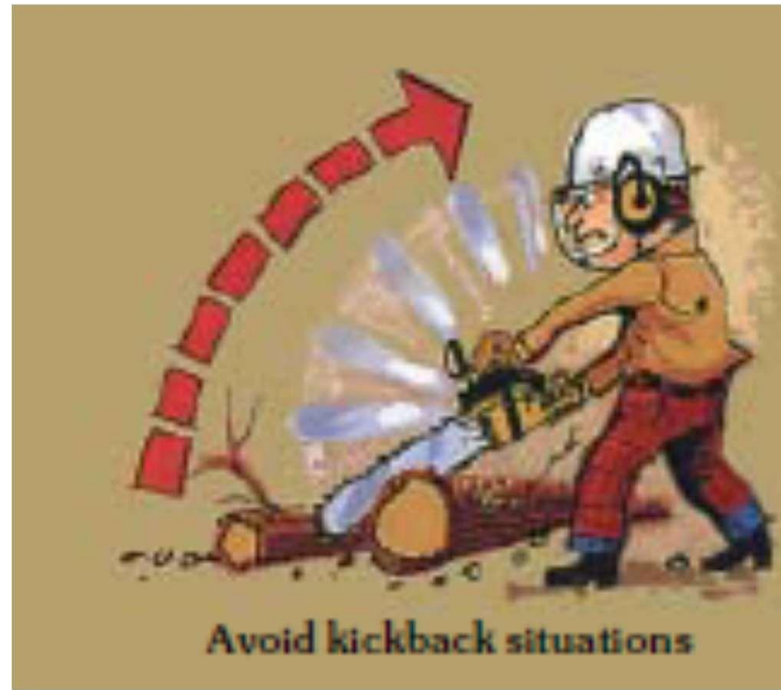
# Kickback

- Why does it occur?
  - Contact with Kickback zone
  - Pinching
- What happens when it does?
  - Injuries!!!

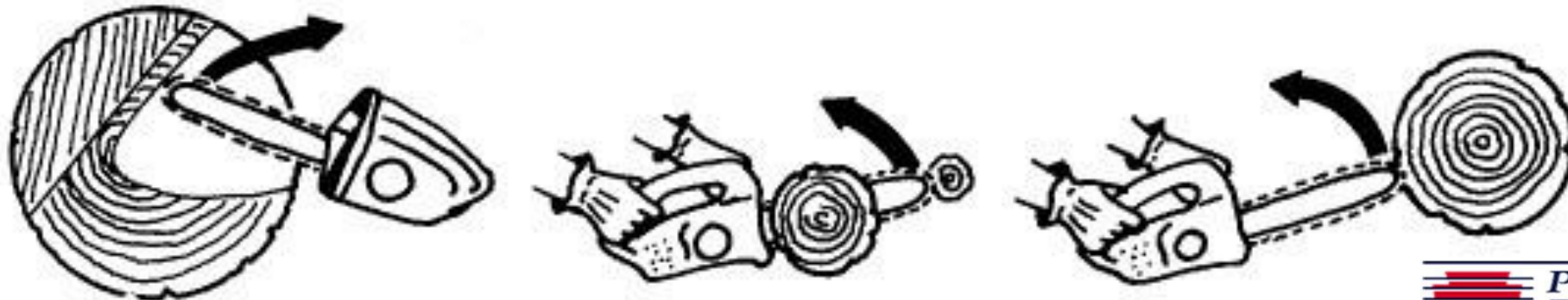


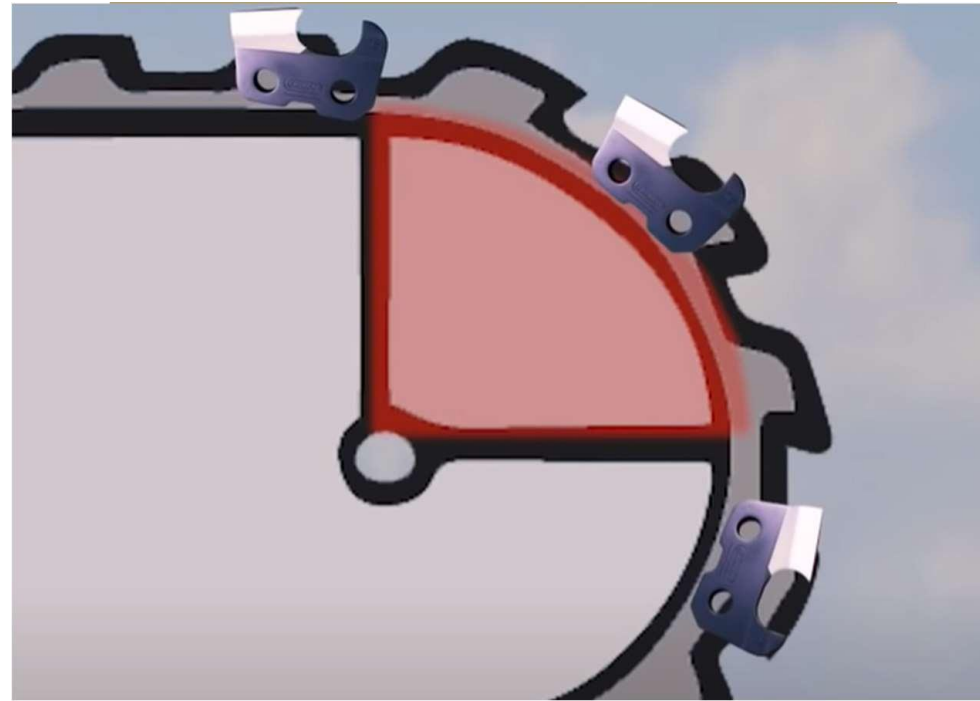
# Where is the kickback zone?



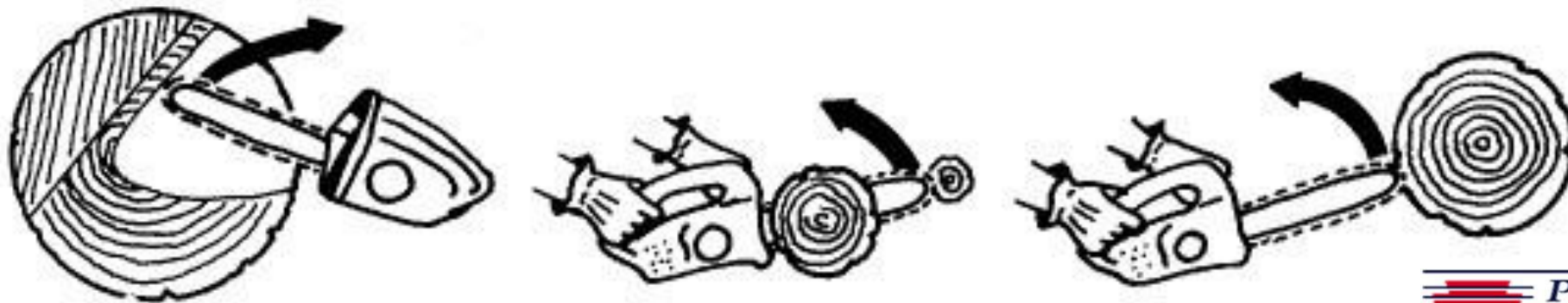


**Top Half of Bar Nose / chain comes into contact w/ resistance**



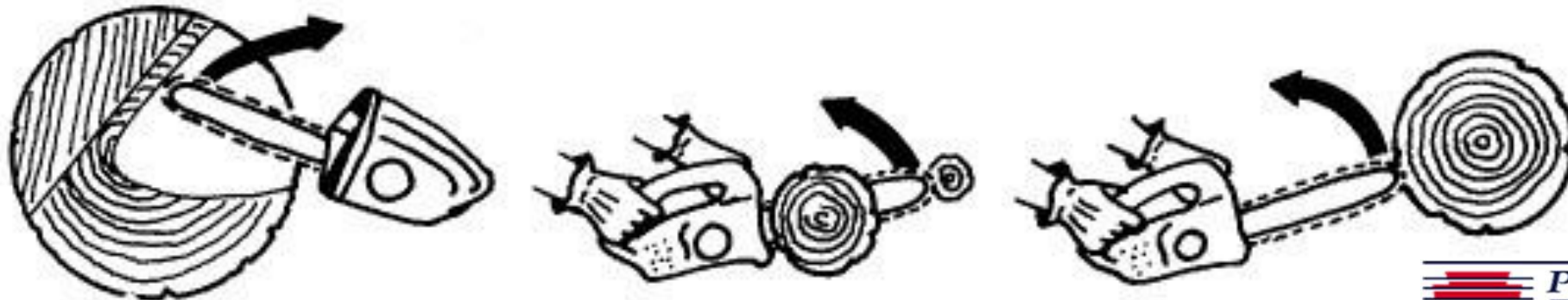


Top Half of Bar Nose / chain comes into contact w/ resistance





**Top Half of Bar Nose / chain comes into contact w/ resistance**





# Kickback Injury

## *Prevention & Reduction*

- **Prevention**

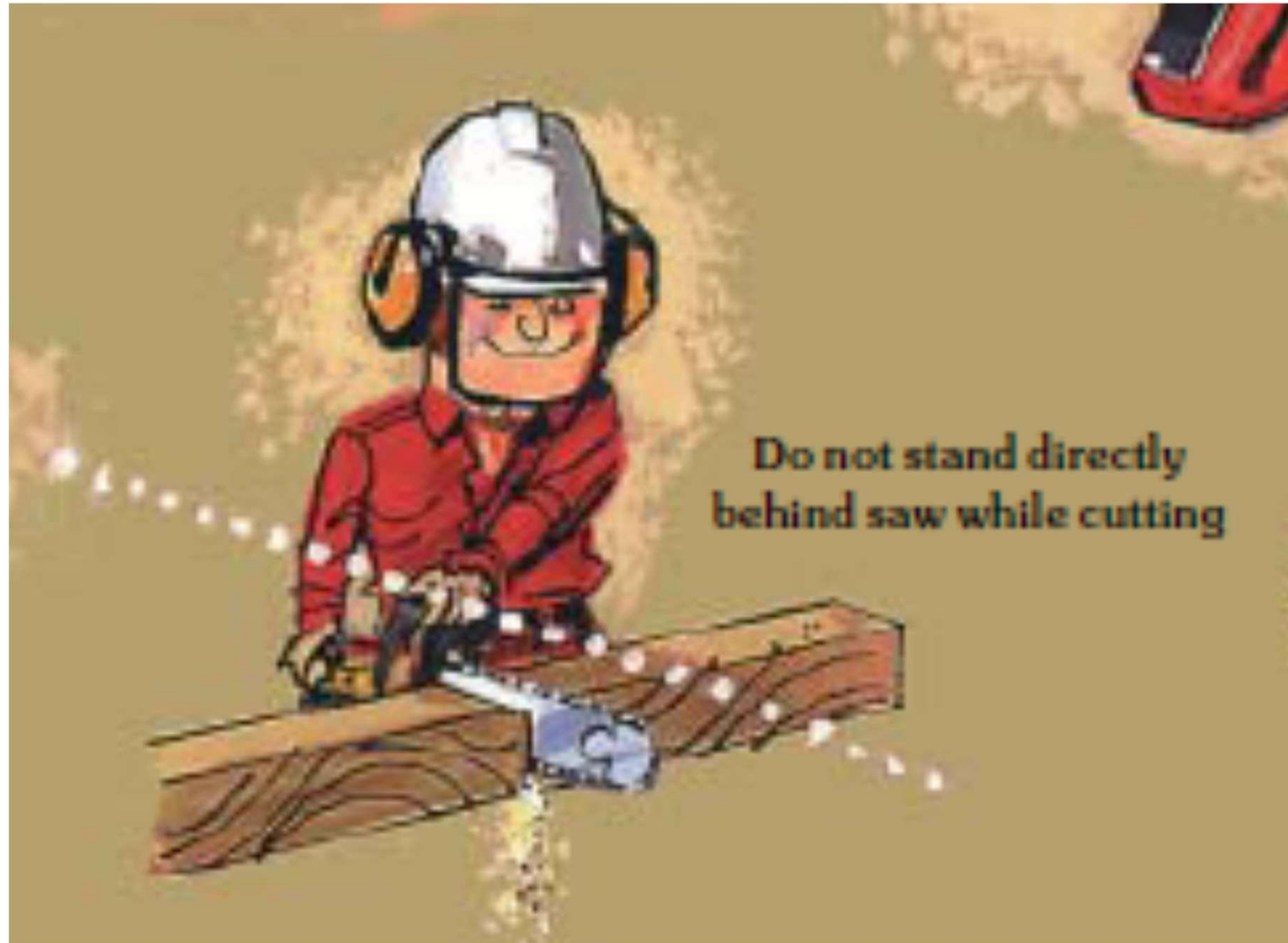
- Don't allow the bar nose to contact anything while cutting
- Don't cut w/ bar-nose
- Use bar-nose guard
- Use a low kickback chain / bar
- Nails and knots – look first
- Use wedges, when possible.
  - Don't let the chainsaw meet the wedge.

- **Severity Reduction**

- Body positioning
- Grip
- Saw w/ chain brake
- Maintain your saws
- PPE

# Body Positioning?

- **Where?**
  - Directly behind the cutting saw
    - OR
  - To the side



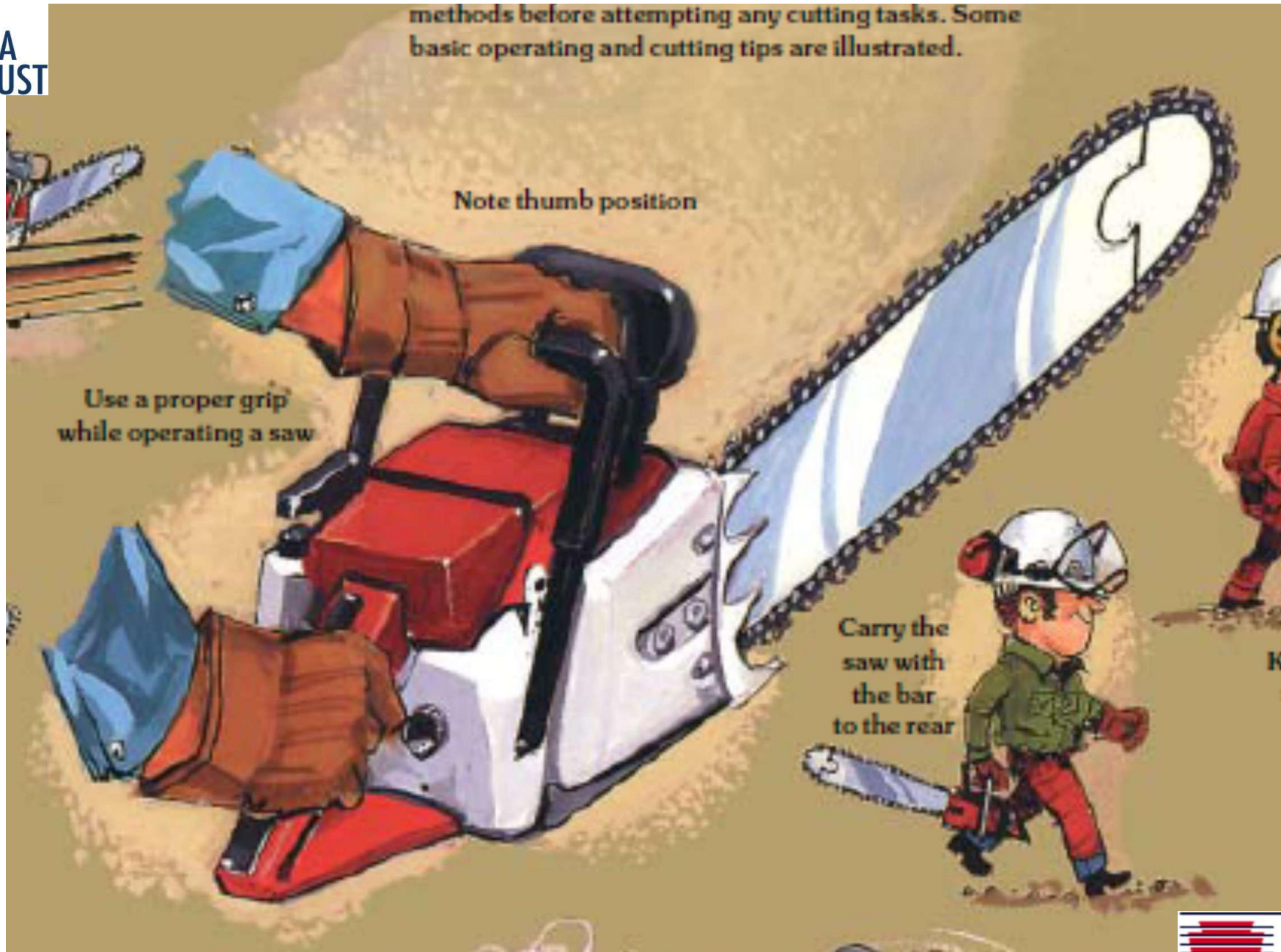




# Arm / Hand Positioning?

- **Where?**
  - Bent?
  - Straight?
  - 1 hand or 2?

methods before attempting any cutting tasks. Some basic operating and cutting tips are illustrated.







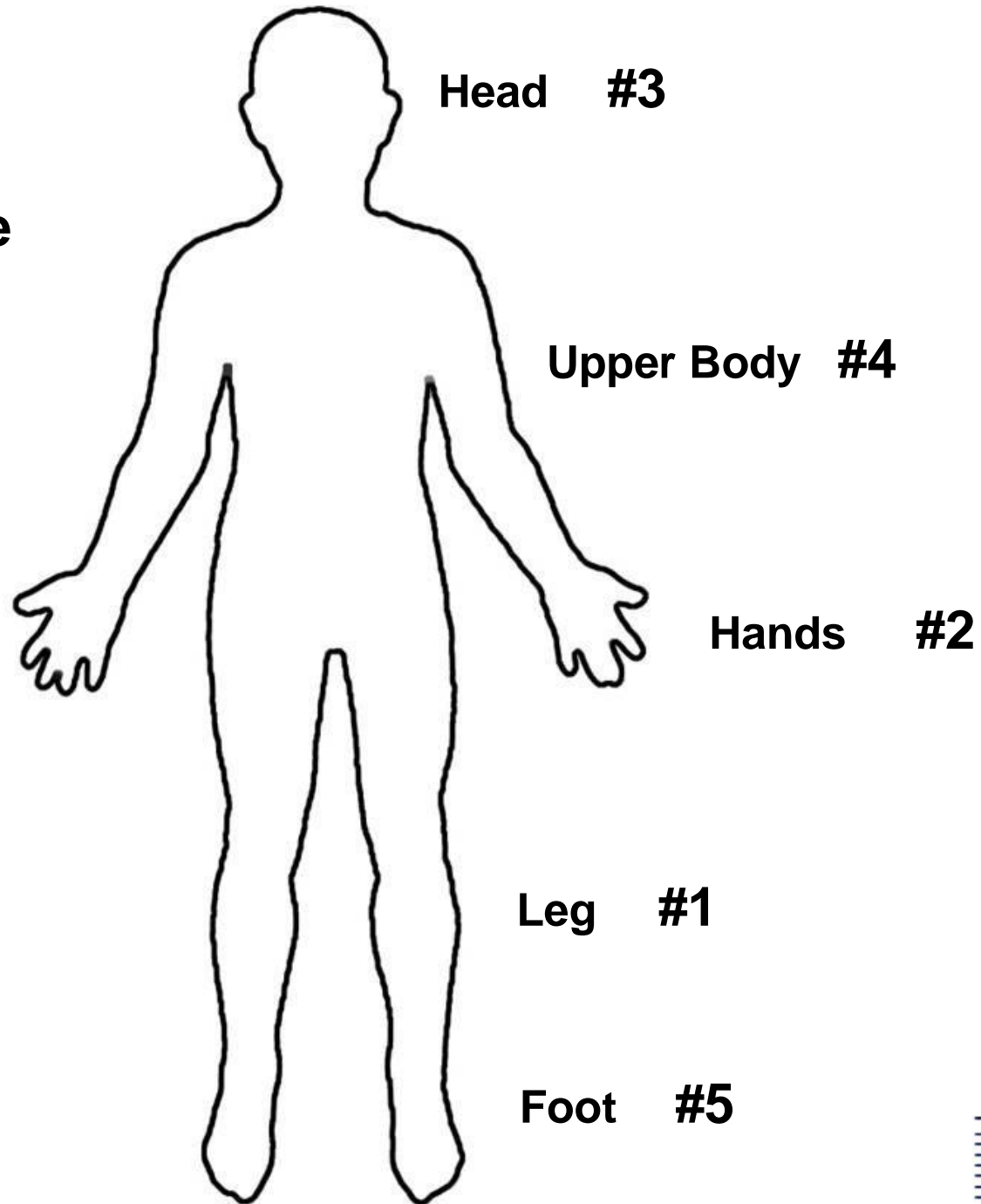


According to the  
US CPSC...

Most Common  
Body Parts  
Injured  
Ranking?

Average # of  
stitches from  
chain saw  
injury?

110







# PPE?

Primary Purpose? →





# R.O.P.S.



# R.O.P.S.

- To determine ROPS specific for your equipment, and how to best prevent rollovers, please refer to the machine specific operator safety manual for each piece of equipment.
- Also, dealers and manufacturers may be available to provide machine specific safety training on these topics.



09 21





# Types of ROPS

- Two-Post ROPS
- Four-Post ROPS
- ROPS with enclosed cabs



# R.O.P.S.

## Initial Facts:

- A 66-year-old male (the victim) was killed while mowing his farm land. He was driving a Case tractor model 1212 with a front-end loader and 4-foot rotary mower attachments. The tractor had a homemade canopy attached for sun protection but it was not intended to function as a Rollover Protective Structure (ROPS).
- Tracks in the field show that he had made several passes and had likely worked for about three hours when the incident occurred. It was about 1 p.m. when he began mowing along the edge of the woods that bordered the field. Although the field was relatively flat, the ground sloped slightly upward along a line of trees.
- As he drove along the tree line, the right rear tire fell in a sink hole causing the tractor to become unbalanced while on the incline. Marks in the grass show the tractor moved forward a few feet then flipped over and landed upside down.
- When he did not come home that evening, his wife called the sheriff's department and a search party was sent out at 1 a.m. The rescue squad found him about 4 a.m., crushed under the tractor. The county coroner was called and the victim was pronounced dead at the scene.

# R.O.P.S.

## **Equipment:**

- The tractor was a Case (David Brown) model 1212 which was manufactured during 1971-1975.
- A front-end loader attachment had been added to the tractor (this model was not originally equipped with this feature) and the victim used a 4-foot rotary mower attachment to mow the farmland.
- The tractor had a 4-cylinder diesel engine, a PTO horsepower of 65, and a weight of 6270 pounds (without the front-end loader attachment).
- It appeared to be in good condition for a tractor of this age. This model was not originally equipped with a Rollover Protective Structure (ROPS).
- The victim's tractor was equipped with a homemade canopy for shade purposes, although it was not intended to function as a ROPS.

# R.O.P.S.

- Causes?
  - What do you think?

### Investigation:

- On the day of the incident, the weather was warm and pleasant. The victim left his home that morning and made the 30 minute drive to the farm as he did several times each week since retiring. Neighbors living on the road near the victim's land reported that he passed by about 10 a.m.
- Upon arriving at the field, he attached the rotary mower to the tractor and proceeded to the field to mow the grass. **He was working alone that day as usual.** The land he owned was mostly hilly with a lot of wooded area; however, the field he mowed on the day of the incident was relatively flat and was bordered by woods. After arriving in the field he apparently spent some time cutting wood with a chainsaw he had brought with him. Tracks in the field indicated he then made several passes with the rotary mower. It was estimated to be about 1 p.m. when he began mowing along the edge of the woods that bordered the field. Although this field was relatively flat, the ground sloped slightly upward along the edge of the trees at approximately 15 degrees. Because of the tall grass and brush along the trees, it appeared that he did not normally mow as close to the woods as he did on that day. As he drove along the tree line with the bucket of the loader in the up position, the tractor's right rear tire fell in a sink hole about 12 inches in diameter that was covered by tall grass. The tractor became unbalanced while on the slight incline and began to tip over. Marks in the grass show that the tractor moved forward a few feet then flipped over and landed upside down.
- When he did not come home that evening, his wife called the sheriff's department and a search party was sent out at 1 a.m. At approximately 4:30 a.m., the rescue squad found him crushed under the tractor. When the tractor flipped upside down, the canopy collapsed under the vehicle. The victim had remained in the seat of the tractor so that he was crushed between the steering wheel and the canopy. The county coroner was called at 4:58 a.m. and arrived at the scene at 5:39; he pronounced the victim dead at 5:55 a.m.

# Investigation:

- Front-end Loader W/ a Mowing Deck
- Working Alone
- Mowing on an incline
- Tall Grass and Brush
- Front-end Loader in up position
- A Homemade Canopy instead of ROPS

# R.O.P.S.

- Prevention / Recommendations?
  - What do you think?

# R.O.P.S.

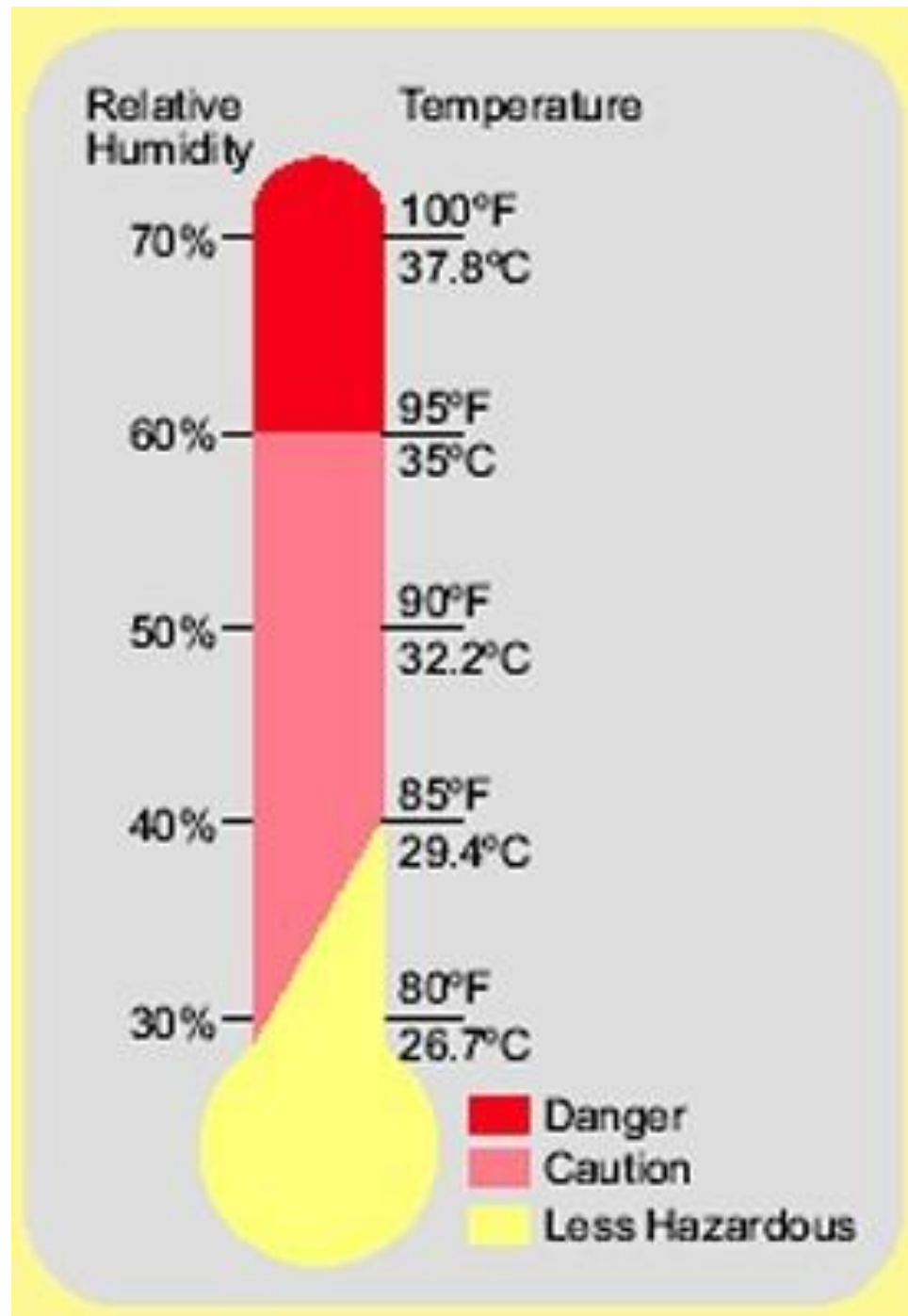
- **NIOSH Recommendations:**
  - **#1.** Older tractors should be retrofitted with a Rollover Protective Structure (ROPS) and seatbelts. **Why? Cost?**
  - **#2.** Front-end loaders should be kept in as low a position as possible; when lifted, they change the balance and handling properties of the tractor. **Why?**
  - #3.** Tractor operators should consider removing unnecessary attachments from the vehicle. **Why?**



# Cold & Heat Stress

- For complete information on recognizing and treating heat or cold stress, you should pursue certification through various agencies such as the Red Cross or the American Heart Association.
- If in doubt, regarding treatment, call 911 for emergency medical treatment.

**OSHA Heat  
Stress  
Equation  
High Temps  
+ High Humidity  
+ Physical Work  
= Heat Illness**



# OSHA Heat Stress Card

- Heat Exhaustion
- Heat Stroke
- Heat Stress Table

		Relative Humidity (%)												
		40	45	50	55	60	65	70	75	80	85	90	95	100
Air Temperature °F	110	136												
	108	130	137											
	106	124	130	137										
	104	119	124	131	137									
	102	114	119	124	130	137								
	100	109	114	118	124	129	136							
	98	105	109	113	117	123	128	134						
	96	101	104	108	112	116	121	126	132					
	94	97	100	103	106	110	114	119	124	129	135			
	92	94	96	99	101	105	108	112	116	121	126	131		
	90	91	93	95	97	100	103	106	109	113	117	122	127	132
	88	88	89	91	93	95	98	100	103	106	110	113	117	121
	86	85	87	88	89	91	93	95	97	100	102	105	108	112
84	83	84	85	86	88	89	90	92	94	96	98	100	103	
82	81	82	83	84	84	85	86	88	89	90	91	93	95	
80	80	80	81	81	82	82	83	84	84	85	86	86	87	

**Extreme Danger:** Heat stroke highly likely

**Danger:** Muscle cramps, and/or heat exhaustion likely

**Extreme caution:** Muscle cramps and/or heat exhaustion possible

**Caution:** Fatigue possible

# Heat Stress

- **Factors Leading to Heat Stress**
- **Symptoms of Heat Stroke and Exhaustion**
- **Preventing Heat Stress**
- **How to Treat Heat-Related Illness**



# Heat Stress

- **Factors Leading to Heat Stress**
  - High temperature and humidity, direct sun exposure, no breeze or wind
  - Heavy physical labor
  - No recent exposure to hot workplaces
  - Low liquid intake
  - Waterproof clothing



# Heat Stress

- **Heat Illness Symptoms**

- **Heat Exhaustion**

- Headache, dizziness, or fainting
    - Weakness and wet skin
    - Irritability or confusion
    - Thirst, nausea, or vomiting

- **Heat Stroke**

- May be confused, unable to think clearly, pass out, collapse, or have seizures (fits)
    - May stop sweating



# Heat Stress

- **How to Treat Heat-Related Illness**
  - **Call a supervisor for help or call 911.**
  - **Stay with them**
  - **Move them to a Shaded Area**
  - **Water and Ice**



# Heat Stress

- **Preventing Heat Stress**
  - Heat Illness Prevention Program
    - Modify Work Schedules
    - Training
  - Lots of Cool Water
  - Monitor Conditions





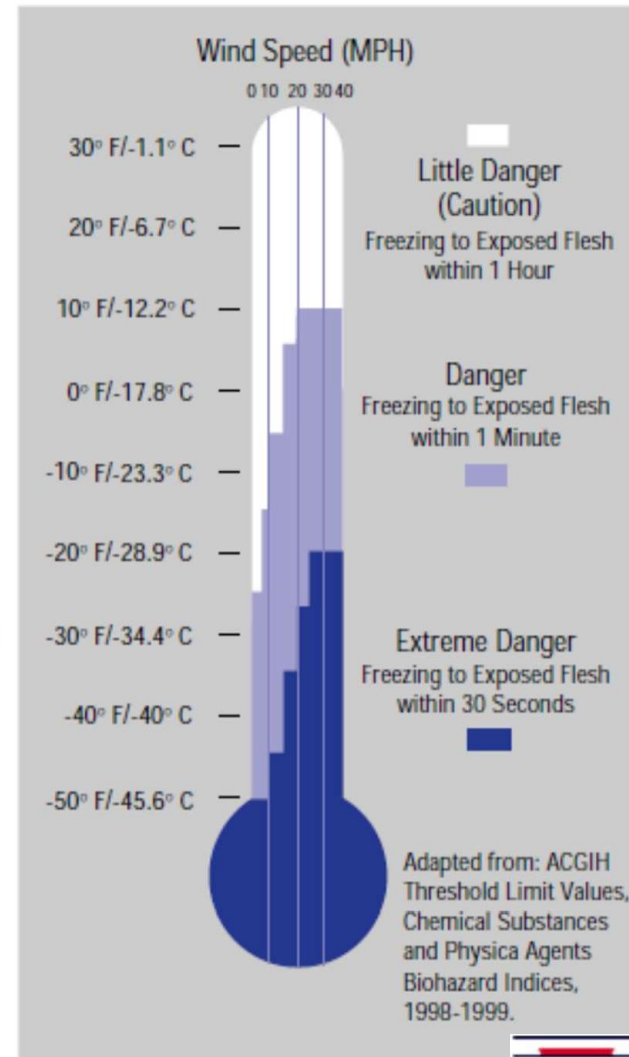
# OSHA's Cold Stress Equation

**Low Temps  
+ High Wind Speed  
+ Wetness  
= Injuries & Illness**

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result. Hypothermia can occur when *land temperatures* are above freezing or *water temperatures* are below 98.6°F/ 37°C. Cold-related illnesses can slowly overcome a person who has been chilled by low temperatures, brisk winds, or wet clothing.

## THE COLD STRESS EQUATION

LOW TEMPERATURE + WIND SPEED + WETNESS  
= INJURIES & ILLNESS



# Cold Stress

- **Frost Bite**
  - What happens to the body
  - What should be done



# Cold Stress

- **Hypothermia**
  - What happens to the body
  - What should be done



# Cold Stress

- **How to Protect Workers**
- **Workers are at increased risk when...**



# Grounds & Landscaping Safety Summary

## Chain Saws

- Plan ahead, know your equipment, PPE

## ROPS

- Use as required, seat belt or not

## Heat & Cold Stress

- Be smart, signs & symptoms, take care of yourself

*Thank you!*



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