AgriLIFE EXTENSION
Texas A&M System

CHAINSAW SAFETY

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In the past, chainsaws were primarily sold only to workers in the timber industry. Today, about three million chainsaws are sold in the United States each year in home and garden stores.

Since 1985, chainsaws have been equipped with special safety features, including kickback protection and chain brakes. However, chainsaws are still among the most dangerous power-driven tools available on the market. There were more than 28,500 chainsaw related injuries in 1999 according to the Consumer Products Safety Commission.

Facts about Chainsaw Injuries

- More than 28,500 chainsaw injuries occurred in 1999.
- Thirty-six percent of chainsaw accidents result in injuries to the legs and knees.
- The average chainsaw injury required 110 stitches.
- Medical costs for chainsaw injuries exceed $350 million per year.

Source: U.S. Consumer Products Safety Commission.

CHAINSAW ACCIDENTS

Kickback is the most serious risk of chainsaw operation. It occurs when the tip of the guide bar and chain contact an object, forcing the guide bar violently backward and upward. Kickbacks can occur in less than one-tenth of a second, causing severe head, face, neck, shoulder, and hand injuries.

Table 1. Chain-related Injuries in 1999

Location	Frequency
Head Area	2,686
Upper Body	2,452
Hand Area	10,200
Upper Leg, Knee, Lower Leg	10,310
Foot Area	1,872

Source: U.S. Consumer Product Safety Commission.

Chainsaw accidents also occur when the operator:

- Reaches across a moving chain
- Loses footing while using the chainsaw
- Loses control of the chainsaw while cutting at or above waist level
- Falls while carrying a running chainsaw
- Is struck by falling limbs or flying particles
- Is burned by hot chainsaw parts or fires

PURCHASING A CHAINSAW

A chainsaw is a dangerous tool, especially in the hands of an inexperienced operator. Choose a chainsaw sized according to the job, and one equipped with built-in safety features. Look for one with kickback protection, such as a guide bar tip guard to prevent you from cutting with the tip of the chainsaw. The chainsaw should also have:

- A clearly-marked ON/OFF switch
- Chain brake with a front hand guard
- Safety throttle
- Chain catcher (in case the chain brakes)
- Rear hand guard
- Anti-vibration system (including a cushioned handle)
- Exhaust system that directs fumes away from the operator and is equipped with a spark arrester to prevent fires
- Chain bar cover for transportation and storage
- Low-kickback-type chain

- Bumper guard to protect the motor housing
- Tool kit for corrective and preventative maintenance.

OPERATOR SAFETY

Using a chainsaw is physically demanding and requires concentration and attention to your surroundings. Learning how to start, transport, cut, and maintain a chainsaw is essential for personal safety. Wear the right personal protection equipment, check your surroundings, and anticipate what will happen when trees and limbs are cut down. Establish an escape route from falling timber. Maintain a sharp chain and kickback guard.

Personal Protective Equipment

More than 80 percent of all chainsaw accidents injure the hands, legs, knees and feet. Dress with the appropriate protection to significantly reduce the risk of injury. For maximum protection, wear cuff-less pants and long-sleeve shirts, steel-toe boots with non-slip soles, fitted gloves, a hardhat, eye protection, and hearing protection. Safety chaps made of ballistic nylon or Kevlar are designed to slow or stop the chain if it strikes your leg.

Starting a Chainsaw

Many accidents occur from unsafe starting practices. To start a chainsaw safely, place the chainsaw on a level surface. Make sure the chain is clear of debris. Apply the chain brake. Hold the rear handle down with the right foot and secure the front handle with the left hand. Pull the starter core with the right hand.

Never "drop-start" a chainsaw (i.e., hold onto the starter cord with the right hand while forcing the chainsaw towards the ground). This is extremely dangerous to you and to others in the vicinity.

Maintenance

One aspect of chainsaw safety is to check that it is in good condition. Before and after using the chainsaw, check the saw for loose, damaged, or broken parts. Check the chain bar for dents, warps, and other damage. Make sure the chain is sharp and set at the proper tension, and check the condition of guards and shields. Test the chain brake periodically, and make sure the chain does not move at idle speed.

Preparation for Work

Before starting work, remove any broken or dead limbs that could fall from the tree. Watch for trees with tension that could spring when cut. Clear any underbrush from around the tree that might be struck by the chainsaw and cause it to kick back. Make sure there are no bystanders, animals, cars, buildings, or power lines that may be struck by the falling tree. Clear an escape path 45 degrees to the rear of the tree fall line. Locate the best direction for the tree to fall, and plan your cut accordingly.

Rain, snow, or high wind conditions increase the risk of accidents. Rain results in poor footing. Snow may accumulate in the trees and make it difficult to locate the tree's center of gravity. Trees with thick canopies can be redirected by high winds.

Felling, Limbing and Bucking

Conventional

Humboldt

Open Face

Many chainsaw accidents can be avoided using safe felling, limbing, and bucking techniques. *Felling* is the act of cutting down trees. *Limbing* is the act of removing limbs from the main trunk. *Bucking* is the act of cutting felled trees into smaller pieces for removal and transport.

Small trees less than six inches caliper (diameter) may be cut all the way through with one cut. However, larger trees should be cut using a front-cut and back-cut to establish a notch and hinge to control the tree's line of fall.

Three common cutting patterns, *Conventional, Humboldt, and open face,* are shown here. These techniques will greatly reduce the need to stay near the tree to physically guide the direction of the fall. Do not try to cut down a tree with caliper greater than the length of the chainsaw guide bar. This will increase the risk of kickback injury.

Most accidents occur during limbing operations. A small chainsaw is generally easier to maneuver through thick branches. Long chainsaws increase fatigue and are more likely to contact other branches, resulting in kickbacks. Stand at an angle to the limbs you are cutting, so that if the chainsaw suddenly kicks back or cuts through a limb, the chainsaw will not strike you.

Plan each cut. Beware of shifts in the main trunk that will result from cutting weight-bearing limbs. Clear the area periodically of cut limbs so that you don't accidentally step on cut limbs and lose your balance during a cut.

Maintain two hands on the chainsaw at all times. Extend the left arm while gripping the front handle. If the chainsaw does kick back, it will kick up over your shoulder instead of directly at you.

Never attempt to cut a limb above mid-chest level. In this position, your strength is limited and you are more likely to lose balance if the chainsaw kicks back. Instead, use a sturdy ladder to reach high limbs.

Bucking or cutting the truck into smaller lengths is relatively safe compared to felling and limbing. However, always maintain control of the chainsaw with both hands and with firm footing.

Watch for rolling logs and kickback. Remember not to use the front one-forth of the chainsaw for cutting. Chainsaw bar tip guards will prevent this from happening.

OTHER SAFETY PRECAUTIONS

- Read the user's manual carefully.
- Walk with the blade behind you.
- Apply the chain brake when the chainsaw is not cutting.
- Never leave a running chainsaw unattended.
- Change or sharpen dull chains before use.
- Install the chainsaw bar guard cover during transportation and storage.
- Do not use a chainsaw above shoulder height or when off balance.
- Ensure that others are at least two full chainsaw lengths away from the operator.
- Never add fuel to a hot chainsaw.
- Adjust the chain tension before each use to prevent the chain from coming off during operation.

KICKBACK PREVENTION

- Maintain a firm, two-handed grip on the saw.
- Grasp the forward handle with the left hand, palm down.
- Wrap your fingers around the handle bar, and keep it between your index finger and thumb.
- Firmly grasp the rear handle with the right hand.
- Never stand directly behind a cut. Stand on one side of the cut.
- Saw only with the bottom part of the chain using the part close to the bumper. Never use the tip or nose of the chain to cut.
- Avoid cutting above mid-chest level.

CHILD CHAINSAW RESTRICTIONS

The U.S. Department of Labor (29 CFR 570 Subpart E-1) forbids children under 16 from operating, adjusting, or cleaning a chainsaw or any other power-driven saw. It also forbids children under 16 from working in operations related to felling, bucking, skidding, or loading and unloading timber with a butt diameter more than six inches.