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Program Guide: Smoke Detectors Can Save Your Life

Larry R. Piercy
University of Kentucky

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PROGRAM GUIDE

SMOKE DETECTORS CAN SAVE YOUR LIFE¹

Smoke detectors have the potential of greatly reducing the number of deaths resulting from home fires and at a very reasonable cost to the consumer. Yet some homes still do not have smoke detectors installed or do not have a sufficient number to provide a minimum level of protection.

A discussion outline and suggested teaching activities are provided to assist you in presenting a program on smoke detectors.

PROGRAM OBJECTIVES:

Upon completion of this program the audience will be able to:

1. Identify the types of smoke detectors and the power sources available.
2. Locate and install smoke detectors in their home to provide maximum protection.

¹Prepared by Larry R. Piercy, Extension Safety Specialist, Biosystems and Agricultural Engineering Department, College of Agriculture Cooperative Extension Service, University of Kentucky, Lexington, KY 40546-0276.

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3. Identify maintenance and test procedures necessary to assure proper operation.
4. Recognize the important elements of a home fire escape plan.

SUGGESTED TEACHING ACTIVITIES & MATERIALS:

1. Have several types of smoke detectors available for the group to examine.
2. Emphasize the importance of placing a smoke detector outside of each bedroom area and on every level of the home.
3. Identify groups in the community who may not have smoke detectors and discuss ways of providing detectors to all homes in the community.
4. If time is available also use the Program Guide "A Home Fire Escape Plan" activity sheet for identifying fire escape routes.
5. The following materials and visual aids are available from Larry Piercy, Biosystems and Agricultural Engineering Department, University of Kentucky, Lexington, KY 40546-0276.
 - a. The Leader's Program Guide "A Home Fire Escape Plan"
 - b. The one page "Fire Escape Planning Guide" for individuals use in developing a home escape plan.

**SMOKE DETECTORS CAN SAVE YOUR LIFE!
DISCUSSION OUTLINE**

LEADER NOTES:

- I. Smoke detectors have the potential for reducing death losses in home fires by 50%.
 - A. The majority of the fatal home fires occur at night while the family is asleep with nearly 40% occurring between midnight and 4:00 a.m.
 - B. According to NFPA the largest single source of residential fires is the misuse of smoking materials causing ignition of upholstered furniture and bedding. Other common sources are fuel fired appliances, open flames and electrical equipment.
 - C. Smoke and toxic gases are the largest killers in home fires.

- D. Smoke detectors sense particles of soot, tar, or vapors given off by fire.
- E. If strategically located and properly maintained, they will sound an alarm to alert your family to escape.

II. Types of Smoke Detectors

A. **Ionization** - uses a small radioactive source to ionize the air in the detector chamber. Particles of combustion entering the chamber interfere with the flow of electrical current in the ionized air and an alarm is sounded.

1. Detects invisible smoke and particles of combustion.
2. Senses an open flaming fire the fastest.

B. **Photoelectric** - uses a light source and photoelectric cell. When large visible smoke particles enter the chamber, the light beam is interrupted and reflected by the smoke and the alarm is sounded.

1. Detects large visible smoke particles the best.
2. Senses a smoky and smoldering fire the fastest.

C. Which type is best?

Both types will provide adequate warning if they are properly installed and maintained.

III. Battery vs. House Current as a Power Source

A. Battery Powered

1. Provides continuous protection as long as battery is good.
2. Conventional batteries need to be replaced yearly. New lithium batteries will last up to 6 years.
3. UL approved units give a chirping signal for 4 to 7 days before a battery fails. Newer units will give up to a 30 day warning. During this time it would still sound an alarm for a fire.

4. Suggest buying replacement battery annually on a holiday or birthday unless a lithium battery is used.

B. AC House Current Powered

1. Provides continuous protection unless the household electrical power is interrupted.
2. Wires directly into house wiring system.

C. Combination, Battery and House Current

Some models are powered by house current and have a backup battery for those periods when the house current fails.

IV. Look for the Seal of Approval

- A. Buy only units with Underwriters' Laboratory (UL) or Factory Mutual (FM) seal of approval.
- B. A seal assures quality, safety and rated sensitivity requirements.

V. Locating Smoke Detectors

- A. For a minimum recommended level of protection, locate a detector:
 1. In the hallway between each sleeping area and the rest of the house.
 2. On every level of the home or the enclosed portion of the stairway leading from one level to the next. (According to the National Bureau of Standards, a single smoke detector in the sleeping area provided over 3 minutes to escape through the normal exit in over 35% of the test fires. With a smoke detector on every floor level, a 3 minute escape time was provided in 89% of the test fires. That is a significant life saving protection at a reasonable cost.
- B. Increase protection by adding additional detectors in each bedroom and using both types of detectors in the home.
 1. Use an ionization detector outside sleeping area for quick response to fast spreading flaming fires.

2. Use photoelectric detectors in living room, family room or bedrooms where smoking materials could cause smoldering, smoky furniture or bedding fires.
- C. Avoid locating detectors in kitchens, bathrooms, and workshops, where grease, humidity, and dust may cause malfunction and nuisance alarms. Extreme cold locations like the garage or attic may affect the battery operated models. Check your owners' manual for information on your detector.

VI. Smoke Detector Installation

- A. Preferred location - on ceiling near center of hall or room.
- B. Optional location - on wall located 6 - 12 inches below ceiling.
- C. Locations to avoid:
 1. Dead air space where wall and ceiling meet.
 2. Poorly insulated wall or ceiling - A cold surface may set up an invisible thermal barrier to the smoke. (In this case, locate the detector on an interior wall.)
 3. Drafty locations within 3 feet of air registers or open windows.
- D. In mobile homes, mount detector on interior walls.

VII. Smoke Detector Maintenance

- A. Replace conventional batteries yearly or whenever the weak battery signal sounds. Lithium batteries should last up to 6 years.
- B. Clean with vacuum twice a year. (Check owner's manual for further instructions.)
- C. UL approved detectors should have an average life of 15-20 years. Thus, half the detectors will fail before that time.
- D. Test your detectors once a month or upon returning home after being gone for more than a few days. Some have a test button, but check the owner's manual to determine if it checks the sensitivity or simply the horn/battery circuit. Some newer units can be checked with a light beam. To be safe, check with smoke.

VIII. Special Features Presently Available

(First priority should be minimum level of protection, then consider special features.)

- A. Combination of an ionization and photoelectric system in the same detector unit.
- B. An escape light which comes on when the alarm sounds. (An additional battery is required.)
- C. Inter-connected systems where an alarm from one detector sounds all detectors in the system.
- D. Systems which combine smoke detection and home security.
- E. Systems using high intensity strobe lights for the hearing impaired.

IX. Other Types of Detectors

- A. Heat detectors sense temperature or temperature change and must be located near the source of the fire.
 - 1. Should not be relied upon as the primary life protection system in the home.
 - 2. Can be used in areas not recommended for smoke detectors such as kitchen, attics, workshops, and garages. (According to the National Bureau of Standards, a heat detector in every room only provided a warning for the needed 3 minute escape time in 11% of the test fires.)
- B. Gas Detector Alarms
 - 1. Senses combustible gases such as L.P. gas and natural gas and alerts family of a potential fire hazard.
 - 2. Locate gas detectors according to the type of hazard. Near the floor for L.P. gas which is heavier than air and near the ceiling for natural gas which is lighter than air.
 - 3. Only consider after an adequate system of smoke detectors has been installed.
- C. Carbon Monoxide Alarms
 - 1. Detects deadly carbon monoxide (CO) gas.

2. Earlier models were overly sensitive causing false alarms.
- X. Remember this 4-Point Plan
- A. **Buy smoke detectors** for each sleeping area and every level of the home.
 - B. **Install them properly** - the ceiling mount is preferred but the wall mount is an optional location.
 - C. **Maintain them regularly** - test monthly, clean every 6 months and replace batteries annually. Consider use of long life Lithium batteries.
 - D. **Have an escape plan** so that you can quickly exit the home when your alarm sounds.
- XI. Escape Planning (If you are also using the "Home Fire Escape Plan", refer to it at this point.)
- A. Smoke detectors only alert you; every home needs a plan for escape in case of fire.
 - B. Key factors in escape:
 1. Know the sound of your alarm and what to do when it sounds.
 2. Plan an exit and alternate exit from each area where a family member might be trapped by smoke or flames.
 3. Write the plan down and practice it periodically.
 4. Practice crawling to safety and staying under the layer of smoke and toxic gases.
 5. In case of a fire, always test the door and if it's hot, use the alternate exit.
 6. When the alarm sounds, immediately leave the house and go to a pre-arranged meeting place. A tree, street light or neighbor's house can serve as a meeting place.
 7. **NEVER RE-ENTER A BURNING BUILDING!!**