

Steps to Healthier Homes

- Start with People
- House as a System
- Keep It:
 - Dry
 - Pest-Free
 - Safe**
 - Maintained
- Making it Work
 - Clean
 - Ventilated
 - Contaminant-Free



National Center for Healthy Housing
Healthy Homes Training Center

1

Version 2.2

April 23, 2009

These are steps to reduce household hazards. People are not born knowing that they must brush their teeth to prevent decay, they must learn it. So with household hazards, they must learn how to take care of themselves. Occupants know things about the building and themselves that can be learned nowhere else. Start with the people.

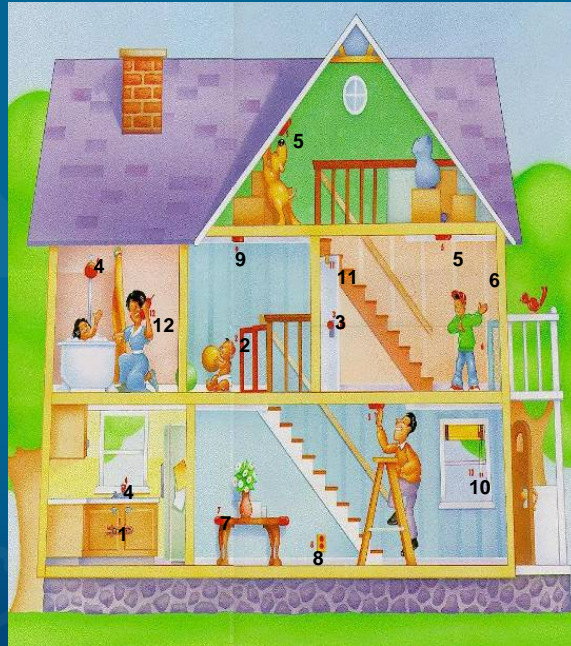
The second step is to keep the household in a certain condition:

- limit moisture related problems,
- limit dust and allergens,
- limit pest borne disease,
- provide local exhaust ventilation and general dilution ventilation to control unavoidable air contaminants,
- provide a comfortable space by limiting hazards like slips, falls, electric shock, drowning and poisons.

Third, limit sources of contaminants like lead, asbestos, combustion fumes, VOCs (Volatile organic compounds) and radon.

Fourth, maintain the house so it continues to provide dry, clean, comfortable and safe conditions.

Keep it Safe: There are many ways to be injured in the home



National Center for Healthy Housing
Healthy Homes Training Center

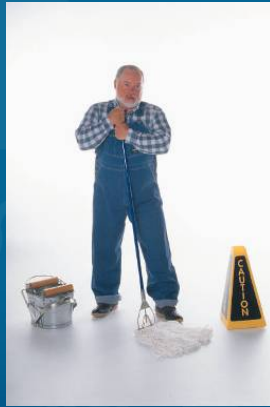
2

There are many possible ways to be injured in a house. There are twelve issues illustrated in this section of a house. ^[1]

1. Safety gates help prevent falls down stairs and to keep children away from dangerous areas.
2. Safety latches and locks for cabinets and drawers in kitchens, bathrooms, and other areas help prevent poisonings and other injuries.
3. Door knob covers and door locks help prevent children from entering rooms and other areas with possible dangers.
4. Use anti-scald devices for faucets and shower heads and set the water heater temperature to 120 degrees.
5. Place smoke detectors on every level of the home and near bedrooms to alert residents to fires.
6. Window guards and safety netting help prevent falls from windows, balconies, decks, and landings.
7. Corner and edge bumpers help prevent injuries from falls against sharp edges of furniture and fireplaces.
8. Outlet covers and outlet plates help prevent electrocution.
9. Carbon monoxide (CO) alarm outside bedrooms helps prevent CO poisoning.
10. Cut window blind cords. Use safety tassels and inner cord stops to help prevent children from strangling in blind cord loops.
11. Door stops and door holders help prevent injuries to fingers and hands.
12. Cordless phones make it easier to continuously watch young children, especially when they're in bathtubs, swimming pools, or other potentially dangerous areas.

Are Injuries Accidents?

Injury is the leading cause of death and disability among children and young adults [2]



Accidents are events that happen completely by chance, with no planning or deliberate intent. Injuries are preventable: they do not occur at random.



National Center for Healthy Housing
Healthy Homes Training Center

The key point to remember is that injuries are preventable!

Safety-Related Housing Issues

- Holes big enough to trip on
 - 1.0% of homes have holes in floors
 - 2.5% in mobile homes
 - 2.7% for residents below poverty level
- Electrical Wiring
 - 1.0% have exposed wiring
 - 1,3% have rooms without electric outlets
 - 9.1% have blown fuses or breakers in last 3 months

From American Housing Survey – 2007

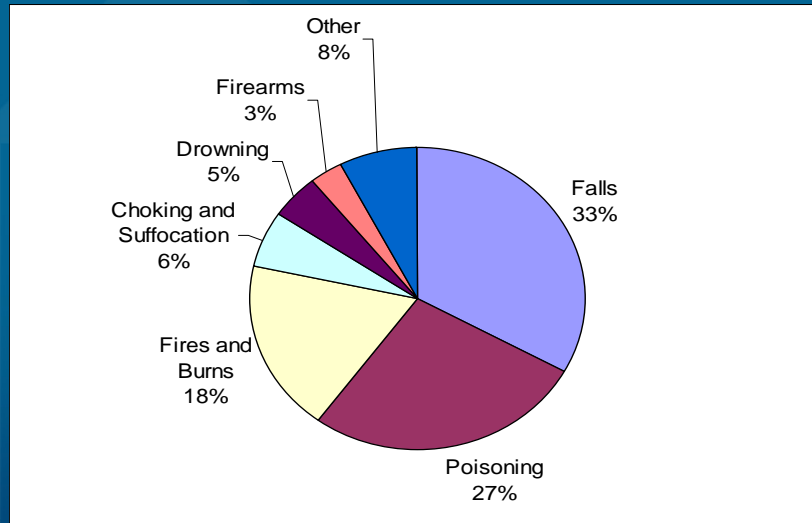


National Center for Healthy Housing
Healthy Homes Training Center

4

Basic Stats from 2007 American Housing Survey. See Overview Module for more information.

What are the most common causes of home injury deaths?



National Center for Healthy Housing
Healthy Homes Training Center

5

Here is a graph showing the most common causes of home injury deaths. As you can see falls, fires/burns, and poisonings are the top three causes of home injury deaths. Falls account for 33% of all deaths, poisoning 27%, and fires 18%. [3]

Which age groups are most susceptible?

Falls are leading cause of nonfatal home injury for children from birth through 14 and for older population.



Adults 80+ years of age are at **20** times higher risk for death from injury than younger individuals.

The highest rate of injury death for infants is from **choking and suffocation.**



Highest rate of injury death for 1-14 year olds is **fires and burns.**



National Center for Healthy Housing
Healthy Homes Training Center

6

Children and older adults (70 and above) tend to be the most susceptible groups for home injuries.

Adults 80+ years of age are at 20 times higher risk of death due to injury (e.g. falls) than younger individuals. When the elderly do survive a fall, they take longer to recover and often do not fully recover.

However, falls are leading cause of nonfatal home injury for children from birth through 14 and for older population. ^[4]

The highest rate of injury death for 1-14 year olds is fires and burns.

For infants, the highest rate of injury death is choking and suffocation.

Where do kids play?



National Center for Healthy Housing
Healthy Homes Training Center

7

Children on trampoline.

So many children are injured on trampolines that many school districts can no longer get insurance for them. In this slide there are a number of potential problems.

By covering the springs, children are protected from falls in which limbs become caught in the springs.

An open dug well is an attractive nuisance for children.



National Center for Healthy Housing
Healthy Homes Training Center

8

Irresistible nuisances.

In this yard, a wheel barrow is a tempting, easily tipped, unofficial jungle gym. The lumber piled near the wall presents trip, splinter and nail puncture hazards.

What are better storage options for the wheelbarrow and wood?

What do they land on?



National Center for Healthy Housing
Healthy Homes Training Center

9

Soft materials under playground equipment.

But note the potential for moisture and rodent problems with the materials so close to the exterior wall.



Sharp-edged bolts protruding from swing set.

Protruding hardware are cut hazards and can also catch in clothing, resulting in falls.

Exposed concrete reinforcing bar and barbed wire are other common puncture and cut hazards found in outdoor play areas.

Window Safety Guard



Safety Glass?



National Center for Healthy Housing
Healthy Homes Training Center

Hand rails where needed?



National Center for Healthy Housing
Healthy Homes Training Center

12

Handrails are important safety aids in tubs and on stairs, especially for elderly.

Accessibility ramps are also important.

Poisoning



- 82% of households keep medicines in unlocked drawers or cabinets.

- 69% of homes with young children store household chemicals in unlocked areas.



National Center for Healthy Housing
Healthy Homes Training Center

13

Here are some more statistics.^[5]



National Center for Healthy Housing
Healthy Homes Training Center

14

Provide secure storage for hazardous products and cleaning supplies.

General purpose cleaners, bleaches, and drain cleaners are among materials commonly used in kitchens that are acutely toxic if ingested or, in the case of chlorine bleach, if mixed with the wrong chemicals.

In this slide, many hazardous products are stored on open shelving, low enough for children to reach. Combining some of these products, like chlorine bleach and window cleaner, produces chlorine gas.

Labels

- Food, Drugs and Cosmetics
 - Food and Drug Administration
- Pesticides
 - Environmental Protection Agency
- Other Products Containing Hazardous Substances
 - Consumer Products Safety Commission (CPSC)
- Material Safety Data Sheets (MSDS)
 - Occupational Safety and Health Administration



National Center for Healthy Housing
Healthy Homes Training Center

15

Three agencies regulate labels for consumer products that may contain hazardous substances.

Materials safety data sheets (MSDSs) are not labels. They are separate documents describing the potential hazards to workers. They are required by the Occupational Safety and Health Administration for hazardous chemicals. Some consumer product manufacturers make MSDS available to the public.



What's under the sink?

Warning, Caution,
Danger



National Center for Healthy Housing
Healthy Homes Training Center

16

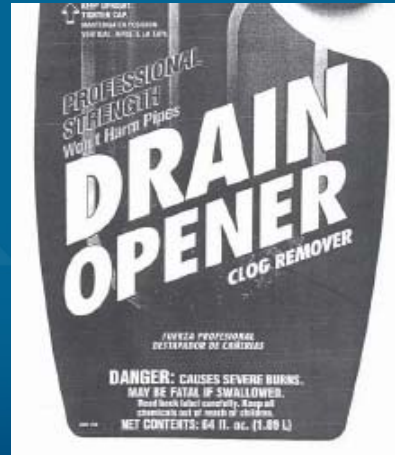
Do all cleaning product labels have hazard warnings? No, not unless they involve a potential specific hazard. All products are governed by the Federal Hazardous Substances Act that was passed in 1960. This covers household cleaning products that are expected to be stored in the home or garage, but specifically excludes food, drugs and pesticides. These are covered by other legislation. The signal words ^[6]: **Caution, Warning, Danger** must appear on the main panel of the label with the specific hazard following. Additional information such as "Keep out of reach of Children" is also required.

What products typically have the "Caution" label? Most automatic dishwashing and laundry detergents. Common warnings are: ***Eye Irritant, Skin Irritant, Harmful if Swallowed***. These generally are not expected to cause permanent damage, but an inflammation of the affected area might occur. Caution or Warning also appears on products that are flammable or apt to explode if heated.

What products are likely to have Danger or Poison on the label? Oven cleaners, rust cleaners, clogged-drain openers, or highly flammable products. **Poison** is rarely used, but household lye, antifreeze and some car-care products stored around the house may have this label.

CPSC Principal Display Panel

- Signal word
 - CAUTION
 - WARNING
 - DANGER
 - POISON
- Affirmative statement of principal hazard
 - ex: HARMFUL IF SWALLOWED, FLAMMABLE, IRRITANT, CORROSIVE
- Statement to read other cautions on another panel if all labeling is not on Principal Display Panel



National Center for Healthy Housing
Healthy Homes Training Center

17

The Federal Hazardous Substances Act regulates all consumer products other than:

- Foods, drugs, dietary supplements and cosmetics (regulated by FDA)
- Pesticides (fungicide, insecticides, herbicides, rodenticides, etc) (regulated by EPA)

See www.cpsc.gov/BUSINFO/regsumfhsa.pdf and www.cpsc.gov/BUSINFO/pppa/pppa09.pdf

The Consumer Product Safety Commission (CPSC) requires consumer products containing hazardous substances to have:

- Principal Display Panel containing:
 - o Signal word – CAUTION is least dangerous, POISON is most dangerous
 - o Affirmative Statement of Principal Hazard
 - o If all labeling not on principal display panel, then read other cautions on another panel.
- Other Label Requirements
 - o Name and place of business of the manufacturer, packer, distributor or seller
 - o Common or usual name or chemical name
 - o Precautionary measures to follow
 - o Instructions for first aid treatment when appropriate
 - o Instructions for handling and storage
 - o “Keep out of the reach of children” or its practical equivalent
 - o Special labeling for certain chemicals
 - Charcoal
 - Art materials
 - Additional items (fireworks, etc)

Danger

“Danger” Signal Word Required if:

- **Highly Toxic**
- **Corrosive**
- **Extremely Flammable**



National Center for Healthy Housing
Healthy Homes Training Center

18

www.cpsc.gov/BUSINFO/regsumfhsa.pdf and www.cpsc.gov/BUSINFO/pppa/pppa09.pdf

Consumers should avoid products labeled Danger. They should prefer products labeled “Caution”

Corrosive v. Irritant

- **Corrosive:** Destroys living tissue such as skin or eyes by chemical action.
- **Irritant:** Not corrosive and causes a substantial injury to the area of the body that it comes in contact with. Irritation can occur after immediate, prolonged, or repeated contact.

Many liquid products cause irritation.
Avoid products that are corrosive.



National Center for Healthy Housing
Healthy Homes Training Center

19

www.cpsc.gov/BUSINFO/regsumfhsa.pdf and www.cpsc.gov/BUSINFO/pppa/pppa09.pdf

Corrosive and irritant are two important words to know. Often consumers can find a product that is labeled irritant instead of corrosive but works equally well. Consumers should avoid corrosives.

The key is that corrosives cause irreversible (permanent) damage. Irritants cause reversible damage. That does not mean irritants are completely safe. Most product will cause irritation to the eye if put in the eye as a liquid.

Flammable v. Combustible

- Flash Point: Temperature where liquid will support a flame.
- Extremely Flammable: Flash Point is 20°F or less
- Flammable: Flash point between 20°F and 100°F
- Combustible: Flash point between 100°F and 150°F

Flammables start fires.
Combustibles feed fires once started.
If you need to choose, pick a combustible.



National Center for Healthy Housing
Healthy Homes Training Center

20

www.cpsc.gov/BUSINFO/regsumfhsa.pdf and www.cpsc.gov/BUSINFO/pppa/pppa09.pdf

Flash points are measured by putting a spark or a flame above a liquid as the liquid is warmed. At the flash point, the liquid will release enough vapors that it can support the flame. The lower the flash point, the greater the risk.

An extremely flammable liquid can start a fire under most conditions. Gasoline is extremely flammable. It has a flash point of about -20 degrees F. Flammables require higher temperatures to support combustion but can catch fire on a hot day.

In contrast, combustibles need more than a hot day to catch fire. They need to be heated about 100 F or they need to be sprayed into the air. A spray will increase the surface area of the liquid releasing more vapor. This makes it burn at lower temperatures.

As a general rule, flammables start fires and combustibles feed fires. Avoid flammables.

EPA Pesticide Product Label

- Product Name
- Ingredients
 - Active
 - Inert / Other
- “Keep Out of Reach of Children”
- Signal Work - Poison / Danger / Warning / Caution
- First Aid
- If Poison, then skull and crossbones
- Net contents.

Active ingredient Boric Acid.....	40%
Inert Ingredients.....	60%
Total	100%

ORIGINAL FORMULA WITH ADDED LURE

KILLS ROACHES
WATERBUGS, AND SILVERFISH!

CAUTION
KEEP OUT OF REACH OF CHILDREN.
SEE SIDE / BACK PANEL FOR FIRST AID
AND ADDITIONAL PRECAUTIONARY STATEMENTS

NET WT. 2OZ. (56g)

EPA Registration Number is Key



National Center for Healthy Housing
Healthy Homes Training Center

21

You may have already covered this topic in the Keep It Pest-Free. If so, skip it here. If not, cover it here. EPA approves the language and layout for the label on every pesticide. Copies of all labels are available on-line at www.epa.gov/pesticides/pestlabels/. For labeling requirements, see www.epa.gov/oppfead1/labeling/lrm/.

EPA requires that the front panel include the information identified above. Back panel typically includes:

- EPA Registration Number - identifies the manufacturer/formulator and the product.
- Company Name and Address
- Precautionary Statements
 - o Hazards to Humans and Domestic Animals
 - o First Aid
 - o Environmental Hazards
 - o Physical or Chemical Hazards
- Directions for Use
- Storage and Disposal
- Warranty Statement (voluntary)
- Worker Protection Labeling

- Well labeled bottles
- Easy to identify
- Store hazardous materials in secure location



National Center for Healthy Housing
Healthy Homes Training Center

22

Anything kept in a bottle should be correctly labeled. Hazardous materials should be kept in secure locations.

In 1971, Mr. Yuk was created by the Pittsburgh Poison Center at Children's Hospital of Pittsburgh. Since then, Mr. Yuk has been used to educate children and adults about poison prevention and to promote poison center awareness. In addition, Mr. Yuk has raised awareness that poison centers are available 24 hours-a-day, every day of the year to assist in the management of poisoning emergencies. [7]

What about bug spray?



National Center for Healthy Housing
Healthy Homes Training Center

23

Bug spray.

When applying insect repellents to children, read all directions first. Do not apply over cuts, wounds, or irritated skin. Do not apply to eyes, mouth, hands, or directly on the face. Also use just enough to cover exposed skin or clothing, but do not use under clothing.

Arts and Craft Materials



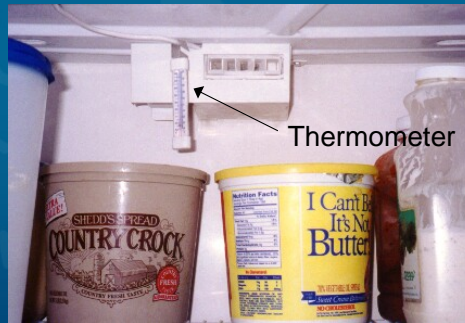
National Center for Healthy Housing
Healthy Homes Training Center

24

Many art materials contain hazardous materials. For a given need, there are often nontoxic alternatives that accomplish the same purpose. Products bearing the labels “AP approved product” or “CP certified product” have been reviewed by a special program of the Arts and Crafts Materials Institute and do not present toxicity concerns. ^[8]

Spoiled Food

- Refrigerator - 40 degrees F
- Freezer - 0 degrees F



National Center for Healthy Housing
Healthy Homes Training Center

25

Refrigerator temperature.

To safely preserve food, keep refrigerators at 40 degrees F. The only way to know is to measure the temperature. Don't measure the temperature after you've just filled it with food because the food will temporarily warm the refrigerator.

Also, note that the thermometer in this photo is not in the best location. It is right by the place where the cold air comes in. It will always be reading a colder temperature than the rest of the refrigerator. It is better on a lower shelf.

Fires and Burns



75% of households did not know the temperature setting on their water heaters.

91% were unaware of the temperature of hot tap water.



National Center for Healthy Housing
Healthy Homes Training Center

26



- Smoke Alarm
- CO Alarm
- Fire Extinguishers



 **National Center for Healthy Housing**
Healthy Homes Training Center

27

Placing and maintaining a smoke and fire detector.

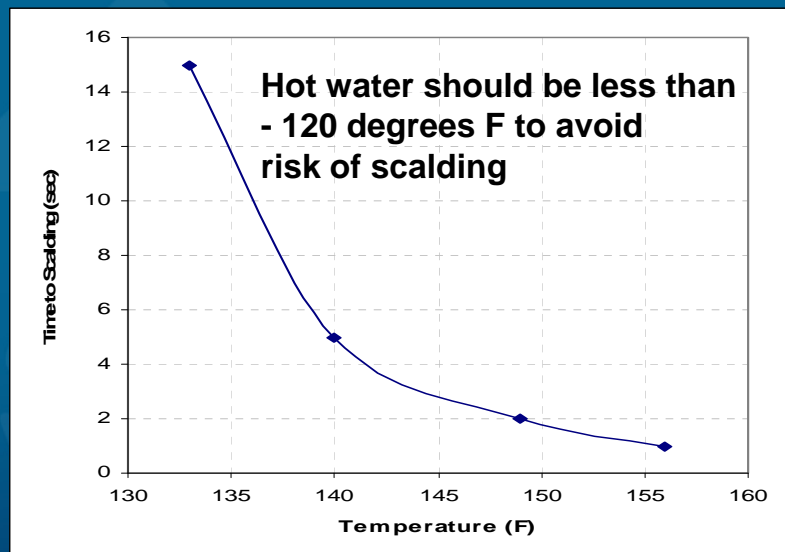
Smoke and fire alarms are needed to sound an alarm. Place them where hot air from a potential fire will collect so they will sound the alarm at the beginning of a fire, when moments are precious.

Regulations vary on whether the alarms must be hard-wired, battery powered or both.

In this photo, a smoke and fire alarm are placed next to a CO alarm in the hallway outside of frequently-occupied bedroom. Although the alarm is probably being placed too close to a corner where there may not be good airflow. They need to follow manufacturer's instructions.

During the review, these devices should be tested by pressing the TEST button. A common cause of failure is weak or missing batteries, which should be replaced routinely.

Scalding



National Center for Healthy Housing
Healthy Homes Training Center

28

Hot water must be warm enough to make soaps effective and kill most environmental bacteria, like Legionella. To kill dust mites in laundered items for a child or asthmatic, use water temperatures of 130 degrees F or more. If you cannot get the temperature high enough, asthma experts recommending adding bleach to the laundry.

The problem is that these higher temperatures can cause scalding. If it is above 120 degrees F, it can cause scalds and burns especially in a bathtub where a child could have longer exposures.

The 2006 International Residential Code requires the use of water mixing devices on showers and bathtubs. These devices blend hot and cold water to keep the temperature less than 120 degrees F.

Choking and Suffocation



National Center for Healthy Housing
Healthy Homes Training Center

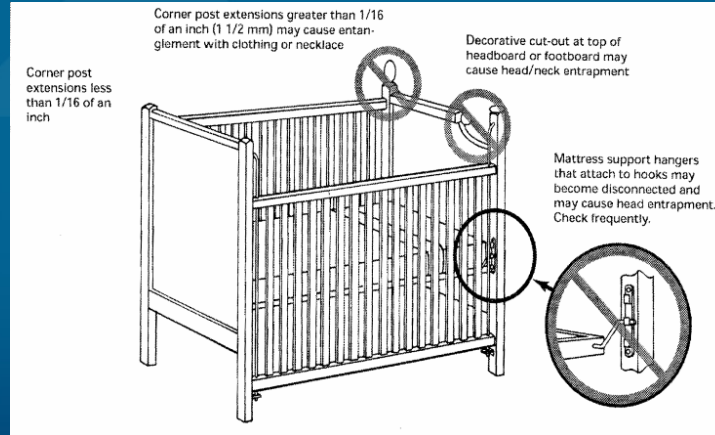
29

Choke hazard on railing

To prevent falls, uprights on railings should be close enough to prevent a six inch diameter sphere from passing through. The uprights on this railing are close enough together to prevent a child's head fitting through it. However, the railing with horizontal bars has one opening wide enough to crawl through and another that is wide enough to get a head through, and also narrow enough to create a choke hazard.

Children should be properly supervised while in outdoor play areas.

Crib Safety



National Center for Healthy Housing
Healthy Homes Training Center

30

Cribs should be free of sharp edges and choke hazards.

Choke hazards?



Electric shock hazard?



National Center for Healthy Housing
Healthy Homes Training Center

31

Loose cord for blinds

Many objects can pose choking or suffocation hazards to small children. They should be kept out of reach. A dangling cord attracts the curiosity of a toddler who can become tangled and is not sure enough on his or her feet to escape.

Electric shock

Electrical outlets should be covered. Brightly colored outlets and covers or, worse yet, those with images of popular cartoon figures, draw children to them. Transparent, uninteresting covers are the safest. Outlets should be checked to be certain that the hot, neutral and ground wires are not mixed up.

Drowning



National Center for Healthy Housing
Healthy Homes Training Center

32

Hazards in the yard – bucket, swimming pools and plants.

Drowning hazards found in yards include swimming and wading pools, wells, streams, and ponds.

Even a bucket of water is a drowning hazard to a toddler, who can tip into the bucket, but can not get out. Pools should be fenced, with a gate children cannot enter. Swimmers should be supervised by a responsible adult.

Many plants are poisonous and should not be found in yards with small children. Occupants should learn which of their outdoor and indoor plants are poisonous and teach their children to not put plants in their mouths.

Firearms



Trigger
locks and
secured
storage

Store ammunition separate
from weapon



National Center for Healthy Housing
Healthy Homes Training Center

33

Trigger lock.

Firearms should be unloaded, locked, and in secure storage. Trigger locks are inexpensive and easy to use. Ammunition should be kept in separate locked storage.

IPMC Sections Related to Safety

- **304.10 Stairways, decks, porches and balconies.** Every exterior stairway, deck, porch and balcony, and all appurtenances attached thereto, shall be maintained structurally sound, in good repair, with proper anchorage and capable of supporting the imposed loads.
- **304.13 Window, skylight and door frames.** Every window, skylight, door and frame shall be kept in sound condition, good repair and weather tight.
- **304.18 Building security.** Doors, windows or hatchways for dwelling units, room units or housekeeping units shall be provided with devices designed to provide security for the occupants and property within.
- **304.18.2 Windows.** Operable windows located in whole or in part within 6 feet (1828 mm) above ground level or a walking surface below that provide access to a dwelling unit, rooming unit or housekeeping unit that is rented, leased or let shall be equipped with a windowsash locking devices.
- **305.2 Structural members.** All structural members shall be maintained structurally sound, and be capable of supporting the imposed loads.



National Center for Healthy Housing
Healthy Homes Training Center

34

You don't need to go over these sections in detail. The key is to highlight the general requirements that things be maintained and in good repair.

IPMC Sections Related to Safety

- **305.4 Stairs and walking surfaces.** Every stair, ramp, landing, balcony, porch, deck or other walking surface shall be maintained in sound condition and good repair.
- **305.5 Handrails and guards.** Every handrail and guard shall be firmly fastened and capable of supporting normally imposed loads and shall be maintained in good condition.
- **306.1 General.** Every exterior and interior flight of stairs having more than four risers shall have a handrail on one side of the stair and every open portion of a stair, landing, balcony, porch, deck, ramp or other walking surface which is more than 30 inches above the floor or grade below shall have guards. Handrails shall not be less than 30 inches high or more than 42 inches high measured vertically above the nosing of the tread or above the finished floor of the landing or walking surfaces. Guards shall not be less than 30 inches high above the floor of the landing, balcony, porch, deck, or ramp or other walking surface.
- **402.2 Common halls and stairways.** Every common hall and stairway in residential occupancies, other than in one- and two family dwellings, shall be lighted at all times with at least a 60-watt standard incandescent light bulb for each 200 square feet of floor area or equivalent illumination, provided that the spacing between lights shall not be greater than 30 feet.



National Center for Healthy Housing
Healthy Homes Training Center

35

You don't need to go over these sections in detail. The key is to highlight the general requirements that things be maintained and in good repair.

IPMC Sections Related to Safety

- **604.2 Service.** The size and usage of appliances and equipment shall serve as a basis for determining the need for additional facilities in accordance with the ICC *Electrical Code*. Dwelling units shall be served by a three-wire, 120/240 volt, singlephase electrical service having a rating of not less than 60 amperes.
- **604.3 Electrical system hazards.** Where it is found that the electrical system in a structure constitutes a hazard to the occupants or the structure by reason of inadequate service, improper fusing, insufficient receptacle and lighting outlets, improper wiring or installation, deterioration or damage, or for similar reasons, the code official shall require the defects to be corrected to eliminate the hazard.
- **605.2 Receptacles.** Every habitable space in a dwelling shall contain at least two separate and remote receptacle outlets. Every laundry area shall contain at least one grounded-type receptacle or a receptacle with a ground fault circuit interrupter. Every bathroom shall contain at least one receptacle. Any new bathroom receptacle outlet shall have ground fault circuit interrupter protection.
- **605.3 Lighting fixtures.** Every public hall, interior stairway, toilet room, kitchen, bathroom, laundry room, boiler room and furnace room shall contain at least one electric lighting fixture.



National Center for Healthy Housing
Healthy Homes Training Center

36

You don't need to go over these sections in detail. The key is to highlight the general requirements that things be maintained and in good repair.

Key Messages

- Injuries are not accidents. They are preventable.
- There are many simple and inexpensive ways to prevent home injuries.
- Children and older adults are more at risk for injuries in the home.
- Falls, poisoning, and fires/burns are the most common causes of injury deaths.



National Center for Healthy Housing
Healthy Homes Training Center

37

Learning Objectives

- Explain the difference between an injury and an accident.
- Name the 3 most common home injury related causes of death.
- Name five locations to look for safety hazards in the home.
- Name five ways to prevent home injuries.

