



**Taking it one step  
at a time.**

# Killer on the Loose!

**Reducing the risk of death,  
injuries, and damage caused  
by earthquakes**



*Most injuries during an earthquake are caused by falling objects.  
Over 90% of earthquake damage in the US is to building contents.  
**Non-structural mitigation** can save lives and prevent damage!*

**Non-structural:** Building contents and components that are not part of the physical structure, i.e., everything except the columns, floors, beams, and load-bearing walls. Typical non-structural elements include: suspended ceilings, light fixtures, windows, doors, furniture, cabinets, computers, appliances, TVs, stereos, display cases, bookshelves, interior or exterior ornamentation, heating and air-conditioning equipment, and electrical systems.

**Mitigation:** Eliminating a hazard or reducing exposure to it in order to prevent an emergency or minimize its impact.

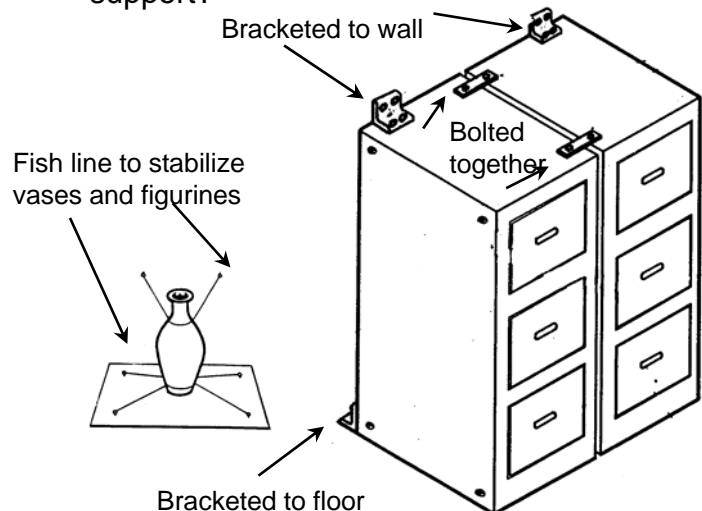
**STEP 1 - Identify the Hazards:** The first step in reducing your vulnerability to earthquakes is to do a hazard assessment. To do this, you must first determine which non-structural hazards are present in your home or workplace and assess the threat those risks pose.

## At home:

- Are there heavy and/or tall items in your home that may move or fall over during an earthquake?
  - ◆ If these items moved or fell, would they block exit routes out of a room or out of your house?
  - ◆ Can these items be secured to structural support (i.e., wall studs)?
- Are hanging plants and light fixtures secured to prevent them from swinging free, breaking against walls or furniture, or breaking windows?
- Are gas appliances securely fastened in place (e.g., water heater and clothes dryer) so they won't pull the gas line connections apart? Are the gas lines and connections flexible?
- Are wall-mounted objects (clocks, pictures, mirrors, etc.) fastened to the structure (as opposed to wallboard)?
- Are items on shelves and in display cabinets secured to prevent them from falling out?
- Is your house securely fastened to its foundation?

## At work:

- Are items on shelves and in cabinets secured to prevent them from falling out?
- Are there items that no longer serve a useful function that can be removed?
- Are there incompatible chemicals stored together that should be moved to prevent mixing if the containers should break? Do your shelves have lips to keep items in place?
- Are free-standing file cabinets, bookcases, and other tall pieces of furniture secured to structural support?

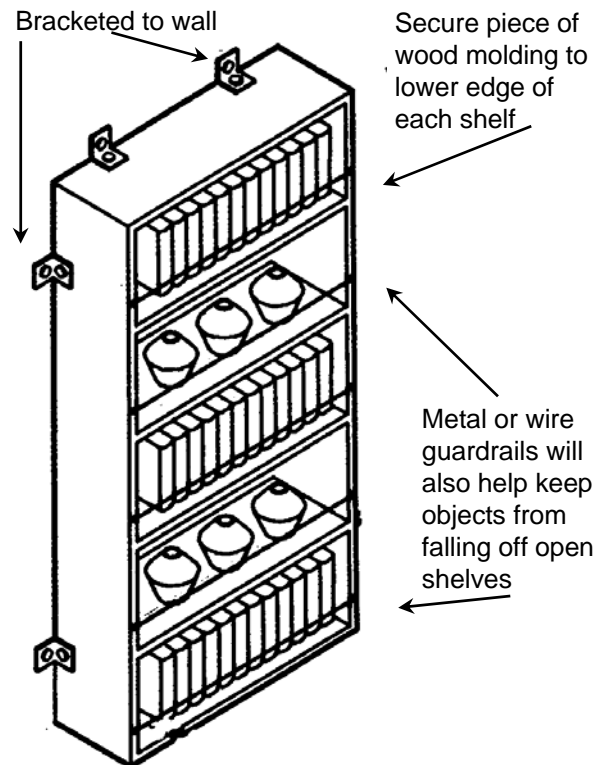


## STEP 2 - Once you've identified the hazards...Take action.

- Identify which mitigation activities will most reduce your risk of injury and damage.
- Determine which activities can be accomplished at little or no cost (e.g., securing bookcases to walls, closed hooks for pictures and mirrors)
- Determine the best method for correcting larger problems (retrofit, remodel, or incremental upgrades).
- In the future consider purchasing only items that are considered "seismic-safe" or "earthquake-resistant." e.g., file cabinets with strong latches on the drawers and wall or floor attachments.
- Routinely check any protective measures you have already taken to confirm that they are still effective.

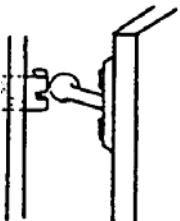
### Mitigation Activities:

- Bolt heavy, tall, upright furniture to wall studs.
- Lock or remove rollers on beds, furniture, and appliances.
- Secure hanging plants and light fixtures with wires to prevent swinging into walls, windows, or people.
- Locate beds away from windows and heavy wall-mounted objects.
- Secure kitchen and bathroom cabinets with "positive" (self-closing) latches.
- Secure items on shelves with quake mats, Velcro™, low shelf barriers, or other restraining devices.
- Store heavy and/or breakable items on lower shelves.
- Strap water heater and all gas appliances to wall studs.
- Use flexible connections on gas appliances.
- Check chimney for loose bricks and repair as needed.
- Bolt home to foundation to prevent shifting during an earthquake.
- Secure mirrors and pictures to walls or hang them with heavy wire looped through eye screws or tongue-in-groove hangers.
- For additional information on non-structural mitigation activities, contact TVF&R or your local emergency management office.

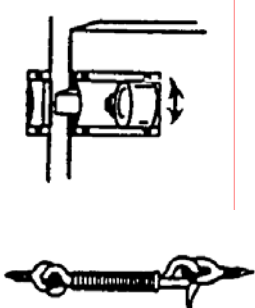


### Types of positive catching latches for cabinets

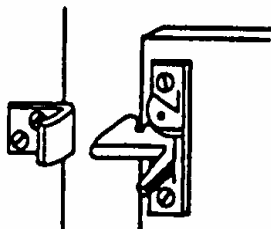
Child-proof  
(out of sight.)



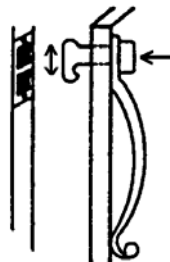
Decorative  
(turn knob to open)



Decorative  
(pull back handle to open)



Decorative  
(press knob to open)

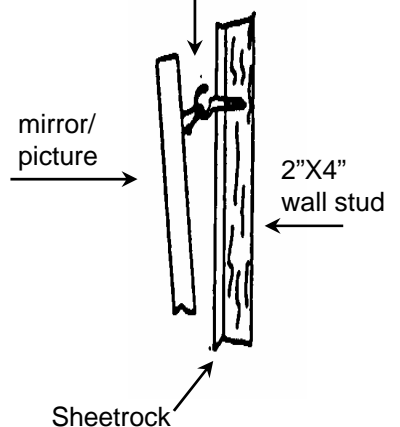


Hook and Eye  
(Suitable for Garage Cabinets)

### Mirrors and Pictures

Closed hook/loop

mirror/  
picture



2"X4"  
wall stud

Sheetrock