

Medical Reserve Corps
of Eastern Washington

SHELTER-IN-PLACE FAMILY FIRST

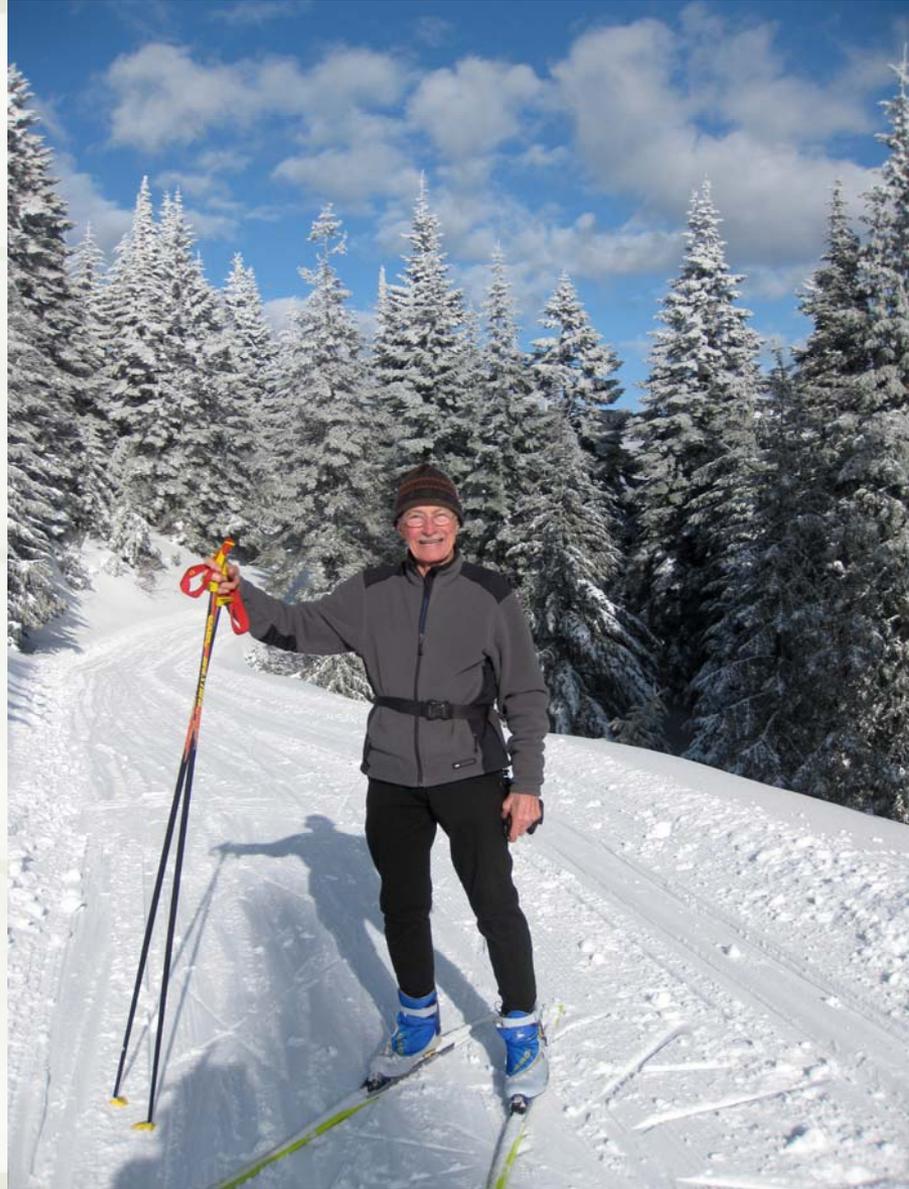
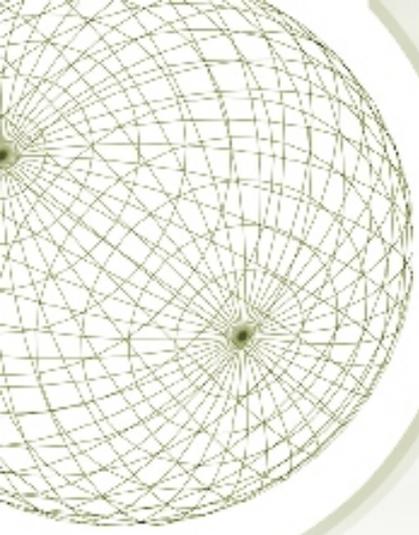
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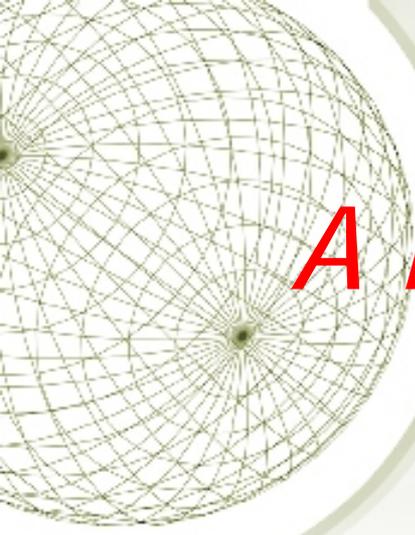
Gov. AADM, ABDM





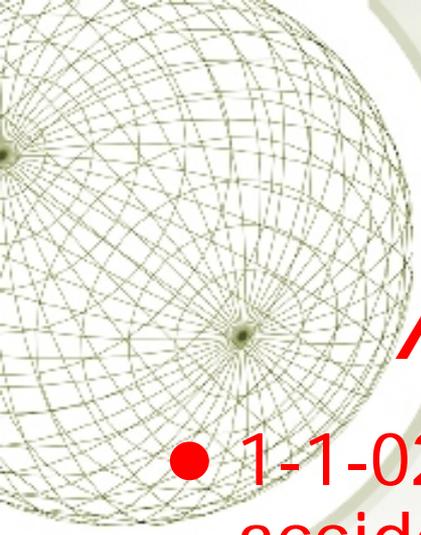
HAZARDOUS MATERIAL & TRUCKS

- Daily 800,000 shipments of hazardous material in trucks. 200 a year are involved in fatal crashes. Shipments include gasoline, explosive and radioactive materials. In 1991-2000 there were 636 hazmat releases in fatal truck crashes.

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A RAIL RUNS THROUGH IT





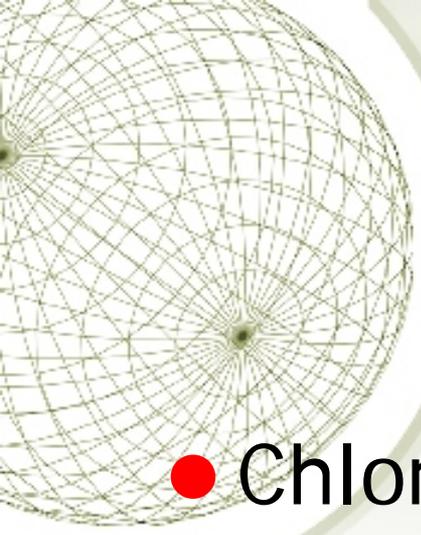
Truck & Federal Railroad Administration Accidents

- 1-1-02 to 1-1-05 there were 6556 train accidents nationally.
- WA State had 111, Idaho 61, N. Idaho 16, Spokane Co. 10, (3 in 2005)
- Nationally 2000 to 2009: 11,453 train accidents. 14,657 HAZMAT (hazardous materials) transported and 44 releases of HAZMAT. Fatalities 779.
- Trucks carry HAZMAT daily in our towns.
- 2000-04: 60,950 highway accidents, 45 died and 652 injured.

Chlorine Rail Car Crash Leak

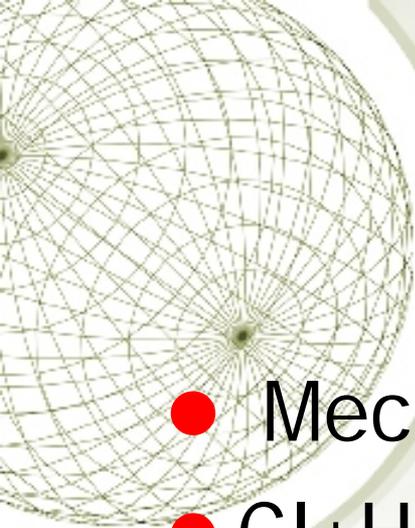
- Are you familiar with this headline?
- S.Carolina TRAIN CRASH - CHLORINE GAS CLOUD KILLS 9 (Jan. 2005). Man trapped in his car, survives derailed tank cars mid town rail crossing.
- What did he do? Stopped engine, heater and closed windows, and waited! Cell phoned 911. (His own Shelter-in Place.)
- He was rescued alive, chlorine gas outside, 69 hospitalized, 529 treated released, 5453 evacuated in Graniteville, 9 died.





LIQUID CHLORINE

- Chlorine is used in manufacturing for:
 - H₂O purification.
 - Oxidizer.
 - Bleach.
 - Plastic & Rubber Manufacturing.

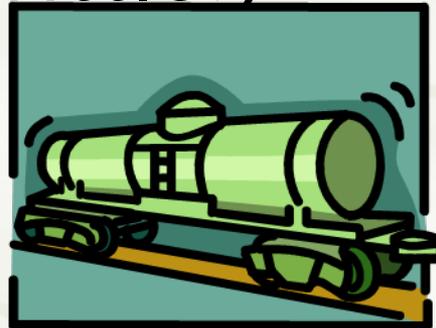


CHLORINE TOXICITY

- Mechanism of action:
- $\text{Cl} + \text{H}_2\text{O} = \text{HCl}$ acid, if fumes inhaled, it burns all mucus membranes, alveolar capillary membranes, eyes, and other structures.

RAIL TANK CARS

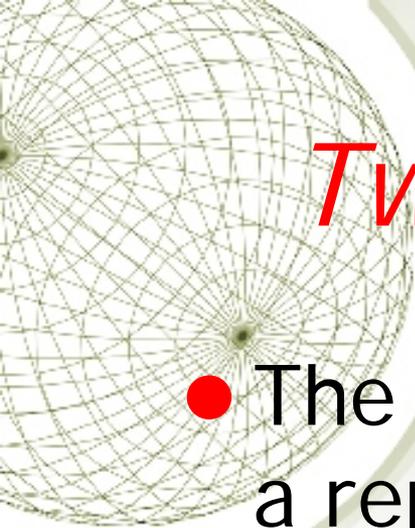
- Chlorine shipped as liquefied pressurized gas in 90 ton steel shelled tank cars. (Older cars are single walled and brittle, newer ones are double walled, heat treated, and less brittle.)



A wireframe sphere, resembling a globe or a celestial body, is positioned in the top-left corner of the slide. It is composed of a grid of lines forming a spherical shape.

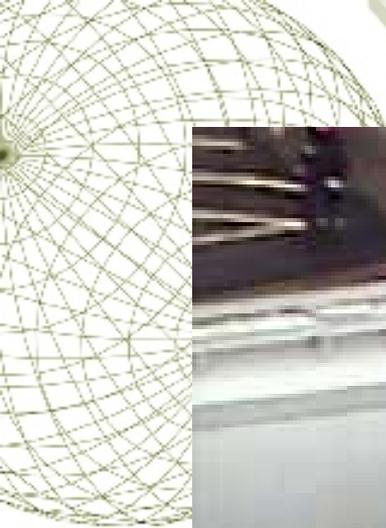
*Did You See This Story on
February 9, 2003?*





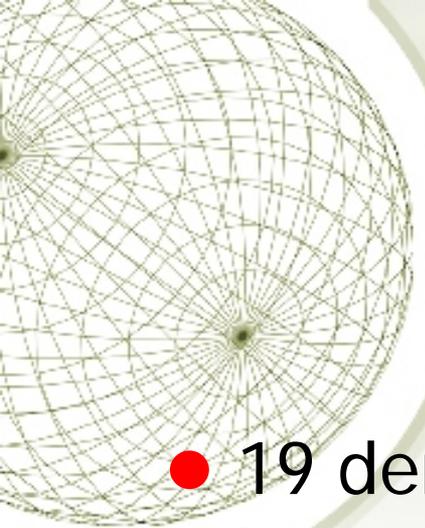
Twenty two Car Derailment

- The National Response Center received a report of a 22 car derailment in Tamaroa IL, a small rural town, with a rail line running through its center.







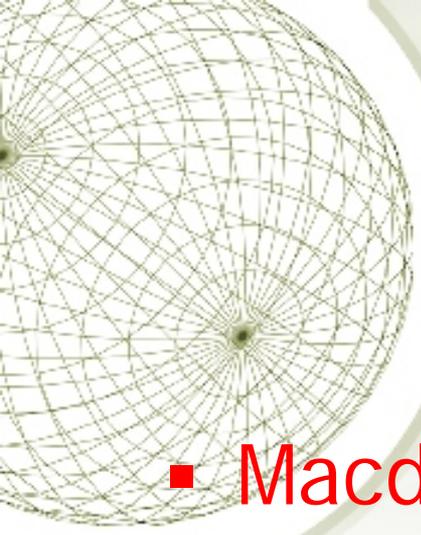


22 Car Derailment

- 19 derailed cars contained vinyl chloride, hydrochloric acid, methanol and formaldehyde-all hazardous materials.
- Rail cars caught fire, causing an explosion hazard.
- There were 850 people in a 3 mile radius. The entire village had to be evacuated, some for up to 6 days. There were NO deaths. They were prepared.

- Twelve days later during the clean-up process, a tank of hydrochloric acid failed, releasing a cloud of acid into the air, causing the evacuation of a local school. There were no injuries. Clean-up was completed 49 days later. They were prepared are you?



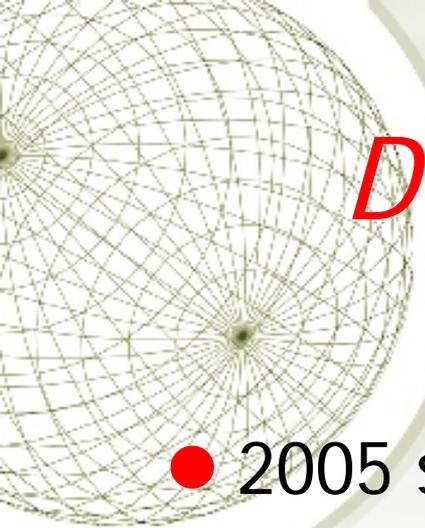


RAILWAY ACCIDENT

- Macdome Texas on 6-22-04 a railway train accident occurs and a chlorine tank ruptures. Chlorine gas kills 3, injures 51.

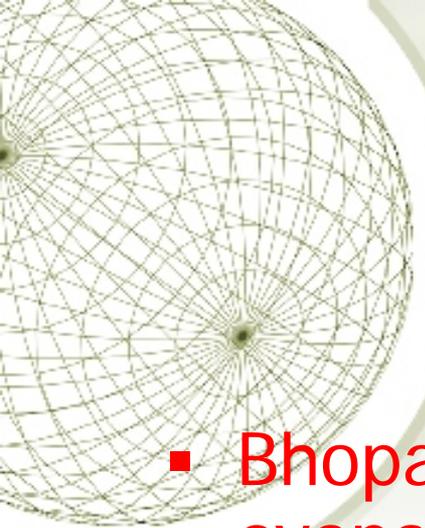






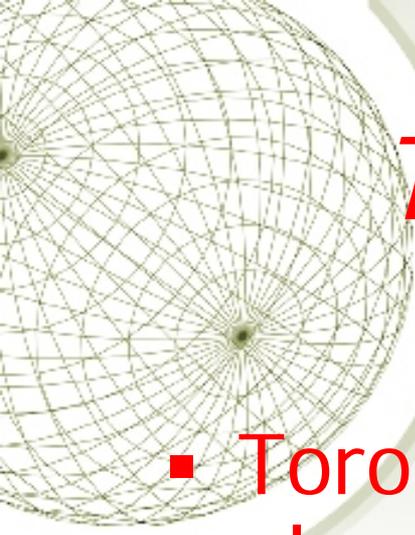
Doctors & Nurses Response Failure Survey

- 2005 survey of healthcare workers only 48% report for H5N1, 68% for chemical, 57% for nuclear event.
- 2007 of all hospital staff only 50% would report for pandemic, 45% maybe, 5% "no".
- Why? Fear for Self 31%, Family 47%, Poor leadership 15%, Poor PPE placed them at risk 66%. (Dr. A. Garrett Columbia U)



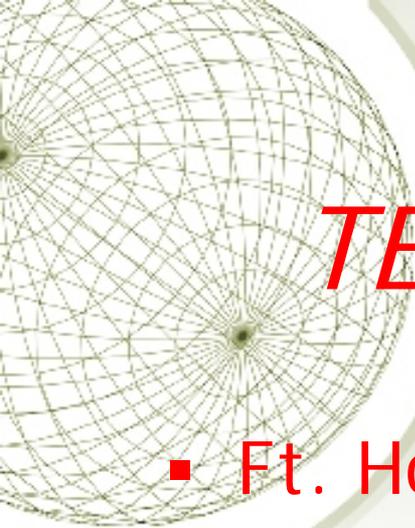
DISASTERS & TERRORISM

- Bhopal India pop. 90,000 12-3-1984 methyl cyanate 40 ton leak, 3-8000 died, 20,000 died later, 120,000 affected.
- London 7-7-05, 4 suicide bombers cause 3 underground rail and 1 double deck bus explosions, 56 died, 700 injured.
- SARS Canada 2003, 257 case hospital staff outbreak (1 patient from Hong Kong). Nurses over 60 yrs, mortality 43% estimated by Dr. Loeb. Ontario Health Commission zeroed in on N95 mask, knowledge deficit, infection controls ? 30% of staff failed to report!



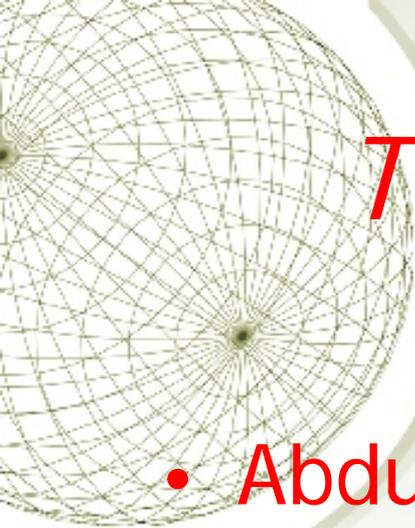
TERRORISM INCIDENTS COLLEGE STUDENTS ?

- Toronto 18: June 2006 muslim students plan: to bomb CBC, Parliament Bldgs, CSIC headquarters, and behead Prime Minister Harper.
- Toronto 19: hijack 4 airliners Toronto airport, fly them into nuclear power plants about New York.



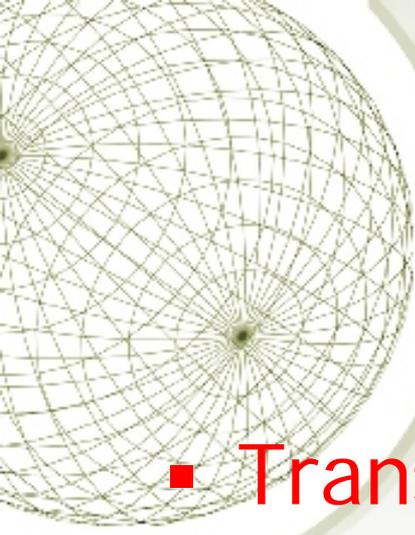
TERRORISM INCIDENTS MDs?

- Ft. Hood:11-10-2009 Dr. Nidal Hasan kills 13 & injures 31.He was appointed to a National Preparedness Commission.
- Glasgow Airport Scotland:6-30-2007 Kafael Ahmed a Ph D engineer ,British born, & Bilad Abdullah an MD, drove a blazing car into airport entrance.Ahmed later dies of burns ,an IED removed outside the Emergency Room.



TERRORISM INCIDENTS MDS COLLEGE GRADUATES?

- Abdullah sentenced 32 years for the terrorism attempt.
- Manhattan Times Square 5-3-10 car bomb attempt by Faisal Shazad.



NUCLEAR TERRORISM

- Transdneister Moldova break away Soviet Republic: a 2005 London Times May 8th report Alazan rockets for sale modified to carry radioactive materials 8 miles
- Decaying nuclear material 182 lbs stolen? New York times article?

Weapons of Convenience/Opportunity

- A truck load of Anhydrous Ammonia. Someone sends a 308 caliber rifle bullet, into the truck tank, in the center of your town. What would you do? Shelter in Place? Go where? What about family?

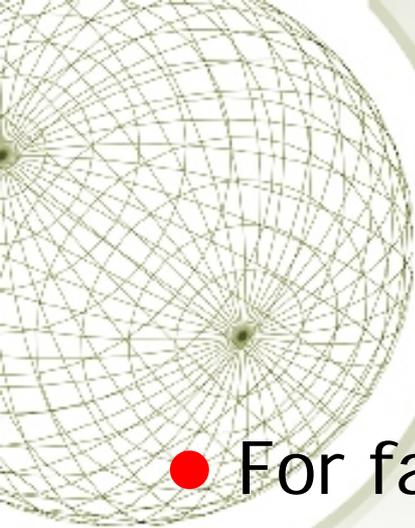




Weapons of Convenience and Opportunity, and Accidents

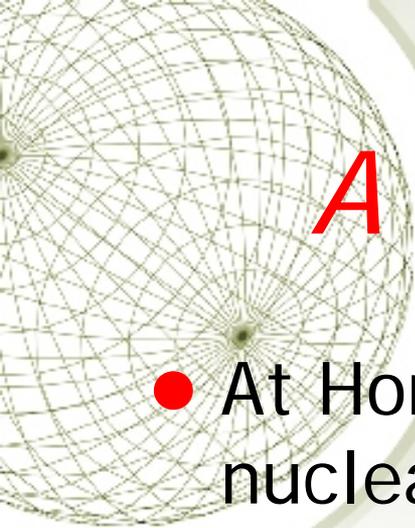
- 911(Airliner), Chemical Companies.
- Propane, Sulfuric Acid, Ammonium nitrate(fertilizer).
- Gasoline, petrochemical materials.
- Anhydrous Ammonia.
- Decaying nuclear materials (dirty bomb).
- H₂SO₄, Methanol, Org. Peroxides.
- Railway tank cars and semi trucks carry these chemicals every day.





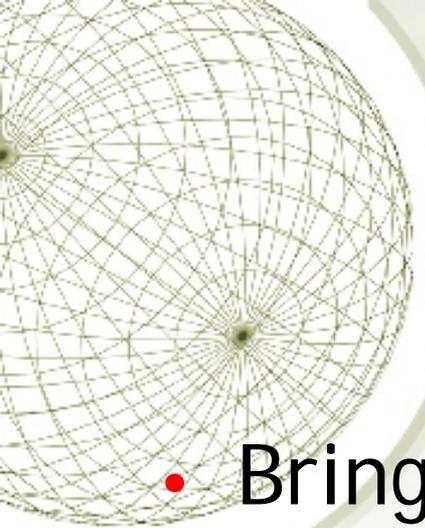
Do You Have A Plan ? A Shelter-in-Place?

- For family, at work, at home, a school plan?
- Do you practice Shelter-in-Place? For chemical, nuclear or gas released in air?
- In an Emergency Alert for mass evacuation, would you know what to do? All supplies should be in large duffel bags, for quick evacuation.



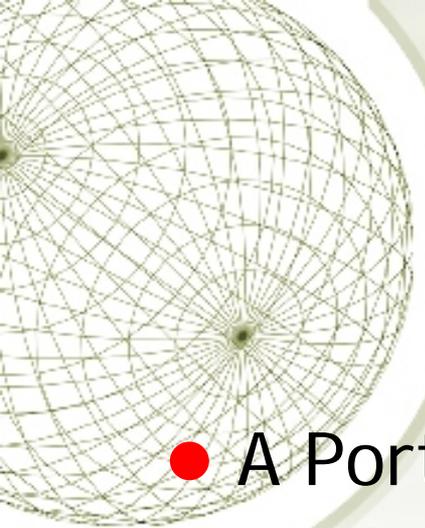
A Shelter-In-Place

- At Home choose a room above ground, nuclear and chemicals seep into basements. (Emergency radio or NOAA will alert you).
- Lock doors, windows, turn off air or heating systems. Have stored H₂O, cell and wired phones, dried food, radios(electric and battery), a crank radio, TV, battery lamp and propane lamp, fire extinguisher.
- Mess kits, paper cups, plastic utensils.



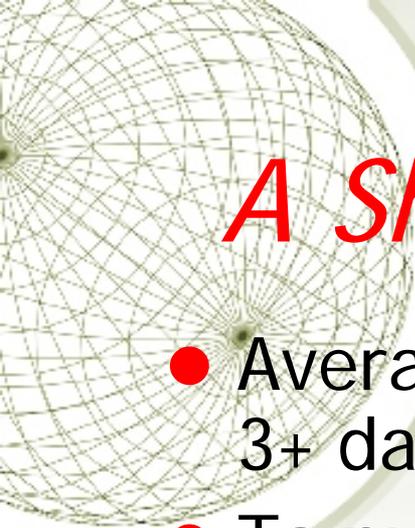
A Shelter-in-Place

- Bring all family members to room and LISTEN to RADIO for ALERTS.
- Have sleeping bags or seating for comfort. Reading materials & wait.
- By radio follow emergency instructions
- A portable survival kit (you can buy them for your auto).



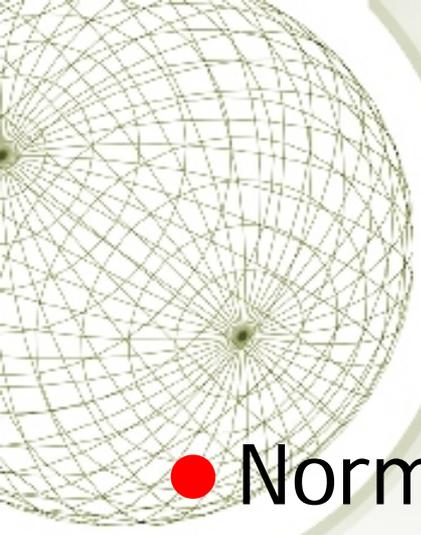
A Shelter-In-Place

- A Porta John, privacy curtain, small frig.
- Hygiene supplies, toilet paper, towelettes, soap, garbage bag, chlorox wipes.
- Duct tape plastic sheets to seal all vents, doors, windows. LISTEN to radio. Evacuation may be required in some areas. Have all items in duffel bag for a quick exit.
- Prepare for at least 3+ days H₂O, medications and dried foods etc.



A Shelter-In-Place: Basic H₂O

- Average person requires 1gal/day, plan for 3+ days if evacuation.
- To purify H₂O: Micropur Tabs 2/gal H₂O, or Aquamira follow directions. Pure Bleach 8 drops/gal. Let stand for 30 min. Still a bad odor or cloudy, repeat 8 drops. Still bad, throw it out. Water should smell of chlorine to drink.
- Boil H₂O for 10 mins. (filter first.)
- Water boxes if unopened last 5 yrs.
- Camping water filtration equipment.



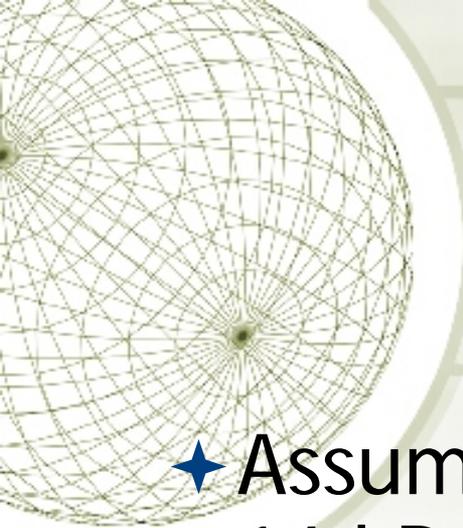
Basic Food Needs

- Normal daily requirements: 2500cal.
- Working daily: 3700 cal. or 16 power bars.
- Dried peaches, tomatoes, apples, fruit, nuts, beef, turkey, corn flakes. Salt causes thirst, avoid it.



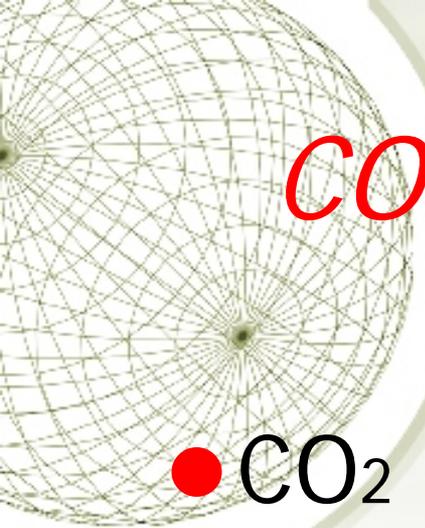
Basic Space & O₂ Calculations for Shelter-in-Place

- One person 10 sq ft x 8ft high=80 cubic ft.=2,270 liters(l) air = 477 l O₂. A 70 kg person needs at rest 210 ml.O₂/min = 12.6 l/hr. 477lO₂/12.6=38hrs total O₂. Then usable O₂ is 3/4 or 75% at sea level O₂ hours which is 38 x .75=28 hrs of O₂ available.



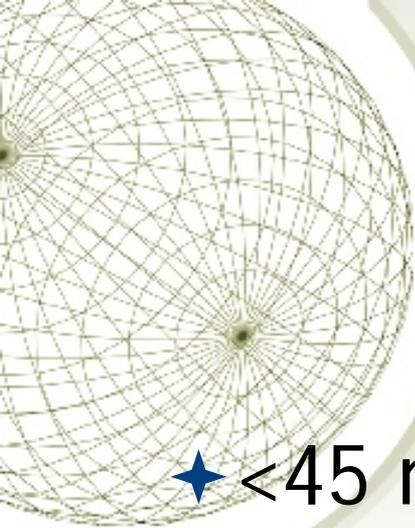
O₂ Calculations

- ★ Assume sea level O₂ partial pressure is 14 kPa (105mmkHg) in blood. Top of Mt Everest (above the “death zone”) the O₂ pp is 4 kPa(30mmHg) (Oxy-Hemoglobin dissociation curve non-linear, but correct). Usable O₂ is 3/4 of O₂ available. So 75% of 477l = 340l; 340l / 12 l/hr = 28 hrs usable O₂ at rest for a 70 kg person.



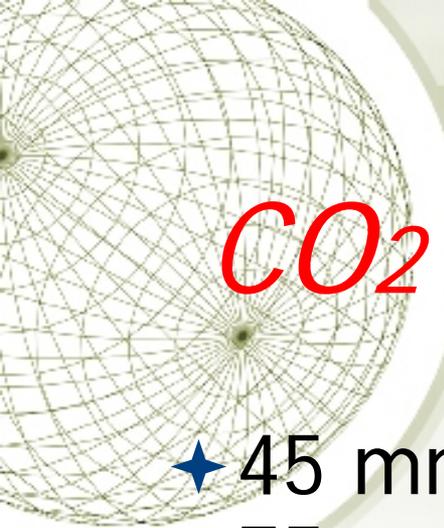
CO₂ Production is the real problem !

- CO₂ production: There is a 1 to 1 ratio of O₂ consumed to CO₂ produced. As CO₂ level increases, toxicity in the body occurs. Normal partial pressure of CO₂ in blood is 40 mmHg at sea level. Normal pp of CO₂ in the atmosphere is 0 mm Hg.



CO₂ TOXICITY-cont.

- ★ <45 mmHg - minimal symptoms.
- ★ 45-65 mmHg - mild distress- Increased HR, SOB, Mental status changes.
- ★ 65-75 mmHg - moderate distress-panic, dizzy, sweating, then lethargy.
- ★ >75 mmHg - severe distress - Seizures, coma, respiratory arrest.



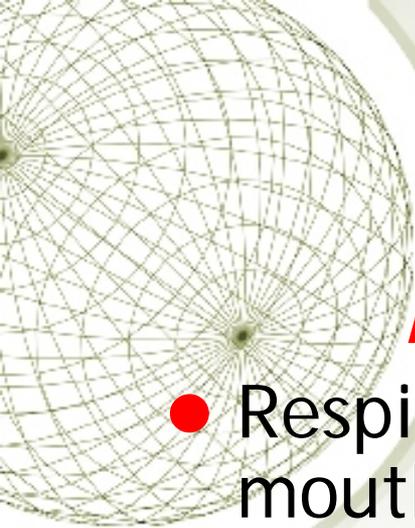
CO₂ TOXICITY-percentages

- ★ 45 mmHg=6.0% CO₂, 65 mmHg= 8.6%, 75 mmHg = 10% CO₂ in atmosphere.
- ★ So 6.0% of 2270l = 140l CO₂. Assuming person produces .21l CO₂/min., it takes 11 hrs to reach this 6% concentration.
- ★ Summary: at 11hrs uncomfortable, 15 hrs distress, 18 hrs coma and death.



CO₂ TOXICITY in our Sheltered Space

- ★ The limitation is our own CO₂ production at 11hrs. Time can be extended by having a CO₂ absorber (ie soda lime) in the ventilation system. So 11 hrs. of time is available in 80 cubic ft of space for one 70kg person at rest.



Lungs, Eye, G-I Tract Protection for Evacuation

- Respiratory Protection. A two cartridge nose mouth mask for every one! Cartridges for pesticides, nuclear, fumes, chemicals.
- Eyes Protection (Swim goggles)
- Many layers of Kleenex, over nose and mouth moistened if nothing else.
- Stop all chemical, nuclear, gases, from entering your body by any means.
- Do not eat, drink, smoke, use lipstick or balm lips until decontaminated. You may have to do self decontamination if no help available.



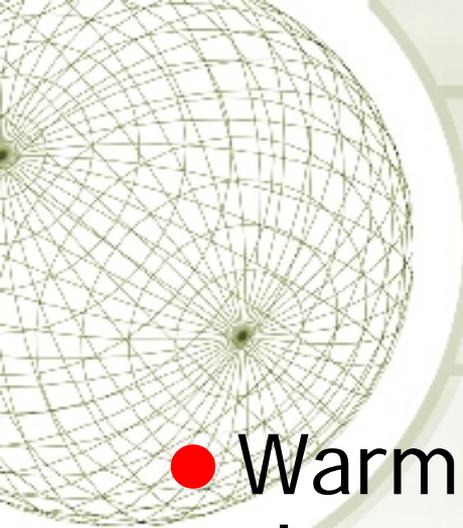
Family Decontamination

- Cover up your hands, face, eyes, mouth.
- Help your family SLOWLY and CAREFULLY remove outer clothing and shoes. Do not shake! Place all in a plastic bag carefully and seal it! Removing all clothing removes 85% of all contaminants. Most nuclear, chemical, biologicals cling to surfaces. DO NOT SHAKE YOUR CLOTHES!
- Have them shower well using lots of H₂O and soap.
- Nuclear & most chemicals are on the ground in 30 mins. WAIT! LISTEN TO YOUR RADIO!



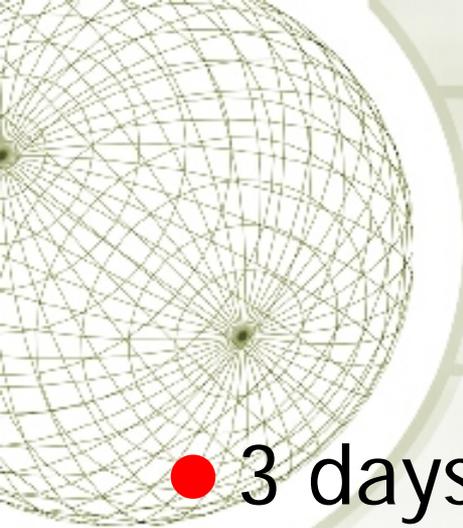
VISION and LIGHTING

- Head lamps are invaluable in emergencies, you need your hands free. Always 3-4 spare batteries.
- A flashlight or reflecting mirror may signal help in emergency evacuation.
- Matches or lighter for fire and warmth, or signal, may save a life on evacuation.



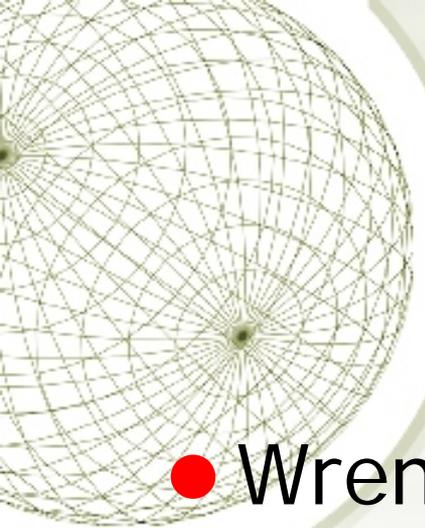
CLOTHING and WARMTH

- Warm change of clothing, all long sleeves and pants. Rain gear, gloves.
- Sleeping Bags, sturdy boots for evacuation. Long polypro underwear (easy storage). Warm jackets, Sunglasses.
- Tents may be necessary for evacuation.



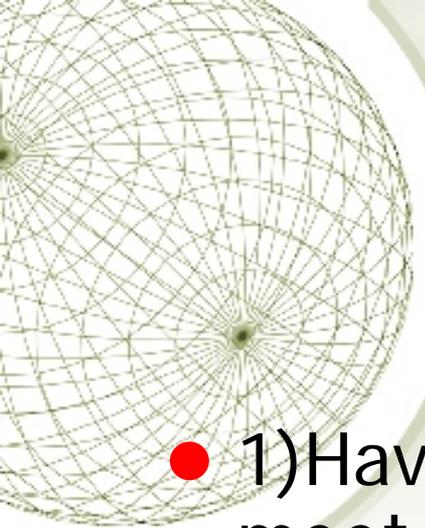
MEDICAL KIT

- 3 days of prescription drugs
- Bleach, antibiotic ointment, ASA, antacid, imodium, Potassium iodide, latex gloves, antiseptic, bandaids.
- Sterile bandages, tape, thermometer.
- Scissors, anti-bacterial soap.



EQUIPMENT, CASH, and DOCUMENTS

- Wrench set, fire extinguisher, can opener, mess kits, paper cups, plates, plastic utensils.
- Have cash, travelers checks, copies of all important records in secure bag, same records in bank deposit box.



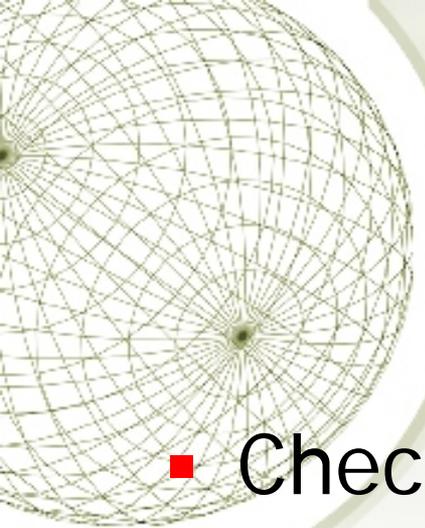
BASIC RULES

- 1) Have a meeting spot outside for all to meet on evacuation. Also a place away from home. Practice and have two fire drill evacuation routes from your house.
- 2) Create a family communication plan, and have an out of town contact, and give each every one`s cell, phone, e-mail, home addresses. Store at work, school, in wallet, purse, in auto, at home.
- 3) For Rapid Evacuation use Duffel bag or trash bagged supplies.



DUFFEL BAG RULE FOR EVACUATION

- In bag have: first aid kit, prescription meds, change of long sleeved shirts and long pants for all of family, sleeping bags, tent, cash, account numbers, important documents, H₂O, tools, family medical records, dried food, chlorox wipes, maps and ALWAYS DRIVE UP WIND.



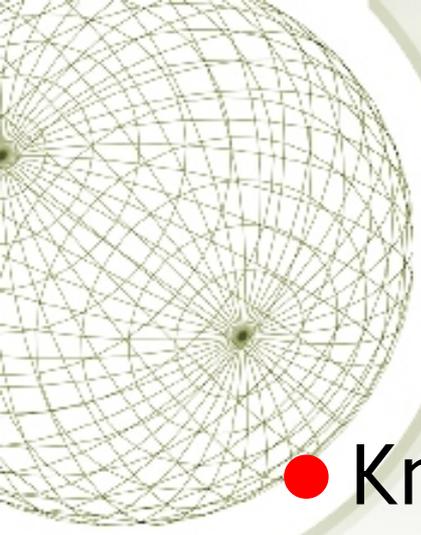
SCHOOL RULE

- Check your school emergency plan.
- Do they keep your child until you or a designated person arrives?
- Give school all your contact information.
- Document this and outside meeting place to school & all family members for evacuation purposes.



- *First Aid, Utilities, Evacuate*
Rule

- For disaster preparedness, take a first aid course to treat your family or those injured.
- Do not light matches, candles, or turn electric switches in your home.
- Use flash light to check for damage, fire, or other hazards etc.
- Switch off H₂O, electricity, gas furnace, heater, stove, fireplace, + outside gas at meter if gas odor is present. Open windows GET EVERYONE OUT QUICKLY. Lock doors. Take pets with you.
- Call your family contact and leave.



YOUR NEIGHBORS

- Know your neighbors special skills (medical, etc).
- Work with your neighbors during a disaster. Organize and talk to them.



Instruct your Family for Disaster, Drill, Drill, Drill.

- Instruct family on emergency evacuation of your home every 6 months.
- Chose a meeting site outside.
- Learn to turn off the electricity and water.
- Leave the gas alone unless leaking, it will not come back on unless the gas company comes out..
- Do a shelter-in place. BE PREPARED.
- This applies to us all and ALL RESPONDERS
- Thanks to Dr.Andy Garrett, Columbia U for his research.



Be Prepared Information Sites:

- [www.\(your city name\)prepares.org](http://www.(your city name)prepares.org)
- <http://theepicenter.com/howto.html>
- <http://www.read.gov/>
- <http://redcross.org/services/prepared>
- Take a CERTS(Community Emergency Response Team) Red Cross Training course it is free.(Excellent training)
- Questions?? Thank you.

U of WA 25 Residents Networking

2009-2010 Resident Physicians
Family Medicine Spokane

R1s



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Spokane Co. Disaster Planning Committee



THE END

- ★ Granddaughters in the Italian Alps on the “Via Ferrata” high alpine route.





WHEN IN ROME DO AS THE ?