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Preparation by Individuals and Families for Natural Disasters, Major Accidents, Terrorism, and Pandemics

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Part I: Planning for Natural Disasters and Major Accidents

Planning for Emergency Response

It is essential that plans be made to manage emergencies that involve our families and ourselves. Emergency situations may range from natural events, including earthquakes or high winds, to major accidents impacting utilities and other resources, to terrorism events, including bioterrorism, chemical exposures, and explosions. Planning before an emergency event can help overcome the very natural tendency to panic. In a panic situation, people may carry out actions that are not only ineffective but also may actually make the situation worse, with resultant injuries or life-threatening situations that might otherwise have been avoided. Having a plan, and reviewing it with family members at least every 6 months, will help everyone involved respond in a coordinated and effective way, helping to assure their safety.

Planning Emergency Escape Routes

It is important to plan escape routes from all rooms in the house. There should be at least two ways to exit each room in the event that one way is blocked by fire or by falling objects. If the home is two stories, this requirement may necessitate providing a means, such as a rope ladder, to escape through an upper story window. If a home office or work area is located in a room with only one door, the windows should be large enough to permit exit. If bars are over windows, these should be affixed so that they can be readily detached from the inside. If outside doors have locks that require a key to be opened from the inside, it is important to place extra keys at locations where they can be readily found in case of an emergency.

It is absolutely essential that an assembly point be chosen that is away from the house and the possibility of any falling debris. All family members should immediately proceed to the assembly point in the case of fire, earthquake, or similar major event. Such assembly will confirm that everyone is out of the house, or, if not, who is missing. Emergency responders can then be advised of the situation. If all are accounted for, the responders will avoid placing themselves at risk by attempting to rescue someone who, in actuality, has escaped.

All family members should know the number of an out-of-state contact who can be contacted to “check in” if family members are separated, e.g. at work or at school. The contact person can then let other family members know of each person’s location and status.

It is also important to plan evacuation routes if events require evacuation from a disaster area. Planning should include possible alternate routes since primary roads and highways will likely be very crowded. Both Katrina and the 2004 Florida hurricanes demonstrated the importance of having a full tank of gas should it be necessary to evacuate an area. Since an earthquake or other disaster may occur without warning, it is a good practice to “keep the top half of the tank full”. Conversely, it may be necessary to “Shelter in Place”, where doors and windows can be locked; air conditioning and heating systems turned off; windows; and vents and fireplace dampers can be closed. You will be advised via the radio and television emergency communication systems if you do need to shelter in place.

Emergency Communications

A fire, explosion, chemical or biological contamination, earthquake, flood, or severe storm may affect power-generating facilities with a resultant loss of electrical power. Many phones now rely on external power for such items as recording messages, caller ID, and similar services. Loss of power may mean the phones cannot be used. Those at home should consider having a charged cellular phone available for such situations.

It is also advisable to have a portable radio or television with fresh batteries readily available. This will provide access to status reports and guidance from authorities if an emergency occurs.

Smoke and Carbon Monoxide Detectors

Smoke and carbon monoxide detectors should be placed in each floor of the house. Batteries for these devices must be checked annually. Tragically, deaths still occur each year because the smoke detectors in a home struck by fire did not have working batteries. Changing batteries when changing to standard time in the fall is an excellent memory aid for this process.

Carbon monoxide cannot be detected by smell and is not visible. In the United States, approximately 1,800 people die each year from carbon monoxide poisoning. Depending on circumstances, it can be produced by any flame in the house. To reduce risk, never use a fire place or other combustion device indoors that is not properly vented to the outside.

A person exposed to carbon monoxide is not aware of the problem until symptoms, including headache, fatigue, and dizziness, occur. Unfortunately, the symptoms are often considered to be “flu” or a “cold” are treated with aspirin or similar medicine, and the person continues to be exposed to the gas. By the time the person recognizes that something is seriously wrong, he or

she is often so incapacitated that it is not possible to get out of the house, and death ensues. If the exposure occurs while the person is sleeping, the individual is not aware of any problems and dies without waking.

Central monitoring of detectors by an alarm company could be particularly valuable if some occupants were away from the home at the time a fire occurred.

Earthquake or Explosion Preparation

During earth tremors, or if an explosion occurs nearby, it may be wise to leave the home if it can be done immediately. Plan alternate exits from the home ahead of time in the event that the normal exits become blocked. (See “Emergency Escape Routes” above.) If debris is falling, moving under a desk, a sturdy table, or within a doorframe may be the best alternative, although some question the safety of doorframes. If possible, take a cellular phone. (See discussion under “Communication” above.) This will permit contact with rescuers for anyone who is unable to get out of the building. Once outside the building, family members who were home should meet in the previously designated assembly area.

After-shocks from an earthquake or explosion should be expected, and they may be severe. Do not attempt to re-enter the home until advised to do so by authorities. Homes that look sound after an earthquake may be hazardous due to structural weakening that is not readily apparent.

Since the Wasatch Front is an area with significant risks of earthquakes, it is important to take steps to prepare your home. Some recommended steps include the following:

1. Anchor water heaters with a strap affixed to a sturdy wall. Straps are available in hardware stores for self-installation or can be installed by commercial home service personnel.
2. Anchor any bookcases, file cabinets, or other furniture over 42" tall.
3. Do not stack furniture or heavy boxes.
4. Move tall furniture, file cabinets, or other objects away from exits. They should be moved a sufficient distance so that they will not block the exit if they topple over.
5. Do not use tall furniture as room or work area dividers.
6. Secure computers, equipment, and display or bookcases.
7. Store heavy items at floor level.

8. Back-up important work data and store away from the home workplace.
9. Develop an Emergency Survival Kit (See later discussion.)

Fire Response

Fire remains a major hazard for any home. Good housekeeping, avoidance of overloading electrical outlets, use of UnderwritersTM-Approved appliances and cords, and Ground Fault Interrupters will help reduce the risk of fire. Any use of candles or burning of incense must be carefully monitored and the materials properly extinguished.

In view of the heavy concentrations of electrical and electronic computer equipment in home work areas, such areas should be equipped with an ABC (meaning it can be used on paper and wood, grease, or electrical fires) fire extinguisher. ABC fire extinguishers are also recommended for the kitchen, garage, and any floor of the home that does not otherwise have an extinguisher.

It must be recognized that fire extinguishers have limited capabilities. Even if it appears that the extinguisher will stop the fire, the responder should immediately call the fire department by using 911. If calling from the standard house phone, most monitoring agencies will be able to tell the location to the responding fire fighters. At the present time, if using a cell phone, it will be necessary to tell the person receiving your call the location of the home. In addition to calling the fire department, it is important to notify everyone in the home to evacuate the home immediately. Wait in the assembly area for fire fighters to respond.

Solvents may be used in homes to clean equipment or for other purposes. Never use solvents near an open flame, such as the pilot light of a stove, water heater, or furnace. Assure solvents are stored only in properly labeled and tightly capped containers.

If a person smokes in the home, it is imperative that the smoker be alert when smoking. A significant number of home fires occur each year from smokers who fall asleep watching television or are otherwise distracted. Use ashtrays that will not tip and be certain that each cigarette is completely extinguished before leaving the room or disposing of the cigarette.

Power Failure

Loss of power may be due to a simple malfunction in the electrical distribution system or due to a disaster such as an earthquake, tornado, or explosion. Abrupt loss of power can pose serious problems for the home worker as well as other family members. If a power outage happens at night, there is the potential for serious injury in the dark due to falling over an object or down stairs. Lack of light will make it very difficult to evaluate the injury and accomplish any first aid. A flashlight with fresh batteries should be immediately available on each floor of the house. It is also recommended that one be kept at bedside.

With loss of power, heating systems, air conditioning, refrigerators, and telephones that require an electrical source will stop working. A cellular phone will assist in ascertaining the nature of the power failure and expected duration. If the temperature is quite cold or hot, it may be necessary to make alternate living arrangements or use the emergency supplies described below. If an attempt is made to prepare hot food by using propane gas or other fuel, be certain the cooking area is well ventilated and the stove is placed securely so that it will not tip over.

Accidents and First Aid (including poisoning)

Falls, solid and liquid poisoning, fires, and suffocation due to ingested objects are leading causes of deaths in homes. A disabling injury occurs every 5 seconds in homes in the United States. Prompt response and first aid can help prevent deaths or, in the case of an injury, help avoid further injury and speed healing of the injured part. It is recommended each person take a first aid course, such as the one offered by the American Red Cross. Each home should be equipped with a basic first aid kit, complete with instructions that should be reviewed by each family member. You can obtain AFirst Aid Fast® from local chapters of the American Red Cross that provides first aid information and recommendations for a first aid kit. Recommendations of the American Red Cross and others for a basic first aid kit include the following:

- Analgesic, e.g. Acetaminophen, Ibuprofen
- Activated Charcoal (use only if instructed by Poison Control Center)
- Adhesive Tape
- Antiseptic Ointment
- Band-Aids (assorted sizes)
- Blanket
- Cold Pack
- Disposable gloves
- Eye pads
- Gauze Pads and Roller Gauze (assorted sizes)
- Hand Cleaner
- Plastic Bags
- Scissors and Tweezers
- Small Flashlight and Extra Batteries
- Syrup of Ipecac (use only if instructed by Poison Control Center)
- Triangular Bandage

(Note: See information in the 72 Hour Kit section on storing medication for chronic conditions.)

Check First Aid kits regularly, make sure the batteries work, and replace any expired items.

NOTE that contents of a First Aid kit may be dangerous--they must be kept in a secure place out

of the reach of young children.

Poisoning has always been one of the leading causes of fatalities in the home. Prompt action is essential in any poisoning, and a Poison Control Center can give rapid instruction on the best way to treat ingestion of a toxic substance. The national number for poison control centers is 1-800-222-1222. Keep the number readily available but, if not available, most 911 centers can direct you to contact with a Center.

Tragically, gun accidents continue to cause deaths in children and adults. Guns must be kept secure to avoid any possible misuse. Accidents involving both children and adults continue to occur because the gun was thought to be unloaded. Gun safety is of crucial importance if weapons are to be kept in the home.

Cardio-Pulmonary Resuscitation (CPR) and the Heimlich maneuver

The Red Cross and other organizations also offer CPR courses, and taking a course is strongly recommended. If infants are in the home, it is essential to take a course that includes the special instructions needed to respond to a problem in an infant or child. Prompt administration of CPR, even if done by only one person, can save a life. The Heimlich maneuver has been highly effective in restoring breathing to people choking on food or other object. As with CPR, it is essential to know how to do the Heimlich on children, who frequently choke on objects they have put in their mouths.

Floods and Other Conditions Requiring Turn Off of Water, Electricity, and Gas

If in a flood plain, the emergency escape plans discussed previously must include plans for rapid evacuation or other appropriate action should a flood occur. Even if not in an area with flood potential, a broken pipe, drain back-up, or similar problems can produce water hazards. Depending on location of the water and electrical equipment or outlets, a serious electrical hazard may result. Extinguishing of gas flame devices may result in release of gas if there is not an automatic shut-off device for such situations. It is important to consider such possibilities in developing emergency response plans and know how to shut off these services.

Emergency Survival Kits: Food, Water, and Other Supplies

In view of the potential for natural or terrorist events that may necessitate evacuating the home, consider obtaining or preparing a 72-hour kit to be used in such an emergency. The kit could also be used while staying in the home even if water, electricity, and natural gas were not available, e.g. after an earthquake. Experience during Katrina suggests it would be wise to plan for periods longer than 72 hours. Kits are available from commercial sources or can be prepared by individuals. One listing of recommended contents for a 72-hour kit follows:

72-Hour Emergency/Survival Kit

This 72-hour kit should meet the needs of your family. Use ready to eat foods your family will eat and hobbies and entertainment your family likes to do. **Include individual medication as required by your family members.** Whatever container is used should be portable. Smaller versions should be kept in vehicles for storm or evacuation situations.

A class ABC fire extinguisher is recommended for each home. (See prior discussion of fire prevention)

You should have:

- | | | | |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----|--------------------------------------------------------------------------------------------|
| 1 | Immediately available | | |
| | A Battery powered radio | | B Rotate medications at least annually to assure they are still potent |
| | B Flashlight and extra batteries | 7 | Suggested Additions |
| | C Cellular phone | | A Family Photographs |
| | D ABC Fire Extinguisher | | B Medical Information Sheet |
| 2 | Emergency Needs | | C Insurance Information |
| | A Instruction Manuals on Emergency Preparedness | | D Photo identification for each Family Member |
| | B Bottled or stored water (1 al/person/day) | | E Will or Trust Information (copies of each) |
| | C. Sleeping bags and blankets | | F Cash in \$20.00 or smaller denominations since ATMs and Credit Card readers may not work |
| 3 | Sanitation Kit | | |
| | A Plastic bucket with tight fitted lid | 8 | Food - Ready-to-eat |
| | B Plastic bags and ties | | A Meats: canned |
| | C Toilet paper | | B Fruit Cocktail |
| | D Disinfectant | | C Peanut Butter |
| | E Improvised toilet seat (for bucket) | | D Powdered Milk |
| | F Feminine hygiene needs | | E Infant Care: Canned milk and bottles |
| | G Paper towels | | F Dried Fruit: (caution - drink plenty of water.) |
| | H Soap | | G Raisins, prunes, fruit leather |
| 4 | Stress Factors | | H Crackers |
| | A Children - coloring book, crayons | | I Paper cups |
| | B Adults - books, needle work | | J Paper plates |
| | C Battery powered TV | | K Plastic utensils |
| 5 | In the Car | | L Can opener |
| | A Standard First Aid Kit | | M Utility knife |
| | B Blanket | | |
| | C Flashlight and batteries | 9 | Stress Foods |
| | D Reflectors and flares | | A Sugar Cookies |
| 6 | Individual Medical Needs | | B Sweetened Cereals |
| | A Provide medications for chronic conditions, such as hypertension and diabetes, in sufficient quantities to last until more normal services become available | 10 | C Hard Candy |
| | | | Standard First Aid Kit (see prior comments) |
| | | | At least one change of clothing for everyone |
| | | | A Including shoes |

Part II: Preparation by Individuals and Families for Terrorism and Pandemics

Preparing for Terrorism Events

The events of September 11, 2001 and the subsequent anthrax exposures have underscored our vulnerability to terrorist attacks. Although these events were tragic, our nation and its response agencies are now better prepared to respond to terrorist events. Additionally, health providers are now poised to recognize, *and treat*, a disease caused by bioterrorism. Early diagnosis and treatment during the anthrax exposures resulted in many fewer deaths than those projected from prior studies that noted a high fatality rate. Bioterrorism agents of primary concern to the Centers for Disease Control and Prevention are those producing anthrax, botulism, pneumonic plague, smallpox, tularemia, and viral hemorrhagic fevers. These agents are called Category A agents, the each one meets the following criteria:

- Easily disseminated or transmitted from person to person
- High mortality rates
- Major public health impacts
- Produce public panic and social disruption
- Require extensive, special public health action

Other terrorist agents are chemical, with the nerve gas used in the Tokyo subways as a classic example; radiological, including the “dirty bomb” or other dispersal of radioactive material, such as the Polonium-210 poisoning in the United Kingdom; nuclear, with particular concern regarding “small” nuclear weapons; and explosive devices, as demonstrated on 9/11 in 2001 and more recently in the London subway bombings. The overwhelming majority of terrorist devices to date have been explosive ones.

Should a terrorist event occur, local, state, and federal agencies would be rapidly involved and able to provide assistance. However, there are planning and other steps individuals can take to respond to the possible threats. These include the following:

1. Ensure all family members receive annual influenza immunizations. Respiratory symptoms are the initial manifestations of exposure to a number of biological agents. Preventing influenza will help reduce concerns in those that would have developed symptoms had they not had the immunizations. Similarly, a history of immunization will aid health providers in evaluating patients who do develop symptoms. (It is recognized that a specific person may still contract influenza even if immunized. However, large numbers of epidemiologic studies have clearly demonstrated that immunizations will dramatically reduce the number of people who contract influenza.)
2. Ensure all family members recognize the need to respond rapidly to unusual events, including:
 - A. If in a shopping mall or other crowd situation, evacuate the area *immediately* and obtain medical evaluation if any of the following occurs (all are suggestive of

exposure to a chemical agent or agents):

- 1.) Sudden occurrence of an unusual odor that permeates the area.
- 2.) Sudden onset of sneezing, coughing, watery eyes, nasal discharge, or shortness of breath.
- 3.) Onset of itching or burning of the eyes or skin.
- 4.) Onset of tremors, twitching of muscles, or other muscular symptoms.
- 5.) Abrupt onset of nausea, vomiting, urination, defecation.
- 6.) Flush eyes and skin with water if tearing or burning occurs. Remove all clothing with minimal handling to avoid on-going or further contamination.

B. Obtain prompt medical evaluation if any of the following develops:

- 1.) Fever, severe malaise, non-productive or minimally productive cough, headache, respiratory distress. (Several biological agents)
- 2.) Blurred vision, double vision, dry mouth, muscle weakness or paralysis. (Botulism)
- 3.) Unusual skin lesion or lesions, especially black, ulcerated lesions. (Cutaneous anthrax)
- 4.) High fever, prostration, headache followed by rash on face and extremities. (Smallpox)
- 5.) Other unusual or unusually severe symptoms.

C. Suspicious mail or packages, e.g. no, or unknown, return address, excessive postage, excessive tape or string, discoloration, odor, incorrect titles. (CDC recommendations)

- 1.) Do not shake or empty the contents.
- 2.) Do not carry the package or envelope, show it to others, or permit others to examine it.
- 3.) Put the package or envelope on a table or other stable surface.
- 4.) Do not touch, taste, or sniff any contents that may have come out of the envelope or package.
- 5.) Alert others in the area, depart the area, close doors. Turn off ventilation system if possible.
- 6.) Wash your hands promptly with soap and water.
- 7.) Notify police or security personnel.

What about gas masks?

A properly fitted “gas mask” will protect against inhalation of bioterrorism agents as well as some chemical agents. However, such a mask must be “fit tested” by professionals to preclude leaks. The filtering cartridges must be kept current to assure effectiveness. Since bioterrorism agents cannot be seen, one would have to wear the mask 24 hours a day 7 days a week to be certain of effectiveness.

As anyone who has used such a mask will attest, the masks are uncomfortable and 24/7 use is not practical. Additionally, many chemical agents are absorbed through the skin so the mask would not prevent toxic effects from such agents.

Respirators, e.g. N-95 respirators, are filtering face-pieces that may be effective in filtering bacteria and viruses. However, they must be fitted as snugly as possible to reduce inhalation of small particles or dispersing similar particles when the wearer sneezes or coughs. Face masks, such as surgical masks, are more comfortable for prolonged wearing, but not as effective as N-95 respirators in reducing the inhalation of pathogens.

Preparing for Pandemics:

Dr. Gerberding, Former Director of the Centers for Disease Control and Prevention (CDC), has appropriately commented, “It is not ‘if’ we have an influenza pandemic but ‘when’.” Recent estimates are that an influenza pandemic of the severity of the 1918 outbreak would produce illness in 80 million people in the United States, with 45 million needing hospitalization and 2 million deaths. In Utah, 800,000 patients would be infected and 4,000 people would die.

Of course, the H5N1 Avian Flu outbreaks could present a new challenge. To date, almost all of the cases of this disease in humans have been the result of close contact with infected birds. However, the human mortality rate has been over 50%. Influenza viruses are known for their ability to mutate, and if the virus mutates to permit human-to-human transmission, the stage would be set for a serious pandemic. The 1918 influenza pandemic, as well as more recent ones, has been due to an avian flu variant.

The recent outbreak of Severe Acute Respiratory Syndrome (SARS) illustrates the threat from emerging infections. SARS spread rapidly around the world, and required a hospital in Toronto to close because it became a source of the disease. Fortunately, rapid public health action controlled the situation before widespread outbreaks occurred.

There are a number of steps that can be taken to respond to widespread respiratory disease outbreaks, such as the 2009 H1N1 event. It will be important to avoid crowds. Police, fire, hospitals, and business organizations may experience absentee rates of approximately 40%. Such absences will have a severe impact on the services that can be provided. It would be appropriate to increase home stores of food, water and other necessities to avoid having to visit locations with crowds. Currently, it is recommended that you plan to have such supplies available for periods of 2 to 4 weeks in preparing for a pandemic. You may wish to expand the other supplies in your “72-hour” kit. If possible, prepare to work from home to the extent possible and recognize that schools may be closed. Frequent hand washing, covering coughs, avoiding touching the face, and use of disposable tissues are of particular importance. Ill people should stay home and voluntary home quarantine if a member of the family is ill may also help control influenza transmission. Dust masks from local hardware or similar stores can provide some protection as will N-95 respirators obtained from medical supply houses. However, as of 4 May 2009, the CDC notes “Information on the effectiveness of facemasks and respirators for the control of influenza in community settings is extremely limited. Thus, it is difficult to assess their potential effectiveness in controlling swine influenza (H1N1) virus transmissions in these settings.”

(<http://www.cdc.gov/h1n1flu/masks.htm>) Government agencies have plans to provide additional instructions by television or radio. The Web site, www.pandemicflu.gov has a special link to planning by individuals for avian or other influenza pandemics.

Summary:

Disasters will occur, and those who have planned for their response will take more effective actions than those who have not. Plans need to address the areas discussed above and be reviewed with all family members at least annually. Use the Internet or other government contacts to update information as disaster response planning at the national and state levels progresses.

Sources for Additional Information

www.emergency.cdc.gov (Site with links to chemical, biological, radiological, nuclear, and explosive terrorism as well as natural disasters and other mass casualty situations.)

www.pandemicflu.gov (Provides latest information on influenza threats and situations—see extract below.)

Pandemic Flu Planning Checklist for Individuals and Families

You can prepare for an influenza pandemic now. You should know both the magnitude of what can happen during a pandemic outbreak and what actions you can take to help lessen the impact of an influenza pandemic on you and your family. This checklist will help you gather the information and resources you may need in case of a flu pandemic.

1. To plan for a pandemic:
 - Store a supply of water and food. During a pandemic, if you cannot get to a store, or if stores are out of supplies, it will be important for you to have extra supplies on hand. This can be useful in other types of emergencies, such as power outages and disasters.
 - Have any nonprescription drugs and other health supplies on hand, including pain relievers, stomach remedies, cough and cold medicines, fluids with electrolytes, and vitamins.
 - Talk with family members and loved ones about how they would be cared for if they got sick, or what will be needed to care for them in your home.
 - Volunteer with local groups to prepare and assist with emergency response.
 - Get involved in your community as it works to prepare for an influenza pandemic.
2. To limit the spread of germs and prevent infection:
 - Teach your children to wash hands frequently with soap and water, and model the correct behavior.
 - Teach your children to cover coughs and sneezes with tissues, and be sure to model that behavior.
 - Teach your children to stay away from others as much as possible if they are sick. Stay home from work and school if sick.
 - Consider use of a face mask (from hardware stores, etc.) or N-95 respirator, available from medical supply houses and on-line.

3. Items to have on hand for an extended stay at home:

Examples of food and non-perishables	Examples of medical, health, and emergency supplies
› Ready-to-eat canned meats, fruits, vegetables, and soups	› Prescribed medical supplies such as glucose and blood-pressure monitoring equipment
› Protein or fruit bars	› Soap and water, or alcohol-based hand wash
› Dry cereal or granola	› ibuprofen › Medicines for fever, such as acetaminophen or
› Peanut butter or nuts	› Thermometer
› Dried fruit	› Anti-diarrheal medication
› Crackers	› Vitamins
› Canned juices	› Fluids with electrolytes
› Bottled water	› Cleansing agent/soap
› Canned or jarred baby food and formula	› Flashlight
› Pet food	› Batteries
	› Portable radio
	› Manual can opener
	› Garbage bags
	› Tissues, toilet paper, disposable diapers