



Wireless Information System for Emergency Responders

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Specialized Information Services

WebWISER Home Substance List Help Identify Tools Help

Current Profile 1st Responder

Wireless Information System for Emergency Responders

WebWISER Home Substance List Help Identify Tools Help

Current Profile 1st Responder

Select your profile to customize WISER's content to better suit your role in an emergency.

Other Chemical Emergency Resources at NLM

- Chemical Hazards Emergency Medical Management (CHEMM)
- Radiation Emergency Medical Management (REMM)
- TOINET
- MedlinePlus offers trusted links to general health topics
 - Fire Safety
 - Disaster Preparation and Recovery
 - Poisoning
 - and more.
- Household Products Database
- Tox Town
- Other Environmental Health Topics

Other Chemical Emergency Resources

- DOT ERG - (Department of Transportation - Emergency Response Guidebook)
- EPA Chemical Fact Sheets
- ATSDR ToxFAQs
- New Jersey Hazardous Substance Fact Sheets
- CHEMTREC
- CDC's Chemical Emergency Preparedness and Response

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National Institutes of Health, Health & Human Services

WebWISER is best viewed with the following browsers (indicated version or higher): Internet Explorer 7, Firefox 24, Safari 3.2, or Google Chrome 30.

WISER is also available as a stand-alone application for PCs and various PDAs, including iOS and Android devices). See the [WISER home page](#) for free downloads and more information about WISER.

Symptom Category
Respiratory

Options

- irregular breathing - 425
- slow breathing - 272
- rapid breathing - 316
- shortness of breath - 407
- wheezing - 294
- respiratory arrest - 276
- resp burning/irritation -

Selected Symptoms

Body Temp

Skin

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Current Profile 1st Responder

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1. Introduction

The Wireless Information System for Emergency Responders (WISER) is a system concept for providing first responders at the scene of hazardous material incidents – chemical, biological, or radioactive – with integrated information, decision support, and communications. WISER provides critical chemical information quickly and conveniently on mobile devices, such as PDAs, Windows Desktop computers, tablet computers, field laptops, and mobile phones. It aids in the identification of unknown chemicals and, once the chemical is identified, provides guidance on immediate actions necessary to save lives and protect the environment. Substance information and identification properties come from [PubChem](#), developed and maintained by the National Library of Medicine.

WISER currently exists as a standalone application for the Microsoft Windows, iOS, and Android platforms and as a web application; this document describes the web application version of WISER, WebWISER, that is often referred to as simply WISER below. WISER contains PubChem information and decision support logic for 500+ substances (future versions will provide access to more substances). The substances were chosen based on first responder inputs, the degree of chemical hazard, and the historical frequency of incidents. The WISER application assists first responders in rapidly determining the substance involved and gives the first responder critical information regarding the substance, allowing them to take the necessary immediate actions to minimize the effects of the hazmat incident.

1.1. Features

- Access to NLM's PubChem and Chemical Hazards Medical Management (CHEMM) content, which contains a wealth of detailed, peer-reviewed information on hazardous substances
- Comprehensive decision support, including assistance in identification of an unknown chemical or chemical syndrome and guidance on the immediate actions necessary to save lives and protect the environment
- GIS support provides for isolation/protective distance overlays on a map of the incident
- Tools and reference materials, including triage tools, radiological incident support, and WMD response guidelines
- User Profiles enable users to specify the role they are currently playing at the scene of an incident: first responder, HAZMAT specialist, EMS specialist, hospital provider, or preparedness planner. The application interface is customized so that the information most relevant to the respective job can be quickly accessed.
- Biological substance list and substance data
- Radiologicals
 - Radioisotope substance list and substance data
 - Tools and reference documentation for on-scene support of radiological events

1.2. System Requirements

WebWISER requires a computer with access to the internet and is best viewed on the following browsers:

- Google Chrome 30 or greater

- Mozilla Firefox 24 or greater
- Internet Explorer 7.0 or greater
- Safari 5 or greater

1.3. Disclaimer

The U.S. Government does not warrant or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed.

It is not the intention of NLM to provide specific medical advice to the public, but rather to provide users with information to better understand their health.

NLM does not endorse or recommend any commercial products, process, or services.

2. A Walkthrough of WISER

NIH U.S. National Library of Medicine
Specialized Information Services

WISER

Wireless Information System
for Emergency Responders

WebWISER Home Substance List Help Identify Tools Help

Current Profile Hazmat Specialist

Welcome to WebWISER

WISER is a system designed to assist emergency responders in hazardous material incidents. WISER provides a wide range of information on hazardous substances, including substance identification support, physical characteristics, human health information, and containment and suppression advice. To get started, configure your profile and select an item below.

Known Substances
Search for a substance within WISER's database of known substances.

Help Identify Chemical
Identify an unknown chemical based on its physical properties, symptoms of exposure, the environment, and other criteria.

Tools
Explore general tools and reference material.

Latest News

- What's New - WISER 5.4
- What's New - WISER 5.3

WISER is best viewed with the following browsers (indicated version or higher): Internet Explorer 9, Firefox 26, Safari 7, or Google Chrome 30.

WISER is also available as a stand-alone application for PCs and various mobile platforms, including iOS and Android devices. See the [WISER home page](#) for free downloads and more information about WISER.

Other Chemical Emergency Resources at NLM

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- ATSDR ToxFAs
- New Jersey Hazardous Substance Fact Sheets
- CHEMTREC
- CDC's Chemical Emergency Preparedness and Response

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National Institutes of Health, Health & Human Services

WebWISER is accessed by visiting <http://webwiser.nlm.nih.gov> with your browser of choice.

The remainder of this section details the functionality of WISER using a walkthrough of two typical scenarios. The first of these scenarios discusses the use of WISER when dealing with a known substance. This scenario demonstrates how to search for a specific WISER substance, details several options for browsing WISER's set of substances, and explains how to delve into WISER's extensive database of substance information. The second of these scenarios demonstrates the Help Identify Unknown Chemical feature of WISER, a feature that allows the user to identify a chemical substance using its physical properties, symptoms of exposure, the environment, and other criteria.

Look for this symbol  for quick tips that can help you take advantage of advanced WISER features.

2.1. Known Substance

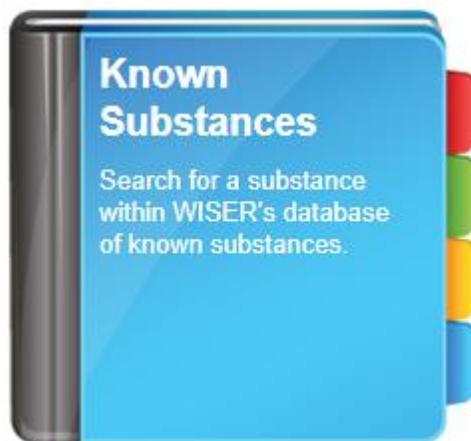
In the known substance scenario, you are the first responder at a scene. There is an overturned cargo tank with the words 'Hydrogen Peroxide' on the side; the papers on board and the driver verify that it is hydrogen peroxide. There is a small fire caused by the engine on the cargo tank. The driver of the truck has been splashed with hydrogen peroxide and may have ingested some of it.

2.1.1. Assess the Scene

Use WISER to assist you with the immediate tasks at hand:

1. Clear out an appropriate area around the tanker truck
2. Treat the driver.
3. Respond to the small fire.

First, select the Search Known Substances button from the WISER home page or Substance List from toolbar.



Search for the substance by name. Enter 'Hydrogen Peroxide' into the Search text field.

Search Known Substances

Search Text

Browse By Category

- Substance Type
- DOT Hazard Classifications
- CDC Bioterrorism Agents/Diseases
- WMDs
- Miscellaneous Categories

Total: 98

	Hydrogen	name
	Hydrogen-3 Tritium, Radioactive	alias
	Anhydrous Hydrogen Bromide Hydrogen Bromide	alias
	Anhydrous Hydrogen Fluoride Hydrogen fluoride	alias
	Aqueous hydrogen chloride Hydrogen Chloride	alias
	Aqueous hydrogen fluoride Hydrogen fluoride	alias
	Arsenuretted Hydrogen Arsine	alias
	Bicarburet Of Hydrogen Benzene	alias
	Bicarburretted hydrogen Ethylene	alias
	Chromium hydrogen oxide Chromic Acid	alias
	Cyanide, Hydrogen Hydrogen cyanide	alias
	Dihydrogen Hexafluorosilicate Fluosilicic Acid	alias
	Dihydrogen Hexafluorosilicate(2-) Fluosilicic Acid	alias

Find 'Hydrogen Peroxide' in the results list and select it. This will display the substance data page for this substance. By default, the Key Info data item will be displayed. This provides a very brief summary of the most critical information about the substance.

Key Info

- Identification
- Protective Equipment/Clothing
- Protective Distance
- Protective Distance Map
- Fire Fighting Procedures
- Reactivities/Incompatibilities
- Treatment Overview
- ▶ Basic
- ▶ Properties
- ▶ Hazmat
- ▶ Medical
- ▶ Environment

Hydrogen Peroxide

CAS RN: 7722-84-1

Key Info

OXIDIZERS

- These substances will accelerate burning when involved in a fire
- Following product recovery, flush area with water

Find more information on this substance at: [Hazardous Substances Data Bank](#) , [TOXMAP](#) , [TOXNET](#) , [PubMed](#)

To determine the appropriate area to clear out, select the Protective Distance option from the data menu, as shown in the following figure. This brings up the evacuation distance information from the DOT Emergency Response Guidebook (ERG). (The ERG is also accessible by selecting it from the Hazmat submenu.)

- Key Info
- Identification
- Property Summary
- Protective Equipment / Clothing
- Protective Distance**
- Chemical Reactivity
- IDLH
- ▶ Basic
- ▶ Properties
- ▶ Hazmat
- ▶ Medical
- ▶ Environment

Hydrogen peroxide

CAS RN: 7722-84-1

Distance Data Map

Protective Distance

[Distances per ERG Guide 140](#)
[Distances per ERG Guide 143](#)

The following is extracted from [ERG Guide 140](#): OXIDIZERS

PUBLIC SAFETY

- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

- In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the Canada and United States National Response Centers reference document.

[Go to top](#)

The following is extracted from [ERG Guide 143](#): OXIDIZERS (Unstable)

PUBLIC SAFETY

- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

EVACUATION

Spill

- See the [Initial Isolation and Protective Action Distances](#) for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY."

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

- In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the Canada and United States National Response Centers reference document.

[Go to top](#)

Find more information on this substance at: [Hazardous Substances Data Bank](#) , [TOXNET](#) , [PubMed](#)

Treatment of the driver can be determined by selecting the Treatment hot link, as shown below. (The treatment data is also accessible from the Medical submenu).

<ul style="list-style-type: none"> Key Info Identification Protective Equipment/Clothing Protective Distance Protective Distance Map Fire Fighting Procedures Reactivities/Incompatibilities Treatment Overview ▶ Basic ▶ Properties ▶ Hazmat ▼ Medical <ul style="list-style-type: none"> Treatment Overview Health Effects IDLH Threshold Limit Values NIOSH Recommendations 	<p>Hydrogen Peroxide CAS RN: 7722-84-1</p> <hr/> <p>Treatment Overview</p> <p>0.4.2 ORAL EXPOSURE</p> <p>A) MANAGEMENT OF MILD TO MODERATE TOXICITY 1) Treatment is symptomatic and supportive. Water can be administered to dilute the solution in the case of ingestion. Gastric distention may be relieved by insertion of a nasogastric tube and suction. A careful examination should be done to detect any gas formation. Ocular exposure to 3% solution usually requires only thorough irrigation.</p> <p>B) MANAGEMENT OF SEVERE TOXICITY 1) Upper airway injury may require intubation. Patients may require resuscitation for burns. Endoscopy should be performed to assess gastrointestinal tract injury if the patient is symptomatic or if higher concentration ingestion is suspected. Obtain surgical consult for patients with evidence of gastrointestinal tract perforation. If the patient has significant symptoms of oxygen embolism (such as CNS effects), place the patient in Trendelenburg position and consider treatment with hyperbaric oxygen. Treat seizures with IV benzodiazepines or barbiturates. Ocular exposure to high concentrations warrants slit lamp examination and ophthalmologic consultation.</p> <p>C) DECONTAMINATION 1) PREHOSPITAL: Do not induce vomiting or administer activated charcoal. Irrigate any dermal or ocular exposures with large volumes of water. 2) HOSPITAL: Because hydrogen peroxide causes tissue injury rather than systemic toxicity, there is no role for activated charcoal. Insertion of a nasogastric tube to remove gastric contents and to decompress the stomach may be attempted following large ingestions.</p> <p>D) AIRWAY MANAGEMENT 1) Endotracheal intubation should be considered early for patients who have symptoms of upper airway obstruction.</p> <p>E) ANTIDOTE</p>
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Finally, for information on the correct response to the fire, select the Fire Procedures hot link in the data menu, as shown below. (The Fire Procedures is also accessible from the Hazmat submenu).

<ul style="list-style-type: none"> Key Info Identification Protective Equipment/Clothing Protective Distance Protective Distance Map Fire Fighting Procedures Reactivities/Incompatibilities Treatment Overview ▶ Basic ▶ Properties ▶ Hazmat ▶ Medical ▶ Environment 	<p>Hydrogen Peroxide CAS RN: 7722-84-1</p> <hr/> <p>Fire Fighting Procedures</p> <p>Fires caused by the compound are best controlled by large amounts of water. Chemical extinguishers should be used as they hasten decomposition of the peroxide. Fire fighters should wear goggles and self contained breathing apparatus.</p> <p>Water for fires resulting from spillage.</p> <p>If material involved in fire: use water in flooding quantities as fog. Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible.</p> <p>Evacuation: If fire becomes uncontrollable - consider evacuation of one-half (1/2) mile radius.</p> <p>In case of fire, water should be applied by the sprinkler system or by hose from a safe distance, preferably with a fog nozzle. Foam may be necessary instead if the peroxide is diluted in a low density flammable solvent. Portable extinguishers should not be used except for very small fires. Peroxides threatened by fire should be wetted from a safe distance for cooling. /Peroxides, Organic and Inorganic/</p> <hr/> <p>Find more information on this substance at: Hazardous Substances Data Bank , TOXMAP , TOXNET , PubMed</p>
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Customize the hot links and content that appear in the substance data menu by selecting your WISER profile.

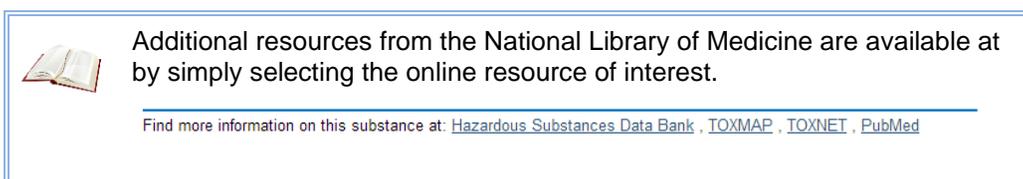
 **Current Profile**  1st Responder 

Select your profile to customize WISER's content to better suit your role in an emergency. 

2.1.2. Dive Deeper

The data presented above is only a small sample of the data provided by WISER. Use the data menu to acquire other information as the situation requires. Here is a small sample of the data that is available for a given substance:

- DOT Emergency Guidelines
- WMD Response Guidelines
- NFPA Hazard Classification
- PPE (Personal Protective Equipment & Clothing)
- Synonyms
- Reactivities & Incompatibilities
- AEGL (Acute Exposure Guideline Levels)
- NIOSH Recommended Exposure Levels
- OSHA Standards
- Environmental Fate
- Non-Human Toxicity Values
- Imagery (biological substances)
- And much, much more



 Additional resources from the National Library of Medicine are available at by simply selecting the online resource of interest.

Find more information on this substance at: [Hazardous Substances Data Bank](#) , [TOXMAP](#) , [TOXNET](#) , [PubMed](#)



WISER substances are categorized. Use the Browse By Category section to filter substances (e.g. all biological substances).

Browse By Category

- Substance Type
- DOT Hazard Classifications
- CDC Bioterrorism Agents/Diseases
- WMDs
- Miscellaneous Cate

Browse By Category

< Any Category

Substance Type

- Chemical
- Radiological
- Biological

2.1.3. Map the Protective Distance

Protective distance data represents the areas likely to be affected during the first 30 minutes after substances are spilled, per the DOT Emergency Response Guidebook. In addition to viewing the raw distance data for a substance, these distances can be visualized on a live map. This feature leverages Microsoft's Bing™ mapping technology.

Open Protective Distance from the Hazmat data menu item and then choose the map tab found below the substance name.

A generic map with no specific location will be displayed. Using an address or specific longitude and latitude, enter a specific spill location.



A full or partial address can be provided. The following addresses are valid examples:

- 9999 Main street, Silver Spring, Maryland
- Main St., Silver Spring, MD
- Silver Spring, MD
- 21023 (a zip code)

Latitude and longitude pairs should be fully specified to guarantee a successful lookup. The rules for parsing are as follows:

- Both numbers must be formed *using the current locale's decimal*

separator, with an optional “+” or “-” prefix

- The numbers must be separated by one of the following, excluding the current decimal separator and with an allowance for extra spaces: “,” “ ”, “-”
- The latitude coordinate, specified first, must be in the inclusive range -90 to 90; the longitude coordinate, specified second, must be in the inclusive range -180 to 180

When the submit button is clicked, if there is no exact match, Microsoft’s Bing™ mapping technology will plot the overlay at the location that most closely matches the search text.

Adjust the parameters of the spill as needed. These parameters include:

- Wind direction (Note that you must point the arrow into wind.)
- Spill size
- Time of day
- Location of spill (for water reactive substances)
- Container Type (for a limited number of substances)
- Wind Speed Type (for a limited number of substances)

Chlorine
CAS RN: 7782-50-5

Distance Data

To plot a protective action distance, first specify a location and wind direction below. Once a distance is plotted, you can drag the spill or right click the map to move the spill to a new location.

Location: 9600 Rockville Pike, Bethesda, MD 20894

Wind Direction:

Spill Size: Large Small

Time of Day: Day Night

Container:

Wind Speed: Low Moderate High

Hide unit labels on map

1000 m

Find more information on this substance at: [Hazardous Substances Data Bank](#) · [TOXNET](#) · [PubMed](#)



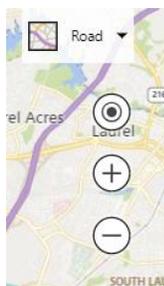
Some substances may have more than one set of distance data. If this is the case, you may select the specific material. By default, the worst case distances are overlaid on the map.

Materials:

Select material or worst case:

Use Worst Case distar ▼

The right corner of the map contains a set of controls that may be used to manipulate the map. You may use these controls to zoom or pan the map. This can also be accomplished with your mouse: click and drag in the map to pan, and use your mouse wheel to change the zoom level. The bottom right corner of the map displays the scale.



The road and aerial options change the type of information provided by the map.



Customize your map by altering your user preferences. These preferences can be accessed through a drop down found beside the protective distance map. Preferences include the colors of the protective distance overlay.

Preferences

Fill

Color

Opacity

2.1.4. Investigate Chemical Reactivity

The chemical reactivity feature of WISER allows a user to investigate the possible hazards involved when mixing two or more substances. Continuing the known substance scenario above, mix Hydrogen Peroxide, the chemical of interest, with gasoline, a potential danger at the scene.

To access this feature, click on the Chemical Reactivity link within the Hazmat data menu. This will bring up an empty worksheet populated only with the initial substance, Hydrogen Peroxide.

Select the Add Chemicals button to search for a new chemical to add to the mix.

In the Chemical Reactivity Search dialog, search for Gasoline by name. Enter 'Gasoline' into the Search field. As you type in the name, the results will update to reflect the current search text. Select the Add to Mixture button next to Gasoline to add this new chemical to the mix. Close the search dialog.

Hydrogen peroxide

CAS RN: 7722-84-1

To begin using the chemical reactivity worksheet, add chemicals to the mix. The report below will update automatically.

Mix

Hydrogen peroxide
Explosive, Strong Oxidizing Agent

Gasoline

Hazard Summary

-  Exothermic reaction at ambient temperatures (releases heat). [?](#)
-  Reaction liberates gaseous products and may cause pressurization. [?](#)
-  Reaction may be particularly intense, violent, or explosive. [?](#)
-  Reaction products may be flammable. [?](#)
-  Reaction products may be toxic. [?](#)

Gases Produced

Alcohols [?](#)
Carbon dioxide [?](#)
Carbon monoxide [?](#)
Ethers [?](#)
Hydrocarbons [?](#)
Oxygen [?](#)

Find more information on this substance at: [Hazardous Substances Data Bank](#), [TOXNET](#), [PubMed](#)

The reactivity worksheet will provide a navigable report consisting of the hazards and gases that may result from the current mixture. Intrinsic hazards, displayed in grey just under the chemical name, are also provided.

Hazard Summary

-  Exothermic reaction at ambient temperatures (releases heat) [?](#)
-  Reaction products may be flammable [?](#)
-  Reaction liberates gaseous products and may cause pressurization [?](#)
-  Reaction products may be toxic [?](#)
-  Reaction may be particularly intense, violent, or explosive [?](#)

To display detailed information regarding a specific reaction or set of reactions that caused a particular hazard or gas release, move your mouse over the information bubble found beside the hazard or gas of interest. A popup containing detailed reaction information will be displayed.

Detailed Reaction Information

Oxidizing Agents + Hydrocarbons, Aliphatic Saturated

Materials:

Hydrogen peroxide + Gasoline

Hazards List:

-  Reaction products may be flammable
-  Reaction liberates gaseous products and may cause pressurization
-  Exothermic reaction at ambient temperatures (releases heat)
-  Reaction may be particularly intense, violent, or explosive
-  Reaction products may be toxic

Hazard Notes

Hydrocarbons, Aliphatic Saturated WITH Oxidizing Agents, Strong:

Methane will ignite or explode on contact with BrF5 (Mellor, J.W. 1956. Mellor's Comprehensive Treatise on Inorganic and Theoretical Chemistry. Vol. 2, Supp. 1, p. 172. Longmans, Green and Co Ltd.).

Methane will explode on contact with F2O2, or F2O2/F2O4 mixtures, at cryogenic temperatures (Streng, A.G. 1963. Chemical Reviews 63:615.)

Methane or ethane will explode on contact with dioxxygen



Reactive groups of chemicals may also be added to a mix. While using the Chemical Reactivity Search dialog, select the Reactivity Groups tab to explore these groups. Water, one of these groups, can be added directly from the worksheet by selecting the Add Water button.

Chemicals Reactivity Groups

Enter the name of a reactive group to begin your search

Search Text

Enter Search Text

Acids, Strong Non-oxidizing	Add to Mixture
Acids, Strong Oxidizing	Add to Mixture
Acids, Carboxylic	Add to Mixture
Alcohols and Polyols	Add to Mixture
Aldehydes	Add to Mixture
Amides and Imides	Add to Mixture
Amines, Phosphines, and Pyridines	Add to Mixture
Azo, Diazo, Azido, Hydrazine, and Azide Compounds	Add to Mixture
Carbamates	Add to Mixture
Bases, Strong	Add to Mixture
Cyanides, Inorganic	Add to Mixture
Thiocarbamate Esters and Salts/Dithiocarbamate Esters and Salts	Add to Mixture
Esters, Sulfate Esters, Phosphate Esters, Thiophosphate Esters, and Borate Esters	Add to Mixture
Ethers	Add to Mixture
Hydrocarbons, Aromatic	Add to Mixture
Halogenated Organic Compounds	Add to Mixture
Isocyanates and Isothiocyanates	Add to Mixture
Ketones	Add to Mixture
Sulfides, Organic	Add to Mixture
Metals, Alkali, Very Active	Add to Mixture

2.1.5. Sharing

Note: This feature is only available on devices running WISER 6.0 or later.

Most substance data can be shared from the web application by simply copying the URL from the browser's window. Some more complicated features, however, may require that the link is copied from a button available on the interface. These exception data categories are: protective distance, chemical reactivity, and substance imagery.

Copying a link will, of course, open to the same page on a different web browser. In addition, however, a shared link that is opened on an iOS or Android device running WISER 6.0 or later will open straight to the content in the mobile app.

 In protective distance, the share button is right above the settings pane. If a similar button appears anywhere else within the web interface, then the currently displayed data can be shared. Reference documentation, for instance, also has a share button.



2.2. Unknown Chemical

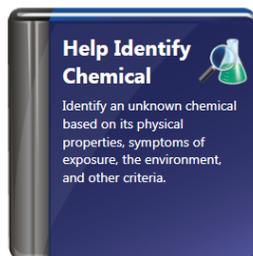
Note: This feature only supports identification of chemicals. The substances in WISER's radioisotope and biological substance lists are excluded.

Note: The tutorial section contains references to substance counts which may change as updated versions of the WISER database are released. This would be caused by the addition of new substances or updates to the search data. The counts reflected in these sections should be used for example purposes only.

In this scenario, you are the hazardous materials specialist responding to an incident at a warehouse. The warehouse has been cleared and the situation has been stabilized. Your primary task is to identify the substance and provide information and recommendations to the incident commander.

The substance in question has been leaking from an unmarked barrel. It has been described as a colorless liquid with an alcohol smell. The workers from the warehouse are showing the following symptoms: nausea, dizziness, headache, eye irritation, and low body temperature.

First, select the Help Identify Unknown Chemical button from the WISER home page or Help Identify from the toolbar.



The initial, or start, help identify page presents the various help identify search criteria available to a first responder as tabs found along the left side of the window.

- Properties: for designating the physical properties of the substance, such as state
- Symptoms: for designating signs/symptoms of victims due to exposure to the substance
- Categories: for classifying a substance by categories, such as “flammable”, “meth lab”, etc.
- NFPA 704: for entering hazard values from a full or partial NFPA 704 placard
- Transport: for indicating the DOT placard found on the transport container, and/or the type of rail car or road trailer used to transport the substance

Results link is used to browse your results, discussed later in this section with the ability to search within them. The Start Over option will return you to this initial screen.

Properties (0 selected)
Symptoms (0 selected)
Categories (0 selected)
NFPA 704 (0 selected)
Transport (0 selected)
Results (438 remaining)
Start Over

Help Identify Unknown

Using the options on the left, identify an unknown **chemical** by selecting criteria from for any combination of the following:

- Physical properties of the substance
- Signs/symptoms from exposure to the substance
- NFPA 704 full or partial placard values
- Substance categories (flammable, meth lab, etc.)
- Transport identification: DOT placard and/or type of rail car or road trailer)

Counts displayed after the criteria options indicate the size of the results list if that option is selected.
Substances not matching ALL selections are eliminated; click **Results** to see a list of the remaining substances.
Click **Start Over** to clear all selections.

Results Count 438 of 438

The Help Identify Unknown Chemical tool presents these options without prompt. Select the criteria appropriate to the current scene and enter the information you know or witness.

In the scene described above, a colorless liquid with an alcohol smell has been discovered. These properties of the unknown chemical can be added as criteria to the search. Select Properties from the menu on the left and select the State button, bringing up the possible values of physical state. Select ‘liquid’ and add it the selected properties using the Add button. The current search results will be reduced to match this newly selected criteria.

Properties (1 selected)

Symptoms (0 selected)

Categories (0 selected)

NFPA 704 (0 selected)

Transport (0 selected)

Results (296 remaining)

Start Over

State

Physical Property Category

State

Color

Options

solid - 55

solid, crystalline - 29

solid, metal - 1

solid, powder - 6

liquid, viscous - 52

liquefied gas - 33

gas - 59

ADD >

< REMOVE

Selected Properties

liquid

Results Count

296 of 438

Following the same process, select colorless from the Color property and select alcohol-like from the Odor property. The results list will be further reduced to match the additional criteria.

Continue by selecting the Symptoms from the menu on the left and adding the criteria described at the scene. The symptoms (nausea, dizziness, headache, eye irritation, and low body temperature) can be added by selecting the body part that shows the symptom and choosing the specific symptom in the presented list.

Properties (3 selected)

Symptoms (5 selected)

Categories (0 selected)

NFPA 704 (0 selected)

Transport (0 selected)

Results (10 remaining)

Start Over

State

Physical Property Category

State

Color

Options

low body temp - 10

high body temp - 9

chills - 9

shivering - 9

ADD >

< REMOVE

Selected Symptoms

nausea

dizziness

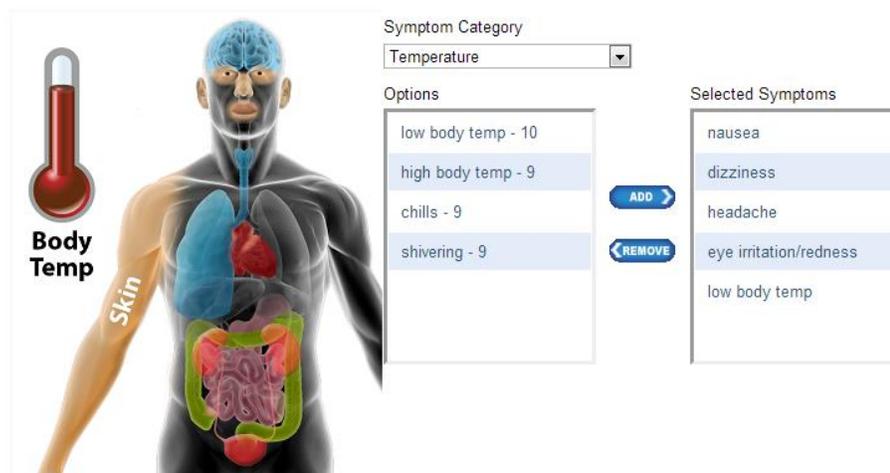
headache

eye irritation/redness

low body temp

Results Count

10 of 438



 Categorization, NFPA 704 placards, and transportation criteria may be specified if that information is available. Enter all the information you know.

Transportation Image Selection
 Select an image to include in your search.

Identify a substance using its placard only if you have not been able to identify the material(s) in transport by ID number or shipping name.



For nausea, click on the stomach and choose nausea. For dizziness and headache, click on the brain and then select the corresponding values in the list. The symptoms of eye irritation and low body temperature can be selected in a similar fashion. For eye irritation, click on the eyes in the image of the human body. Then, select irritation. For low body temperature, click on the image of the thermometer and then select low body temperature.

The current search yields just 12 results, accessed by selecting Results from the left menu. These results may be grouped or sorted, removed if they are known to be incorrect, and, finally, viewed as a substance similar to the process described in section 2.1.

Click the Group By button and select the Specific Gravity grouping found within the Property menu.

Properties (3 selected)

Symptoms (5 selected)

Categories (0 selected)

NFPA 704 (0 selected)

Transport (0 selected)

Results (12 remaining)

Start Over

Click a substance to view its data. Click the button to remove a substance from the results.

List Options

Enter Search Text Group By:

Show Removed Substances

Results: 12 of 438**floats in water (< 1) 5**

 1-Hexanol	Name	<input type="button" value="remove"/>
 Isopropanol	Name	<input type="button" value="remove"/>
 n-Butyl Alcohol	Name	<input type="button" value="remove"/>
 Pinacolyl Alcohol	Name	<input type="button" value="remove"/>
 Sulfur trioxide	Name	<input type="button" value="remove"/>

sinks in water (> 1) 6

 1,4-Dioxane	Name	<input type="button" value="remove"/>
 1-Methylnaphthalene	Name	<input type="button" value="remove"/>
 Dibromomethane	Name	<input type="button" value="remove"/>
 Nitrogen tetroxide	Name	<input type="button" value="remove"/>
 Nitroglycerin	Name	<input type="button" value="remove"/>
 Oleum	Name	<input type="button" value="remove"/>

Unknown 1

 2,3,7,8-Tetrachlorodibenzo-p-dioxin	Name	<input type="button" value="remove"/>
---	------	---------------------------------------

Results Count  12 of 438

Based on the results of the grouping, the user tests the substance and observes that it is not soluble and floats on water. Thus, the “sinks in water” substances can be removed. This is done by clicking the appropriate remove button. This will remove this substance from the current search. Note that the Show Removed Items checkbox may be selected to display these now removed items and, if desired, include these substances in the current search.

The remaining substances must be examined in more detail to determine the correct substance. For example, select Sulfur Trioxide to view its substance data. The Key Info indicates that it is water-reactive. Further investigation and expert analysis on the scene makes it likely that this substance can be removed. Remove this substance from the list by selecting the remove button.

Properties (3 selected)

Symptoms (5 selected)

Categories (0 selected)

NFPA 704 (0 selected)

Transport (0 selected)

Results (4 remaining)

Start Over

Click a substance to view its data. Click the button to remove a substance from the results.

List Options

Enter Search Text Group By:

Show Removed Substances

Results: 4 of 438

floats in water (< 1) 4

 1-Hexanol	Name	<input type="button" value="remove"/>
 Isopropanol	Name	<input type="button" value="remove"/>
 n-Butyl Alcohol	Name	<input type="button" value="remove"/>
 Pinacolyl Alcohol	Name	<input type="button" value="remove"/>

Results Count

The final results of the search are 1-Hexanol, Isopropanol, n-Butyl Alcohol and Pinacolyl Alcohol. Further investigation of each, shows that these hydrocarbons have very similar characteristics and procedures. For example, the Emergency Response Guidelines for three of them are the same.



CHEMM-IST, the CHEMM Intelligent Syndrome Tool, is a new help identify tool that can be used as an aid for identifying the chemical a patient was exposed to in a mass casualty incident. To use CHEMM-IST, simply provide answers to the questions as they are provided. The Syndrome Prediction display will update as more information is provided and the result becomes more certain.

The example below shows the case of Pesticide syndrome. Organic phosphorus pesticides, carbamate pesticides, and the organophosphorus "nerve agents" (e.g., sarin, soman, tabun, and VX) all inhibit acetylcholinesterase, resulting in cholinergic overstimulation. Common signs and symptoms include pinpoint pupils, eye pain, shortness of breath, wheezes, rales, sweating skin, drooling, tearing, vomiting, diarrhea, fasciculation, coma, and seizures. Fill in this information as the pertinent questions are asked. The results in the screenshot below show a high likelihood of an encounter with pesticide syndrome. Select the Pesticide Syndrome link for more information about this syndrome.

U.S. National Library of Medicine

Specialized Information Services

Wireless Informa
for Emergency Re

WebWISER Home
Substance List
Help Identify
Tools
Help
Current Profile
Prep

Guidebooks
Triage Procedures
Radiological Tools
CHEMM Tools

CHEMM Intelligent Syndromes Tool (CHEMM-IST)

Question

SLUDGE?

(salivation, lacrimation, urination, defecation, gastrointestinal, emesis)

Yes

No

Can't Assess

Progress

[State of Alertness?](#) *Unconscious*

[Sudden Onset of Unconsciousness?](#) *No*

[Pinpoint Pupil?](#) *Yes*

[Seizure?](#) *No*

[Cardiac Signs?](#) *No*

[Wheezing?](#) *Yes*

[Wet lungs/Rales?](#) *No*

[Sweaty?](#) *No*

[Irritated or Burning Skin?](#) *No*

[Eye Irritation?](#) *No*

Restart

Syndrome Prediction

[Knockdown Syndrome](#) ↕

0 10

1.0

[Pesticide Syndrome](#) ↕

0 10

8.3

[Acute Solvent Syndrome](#) ↕

0 10

1.7

[Irritant Gas Syndrome](#) ↕

0 10

3.0

Uncertain

More Probable

Most Probable

Assumptions

- The scene is suspicious and/or a reasonably foreseeable setting for a chemical exposure.
- This assumes that an inhalation exposure has occurred and the chemical has not deposited on the skin.
- The form is on the patient's nose.

Clicking on any question (hyperlinked) above in Progress will allow you to go back to the question to select a different answer. The subsequent answers will be erased.

3. Appendix

3.1. Tools

WISER includes a set of utilities and reference materials along with the Known Substance and Help Identify Unknown Chemical functionality discussed above. Access tools using a button on the WISER home page or via the top menu.

Tools fall into one of three categories, outlined below.

- General utilities with their own unique content and functionality.
- Algorithms – these are presented in an “algorithm viewer” which allows the user to respond to questions and walk through a path of an algorithm or flow chart in a “wizard-like” fashion.
- Reference Materials – these are instances of reference documentation, and are presented in a reference material viewer that provides for the browsing of all reference materials.

3.1.1. General Tools / Utilities

Many tools simply provide a specific piece of functionality that compliments existing WISER features. These tools, such as Radiation Unit Converter shown below, provide a specific functionality for a specific task.

Radiation Unit Converter

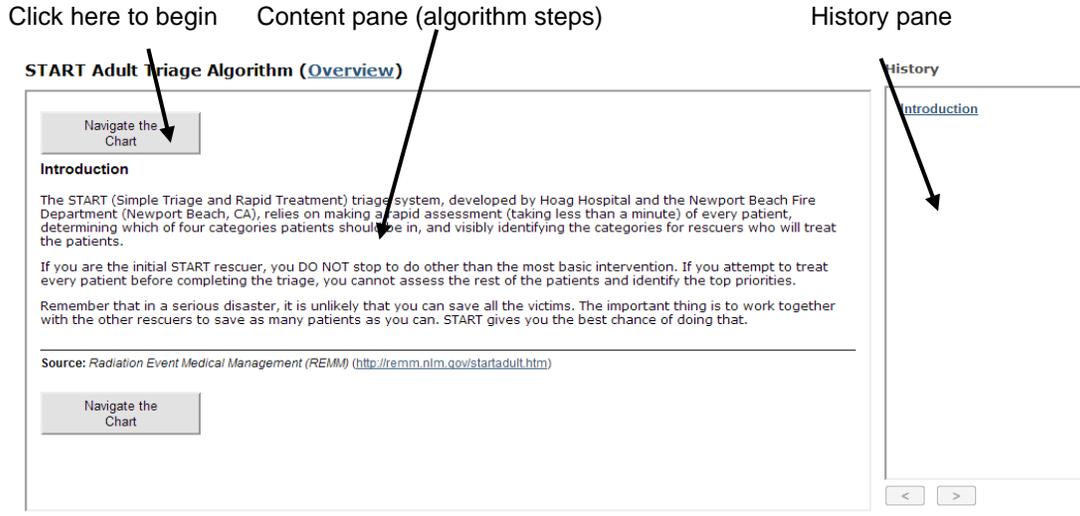
Conversion Type
 From

Unit	Abbrev	Value
millicurie	mCi	1,000
microcurie	μCi	1,000,000
nanocurie	nCi	1,000,000,000
picocurie	pCi	1.00e+012
becquerel	Bq	3.70e+010
terabecquerel	TBq	0.037
gigabecquerel	GBq	37
megabecquerel	MBq	37,000
kilobecquerel	kBq	37,000,000

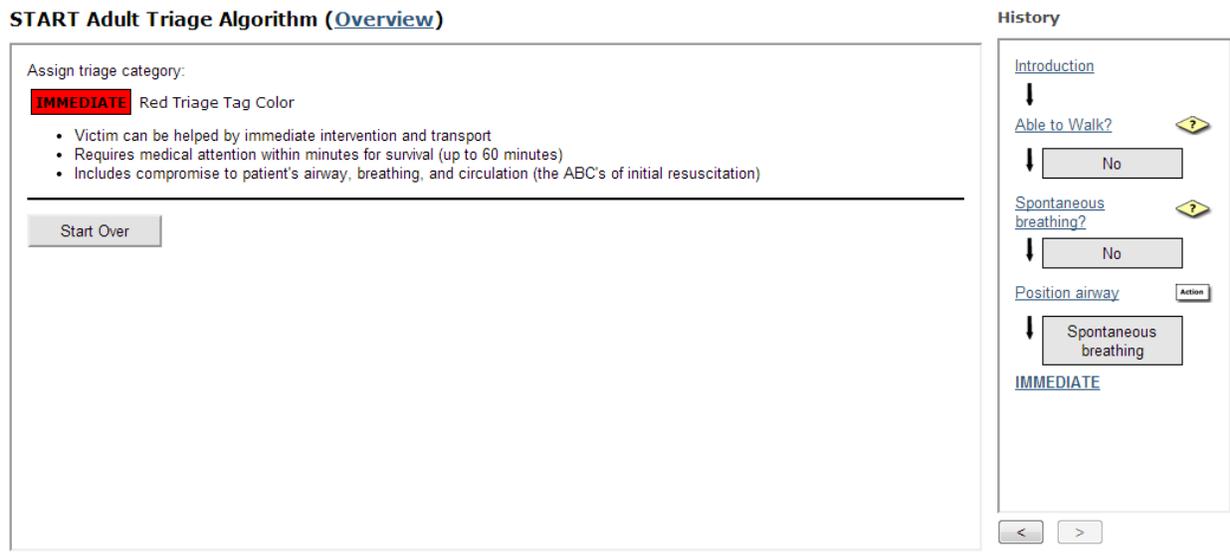
3.1.2. Algorithms

An algorithm viewer is available for helping the user walk through processes that involve multiple steps and decision points, often presented as a “flow chart”. In the WISER Toolbox, these tools are displayed with a flow chart symbol next to them: . Examples include the START and JumpSTART triage algorithms.

The initial display for an algorithm consists of an introduction, a button to begin navigation of the algorithm, and an Overview that previews the entire algorithm. Press the navigate button, and respond to the questions presented until an endpoint is reached (the content pane will not contain any responses to select).



The left and right arrow keys at the bottom of the history pane provide for backing up and going forward through the steps already visited. To quickly return to a specific step, click that step in the list displayed in the history pane. Upon returning to a previous step, a different response can be chosen, and navigation resumes at that point of the algorithm. Boldface is used in the history pane to highlight the step that is currently being viewed in the left content pane.



3.1.3. Reference Materials

Reference material options in the toolbox are displayed with a small note next to them.

Selecting any of these opens a reference material viewer with two panes:

- The right pane displays the selected content.
- The left pane contains a “tree” representing the table of contents of all reference materials for a particular grouping, for example, all radiological reference materials. This tree can be used to navigate to and display the other documents included within the current material subject.

In the table of contents, individual documents can be selected within the table of contents to view their content in the right pane. In addition, documents grouping will concatenate all of their containing children.

A toolbar along the top of the reference material viewer allows for navigation back and forth through the history of previously viewed documents, as well as a print button that will print the contents of the right pane.

Chemical Medical Management Information

<
>
Print Document

Acute Patient Care Guidelines

▼ **Procedures**

- ▶ First Responder
- ▶ Hospital Provider
- ▶ Preparedness Planner
- ▶ Types of Emergencies
- ▶ Initial Event Activities
- ▶ Patient Management
- ▶ Medical Treatment Modifiers
- ▶ Tools, Guidelines, and Planning
- ▶ References, Data Center

On-site Activities

- [Major Goals of the Initial Response](#)
- [Protective Actions](#)
- Specific Types of Emergencies
 - [Discovering an Event](#)
 - [Public Incident](#)
 - [Terrorist Incident](#)
 - [Transportation Accident](#)
 - [Industrial Accident](#)
- **See also:** [Personal Protective Equipment \(PPE\) Guidance](#)
- **See also:** [Triage Guidelines](#)
- **See also:** [Decontamination Procedures](#)

Major Goals of the Initial Response

1. [Notify local authorities](#)
2. **Establish local on-site** [Incident Command System](#) (OSHA)
 - [FEMA Hazardous Material Incident Guidelines](#) (DHS/FEMA)
3. **Establish Control Zones:**
 - [Estimation of protective distance/threat zone](#)
 - **Hotzone/perimeter security**
 - Rescuers should be trained and appropriately attired before entering the Hotzone. If the proper equipment is not available, or if rescuers have not been trained in its use, call for assistance from a local or regional HAZMAT team or other properly equipped response organization.
 - Rescuer Protection - When a chemical is unidentified, worst-case possibilities concerning toxicity must be assumed. The potential for severe local effects (e.g., irritation and burning) and severe systemic effects (e.g., organ damage) should be assumed when specific rescuer-protection equipment is selected.
 - Respiratory Protection: Pressure-demand, self-contained breathing apparatus

4. About NLM

The National Library of Medicine (NLM) is the world's largest medical library. The NLM is part of the National Institutes of Health, an agency of the U.S. Department of Health and Human Services.